

Implementing Hospital Autonomy in Jordan: An Economic Cost Analysis of Al Karak Hospital

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Prepared by:

Ayyoub S.K. As-Sayaideh, MD
Ministry of Health, Jordan

Abdel Razzaq S.H. Shafei, MD
Ministry of Health, Jordan

Dwayne A. Banks, PhD
Abt Associates Inc.

Alia Muhtaseb, BS
Abt Associates Inc.



Partners for Health Reform*plus*



Abt Associates Inc. ■ 4800 Montgomery Lane, Suite 600
Bethesda, Maryland 20814 ■ Tel: 301/913-0500 ■ Fax: 301/652-3916

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Contributors

The following persons are members of workgroups established at the Al Karak hospital to assist with the hospital decentralization effort. Their contributions to data gathering made this report possible.

Dr. Sultan Ma`ad Allah El Tarawneh

Dr. Youssef Mostafa El Sararyeh

Dr. Ali Mansi El Hamaideh

Dr. Ibrahim Ahmad El Adaileh

Dr. Abd El Khader Mahmoud El Habashneh

Dr. Zakaria Hassan El Nawaiseh

Pharmacist Zeena Atallah El Halaseh

Engineer Rashad Taha Kassarbeh

Mr. Naser Ghadeer El Sareireh

Mr. Amjad Khalil El Ma`dnat

Mr. Wajdi Ayed El Ma`jali

Mr. Radi Hasan El Ja`afreh

Mrs. Rehab Micha`eel El Halaseh

Mrs. Mahdeyeh Ibraheem Aka`wei

Miss Fayzeh Yakoub El Houra`ni

Mr. Nabeel Hasan El Houra`ni

Mrs. Hya`at Yaseen El Nawaiseh

Miss Fawzayeh Abd El Mahdi El Bou`toush

Mrs. Enshra`h Hamoud El Nawaiseh

Mr. Sakher Loutfi El Ha`addin

Mrs. Em`an Ali Mo`uafi

Mr. Amjad Kame`l El Majali

Mr. Falah Za`al El Tarawneh

Mr. Isma`el Hassan El Jara`ah

Mr. Noor El Deen Salem El Maiyt`eh



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- ▲ *Generation of new financing for health care, as well as more effective use of existing funds.*
- ▲ *Design and implementation of health information systems for disease surveillance.*
- ▲ *Delivery of quality services by health workers.*
- ▲ *Availability and appropriate use of health commodities.*

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and:
Karen Cavanaugh, CTO
Policy and Sector Reform Division
Office of Health and Nutrition
Center for Population, Health and Nutrition
Bureau for Global Programs, Field Support and Research
United States Agency for International Development

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Abstract

Faced with limited resources and increased demands being placed upon its health care sector due to the changing pattern of diseases and rising consumer expectations, the Ministry of Health (MOH) of the Hashemite Kingdom of Jordan is seeking ways to improve the operating efficiency of its 23 public hospitals. One way to achieve the objective is to provide hospital directors with greater managerial control over their daily decision-making. As such, the government of Jordan has been engaged during the past three years in a hospital autonomy (hospital decentralization) pilot project with Princess Raya and Al Karak hospitals. To date the MOH has completed the first three phases of that project: Phase 1 (the pilot site selection process), Phase 2 (the implementation of short-run changes in operating procedures), and Phase 3 (estimating the costs of services at the hospitals). This document details Phase 3 activities, presenting the first-ever detailed cost analysis of Al Karak hospital. This analysis is of import, given that the MOH is considering the allocation of a partial or complete operating budget to the hospital director, at a later date.

Table of Contents

Acronyms.....	xiii
Acknowledgments.....	xv
Executive Summary	xvii
1. Background	1
1.1 Decentralization of Jordan’s Public Hospitals	1
1.2 Al Karak Hospital	2
1.3 Organization of This Report	3
2. Background on Hospital Cost Analysis	5
2.1 Basic Concepts of Hospital Costing.....	5
2.2 Basic Methodology	7
3. Accounting for Variable Input Costs	9
3.1 Labor Costs Estimations	9
3.2 Labor Costs per Unit Output.....	14
3.3 Nonlabor Variable Factors of Production.....	19
3.4 Nonlabor Variable Factors by Cost Center	21
3.5 Estimations of Per Unit Variable Cost	24
3.6 Distribution of Variable Drug Costs	26
4. Accounting for Fixed Input Costs.....	29
4.1 Estimating Costs of Fixed Inputs	29
4.2 Distribution of Fixed Costs by Cost Center	31
4.3 Estimating Per Unit Fixed Cost	32
5. Estimating Total Hospital Costs	35
5.1 Distribution of Total Costs by Cost Center	35
5.2 Total Costs Per Unit of Output	37
6. Policy Implications and Conclusion	39
Annex A: Summary Tables of Allocation Rules.....	41
Annex B: Service Inventory of Al-Karak Hospital	43
Annex C: Fixed Assets (Equipment and Furniture Inventory) of Al Karak	47
Annex D: Bibliography	65

List of Tables

Table ES-1: Total Labor Costs per Patient Day and Adjusted Patient Day.....	xix
Table 1. Snapshot of Al Karak Hospital.....	2
Table 2: Labor Costs, by Employee Category (in JD).....	10
Table 3: Labor Costs in Full-time Equivalents, by Employee Category	10
Table 4: Percent Distribution of Labor Costs, by Employee Category	11
Table 5: Labor Distribution by Cost Center.....	12
Table 6: Labor Costs by Cost Center.....	13
Table 7: Total Labor Costs by Cost Center, Patient Days, Patients, and Adjusted Patient Days.....	14
Table 8: Total Labor Costs by Cost Center, Bed Days, and Occupancy Rate	15
Table 9: Labor Costs by Cost Center, Admissions, and Adjusted Admissions	15
Table 10: Distribution of Total Physician Labor Cost, by Cost Center.....	16
Table 11: Distribution of Physician Labor Cost by Cost Center, Patients, Patient Days, and Adjusted Patient Days	17
Table 12: Distribution of Nursing/Midwives Labor Costs, by Cost Center.....	17
Table 13: Distribution of Nurses/Midwives Labor Cost by Cost Center, Patients, Patient Days and Adjusted Patient Days	18
Table 14: Distribution of Physician and Nurse/Midwife Labor Cost (L_{pn}) by Cost Center, Patients, Patient Days, and Adjusted Patient Days.....	18
Table 15: Average Product of Labor Estimations, by Hospital Cost Center	19
Table 16: Utility Costs Estimates	20
Table 17: Variable Structure and Equipment Estimates	20
Table 18: Variable Hospital Consumables	21
Table 19: Contracted Services	21
Table 20: Non-clinical Supplies	21
Table 21: Distribution of Utility Cost, by Cost Center.....	22
Table 22: Distribution of Non-utility Variable Cost (N_c), by Cost Center	23

Table 23: Distribution of Total Variable Costs (V_c), by Cost Center	24
Table 24: Distribution of Total Variable Costs, by Cost Center, Patient Days, and Adjusted Patient Days	25
Table 25: Distribution of Total Variable Costs, by Cost Center, Admissions, and Adjusted Admissions.....	25
Table 26: Distribution of Total Variable Costs, by Emergency Room and Outpatient Visits	26
Table 27: Distribution of Drug Costs, by Cost Center, Patient Days, Adjusted Patient Days, and Patients	27
Table 28: Distribution of Drug Costs by Emergency Room and Outpatient Clinic Visit.....	27
Table 29: Annualized Economic Costs of Fixed Hospital Structures	30
Table 30: Annualized Economic Costs of Hospital Vehicles	30
Table 31: Annualized Economic Costs of Equipment and Furniture	31
Table 32: Distribution of Fixed Costs (F_c), by Cost Center	32
Table 33: Distribution of Total Fixed Costs, by Cost Center, Patient Days, and Adjusted Patient Days.	33
Table 34: Distribution of Total Fixed Costs, by Cost Center, Admissions, and Adjusted Admissions	33
Table 35: Distribution of Total Fixed Costs, by Emergency Room Visits	34
Table 36: Distribution of Total Costs, by Cost Center	35
Table 37: Percent Distribution of Total Costs, by Cost Center.....	36
Table 38: Distribution of Total Costs, by Cost Center, Patient Days, and Adjusted Patient Days	37
Table 39: Distribution of Total Costs, by Cost Center, Admissions and Adjusted Admissions	38
Table 40: Distribution of Total Costs, by Emergency Room and Outpatient Visits	38
Table 41: Per Unit Daily Hospital Services Loaded With Admin/Finance Costs.....	38

Acronyms

AFC	Average Fixed Costs
ALOS	Average Length of Stay
ATC	Average Total Cost
AVC	Average Variable Cost
DGFA	Director General of Finance and Administration
ER	Emergency Room
FC	Fixed Costs
FTE	Full-time Equivalent
ICU/CCU	Intensive Care/Critical Care Unit
JD	Jordanian Dinar
L_c	Labor Costs
L_n	Labor [Cost of] Nurses
L_p	Labor [Cost of] Physicians
L_{pn}	Labor [Cost of] Physicians and Nurses
MOF	Ministry of Finance
MOH	Ministry of Health
MOP	Ministry of Planning
N_c	Nonutility Cost
OB/GYN	Obstetrics and Gynecology
OR	Operating Room
PHR	Partnerships for Health Reform
PHR_{plus}	Partners for Health Reform _{plus} Project (USAID)
RMS	Royal Medical Service
TC	Total Costs
U_c	Utility Costs
USAID	United States Agency for International Development
V_c	Variable Costs

Currency Conversion

JD 1 = US\$ 1.41

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Finally, we would like to acknowledge the participation and support of our Ministry of Health and PHR*plus* colleagues in Jordan and the United States.

Executive Summary

The Ministry of Health (MOH) of the Hashemite Kingdom of Jordan has expressed keen interest in granting at least partial autonomy to its MOH-owned and -operated hospitals. The Partnerships for Health Reform (PHR), a United States Agency for International Development (USAID)-sponsored project and predecessor to Partners for Health Reform *plus*, began providing ongoing technical assistance during *Phase 1* of the Ministry's short-run hospital decentralization effort. Initial assistance was the sponsorship of a national workshop entitled "Hospital Autonomy in Jordan," held in Amman on 4 October 1998, at the behest of then-Minister of Health, His Excellency Dr. Na'el Al-Ajlouni. The directors general of the 12 health governorates, as well as the directors of all MOH hospitals, attended the workshop (Sindaha-Muna, 1998). During subsequent meetings between PHR and the Minister of Health, it was decided that the MOH would proceed with *Phase 1* of its decentralization efforts. This entailed the selection of two MOH facilities for piloting hospital autonomy in Jordan. The hospitals selected were Princess Raya, in the Irbid governorate, and Al Karak, in the Al Karak governorate. Their selection in April 1999 concluded *Phase 1* (Banks, 1999).

During *Phase 2*, PHR engaged in several activities to achieve the following set of objectives: (1) to establish "Reference Committees" and "Workgroups" within each pilot hospital; (2) to guide each pilot hospital toward achieving its targeted short-run decentralization objectives; (3) to facilitate the implementation of a detailed training plan, consistent with the expected needs of each pilot hospital; and (4) to facilitate the overall implementation of the short-run recommendations, as explicated by the hospital-based workgroups. This information, as well as the short-run procedural changes that were approved and implemented by the MOH, was detailed in a document entitled *Implementing Hospital Autonomy in Jordan: Changing MOH Operating Procedures* (Banks, As-Sayaideh, Shafei, and Ghanoum, 2000).

Finally, *Phase 3* of the Ministry of Health's short-run decentralization activities entailed working closely with PHR *plus* to conduct a detailed cost analysis of hospital services at both Princess Raya and Al Karak hospitals. This document details the results of the study that was conducted at Al Karak hospital during the period 2000-2001. All data reported in this study are for the year 1 January 1999 to 31 January 1999. A similar study was conducted at Princess Raya hospital and is presented in a separate document (Banks, As-Sayaideh, Shafei, and Muhtaseb, 2002).

Background

In Jordan, the governance of MOH hospitals is highly centralized. All significant managerial, budgetary, and procurement matters are ultimately decided by senior-level executives at the MOH headquarters in Amman. This has created a system in which the needs of hospitals and their patients frequently conflict with the policies of the central ministry. This has led many to speculate that MOH hospitals could be more efficiently operated, and the level of quality enhanced, if greater independence were granted to these institutions. In fact, hospital directors have overwhelmingly stated that greater independence over personnel, financial, and procurement matters is necessary for achieving MOH cost-containment objectives. A well-planned, carefully designed policy can take as long as 10 years to fully implement. Hence, the government of Jordan has divided its implementation

plan into short-run and long-run objectives. The country is now completing *Phase 3* of its short-run decentralization objectives: that is, identifying the existing cost structure at MOH hospitals, and the establishment of a *Hospital Policy Forum* to coordinate and disseminate information among various MOH hospital directors.

Phase 3 Activities

The Hospital Decentralization Implementation Team worked closely with the staff at Al Karak hospital, visiting the site weekly throughout the period of this study. In addition to educating hospital staff on the theory and applications of hospital costing, the team guided hospital personnel through the following activities:

- ▲ Establishing workgroups with specific assignments for compiling and analyzing hospital-based data, to include comparisons of hospital-based statistics with those being compiled at the central ministry. This included the development and validation of equipment and drug inventory lists.
- ▲ Building capacity to understand the theoretical aspects of hospital costing. Personnel were provided information on the differences between accounting principles and economic principles in estimating the total economic costs of operating Al Karak hospital.
- ▲ Guiding workgroups on the principles of data validation and various allocation rules for distributing costs among various hospital cost centers. Working with the Implementation Team members, hospital personnel devised allocation rules to distribute various input costs among cost centers.

Once these steps had taken place, the Implementation Team cooperated with the workgroups to develop a strategy for compiling ongoing hospital economic data. For example, a strategy was developed such that the staff at Al Karak hospital is better able to track the flow of drug consumption throughout the hospital, by cost centers.

Hospital Cost Study Major Findings

Among the most important accomplishments of *Phase 3* were the findings of this first-ever detailed cost analysis of Al Karak hospital, as well as the policy implications of such findings. Below are highlights of the findings:

- ▲ The total 1999 operating costs for Al Karak hospital amounted to JD 3,360,523 (\$4,738,337).
- ▲ Total variable costs including labor amounted to JD 2,403,434 (\$3,388,842) and total fixed costs were JD 957,089 (\$1,349,495).
- ▲ Administrative costs within the hospital are JD 438,989 (\$618,974). This amounts to more than 13 percent of the hospital's total operating costs.

- ▲ The major proportion of total hospital costs, 72 percent, are consumed by variable input factors, the largest of which are the labor costs that are associated with the distribution of administrative/financial services, JD 186,085 (\$262,380), roughly 55 percent of total variable administrative/financial costs.
- ▲ In terms of total costs per patient day, which is a proxy for average total costs, the Intensive Care/Critical Care Unit (ICU/CCU) department exhibited the highest, JD 173 (\$244). This is in contrast to the amounts estimated for Surgery, JD 37; Obstetrics and Gynecology (OB/GYN), JD 25; Internal Medicine, JD 27; and Pediatrics, JD 49.
- ▲ The ICU/CCU also exhibited the highest total costs per admission, JD 467 (\$658). This is in contrast to Surgery, JD 107; OB/GYN, JD 47; Internal Medicine, JD 78; and Pediatrics, JD 162.
- ▲ Total labor costs at Al Karak hospital were JD 1,069,288 (\$1,507,696). Of this amount, JD 1,009,940 (\$1,424,015) was for salaries, JD 53,108 (\$74,882) for incentives (bonuses), and JD 6,240 (\$8,798) for transportation allowances—the three largest components of employee compensation within the hospital.
- ▲ The lowest adjusted labor costs per unit are found within the OB/GYN department, which also had one of the highest estimated average products of labor (a proxy for labor productivity), as illustrated by Table ES-1.

Table ES-1: Total Labor Costs per Patient Day and Adjusted Patient Day

Unit	Total labor costs per patient day	Total days per unit of labor	Total costs per adjusted patient day
Internal Medicine	JD 9	284	JD 42
Surgery	19	154	52
OB/GYN	11	248	40
ICU/CCU	27	88	187
Pediatrics	22	133	64
Total	16	180	JD 55

- ▲ There is a need for greater communication between the MOH Accounting Department and Al Karak hospital on the issue of payroll-related expenses. Oftentimes, the personnel files at the hospital do not match the personnel payment records of the Accounting Department. A management information system that provides systematic updates concerning the placement of personnel throughout the MOH is warranted.
- ▲ The average variable cost of an ER and clinic visit is JD 4.76 and JD 3.71, respectively. The implications are that under existing cost-sharing rules the MOH is not recovering its average variable cost for each ER and clinic encounter. In fact, for a certain category of patients, the MOH can recover its average variable costs by increasing its ER co-payment by JD 3.11, and its clinic co-payment for clinic visits by JD 2.06. However, without a more detailed study of the relative productivity of Al Karak hospital, one cannot rule out that the higher

average variable costs estimates are the result of production inefficiencies. Hence, any attempt to recover average variable costs based upon the findings in this study would be premature.

- ▲ Total drug costs for Al Karak inpatient services were JD 128,230 (\$180,804). This amounted to roughly JD 4 per inpatient day, and more than JD 12 per patient.
- ▲ Once daily hospital services, such as Surgery, OB/GYN, Internal Medicine, ICU/CCU, and Pediatrics are loaded with their administrative overhead, the total costs per adjusted patient day is JD 54, JD 38, JD 85, JD 131, and JD 65, respectively.

Conclusions

With the completion of *Phase 3*, the MOH has taken another step forward in its efforts to decentralize its network of publicly owned and operated hospitals. Hospital workgroups, in collaboration with the Hospital Decentralization Implementation Team, have provided the MOH with detailed information on the costs of operating each pilot hospital. This information will provide the MOH with its first information on the cost structure of each hospital and the distribution of such costs across hospital costs centers. Moreover, this study highlights various areas for policy intervention, such as the establishment of a cost-reporting system that tracks and coordinates hospital expenditures throughout the MOH.

1. Background

The Hashemite Kingdom of Jordan is experiencing discouraging economic conditions that include recessionary growth rates, high unemployment, and declining real wages. Such factors place enormous strain on the provision of public services, particularly health care services. As a result, policymakers within the Ministry of Health (MOH) are seeking ways to contain health care costs, while maintaining access to and sustained quality of care, at the country's 23 public hospitals.

1.1 Decentralization of Jordan's Public Hospitals

In Jordan the governance of MOH hospitals is highly centralized. All significant managerial, budgetary, and procurement matters are ultimately determined by senior-level executives, located at the MOH headquarters in Amman. This has created a system in which the needs of individual hospitals and their patients frequently conflict with the policies of the central ministry. This has led many to speculate that MOH hospitals could be more efficiently operated, and the level of quality enhanced, if greater independence were granted to these institutions. In fact, hospital directors have overwhelmingly stated that greater independence in personnel, financial, and procurement matters is a necessary condition for achieving targeted MOH cost-containment objectives. However, they also stress that the poor must be protected from any adverse effects in the drive towards improved efficiency. One method by which the government may reconcile these ends is to grant to hospital directors limited autonomy over managerial, budgetary, and procurement matters. As a result, the MOH through its Hospital Decentralization Implementation Team has engaged in a systematic move towards hospital decentralization over the past three and one-half years. *Phase 1* of that policy was completed in April 1999, with the selection of Princess Raya and Al Karak hospitals as pilot institutions for the hospital decentralization effort (Banks, 1999).

During *Phase 2*, the directors of Princess Raya and Al Karak hospitals were provided limited authority over certain aspects of their daily decision making through changes in MOH operating procedures (Banks, As-Sayaideh, Shafei, and Ghanoum, 2000); this included the establishment of workgroups and committees at each hospital, as well as the training of administrative and technical personnel in various aspects of hospital management and finance.

Over the long run the MOH seeks to provide Princess Raya and Al Karak hospitals with additional limited authority over aspects of their budgetary, planning, and procurement matters. To achieve this, however, the MOH, as well as the hospital directors, need to understand in detail the cost structures at the two hospitals.

During autumn 2000, the Implementation Team initiated *Phase 3* of the decentralization effort. *Phase 3* had two primary components. The first was the development of an organizational development plan for each hospital. The plan provided the MOH with a detailed understanding of the governance structure of each hospital, based upon their short-run decentralization objectives. The second was the aforementioned look at the cost structures at each hospital. Hence, an essential activity of *Phase 3* was a detailed cost analysis at each hospital. This document details the results of that analysis for Al Karak hospital.

1.2 Al Karak Hospital

Al Karak hospital was established in 1996. The hospital is located approximately 145 kilometers south of Amman, in the governorate of Al Karak. The hospital was originally established in 1956 on another site. During the period of this study, the hospital's outpatient facilities were located at that site, which is approximately 7 kilometers from the present location. However, as of spring 2002, a significant share of outpatient care is being provided at a newly established facility that is adjacent to the hospital. Construction of what is currently Al Karak hospital was completed in 1996, as part of a Jordanian and Italian government cooperative. The hospital has a nursing training facility sponsored by the Italian government. Table 1 provides a snapshot of the hospital, as well as a few summary statistics of the governorate.

Table 1. Snapshot of Al Karak Hospital

Al Karak Governorate	
Total population in governorate:	188,600
Unemployment rate:	32.3%
Insured workers:	69.9%
Comprehensive clinics:	5
Primary health clinics:	34
Peripheral clinics:	36
Maternal and child clinics:	38
Hospital Statistics	
Hospital director:	Dr. Sultan Tarawneh
Physical size (m ²):	8,500m ²
Land area (m ²):	60,000m ²
Occupancy rate:	74%
Bed size:	110
Admissions:	11,066
Outpatient visits ¹ :	63,514
Emergency room visits:	36,366
Average length of stay:	2.7 days
Inpatient days:	29,543
Patient coverage:	
Percent MOH (Civil Insurance Program):	45.7%
Percent RMS:	4.2%
Percent uninsured	33.0%
Staff:	
Administrative/Finance:	32
Physicians:	57
Nurses/Midwives:	173
Pharmacists:	7
Technical:	48
Other:	35

¹These are outpatient visits that Al Karak physicians are responsible for at the specialty clinic.

1.3 Organization of This Report

This document is divided into six chapters. Chapter 2 provides an overview of the basic concepts and methodology of hospital costing. Chapter 3 describes the methods for estimating variable input costs as well as the cost estimates themselves. Chapter 4 presents Al Karak hospital's fixed costs estimates, and Chapter 5 contains the estimation of total hospital costs. Chapter 6 provides policy implications and conclusions.

2. Background on Hospital Cost Analysis

2.1 Basic Concepts of Hospital Costing

Over the past 30 years a vast literature has described theoretical and empirical aspects of methodologies for conducting economic analyses of hospital costs. Prominent among these studies is the seminal work that was conducted by Feldstein (1967), and Carr and Feldstein (1967), which describes the production process of the hospital in terms of the economic behavior of a multi-product firm. More recent work in this area includes that of Breyer (1987), Cowing and Holtmann (1983), Granneman, Brown, and Pauly (1986), and Vita (1990). While the vast majority of this work over the past 30 years focused on the economic behavior of hospitals in developed economies, a more recent work by Barnum and Kutzin (1993) examined the developing country context. The hospital costing work that was conducted at Al Karak hospital emanates from this rich body of literature.

Economists define the economic costs of an institution in two ways. In the first, economic costs are defined as the “market value” of all inputs (both variable and fixed) that are utilized during the production process. Alternatively, economic costs are defined as the market value of inputs in their next best alternative use (Binger and Hoffman, 1988). This latter definition is most often associated with contemporary approaches to economic cost analysis in that it directly associates with the concept of opportunity costs. For example, when economists estimate the cost of fixed capital inputs, they consider not only the cash outlay, but also the fact that those funds alternatively could have been invested in an interest-earning bank account. In Jordan, anecdotal evidence suggests that current MOH procurement policies provide some MOH hospitals with equipment for which they have no use. Such idle equipment imposes a cost to the government in that the money used to purchase the equipment might have been invested in an interest-bearing account, or used to purchase needed equipment. Hence, the total cost to the hospital for the purchase of the unneeded equipment is the sum of the explicit costs (i.e., the cash payment) and the implicit costs (e.g., the forgone interest payment). It is this distinction between explicit and implicit costs that differentiates an economic cost analysis from an accounting or financial cost analysis, which would consider only the explicit costs.

To estimate the total economic costs of operating Al Karak hospital, the various inputs utilized to produce the array of hospital services were divided into two categories: variable inputs and fixed inputs (see also Annex B). Economists refer to each of these inputs as “factors of production.” Each is described below:

- ▲ *Variable Inputs* (Variable Factors of Production): Variable inputs are those factors of production whose quantity varies with the level of output. For a hospital, the most common variable input is the labor it employs, i.e., the numbers of nurses, doctors, and ancillary personnel that are optimal for the size of their patient populations. Other variable factors are butane gas, electricity, and medical consumables, which also vary with the number of patients treated. However, it is not uncommon for hospitals in developing economies, such as Jordan, to have labor categories that are constrained by government regulatory policies. In Jordan, MOH and Civil Service rules allow certain labor categories in MOH facilities to be more variable (flexible) than others. For example, MOH hospital directors have greater

freedom to alter nursing labor input than they do physician labor input. In still other systems, i.e., command economies such as many of the former Soviet Republics, labor assumes the economic behavior of a fixed factor of production. In other words, various categories of labor may be variable, semi-variable, or quasi-variable.

- ▲ *Fixed Inputs (Fixed Factors of Production)*: Fixed inputs are those factors of production that cannot be readily changed as the quantity of service production increases or decreases. Examples are capital inputs such as large medical equipment and the hospital structure itself. Costs that are associated with such fixed factors are often referred to as “sunk costs.”

Economic costs are estimated according to two “temporal” dimensions: the long run and the short run. These dimensions, however, refer less to a defined period of time and more to the way a hospital can treat the various factors of production. For example, long-run cost estimations assume that all factors of production are variable; hence, the hospital has significant flexibility in altering its labor/capital mix. Alternatively, short-run cost estimates assume that at least one factor of production remains fixed throughout the production process. The current study—a single case, Al Karak hospital, for a defined period of time, 1999—is a short-run cost estimation.¹ Such short-run estimations adhere to the following set of economic principles:

- ▲ **Total Variable Costs (V_C)**: Total variable costs are the sum of the costs of variable factors of production. A few examples are labor, utility, structure and equipment, and nonclinical supplies. Chapter 3 discusses these costs at Al Karak hospital.
- ▲ **Total Fixed Costs (FC)**: Total fixed costs are the sum of the costs of the various fixed factors of production. Chapter 4 estimates the total costs of such factors, examples of which are structure, vehicle, equipment, and furniture.
- ▲ **Total Cost (TC)**: Total costs are the summation of total variable costs and total fixed costs. Unlike variable factors of production, the costs of fixed factors must be considered in terms of their annualized depreciation costs as well. As stated previously, this report estimates short-run total costs, given the existence of fixed factors of production.
- ▲ **Average Variable Costs (AVC)**: Average variable cost is the ratio of total variable costs to a particular output category. Several AVC combinations can be estimated for hospitals, because a hospital can be viewed as a multi-product institution. Several standard output proxies capture this multi-product nature of hospital services production. The output proxies that were utilized in this study are inpatient days (both adjusted and unadjusted), admissions (both adjusted and unadjusted), bed-days, patients, and visits. The most commonly estimated AVC is the ratio of total variable costs to total inpatient days.
- ▲ **Average Fixed Costs (AFC)**: Average fixed cost is the ratio of total fixed costs to a particular output category. The hospital as a multi-product institution is relevant to AFCs as well as to AVCs. Hence, AFC estimations can be considered within the context of the various output proxies mentioned above.

¹ Long-run cost functions are typically estimated through the employment of time-series data for a statistically significant sample of facilities.

- ▲ **Average Total Costs (ATC):** Average total cost is the ratio of total costs to a particular output category. Again, the multi-product nature of the hospital allows for various ATC estimates to be obtained, depending upon the category of output utilized in the numerator.

There is one additional common and most important category of cost: marginal cost. Marginal cost is the change in total costs over a defined time period, relative to a particular output category. Estimating marginal costs of a particular output requires data on unit costs from at least two time periods. In cross-sectional studies, such as the current study, which uses data from a single period of time, marginal costs estimates are unobtainable.

2.2 Basic Methodology

With the oversight of the Hospital Decentralization Implementation Team and using a detailed list of all services offered by Al Karak hospital (see Annex A for an inventory of services), the hospital workgroups divided the services into two major “cost center” categories: Daily Hospital Services and Ancillary and Support Services. Once agreement was reached on the two broad classifications, the workgroups further divided the services into cost center subcategories. Under Daily Hospital Services, services that require similar labor and capital inputs and that treat patients with similar maladies were grouped into a single cost subcategory; those that require distinctly different inputs and treatment patterns were classified separately. For example, the Surgery cost center includes urological, gastrointestinal, ophthalmic, and other categories of general surgery, as well as its subspecialties. Intensive care surgical, coronary, and burn services were placed in the Intensive Care Unit/Critical Care Unit (ICU/CCU) cost center. Other cost centers include Obstetrics/Gynecology (OB/GYN), Internal Medicine, Operating Room (OR), Pediatrics, Emergency Room (ER), and Outpatient Clinic departments.

Ancillary and Support Services comprises Administration/Finance, Rehabilitation, X-ray, Laboratory, Pharmacy, and Food and Beverage departments. As with Daily Hospital Services, cost center subcategories were determined based upon their inputs, as well as the outputs (services) that they perform in support of the hospital’s overall function.

Once the cost centers were defined, the workgroups and Implementation Team created a detailed list of variable and fixed factors that the hospital utilizes. The variable factors, and the methodology employed to estimate these costs, are summarized below and detailed in Chapter 3.

- ▲ **Labor:** This includes compensation paid to medical doctors, nurses/midwives, pharmacists, and administrative, finance, technical/medical, technical/nonmedical, and other personnel. An accurate list of employees who worked at the hospital was matched against MOH personnel records, which detailed the level of compensation for each employee. Chapter 3 details the allocation rule used to distribute the employees labor costs among various hospital “cost centers.”
- ▲ **Nonlabor Variable Factors:** This variable input was divided into five specific categories: utility inputs, structure and equipment inputs, consumable inputs, contracted services, and nonclinical supplies. Utility inputs include fuel, butane gas, telephone services, electricity, and water. Structure and equipment inputs include building renovations, rental unit for nurses’ quarters, building maintenance and renewal, equipment maintenance, and supplies. Consumable inputs include drugs and medications, gases, medical consumables, and laboratory and radiological consumables. Contracted services include food services, housekeeping services, laundry services, and other contracted services. Nonclinical supplies

include stationeries, textiles and linens, and perishables. Chapter 3 details the allocation rule employed to distribute such costs across the various hospital cost centers. For example, butane gas use was distributed among cost centers according to the proportion of square meters of physical space that the cost center occupies, based on hospital blueprints and construction documents obtained from the MOH Department of Buildings.

The fixed factors and the methodology employed to estimate and distribute their costs among the cost centers are contained in Chapter 4. The fixed factors employed by Al Karak hospital during the period of this study are listed below:

- ▲ **Fixed Hospital Structure:** the hospital building, electrical structures, sewage and plumbing structures, and CT-Scan facility
- ▲ **Hospital Vehicles:** hearse, buses, sedans, ambulances, and pickup trucks
- ▲ **Equipment and Furniture:** medical equipment and hospital furniture. Equipment and furniture costing JD 100 (US\$140) are listed in annexes A and B.

Variable and fixed factors were distributed among the various hospital cost centers according to the allocation rules that are summarized in Tables A1–A3 of Annex A.

3. Accounting for Variable Input Costs

This chapter presents cost estimates for the various labor and nonlabor cost categories at Al Karak hospital. It also discusses the rules utilized for dispersing the costs to the various hospital cost centers.

3.1 Labor Costs Estimations

As discussed in Chapter 2, the cost of labor is the major contributor to hospitals' variable costs. At Al Karak hospital, labor was grouped into eight categories: medical doctors, nurses/midwives, pharmacists, administrative, finance, technical/medical, technical/nonmedical, and "other."

In Jordan, employee remuneration, paid in cash by the Ministry of Health, consists of three identifiable components: wages, incentives (bonuses), and transportation.² The distribution of these components varies by employee classification and entitlements. For example, all physician personnel within the MOH are eligible for "incentive" payments, which are largely determined by category and class.

The study took the following steps to derive the cost of labor at Al Karak hospital:

- ▲ It first obtained from the hospital an accurate list of all employees in 1999.
- ▲ Using employee ID numbers, it then checked the hospital list against monthly compensation records obtained from the MOH Division of Accounting and Finance.
- ▲ Total annual compensation paid to employees for work directly related to Al Karak hospital was obtained from the division and checked against the hospital's records, and used in the analysis.

As shown in Table 2, the hospital's labor costs for 1999 totaled JD 1,069,288. In nominal terms the most costly labor input was the nursing staff (registered nurses, nurse assistants, and midwives) at JD 409,470 (\$577,353), followed by physician labor, JD 392,034 (\$552,768).

² Under optimal costing rules, payroll-related employee benefits—sick leave, paid holidays, paid vacations, and maternity leave—would be accounted for. However, given the existing system of documentation within the MOH, estimating the costs of these benefits would have necessitated the study to exceed its time constraints.

Table 2: Labor Costs, by Employee Category (in JD)

Labor Categories	Salaries	Incentives	Transportation	Total L _c
Medical Doctors	JD 333,082	JD 52,712	JD 6,240	JD 392,034
Nurses/Midwives	409,470	--	--	409,470
Pharmacists	14,800	396	--	15,196
Administrative	46,792	--	--	46,792
Finance	18,494	--	--	18,494
Technical/Medical	102,493	--	--	102,493
Technical/Nonmedical	4,278	--	--	4,278
Other	80,531	--	--	80,531
Total	JD 1,009,940	JD 53,108	JD 6,240	JD 1,069,288

Note: Administration includes medical records personnel, administrative assistants, personnel, and photocopying staff; technical/medical includes laboratory technicians, x-ray technicians, nutrition technicians, physical therapists, and anesthesiology technicians; technical/nonmedical includes maintenance personnel; "other" includes telephone operators, drivers, security, and tailors.

Table 3 lists the total number of Al Karak personnel and their per-unit labor costs. In addition, it converts the total number of employees into full-time equivalent (FTE) estimates. The MOH does not compile information on the productive and nonproductive hours worked by employees. The FTEs here (*hypothetical-FTEs*, or *h-FTEs*) begin to allow for nonproductive hours by looking at paid holidays per year to which all hospital employees are entitled.

Table 3: Labor Costs in Full-time Equivalents, by Employee Category

Labor Categories	Numbers	FTE Hours	<i>h</i> -FTE	Total Costs	L _c per Unit (per FTE)
Medical Doctors	57	136,344	51	JD 392,034	JD 6,878 (JD 7,687)
Nurses/Midwives	173	323,856	156	409,470	2,367 (2,625)
Pharmacists	7	13,104	6	15,196	2,171 (2,533)
Administrative	24	44,928	22	46,792	1,956 (2,127)
Finance	8	14,976	7	18,494	2,312 (2,642)
Technical/Medical	46	86,112	41	102,493	2,228 (2,500)
Technical/Nonmedical	2	3,744	2	4,278	2,139 (2,139)
Other	35	65,520	32	80,531	2,301 (2,517)
Total	353	690,456	318	JD 1,069,288	JD 3,029 (JD 3,363)

As illustrated in Table 3, when one accounts for the “nonproductive” holiday hours, it appears that Al Karak hospital is operating with no more than 318 FTE employees, instead of the 353 noted in the employee list. One physician FTE puts in 2,392 hours per year; for other worker categories, one FTE is 1,872 hours per year. Study estimates are based on these FTE numbers.³

It should be noted that even this FTE number fails to account for the additional nonproductive hours of employee sick leave and vacation time. A more accurate FTE estimate would take each of these into account; however, such an effort was outside the scope of this study. In short, it is important that Al Karak hospital begin to implement an effective system of compiling employee work hours that differentiates productive from nonproductive time. A follow-on study of hospital worker productivity would form an excellent forum for such an analysis.

Table 4 depicts the percent distribution of employees in each labor category and the proportion of labor costs consumed by each category. As the table shows, each category’s labor costs are quite proportionate to their input distribution. Approximately 49 percent of all employees are classified as nurses (both registered nurses and nursing assistants) or midwives. Their share of labor costs amounts to approximately 38.3 percent of the total. The next largest category is that of physician personnel, at 16.2 percent of labor input and 36.6 percent of labor costs. Pharmacists and their assistants account for roughly 2 percent of hospital-based personnel and 1.4 percent of labor costs. Administrative/finance and technical personnel represent 4.4 percent and 10 percent of input, and 0.6 percent and 0.4 percent of costs, respectively.

Table 4: Percent Distribution of Labor Costs, by Employee Category

Labor Categories	Percent of Personnel	Percent of Lc
Medical Doctors	16.2%	36.6%
Nurses/Midwives	49.0%	38.3%
Pharmacists	2.0%	1.4%
Administrative	6.8%	4.4%
Finance	2.3%	1.7%
Technical/Medical	13.0%	9.6%
Technical/NonMedical	0.6%	0.4%
Other	9.9%	7.5%
Total	100.0%	100.0%

Table 5 presents the distribution of personnel by hospital cost center. Of the two broad categories (Daily Hospital Services and Ancillary and Support Services), the larger share, 64 percent, is employed by cost centers that are directly involved in the provision of daily hospital services. Four of these cost centers account for 70 percent of daily hospital services costs: Pediatrics, 21 percent; Surgery, 19 percent; Obstetrics/Gynecology, 15 percent; and Emergency Room, 14 percent. Thirty-six percent of hospital personnel provide ancillary and support services, with approximately 61 percent of them assigned full time to administrative tasks.

³ Once the FTE hours were calculated, the total number of hours of paid government holidays per year were subtracted from the FTE hours for each labor category. The net figure obtained was then divided by the total number of FTE hours to obtain the FTE estimate.

Table 5: Labor Distribution by Cost Center

Cost Center	Physicians	Nurses/Midwives	Other Personnel	Total Personnel
Daily Hospital Services				
Surgery	20	23	--	43
OB/GYN	8	27	--	35
Internal Medicine ¹	3	20	--	23
Emergency Room	12	20	--	32
ICU/CCU ²	--	15	--	15
Operating Room	3	20	8	31
Pediatrics	7	41	--	48
Outpatient Clinics	NB	--	--	--
Subtotal	53	166	8	227
Ancillary & Support Services				
Admin/Finance	NB	7	70	77
Rehabilitation	1	--	5	6
X-ray Services	3	--	14	17
Laboratory Services	--	--	8	8
Pharmacy Services	--	--	7	7
Food & Beverage	--	--	6	6
Medical Instruments	--	--	5	5
Subtotal	4	7	115	126
Total	57	173	123	353

¹Internal Medicine includes physician time spent doing rounds of patients in the ICU (researchers were unable to disaggregate this component of physician time).

² Al Karak ICU is staffed by full-time nursing staff only.

³NB indicates that this is a secondary task that is covered by physician staff. For example, all physician staff must spend a small number of hours per week in the Outpatient Clinics that are located 7 kilometers from the hospital. These clinics are under the management of the General Directorate of Health and do not enter into the overall hospital budget. Furthermore, to avoid double counting, such part-time assignments are not counted as the physician's primary task.

Table 6 allocates labor costs by cost center. To be consistent with hospital costing rules, all payroll-related expenses incurred by employees must be charged to the relevant cost centers. Incentives (bonuses), severance pay, and benefits are typically charged to such centers. However, as was previously stated, due to data constraints and MOH accounting rules, this study was unable to provide a reasonable estimate of severance pay and other benefits. Hence, a simple allocation rule was employed to allocate labor costs among intermediate and direct services, according to staffing patterns and employees' responsibilities. The following allocation rule was employed:

- ▲ Employees were categorized by the cost center in which they worked.
- ▲ If an employee worked in more than one center, his/her labor remuneration was apportioned among each center as determined by the percentage of time allocated to each. Hence, employees conducting outpatient, inpatient, and administrative services for the hospital would have their salaries apportioned among categories, according to the percentage of hours dedicated to each service category.

Table 6: Labor Costs by Cost Center

Cost Center	Salaries	Incentives	Transportation	Total Costs
Daily Hospital Services				
Surgery	JD 111,722	JD 11,339	JD 1,260	JD 124,321
OB/GYN	93,486	4,117	1,200	98,803
Internal Medicine ¹	56,826	3,382	667	60,876
Emergency Room	97,335	957	--	98,292
ICU/CCU ²	35,917	--	--	35,917
Operating Room	118,886	8,835	640	128,361
Pediatrics	131,224	6,687	320	138,231
Outpatient Clinics	49,879	9,834	1,440	61,153
Subtotal	695,275	45,152	5,527	745,954
Ancillary & Support Services				
Admin/Finance	182,160	3,212	713	186,085
Rehabilitation	16,945	1,739	--	18,684
X-ray Services	51,822	2,609	--	54,431
Laboratory Services	18,832	--	--	18,832
Pharmacy Services	14,800	396	--	15,196
Food & Beverage	17,093	--	--	17,093
Other	13,013	--	--	13,013
Subtotal	314,665	7,956	713	323,334
Total	JD 1,009,940	JD 53,108	JD 6,240	JD 1,069,288

¹Includes physician time spent doing ICU rounds (researchers were unable to disaggregate this component of physician time).

²Al Karak Hospital ICU is staffed by full-time nursing staff only.

Al Karak hospital incurred JD 1,069,288 in payroll expenses in 1999. As indicated in Table 6, 70 percent of that amount was allocated to the provision of daily hospital services. Thirty percent was for the provision of ancillary and support services. Surgery, OR, and Outpatient Clinics⁴ accounted for approximately 17 percent of the labor costs associated with the delivery of those services. OB/GYN, Pediatrics, and ER accounted for 13 percent, 19 percent, and 13 percent, respectively. Of the 30 percent (JD 323,334) of labor cost allocated to ancillary and support services, 58 percent was consumed by administrative and financial services. In fact, these services account for the single largest component of overall hospital labor expenses, roughly 17 percent.

⁴ It is important to note that Al Karak hospital provides physician labor to the outpatient clinics that are located 7 kilometers from the hospitals. Hence, the time that physicians spend outside the hospital is viewed as the opportunity cost that is imposed upon the hospital as a result of their absence. Hence, this cost must be factored into the hospital's economic costs even though the clinics are not under the hospital director's management.

3.2 Labor Costs per Unit Output

Table 7 lists labor costs per unit of output (patient days), one of several flow variables employed in this study. As is typically the case, a patient (census) day includes the day of admission but not the day of discharge or death. Other information contained within this section is number of bed days,⁵ visits,⁶ and hospital occupancy rates,⁷ by cost center. In addition, the total number of adjusted patient days⁸ was estimated by employing a case-mix proxy to account for variations in patients treated across hospital cost centers. This allows for a more accurate comparison of per-unit labor costs across centers. As illustrated in Table 7, the highest adjusted and unadjusted labor cost per patient days is in the ICU/CCU Department of the hospital, JD 27 for each. A more informative comparison, across centers, is conducted later in this section as per-unit costs in terms of total variable costs.

Table 7: Total Labor Costs by Cost Center, Patient Days, Patients, and Adjusted Patient Days

Cost Center	Patient Days	Patients	Adjusted Patient Days	Labor Costs	Lc per Patient Day (Per Adj. Patient Day)
Daily Hospital Services					
Surgery	7,180	2,483	6,627	JD 124,321	JD 17 (JD 19)
OB/GYN	5,987	3,234	8,676	98,803	17 (11)
Internal Medicine ¹	7,091	2,446	6,527	60,876	9 (9)
ICU/CCU ²	1,340	496	1,327	35,917	27 (27)
Pediatrics	7,945	2,407	6,407	138,231	17 (22)
Total	29,543	11,066	29,564	JD 458,148	JD 16 (JD 16)

¹Includes physician time spent doing ICU rounds.

²Only includes nursing staff labor expenditures.

Table 8 distributes labor costs by bed days across the various hospital cost centers. Surgery exhibits the highest cost per bed day. Table 8 also provides information on the overall hospital occupancy rate (74 percent), as well as the occupancy rate for each inpatient department. It is of import to note that the occupancy rates for the Surgery and OB/GYN departments include patients that are categorized as “day service” patients. Such patients may occupy an inpatient bed for up to 23 hours from their time of admission. These patients are categorized as inpatients by the hospital; however, a more appropriate classification would be “outpatient, day-surgical” or “outpatient, day-obstetrics/gynecology” patients.

⁵ Bed day = [(number of licensed beds x number of days in the reporting period)]. Number of licensed beds is the official number of MOH-approved beds; the reporting period is the period of this study 1 January 1999 to 31 December 1999.

⁶A “visit” is defined as the appearance of a patient at the hospital for ancillary or ambulatory treatment.

⁷ Occupancy rate = [(patient days/bed days)]

⁸ Adjusted Patient Day = [(patient days)/(group-average length of stay (alos)/population-alos)]

Table 8: Total Labor Costs by Cost Center, Bed Days, and Occupancy Rate

Cost Center	Bed Days	Patient Days	Lc per Bed Day	Occupancy Rate
Daily Hospital Services				
Surgery	10,220	7,180	JD 12	70%
OB/GYN	7,665	5,987	13	78%
Internal Medicine ¹	8,760	7,091	7	81%
ICU/CCU ²	1,460	1,340	25	92%
Pediatrics	12,045	7,945	11	66%
Total	40,150	29,543	JD 11	74%

¹Includes physician time spent doing ICU rounds.

²Only includes nursing staff labor expenditures.

Table 9 list labor costs per admissions and adjusted admissions.⁹ Unlike a patient day, which typically pertains to a full day of hospitalization, a patient may be admitted and then discharged prior to completing a full day of treatment. Hence, this variable is often considered a flow variable that captures the input costs associated with treating an average case, irrespective of the patient's hospital stay. Moreover, patients may be admitted into a particular cost center and then transferred to another.

Table 9: Labor Costs by Cost Center, Admissions, and Adjusted Admissions

Cost Center	Admissions	Adjusted Admissions	Labor Costs (Lc)	Lc per Admission	Lc per Adj. Admission
Daily Hospital Services					
Surgery	2,483	2,299	JD 124,32	JD 50	JD 54
OB/GYN	3,234	4,687	98,803	31	21
Internal Medicine ¹	2,446	2,244	60,876	25	27
ICU/CCU ²	496	491	35,917	72	73
Pediatrics	2,407	1,941	138,231	57	71
Total	11,066	11,662	JD 458,148	JD 41	JD 39

¹Includes physician time spent doing ICU rounds.

As illustrated in Table 9, the highest labor cost per admission, unadjusted and adjusted, is within the ICU/CCU Department (JD 72 and JD 73, respectively). However, as previously mentioned, considering labor cost within this context is primarily for illustrative purposes, given that labor costs are only one component of variable inputs. Other variable inputs include utilities, gases, renovations, and contracted services. Hence, a more informative method of comparing costs across centers is the total variable costs of production, and the relevant per-unit costs, which is done later in this report.

Table 10 allocates physician labor costs among hospital cost centers according to physician labor distribution throughout the inpatient, outpatient, and ancillary departments. It is not unusual for a physician's work hours to be allocated to more than one cost center. For example, the hospital director at Al Kara hospital may also be a hospital-based pediatrician. As a result, his total labor cost

⁹ Adjusted Admission = [(admissions)/(group-alos/population-alos)]

to the hospital is allocated to both administrative and clinical cost centers. As is true throughout this study, the costs in Table 10 include the three major components of physician remuneration: salaries, incentives, and transportation.

Table 10: Distribution of Total Physician Labor Cost, by Cost Center

Cost Center	Salaries	Incentives	Transportation	Lc
Daily Hospital Services				
Surgery	JD 62,902	JD 11,339	JD 1,260	JD 75,501
OB/GYN	28,156	4,117	1,200	33,473
Internal Medicine ¹	12,491	3,383	667	16,541
Emergency Room	48,303	957	--	49,260
Operating Room	51,655	8,835	640	61,130
Pediatrics	36,065	6,687	320	43,072
Outpatient Clinics ²	49,879	9,834	1,440	61,153
Subtotal	289,451	45,152	5,527	340,130
Ancillary & Support Services				
Administration/ Finance	16,793	3,212	713	20,718
Rehabilitation	7,035	1,739	--	8,774
X-ray Services	19,803	2,609	--	22,412
Subtotal	43,631	7,560	713	51,904
Total	JD 333,082	JD 52,712	JD 6,240	JD 392,034

¹Includes physician time spent doing ICU rounds.

²During the period of this study, Al Karak hospital did not have outpatient clinic facilities. However, Al Karak physicians were required to cover the outpatient clinics for the Health Directorate.

As Table 10 shows, in nominal terms, physician labor costs that are associated with the provision of surgical services (JD 75,501) constitute the largest category of physician remuneration (19 percent), as a function of the amount of time allocated towards the provision of a particular service category. This is followed by OR and the Outpatient Clinics¹⁰, each of which accounts for 15 percent of total physician costs. Roughly 5 percent of physician labor costs is associated with the provision of administrative and financial services, primarily with the duties of hospital director.

Table 11 shows the allocation of physician labor costs to the various cost centers that are engaged in the delivery of daily hospital services. Labor cost per patient day and adjusted patient day were estimated. The highest physician labor cost (both adjusted and unadjusted) is found within the Internal Medicine department. Anecdotal evidence suggests that this department is overstaffed; hence, it is suspected this result is driven by the staffing patterns at the hospital. However, this cannot be substantiated until further studies of labor productivity within the hospital are performed.

¹⁰ During the period of this study, Al Karak hospital did not have outpatient clinic facilities. The outpatient clinic services were provided at the MOH clinics that are located 7 kilometers from the hospital. Al Karak physicians' are required to spend part of their work hours at these facilities. Hence, their time spent must be counted as cost imposed upon the hospital (i.e., opportunity costs).

Table 11: Distribution of Physician Labor Cost by Cost Center, Patients, Patient Days, and Adjusted Patient Days

Cost Center	Patient Days	Patients	Lc	Lc Per Patient Day	Lc Per Adj. Patient Day
Daily Hospital Services					
Surgery	7,180	2,483	JD 75,501	JD 11	JD 11
OB/GYN	5,987	3,234	33,473	6	4
Internal Medicine ¹	7,091	2,446	16,541	2	3
Pediatrics	7,945	2,407	43,072	5	7
Total	28,203	10,570	JD 168,587	JD 6	JD 6

¹Includes physician time spent doing ICU rounds.

Table 12 allocates the largest labor costs component—nursing costs—among the various hospital cost centers. As noted above, the cost estimates include all nursing categories: registered nurses, nursing assistants, and nurse midwives. Nurses are currently ineligible for MOH incentives (bonuses), and they received no transportation allowances during the period of this study. Hence, the sole component of nursing labor remunerations in 1999 was salary compensation. The highest category of nursing labor cost is that associated with the delivery of Pediatrics services, JD 94,310, or 23 percent of total nursing remuneration. The second largest category of nursing labor is found in the OB/GYN department at 16 percent.

Table 12: Distribution of Nursing/Midwives Labor Costs, by Cost Center

Cost Center	Salaries	Number Nurses/Midwives	Cost per Unit of Nursing Labor
Daily Hospital Services			
Surgery	JD 47,531	23	JD 2,067
OB/GYN	65,330	27	2,420
Internal Medicine	46,354	20	2,318
Emergency Room	49,032	20	2,457
ICU/CCU	34,845	15	2,323
Operating Room	45,734	20	2,287
Pediatrics	94,310	41	2,300
Outpatient Clinics	NB	--	--
Subtotal	383,136	166	2,308
Ancillary & Support Services			
Administration	26,334	7	3,762
Other	--	--	--
Subtotal	26,334	7	3,762
Total	JD 409,470	173	JD 2,367

NB: Al Karak hospital nurses, unlike physicians, are not required to spend time at the MOH clinic that is located 7 kilometers from the hospital.

Table 12 also considers the per-unit cost of nursing labor that is involved in the delivery of daily hospital services. The highest per-unit nursing cost is found within the Emergency Room (JD 2,457), followed OB/GYN, ICU/CCU, Internal Medicine, and Pediatrics.

Table 13 allocates nursing labor costs by cost center, patient days, and adjusted patient days. The highest nursing labor costs per adjusted inpatient day are found in the ICU/CCU departments. This is expected, given that ICU/CCU patients are the most ill of all patients within the hospital. As such, they require more intensive nursing labor inputs per patient treated.

Table 13: Distribution of Nurses/Midwives Labor Cost by Cost Center, Patients, Patient Days and Adjusted Patient Days

Cost Center	Patient Days	Patients	Lc	Lc Per Patient Day	Lc Per Adj. Patient Days
Daily Hospital Services					
Surgery	7,180	2,483	JD 47,531	JD 7	JD 7
OB/GYN	5,987	3,234	65,330	11	8
Internal Medicine	7,091	2,446	46,354	7	7
ICU /CCU	1,340	496	34,845	26	26
Pediatrics	7,945	2,407	94,310	12	15
Total	29,543	11,066	JD 288,370	JD 10	JD 10

Table 14 estimates combined total physician and nursing labor costs, and looks at them relative to the hospital's patient days and adjusted patient days. The highest labor cost center per adjusted patient day is the Pediatrics department. This is due primarily to the higher number of health care personnel (physicians and nurses) that are assigned to this department, relative to others. For example, when one considers the information contained in Tables 5 and 14, the number of patients per health care worker in non-ICU/CCU departments, the Pediatrics department exhibits the lowest rate (50 patients per health care worker), indicating a higher concentration of labor. Conversely, Internal Medicine, Surgery, and OB/GYN exhibit ratios of 106, 104, and 92 patients per health care worker, respectively.¹¹

Table 14: Distribution of Physician and Nurse/Midwife Labor Cost (L_{pn}) by Cost Center, Patients, Patient Days, and Adjusted Patient Days

Cost Center	Patient Days	Patients	L_{pn} ($L_p + L_n$)	L_{pn} Per Patient Day	L_{pn} Per Adj. Patient Day
Daily Hospital Services					
Surgery	7,180	4,483	JD 123,032	JD 17	JD 19
OB/GYN	5,987	3,234	98,803	17	11
Internal Medicine	7,091	2,446	62,895	9	10
Pediatrics	7,945	2,407	137,382	17	21
Total	28,203	10,570	JD 422,112	JD 15	JD 15

¹¹ This difference is likely due to case-mix differences among cost centers.

As illustrated in Table 15, the average product of labor for Internal Medicine is significantly higher than other departments: 284 adjusted patient days per labor input.¹² Hence, taking into account the information contained in Tables 7 and 15, it appears that the Internal Medicine department is a low-cost and high-product department, relative to others. Conversely, ICU/CCU represents a high-cost and low-product department, relative to others. Its labor cost of JD 27 per adjusted patient day, coupled with its relatively low average product of labor (88 adjusted patient days per unit) suggest that further research into the hospital's labor policies within this department be conducted.

Table 15: Average Product of Labor Estimations, by Hospital Cost Center

Cost Center	Patient Days	Adjusted Patient Days	Labor Units	Average Product (Days/Unit)	Average Product (Adj.Days/Unit)
Daily Hospital Services					
Surgery	7,180	6,630	43	167	154
OB/GYN	5,987	8,676	35	171	248
Internal Medicine	7,091	6,529	23	308	284
ICU/CCU	1,340	1,327	15	89	88
Pediatrics	7,945	6,407	48	166	133
Total	29,543	29,569	164	180	180

Finally, when one considers that Al Karak hospital delivered 2,249 newborns during the period examined by this study, the OB/GYN labor cost was roughly JD 44 per delivery.

The next section will consider additional variable factors that are utilized in the production of hospital services. These factors, coupled with the hospital's labor input, provide a comprehensive estimate of the total variable cost for producing hospital services at Al Karak in 1999.

3.3 Nonlabor Variable Factors of Production

Nonlabor variable factors of production include utilities (fuel, butane gas, telephone, electricity, and water); structure and equipment (building renovations, housing quarters, building maintenance and renewal, equipment maintenance and supplies); consumables (drugs and medications, gases, medical consumables, laboratory and X-ray consumables); contracted services (food services, housekeeping, laundry, other); and other (stationeries, textiles and linen, perishables). Expenditure information on each was obtained from the MOH Directorates of Supplies and Procurement and Building Maintenance and other agencies.

Table 16 lists the utility cost estimates. Total utility costs were obtained from the MOH Accounting Division, as well as the hospital's accounting department. Using hospital blueprints obtained from the Ministry of Planning (MOP) and the MOH Department of Buildings, a step-down

¹² Given that the capital input of the hospital is assumed fixed in the short run, it is possible to estimate a point on the hospital's short-run expansion path for its variable factor (labor). Hence, the ratio of its total product of labor to the number of labor units employed yields the hospital's average product of labor. A more comprehensive estimate would have entailed the calculation of total productive hours. This would have yielded a more precise estimate of average product by department. However, as explained above, study researchers were precluded from such estimations given the lack of data on productive and nonproductive hours.

method was employed to distribute fuel, butane, electrical, and water expenses among costs centers within the hospital, relative to their proportion of the structure's square meters. Telephone expenditures were estimated similarly; however, the allocation rule entailed distributing costs based upon the proportion of telephone lines available within a given cost center.

Table 16: Utility Costs Estimates

Utilities	Total Costs
Fuel	JD 49,341
Butane Gas	1,100
Telephone Services	7,578
Electricity	36,960
Water	26,400
Total Utility Costs	JD 121,379

Table 17 lists the variable structure and equipment estimates. The costs of building renovations and building maintenance were obtained from the MOH Directorate of Building Maintenance and the Directorate of Planning and Projects. Other building maintenance costs and costs of building supplies were obtained from the hospital's accounting records and the MOH Accounting Division.

Table 17: Variable Structure and Equipment Estimates

Structure and Equipment	Total Costs
Rental Unit for Nurse's Quarters	4,739
Building Maintenance and Renewal	40,000
Equipment Maintenance and Supplies	97,300
Vehicles maintenance & supplies	15,725
Total Structure and Equipment	JD 157,764

Table 18 lists the various medical consumables. The costs of drugs, gases, and other medical consumables, as well as laboratory and radiological consumables, were obtained from the MOH Directorate of Supplies and Procurement and the MOH Central Drug Directorate. Drugs and other consumable prices were estimated according to price per unit. Drugs and medical consumables consumption was allocated across cost centers using a survey designed by the Hospital Decentralization Implementation Team. Al Karak hospital did not employ a drug consumption tracking system prior to the implementation of this study. The survey tracked the distribution of drugs from the pharmaceutical department to the various costs centers over a period of 60 days. The costs of gases were distributed across each cost center based upon the proportion of cylinder connections operating within each center.

Table 18: Variable Hospital Consumables

Consumables	Total Costs
Drugs and Medications	JD 358,110
Gases	12,000
Medical Consumables	190,725
Laboratory and Radiology Consumables	66,617
Total Consumables	JD 627,452

Table 19 lists the various hospital-based services contracted to the private sector. Contracted services are negotiated at the central ministry level, and a single contractor is responsible for providing the indicated services to all 23 MOH hospitals. MOH records of payment for Al Karak hospital were obtained from the MOH Accounting Division, and compared to those of the contractor, for data verification.

Table 19: Contracted Services

Contracted Services	Total Costs
Food services, Cleaning, and Security	JD 203, 770
Maintenance	81,342
Total Contracted Services	JD 285,112

Table 20 lists nonclinical supplies. Estimates for nonclinical supplies were obtained from the Accounting Department at the hospital and the MOH Accounting and Finance Division. They include total expenditure for stationeries, textiles and linen, and perishable items. During the period of this study, the single largest nonclinical supply was perishable items, primarily foodstuffs (JD 116,970).

Table 20: Non-clinical Supplies

Non-clinical Supplies	Total Costs
Stationeries	JD 8,643
Textiles and Linen	15,726
Perishables	116,970
Total Non-clinical Supplies	JD 141,339

3.4 Nonlabor Variable Factors by Cost Center

Employing the aforementioned allocation rules, Table 21 distributes utility costs across hospital cost centers. During the period of this study, the Pediatric department exhibited the highest nominal utility costs, JD 9,394, followed by OB/GYN with total utility costs of JD 9,338. The relatively low

OR utility costs are unexpected, given the high voltage equipment that an OR typically utilizes. In addition, the OR, with its relatively large and open space, typically consumes significant amounts of fuel. In 1999, the Al Karak OR consumed fuel cost of approximately JD 3,526. This is far less than what one would expect, relative to other cost centers. This finding requires further investigation.

Table 21: Distribution of Utility Cost, by Cost Center

Cost Center	Fuel	Telephone	Electricity	Water	Total Utilities
Daily Hospital Services					
Surgery	JD 2,785	JD 292	JD 2,544	JD 1,817	JD 7,438
OB/GYN	3,526	292	3,220	2,300	9,338
Internal Medicine	2,576	146	2,352	1,680	6,754
Emergency Room	2,342	437	2,138	1,527	6,444
ICU	1,436	437	1,311	937	4,121
Operating Room	1,513	292	1,382	987	4,174
Pediatrics	3,492	437	3,188	2277	9,394
Outpatient Clinics	--	--	--	--	--
Subtotal	17,670	2,333	16,135	11,525	47,663
Ancillary & Support Services					
Administration	19,896	2,771	9,698	6,927	39,292
Rehabilitation	551	--	467	333	1,351
X-ray	2,172	292	1,984	1,417	5,865
Laboratory	710	292	602	430	2,034
Pharmacy	772	437	705	503	2,417
Food & Beverage	6,554	1,015	5,437	3,884	16,890
Legal Medicine	624	146	570	407	1,747
Medical Instruments	1,492	292	1,362	974	4,120
Subtotal	32,771	5,245	20,825	14,875	73,716
Total	JD 50,441	JD 7,578	JD 36,960	JD 26,400	JD 121,379

Table 22 lists other nonlabor variable inputs across hospital costs centers. Even though Al Karak hospital did not have Outpatient Clinic facilities during the period of this study, it was responsible for the dispensation of drugs to the outpatient clinics that are located 7 kilometers from the hospital. Hence, the only nonlabor entry for Outpatient Clinic expenditures is the drug expenditures that were realized by the hospital for such services during the period of this study. That amounted to roughly JD 174,800, approximately 2.75 JD per visit.

Table 22: Distribution of Non-utility Variable Cost (N_c), by Cost Center

Cost Center	Eq. Maint & Supplies	Bldg Maint & Renewal	Contract Services	Drugs	Other Nonutility	Total Nonutility
Daily Hosp Services						
Surgery	JD 2,639	JD 2,800	JD 19,713	JD 32,682	JD 4,097	JD 61,931
OB/GYN	3,731	3,200	24,268	11,006	4,095	46,300
Internal Medicine	677	2,400	17,874	36,176	3,441	60,568
Emergency Room	4,810	2,400	16,657	41,094	2,433	67,394
ICU/CCU	4,792	1,600	10,483	9,247	1,572	27,694
Operating Room	36,762	1,600	10,870	13,986	6,012	69,230
Pediatrics	5,140	3,200	24,088	39,119	5,691	77,238
Outpatient Clinics	--	--	--	174,800	--	174,800
Subtotal	58,551	17,200	123,953	358,110	27,341	585,155
Ancillary & Support Services						
Administration	--	10,400	74,610	--	28,729	113,739
Rehabilitation	1,532	400	3,386	--	534	5,852
X-ray	31,463	2,000	15,002	--	30,106	78,571
Laboratory	4,615	800	4,946	--	36,715	47,076
Pharmacy	--	800	5,513	--	190,750	197,063
Food & Beverage	--	6,000	42,170	--	118,070	166,240
Legal Medicine	1,139	800	4,766	--	--	6,705
Medical Instruments	--	1,600	10,766	--	--	12,366
Subtotal	38,749	22,800	161,159	--	404,904	627,612
Total	JD 97,300	JD 40,000	JD 285,112	JD 358,110	JD 432,245	JD 1,212,767

Table 23 represents the total variable costs of operating Al Karak hospital. This amount includes the sum of total labor cost (L_c), total utility cost (U_c) and total nonutility costs (N_c). During the period of this study the total variable costs for Al Karak amounted to JD 2,403,434. The next section will consider the distribution of this cost in terms of per-unit output. Al Karak's support of physician and drug inputs for the MOH outpatient clinics that are not under its management have resulted in that support leading to the single highest variable cost for the hospital in the delivery of daily hospital services. In fact, roughly 26 percent of the variable costs associated with the provision of clinic services is the result of the hospital's expenditures on the labor input¹³ that is employed to provide such services. What is most significant, however, is the amount of variable costs incurred for administrative/financial services (JD 339,116), the largest of any service category. Approximately 55 percent of these costs are due to labor expenditures. The implications of this will become more apparent in Chapter 6, which considers administrative/financial costs as a proportion of total hospital costs.

¹³ It must be noted that the Al Karak hospital only supplies labor to the outpatient clinics that are located 7 kilometers away. The structural costs and utilities are funded and maintained by the General Directorate of Health.

Table 23: Distribution of Total Variable Costs (V_c), by Cost Center

Cost Center	L _c	U _c	N _c	V _c = L _c +U _c +N _c
Daily Hospital Services				
Surgery	JD 124,321	JD 7,438	JD 61,931	JD 193,690
OB/GYN	98,803	9,338	46,300	154,441
Internal Medicine ¹	60,876	6,754	60,568	128,198
Emergency Room	98,292	6,444	67,394	172,130
ICU/CCU ²	35,917	4,121	27,694	67,732
Operating Room	128,361	4,174	69,230	201,765
Pediatrics	138,231	9,394	77,238	224,863
Outpatient Clinics	61,153	--	174,800	235,953
Subtotal	745,954	47,663	585,155	1,378,772
Ancillary & Support Services				
Admin/Finance	186,085	39,292	113,739	339,116
Rehabilitation	18,684	1,351	5,852	25,887
X-ray Services	54,431	5,865	78,571	138,867
Laboratory Services	18,832	2,034	47,076	67,942
Pharmacy Services	15,196	2,417	197,063	214,676
Food & Beverage	17,093	16,890	166,240	200,223
Legal Medicine	--	1,747	6,705	8,452
Medical Instruments	13,013	4,120	12,366	29,499
Subtotal	323,334	73,716	627,612	1,024,662
Total	JD 1,069,288	JD 121,379	JD 1,212,767	JD 2,403,434

¹Includes physician time spent rounding on ICU patients (researchers were unable to disaggregate this component of physician time).

²Al Karak ICU is staffed by full-time nursing staff only.

3.5 Estimations of Per Unit Variable Cost

This section looks at total variable costs (labor and nonlabor) at Al Karak and at the distribution of these costs relative to the number of patients, patient days, and adjusted patient days.

The total variable costs Al Karak hospital incurred are the total costs of utilizing inputs that vary according to the volume of hospital output. As previously explained, hospital output is approximated through the use of various flow variables, typically the number of patient days (adjusted or unadjusted), bed days, patients, admissions, and visits. When total variable costs are considered relative to a particular flow variable, the result is the estimated average variable cost of that variable. The number of hospital beds is occasionally utilized as a flow variable; however, as has been observed in the literature, the use of beds is an inaccurate measure that consistently fails to accurately capture costs effects (Banks, 1993).

Table 24 shows AVCs for five departmental cost centers at Al Karak hospital. The AVC in terms of an adjusted patient day in the ICU/CCU department is JD 51, the most expensive service in the hospital. However, this amount is not surprising, given the patient population treated within the ICU/CCU. The second highest AVC occurs in the provision of Pediatric services (JD 35), followed by Surgery, OB/GYN, and Internal Medicine, which incur AVCs of JD 29, JD 18, and JD 19, respectively.

Table 24: Distribution of Total Variable Costs, by Cost Center, Patient Days, and Adjusted Patient Days

Cost Center	Patient Days	Adjusted Patient Days	Total Variable Costs	Average Variable Cost	Adjusted Average Variable Costs
Daily Hospital Services					
Surgery	7,180	6,630	JD 193,690	JD 27	JD 29
OB/GYN	5,987	8,676	154,441	26	18
Internal Medicine	7,091	6,529	128,198	18	19
ICU/CCU	1,340	1,327	67,732	51	51
Pediatrics	7,945	6,407	224,863	28	35
Total	29,543	29,569	JD 768,924	JD 26	JD 26

Additional information can be extrapolated from the variable cost data in Table 24. For example, of particular concern to the central ministry are the variable costs associated with the delivery of inpatient care within the OB/GYN department, in particular such costs relative to the number of births that have taken place within that department. It is known that Al Karak hospital delivered 2,249 newborns in 1999. Given its total variable OB/GYN costs of JD 154,441, that amounted to an AVC of roughly JD 69 per delivery. This cost approximation may be extrapolated to other MOH hospitals, which exhibit similar cost structures.

Table 25 estimates AVC in terms of hospital admissions, both adjusted and unadjusted. The highest AVC is found in the ICU/CCU department. The lowest is in the OB/GYN department.

Table 25: Distribution of Total Variable Costs, by Cost Center, Admissions, and Adjusted Admissions

Cost Center	Total Admissions	Adjusted Admissions	Total Variable Costs	Variable Costs Per Admission	Variable Cost Per Adjusted Admission
Daily Hospital Services					
Surgery	2,483	2,299	JD 193,690	JD 78	JD 84
OB/GYN	3,234	4,687	154,441	48	33
Internal Medicine	2,446	2,244	128,198	52	57
ICU/CCU	496	491	67,732	137	138
Pediatrics	2,407	1,941	224,863	93	116
Total	11,066	11,662	JD 768,924	JD 69	JD 66

Moreover, policymakers often utilize AVC estimates to assess existing cost-sharing rules, relative to the hospital's overall cost structure. For example, in the short run a hospital, like other organizations, should be able to recover its AVCs of production, even if its average fixed costs are "sunk." Therefore, governments often estimate the AVC for a category of public hospital services and from there, estimate the optimal cost-sharing amounts.

Table 26 shows the total number of Emergency Room and Outpatient Clinic visits to Al Karak hospital in 1999. A visit is the appearance of a patient for ambulatory and/or ancillary services. A clinic visit may consist of diagnostic, preventive, curative, and rehabilitative services. An ER visit occurs with the provision of emergency treatment to an ill or injured person, but may also include services to patients who utilize the ER for nonemergency reasons.

Table 26: Distribution of Total Variable Costs, by Emergency Room and Outpatient Visits

Cost Center	Total Visits	Total Variable Costs	Variable Cost Per Visit
Daily Hospital Services			
Emergency Room	36,366	JD 172,130	JD 4.76
Outpatient Clinics ¹	63,514	235,953	3.71
Total	99,880	408,083	JD 4.09

¹ Clinic figures represent physician and drug cost only.

In 1999, there were 36,366 ER visits and 63,514 clinic visits to the hospital. The number of clinic visits includes only those patients that were treated by full-time Al Karak physicians, with part-time assignment to the outpatient clinic facilities located 7 kilometer from the hospital. The AVC of an ER visit was JD 4.76 and of a clinic visit, JD 3.71. When one considers this information in terms of the MOH patient cost-sharing rules for nonemergency ER patients and clinic patients, the cost-sharing implications are quite interesting. For example, the MOH requires ER patients to pay JD 1.65 at the point of services, while it requires clinic patients to pay JD 1.65 and JD .55 for the first and consecutive visits, respectively.

3.6 Distribution of Variable Drug Costs

According to recent National Health Account estimates, Jordanians spent roughly JD 158 million on drugs. This represents approximately 35 percent of all expenditures on health care services, a substantial amount for any country. In fact, total expenditures on drugs amounted to more than 3 percent of the country's Gross Domestic Product. This makes the cost of drugs within MOH hospitals a paramount concern for policymakers.

Table 27 lists the distribution of drug costs among hospital costs centers. The ICU/CCU department exhibits the highest drug costs per patient, JD 19, roughly 46 percent higher than the cost per surgical patient. However, the costs per patient day for ICU/CCU and Pediatric patients are the highest. The lowest drug costs, in terms of patients and patient days, is within the OB/GYN department: JD 3 per patient and JD 1 per patient day. In fact, its drug costs per patient is 425 percent less than the second lowest hospital cost center, Surgery. In terms of overall patients treated, the hospital's average drug costs amounted to JD 12 per patient, or JD 4 per adjusted patient day.

Table 27: Distribution of Drug Costs, by Cost Center, Patient Days, Adjusted Patient Days, and Patients

Cost Center	Total Drug Costs	Number of Patient	Drug Costs Per Patient Day	Drug Costs Per Adjusted Patient Day	Drug Costs Per Patient
Daily Hospital Services					
Surgery ¹	JD 32,682	2,483	JD 5	JD 5	JD 13
OB/GYN	11,006	3,234	2	1	3
Internal Medicine	36,176	2,446	5	6	15
ICU/CCU	9,247	496	7	7	19
Pediatrics	39,119	2,407	5	6	16
Total	JD 128,230	11,066	JD 4	JD 4	JD 12

¹Includes drugs used during surgical operations.

The outpatient clinics that are located 7 kilometers from the hospital and staffed part time by Al Karak physicians were responsible for 60 percent (JD 215,894) of all drug costs incurred by the hospital. The average drug costs amounted to JD 1.13 per ER visit and JD 2.75 per outpatient visit. Under existing MOH cost-sharing rules, the outpatient co-payment for prescription drugs at all MOH hospitals is 250 fils per prescription. Given that the hospital lacks information on the average number of prescriptions per patient, it is impossible to draw any substantive policy implications from the data presented in Table 28. However, anecdotal evidence suggests that the cost-sharing rules are slightly lower than the hospital's average drug cost, warranting a more detailed study of drug consumption.

Table 28: Distribution of Drug Costs by Emergency Room and Outpatient Clinic Visit

Cost Center	Total Drug Costs	Number of Visits	Drug Costs per Visit
Daily Hospital Services			
Emergency Room	JD 41,094	36,366	JD 1.13
Outpatient Clinics	JD 174.800	63,514	JD 2.75
Total	JD 215,894	99,880	JD 2.16

4. Accounting for Fixed Input Costs

This chapter reports on the costs of fixed inputs at Al Karak hospital. As discussed in Chapter 2, fixed inputs are those factors of production whose quantity does not vary according to the volume of output. At Al Karak hospital, those inputs are hospital structure, vehicles, equipment, and furniture. This chapter first determines the costs of the fixed inputs, then discusses their distribution among hospital cost centers. It closes with a discussion of the unit costs for fixed inputs.

4.1 Estimating Costs of Fixed Inputs

The structural components of Al Karak hospital are the hospital building, electrical structures, plumbing and sewage system, and kidney dialysis unit. The replacement costs of the structural components were estimated based on the original 1995 purchase prices, obtained from the Ministry of Finance (MOF),¹⁴ which then were inflated over the 1996 to 1999 period. The costs of other fixed factors, such as vehicles, equipment, and furniture were based upon their replacement costs in 1999 Jordanian dinars.

The replacement cost of each fixed input then was annualized based on its useful working life. To do this, a definition of working life of each input, along with its depreciation factor, was obtained from the MOF, according to ministry rules for estimating the useful working life of public sector capital inputs. The annualized economic costs of all fixed factors were estimated as follows: an annualization factor was estimated according to Equation (1), using a real interest rate of 3 percent and the relevant depreciation factor.¹⁵ The replacement cost of the fixed factor was then divided by the annualization factor.¹⁶ This yields the base year capital costs of employing the fixed factor (i.e., its 1999 economic costs).

$$A_f = 1/(r+d) \cdot [1-1/(1+r+d)^T] \quad (1)$$

where,

A_f = annualization factor

r = average real interest rate

d = depreciation factor

T = total working life-years of fixed factor

The annualized economic costs of the hospital's structural components are shown in Table 29. Assuming a total working life of 40 years, an average real interest rate of 3 percent, and a depreciation factor of 2.5 percent, the table lists the annualized economic costs that must be imputed onto the base year. The annualization factor calculated under this set of assumptions equaled 16.05.

¹⁴ As is traditional, this study excludes land value from estimates about structural components, because land values typically exhibit significant geographic variation and overstate the capital costs of operating a facility.

¹⁵ Real interest rates were obtained from the Export and Finance Bank, Research and Studies Investment Banking Unit.

¹⁶ This procedure yields the discounted present value of the fixed factor during the base year.

Table 29: Annualized Economic Costs of Fixed Hospital Structures

Fixed Factor	Replacement Costs (1999 JD)	Annualized Capital Costs 1999
Infrastructure of Hospital	JD 1,093,787	JD 68,149
Hospital Building and Electrical Structures, Sewage & Plumbing	6,176,177	384,809
CT Scan Building	80,156	4,994
Drivers' Building	29,541	1,841
Total	JD 7,379,661	JD 459,793

Table 30 presents the annualized economic costs of each hospital vehicle. Replacement costs are based upon the 1999 insurance value of each vehicle model. Employing Equation (1), and assuming the MOF working life of seven years for each vehicle and a depreciation factor of 14.28 percent, the estimated annualization factor was 3.89.

Table 30: Annualized Economic Costs of Hospital Vehicles

Vehicle Number	Model	Replacement Costs	Annualized Capital Costs
21074	Ambulance / Dodge	JD 35,000	JD 8,997
19604	Ambulance / Chevy	35,000	8,997
18332	Renault / Hearst	12,000	3,085
22990	Mitsubishi Bus	23,000	5,913
8411	Coaster Bus	6,000	1,542
14131	Isusu Bus	6,000	1,542
18051	Ford Bus	12,000	3,085
14758	Isusu Salon	12,000	3,085
16343	Mitsubishi Pick up	10,000	2,571
19960	Isusu Bus / Turkish	15,000	3,856
Total		JD 166,000	JD 42,673

Table 31 presents the estimated annualized economic costs of the hospital's medical equipment and furniture inputs. (Annex A contains a complete list of the hospital's equipment and furniture inputs.) Replacement cost was obtained from the MOH Directorate of Procurement and Supplies. The MOF working life of both equipment and furniture is 10 years, and each has a depreciation factor of 10 percent. Based upon this set of assumptions, the annualization factor estimated equaled 5.43.

Table 31: Annualized Economic Costs of Equipment and Furniture

Fixed Input	Replacement Costs	Annualized Capital Costs
Medical Equipment	JD 2,005,327	JD 369,305
Medical Furniture	102,719	18,917
Furniture	360,557	66,401
Total	JD 2,468,603	JD 454,623

4.2 Distribution of Fixed Costs by Cost Center

Table 32 shows the distribution of fixed cost components by cost center. The distribution was determined according to the following allocation rules:

- ▲ The hospital's annualized structural costs were allocated to each cost center in proportion to the total number of square meters occupied by each center according to hospital blueprints obtained from the MOH Department of Buildings.
- ▲ The total annualized costs of the hospital's vehicles were apportioned as follows: total ambulance costs were allocated to departments, based upon their proportion of patients transported. Hearse costs were allocated to the legal medicine department. Costs of hospital buses, used primarily for transporting nursing personnel from their residences to Al Karak hospital, were allocated based upon the proportion of nursing personnel employed within each center. Costs of the pickup vehicle utilized for transporting small equipment and supplies to various hospital cost centers were distributed based upon the proportion of personnel assigned to a particular center, and the same procedure was followed for the passenger vehicle that is utilized for transporting administrative documents and small supplies.
- ▲ Medical equipment and furniture costs were apportioned to costs centers after an inventory of all such items was conducted and their 1999 replacement cost obtained from the MOH Directorate of Procurement and Supplies.

The rightmost column of Table 32 presents the total fixed costs, by cost center, of operating Al Karak hospital: JD 957,089 (\$1,349,495). The ICU/CCU exhibits the highest fixed costs of any center directly involved in the delivery of daily hospital services, JD 161,369. This amount is roughly 80 percent higher than that of the Pediatric department, the second highest cost center in terms of fixed costs. The majority of the fixed costs (86 percent) for the ICU/CCU are due to the hospital's expenditures on the fixed medical equipment that is associated with this center. With respect to ancillary and support services, the highest category of fixed costs is that associated with the allocation of X-ray services, JD 110,196 (\$155,376). Of such costs, nearly three-fourths are allocated for the employment of medical equipment.

Table 32: Distribution of Fixed Costs (F_c), by Cost Center

Cost Center	Structure	Vehicles	Medical Equipment	Medical Furniture	Furniture	Total Fixed Cost
Daily Hospital Services						
Surgery	JD 36,783	JD 6,642	JD 2,954	JD 511	JD 4,960	JD 51,850
OB/GYN	45,979	3,013	12,187	699	4,788	66,666
Internal Medicine ¹	32,186	5,728	3,693	341	5,159	47,107
Emergency Room	32,186	10,576	9,602	2,346	3,201	57,911
ICU/CCU ²	18,392	2,617	138,859	605	896	161,369
Operating Room	18,392	2,479	38,777	13,847	644	74,139
Pediatrics	45,979	6,311	32,499	568	4,502	89,859
Outpatient Clinics	N/A	N/A	N/A	N/A	N/A	N/A
Subtotal	JD 229,897	JD 37,366	JD 238,571	JD 18,917	JD 24,150	JD 548,901
Ancillary & Support Services						
Admin/Finance	JD 78,164	JD 1,317	JD --	--	JD 20,392	JD 99,873
Rehabilitation	---	113	13,295	--	425	13,833
X-ray Services	27,588	283	81,986	--	339	110,196
Laboratory Services	9,196	170	18,096	--	2,078	29,540
Pharmacy Services	9,196	113	--	--	558	9,867
Food & Beverage	78,164	113	--	--	18,014	96,291
Legal Medicine	9,196	3,085	17,357	--	40	29,678
Medical Instruments	18,392	113	--	--	405	18,910
Subtotal	JD 229,896	JD 5,307	JD 130,734	--	JD 142,251	JD 408,188
Total	JD 459,793	JD 42,673	JD 369,305	JD 18,917	JD 166,401	JD 957,089

4.3 Estimating Per Unit Fixed Cost

As discussed in the preceding chapter, hospital output is approximated through the employment of various flow variables. The variables that have been utilized throughout this study are those that are typically employed in hospital cost studies: patient days (adjusted and unadjusted), bed days, patients, admissions, and visits. When total fixed costs are considered relative to a particular flow variable, the result is equivalent to estimating the AFCs in terms of that variable.

This section of the report distributes Al Karak hospital's total fixed costs by cost center, patient days, and adjusted patient days. Where appropriate, that information is presented as the hospital's AFC of producing a particular service category.

Table 33 shows the distribution of total fixed costs of hospital departments that deliver daily hospital services, by cost center, patient day, and adjusted patient day. In terms of adjusted patient days, the AFC of a patient day in the ICU/CCU amounted to JD 122. This represents the highest AFC

for the centers directly involved in the provision of daily hospital services. Other cost centers involved in the distribution of daily hospitals services show significantly lower AFCs: Pediatrics, Surgery, OB/GYN, and Internal Medicine exhibit AFCs of JD 14, JD 8, JD 8, and JD 7, respectively.

Table 33: Distribution of Total Fixed Costs, by Cost Center, Patient Days, and Adjusted Patient Days

Cost Center	Patient Days	Adjusted Patient Days	Total Fixed Costs	Average Fixed Cost	Adjusted Average Fixed Costs
Daily Hospital Services					
Surgery	7,180	6,627	JD 51,850	JD 7	JD 8
OB/GYN	5,987	8,676	66,666	11	8
Internal Medicine	7,091	6,527	47,107	7	7
ICU/CCU	1,340	1,327	161,369	120	122
Pediatrics	7,945	6,407	89,859	11	14
Total	29,543	29,564	JD 416,851	JD 14	JD 14

Table 34 shows AFCs in terms of hospital admissions, both adjusted and unadjusted. Again, the highest AFC (JD 325) is found in the ICU/CCU department. As has been noted throughout this report, the OB/GYN department consistently exhibits the lowest per-unit cost of all centers that are involved in the allocation of daily hospital services.

Table 34: Distribution of Total Fixed Costs, by Cost Center, Admissions, and Adjusted Admissions

Cost Center	Total Admissions	Adjusted Admissions	Total Fixed Costs	Fixed Costs Per Admission	Fixed Cost Per Adjusted Admission
Daily Hospital Services					
Surgery	2,483	2,299	JD 51,850	JD 21	JD 23
OB/GYN	3,234	4,687	66,666	21	14
Internal Medicine	2,446	2,244	47,107	19	21
ICU/CCU	496	491	161,369	325	329
Pediatrics	2,407	1,941	89,859	37	46
Total	11,066	11,662	JD 416,851	JD 38	JD 36

Table 35 provides information on AFCs in terms of variables that are associated with the distribution of ER services. As noted earlier, Al Karak hospital did not have outpatient clinic facilities on its premises during the period of this study. Clinic services were provided by the Health Directorate of Al Karak, and were managed and financed by the same source. However, Al Karak hospital provided physician labor to the facilities, which were located 7 kilometers from the hospital.

Table 35: Distribution of Total Fixed Costs, by Emergency Room Visits

Cost Center	Total Visits	Total Fixed Costs	Fixed Cost Per Visit
Daily Hospital Services			
Emergency Room	36,366	JD 57,911	JD 1.59

5. Estimating Total Hospital Costs

This chapter estimates the total costs of providing services at Al Karak hospital. As was illustrated in Chapter 2, total economic cost is the sum of the total variable costs and total fixed costs of operating an institution. Chapter 3 provided a detailed estimation of Al Karak hospital's total variable costs, based on the hospital's labor and nonlabor variable inputs. Chapter 4 estimated the hospital's total fixed costs by considering the costs of its fixed structure, vehicle, furniture, and equipment inputs.

5.1 Distribution of Total Costs by Cost Center

Table 36 summarizes the total variable costs, total fixed costs, and total operating costs of Al Karak hospital in 1999, by cost center. Table 37 shows the percent distribution of those same costs.

Table 36: Distribution of Total Costs, by Cost Center

Cost Center	Total Variable Costs	Total Fixed Cost	Total Cost
Daily Hospital Services			
Surgery	JD 193,690	JD 51,850	JD 245,540
OB/GYN	154,441	66,666	221,107
Internal Medicine ¹	128,198	47,107	175,305
Emergency Room	172,130	57,911	230,041
ICU/CCU ²	67,732	161,369	229,101
Operating Room	201,765	74,139	275,904
Pediatrics	224,863	89,859	314,722
Outpatient Clinics	235,953	N/A	235,953
Subtotal	JD 1,378,772	JD 548,901	JD 1,927,673
Ancillary & Support Services			
Admin/Finance	JD 339,116	JD 99,873	JD 438,989
Rehabilitation	25,887	13,833	39,720
X-ray Services	138,867	110,196	249,063
Laboratory Services	67,942	29,540	97,482
Pharmacy Services	214,676	9,867	224,543
Food & Beverage	200,223	96,291	296,514
Legal Medicine	8,452	29,678	38,130
Medical Instruments	29,499	18,910	48,409
Subtotal	1,024,662	408,188	1,432,850
Total	JD 2,403,434	JD 957,089	JD 3,360,523

Table 37: Percent Distribution of Total Costs, by Cost Center

Cost Center	Total Variable Costs	Total Fixed Cost	Total Cost
Daily Hospital Services			
Surgery	8.1%	5.4%	7.3%
OB/GYN	6.4	7.0	6.6
Internal Medicine ¹	5.3	4.9	5.2
Emergency Room	7.2	6.1	6.8
ICU/CCU ²	2.8	16.9	6.8
Operating Room	8.4	7.7	8.2
Pediatrics	9.4	9.4	9.4
Outpatient Clinics	9.8	N/A	7.0
Subtotal	57.4%	57.4%	57.3%
Ancillary & Support Services			
Admin/Finance	14.1%	10.4%	13.1%
Rehabilitation	1.1	1.4	1.2
X-ray Services	5.7	11.5	7.4
Laboratory Services	2.8	3.1	2.9
Pharmacy Services	8.9	1.0	6.7
Food & Beverage	8.3	10.1	8.8
Legal Medicine	0.4	3.1	1.1
Medical Instruments	1.2	2.0	1.5
Subtotal	42.6 %	42.6 %	42.7 %
Total	100%	100%	100%

As the tables show, nearly two-thirds of the hospital's operating costs—whether variable, fixed, or total—is consumed by centers directly engaged in the delivery of daily hospital services. This finding is not surprising. Also unsurprising is that the highest percent of variable and fixed costs are those allocated to the distribution of administrative/financial and operating room services, respectively.

What is startling, however, is that the highest percentage (57 percent, or, in nominal terms, JD 438,989, or \$618,974) of total costs is allocated towards the distribution of administrative/financial services.¹⁷ In fact, this represents a lower bound estimate, given that this analysis excludes the proportion of administrative/financial services that are conducted by the central ministry on behalf of Al Karak hospital. For example, the central ministry conducts all procurement (e.g., drugs, devices, and equipment) and most administrative functions that are associated with personnel issues. Under optimal circumstances, such costs would be included in the analysis. However, the lack of an effective budget tracking system within the MOH precluded obtaining robust estimates of such central ministry expenditures.

¹⁷This amount is significantly lower than the national average of 57 percent for U.S. hospitals.

5.2 Total Costs Per Unit of Output

This section discusses Al Karak operating costs per unit of output, using the flow variables that have been employed throughout this study: patient days (adjusted and unadjusted), bed days, patients, admissions, and visits. The result is equivalent to estimating the ATC in terms of that variable. This section also considers various ATC estimates of operating Al Karak hospitals in terms of the aforementioned flow variables.

As Table 38 shows, the costs of ICU/CCU services is the highest among all categories of daily hospital services in terms of both unadjusted and adjusted patient days, JD 171 and JD 173, respectively. This is expected given the significant amounts of variable and fixed factors that are used in the treatment of ICU/CCU patients. The lowest ATCs are found in the treatment of OB/GYN patients, JD 25 for adjusted patient days. Additional information concerning the hospital's total costs may be extrapolated from the data. For example, as was discussed in Section 3.5, Al Karak hospital delivered 2,249 newborns in its OB/GYN department. Given total operating costs of JD 181,992 for this cost center, the ATC is roughly JD 98 (\$138) per delivery.¹⁸

Table 38: Distribution of Total Costs, by Cost Center, Patient Days, and Adjusted Patient Days

Cost Center	Patient Days	Adjusted Patient Days	Total Costs	Average Total Costs	Adjusted Average Total Costs
Daily Hospital Services					
Surgery	7,180	6,630	JD 245,540	JD 34	JD 37
OB/GYN	5,987	8,676	221,107	37	25
Internal Medicine	7,091	6,529	175,305	25	27
ICU/CCU	1,340	1,327	229,101	171	173
Pediatrics	7,945	6,407	314,722	40	49
Total	29,543	29,569	JD 1,185,775	JD 40	JD 40

Table 39 shows estimates of ATCs in terms of hospital admissions, both adjusted and unadjusted. The highest ATC occurs in the production of ICU/CCU services. The lowest ATC occurs during the production of OB/GYN services. In fact, with an adjusted ATC relative to the number of admissions of roughly JD 47 (\$66), OB/GYN service production is 66 percent lower than that of Internal Medicine service production and 128 percent lower than that of surgery service production.

¹⁸ Utilizing the data obtained in this document, the PHR*plus* Health Insurance Pilot project has estimated the total costs per maternity case, including outpatient and inpatient treatment, as well as making adjustments for vaginal and Caesarean cases, to be JD158 per case at Al Karak hospital. See Duffy, 2002.

Table 39: Distribution of Total Costs, by Cost Center, Admissions and Adjusted Admissions

Cost Center	Total Admissions	Adjusted Admissions	Total Costs	Total Costs Per Admission	Total Costs Per Adjusted Admission
Daily Hospital Services					
Surgery	2,483	2,299	JD 245,540	JD 99	JD 107
OB/GYN	3,234	4,687	221,107	68	47
Internal Medicine	2,446	2,244	175,305	72	78
ICU/CCU	496	491	229,101	462	467
Pediatrics	2,407	1,941	314,722	131	162
Total	11,066	11,662	JD 1,185,775	JD 107	JD 102

Table 40 presents total costs per ER visits at Al Karak hospital. A visit is the appearance of a patient in the hospital for ambulatory and/or ancillary services. As shown in Table 26, the AVC of an ER visit is JD 4.76, and as illustrated in Table 40, the ATC of such services is JD 6.33. This information implies that 75 percent of the average costs that are associated with the production of emergency room services are consumed by variable factor inputs.

Table 40: Distribution of Total Costs, by Emergency Room and Outpatient Visits

Cost Center	Total Visits	Total Costs	Total Cost Per Visit
Daily Hospital Services			
Emergency Room	36,366	JD 230,041	JD 6.33

Table 41 contains the unit costs of hospital services, loaded with administrative/financial costs. These administrative/financial costs represent an average of 38.5 percent of total costs of daily hospital services.

Table 41: Per Unit Daily Hospital Services Loaded With Admin/Finance Costs

Cost Center	Total Costs	Admin/Finance (Loaded) Costs	Total Costs (TC) + (Loaded)	Loaded TC per Adjusted Patient Day
Daily Hospital Services				
Surgery	JD 245,540	JD 98,431	JD 343,971	JD 52
OB/GYN	221,107	128,806	349,913	40
Internal Medicine	175,305	96,931	272,236	42
ICU/CCU	229,101	19,701	248,802	187
Pediatrics	314,722	95,120	409,842	64
Total	JD 1,185,775	JD 438,989	JD 1,624,764	JD 55

6. Policy Implications and Conclusion

This detailed economic analysis of the cost of producing hospital services at Al Karak hospital marks completion of an additional step in the Ministry of Health's decentralization of its 23 publicly owned and operated hospitals. The first phase of this process began nearly four years ago when the MOH, with the technical assistance of the Hospital Decentralization Implementation Team, selected Princess Raya and Al Karak hospitals as its two pilot institutions from which this process would begin. Since then, under *Phase 2*, the MOH has made significant strides in this effort. In addition to implementing several short-run changes in existing rules and regulations, the MOH has designed and approved the establishment of hospital governing boards at each hospital, as well as supported the extensive training activities that both PHR and PHR*plus* have provided to hospital personnel. The information contained in this cost study will provide the MOH with needed information that will assist it in its future design of an appropriate operating budget for each hospital. However, prior to implementing such a budget, several key issues must be addressed.

First, an appropriate managerial cost accounting system does not exist at either hospital. Having such a system in place is a necessary condition for keeping track of monetary flows throughout the system, and it is an essential tool for assisting department managers, i.e., cost center managers, to manage their resources efficiently. For example, currently the hospitals do not effectively track the costs and amounts of drugs consumed by each department. As a result, in order to estimate drug expenditures by costs center (department), the Implementation Team had to design a survey instrument to track drug consumption. In tracking consumption, the survey found that both hospitals have excess inventory of certain drug categories and a shortage of others, which they attribute to the highly centralized MOH procurement and supply process. An effective managerial cost accounting system and better coordination between the hospital and the MOH Procurement and Supplies division should allow for more efficiency in hospital drug inventories. PHR*plus* will assist Princess Raya and Al Karak hospitals in the development of a managerial cost accounting system.

Secondly, because labor costs represent 32 percent of Al Karak hospital's total operating costs, the employment and distribution of labor throughout the hospital has significant overall cost implications. As this study shows, the Internal Medicine department of the hospital appears to be quite productive. While this finding cannot be substantiated without further studies on the relative productivity of employees within each department, it implies that the MOH should make a greater effort in tracking the total number of work hours, both productive and nonproductive, for all hospital employees and develop a system to accurately estimate the number of full-time equivalent hours that are worked by hospital employees, not only at Al Karak, but at other MOH hospitals as well. In looking at labor costs the study also revealed that, due to existing MOH and Civil Service rules, personnel records at the central ministry are not updated and matched against the hospital's personnel records on a regular basis. For example, the study found that personnel reassigned from Al Karak hospital to other MOH facilities often are still listed as Al Karak employees in central ministry records. This problem can be eliminated through the development of a more effective system of communication and reporting between the MOH personnel division and the hospital. In this study labor costs were treated as a variable factor. The ability of a hospital manager to vary labor inputs is a matter of MOH policy. The implementation of a managerial cost accounting system will provide

MOH policymakers and hospital managers with additional data to recommend hospital workforce policies that increase efficiency within each cost center.

Finally, it would be inappropriate to use this study to make any conclusion about cost sharing. More analysis of the hospital's services production and the economic and demographic profiles of its patients are needed prior to implementing changes in the existing policies. However, implementation of managerial cost accounting systems, based on the framework suggested by this study, is a logical next step that will add to the complete understanding of hospital costs. This understanding is essential before accurate cost-sharing systems can be designed and implemented.

Annex A: Summary Tables of Allocation Rules

Table A1: Allocation Rules for Utility Cost Estimates, and Variable Structure and Equipment Estimates (See Tables 15 and 16)

Input Category	Allocation Rule	Note
Labor Cost	Distributed according to percent time assigned to relevant cost center	Example, 20% of time implied 20% of labor remuneration to the particular cost center
Fuel, Butane Gas, Electricity, and Water	Distributed according to the percent of square meters of physical space occupied by a respective cost center ¹	Example, 10% of occupied physical space implied 10% allocation of total costs
Telephone Services	Distributed according to the percent of telephone lines that are distributed to the relevant cost center	Example, 5% of hospital telephone lines, entailed 5% distribution of total costs to relevant center
Building Renovations, Maintenance	Distributed according to the percent of square meters of physical space occupied by a respective cost center ¹	Example, 10% of occupied physical space implied 10% allocation of total renovation costs
Rehabilitation, Physician and Technicians Quarters	Distributed according to the percent of nursing staff employed in a particular cost center	Quarters rentals are overnight facilities for rehabilitation, physicians, and technicians
Building and Equipment Maintenance, Renewal and Supplies	Distributed based upon the current costs of maintenance and renewal for a particular cost center	

¹Based upon blueprint estimates that were obtained from the MOH Department of Buildings

Table A2: Allocation Rules Variable Hospital Consumables, Contracted Services, and Nonclinical Supplies (See Tables 17 thru 19)

Input Category	Allocation Rule	Note
Drugs and Medications	Distributed based upon the percent of medications allocated to a particular cost center	Based upon a survey of drug consumption, by cost center, that was conducted over a two-month period
Gases	Distributed based upon the percent of gas valve connections that were available in a particular cost center	Example, 10% of gas valve connectors implied 10% of total cost to be distributed to the relevant cost center
Medical Consumables	Distributed based upon the percent of patient days	Example, cost center that represented 5% of patient days received 5% of total costs
Laboratory and Radiological Consumables	Distributed based upon the percent of patient days	
Contracted Services	Distributed based upon the percent of patient days	
Nonclinical Supplies	Distributed based upon the percent of patient days	

Table A3: Allocation Rules for Fixed Hospital Structure, Vehicles, Equipment and Furniture (see Tables 28 thru 30)

Input Category	Allocation Rule	Note
Hospital Building, Electrical Structures, Sewage and Plumbing	Costs distributed based upon the proportion of square meters	Blueprints obtained from the MOH Department of Buildings
Kidney Dialysis Unit	Costs allocated to the Internal Medicine cost center	Kidney dialysis unit is located within the internal medicine department
Ambulances	Costs allocated to Emergency Room cost center	Emergency transport vehicle
Tanker	Costs allocated based upon inpatient days	Vehicle used for waste disposal
Buses	Costs allocated according to percent of nursing personnel assigned to a particular costs center	Buses are used for transporting nursing personnel from residences to hospital
Pickup and Isuzu Salon	Costs allocated according to the percent of total personnel assigned to a given cost center	Vehicles are utilized for transporting documents and other small material from the central ministry to the hospital, or within the governorate

Annex B: Service Inventory of Al-Karak Hospital

REPORTING REQUIREMENT SERVICES INVENTORY

("X" indicates that service is offered)

	Offer		Offer		Offer
DAILY HOSPITAL SERVICE		LABORATORY SERVICES		CLINIC SERVICES	
INTENSIVE CARE SERVICES		Microbiology		Dental	
Burn		Necropsy		Dermatology	X
Coronary		Serology	X	Diabetes	X
Medical	X	Surgical Pathology	X	Drug Abuse	X
Neonatal	X	DIAGNOSTIC IMAGING SERVICES		Family Therapy	
Neurosurgical		Computed Tomography	X	Group Therapy	
Pediatrics	X	Cystoscopy	X	Hypertension	X
Pulmonary		Magnetic Resonance Imaging		Metabolic	
Surgical	X	Position Emission Tomography	X	Neurology	
Definitive Observation Care	X	Ultrasonography	X	Neonatal	X
ACUTE CARE SERVICES		X-Ray Radiology	X	Obesity	
Alternate Birthing Center (licensed beds)	X	DIAGNOSTIC THERAPEUTIC SERVICES		Obstetrics	X
Geriatric		Audiology	X	Ophthalmology	X
Medical	X	Biofeedback therapy		Orthopedic	X
Neonatal	X	Cardiac Catheterization		Otolaryngology	X
Oncology		Cohart Therapy		Pediatrics	X
Orthopedic	X	Diagnostic Radioisotope		Pediatrics Surgery	
Pediatric	X	Echocardiology	X	Podiatry	
Physical Rehabilitation		Electro cardiology	X	Psychiatric	X
Post Partum	X	Electroencephalography		Renal	X
Surgical	X	Electromyography		Rheumatic	X
Transitional Inpatient care (Acute beds)	X				
NEWBORN CARE SERVICES		Endoscopy		Rural Health	
Developmentally Disabled Nursery Care	X	Gastro – Intestinal Laboratory		Surgery	X
New born Nursery care	X	Hyperbaric Chamber Services			
Premature Nursery Care	X	Lithotripsy		HOME CARE SERVICES	
Hospice care	X	Nuclear Medicine		Home Health Aids Services	

Inpatient care under custody (Jail)		Occupational Therapy		Home Nursing Care (visiting Nurse)	
LONG –TERM CARE		Physical Therapy		Home Physical Medicine Care	
Behavioral disorder care		Peripheral Vascular Laboratory		Home Social Service care	
Developmentally disabled care		Pulmonary Function Services		Home dialysis Training	
Intermediate care		Radiation Therapy		Home Hospice Care	
Residential / Custodial care		Radium Therapy		Home I.V Therapy Services	
Self care		Radioactive Implants		Jail Care	
Skilled nursing care		Recreational Therapy		Psychiatric Foster Home Care	
Sub –acute Care		Respiratory Therapy Services			
Sub –acute care Pediatric					
Transitional Inpatient Care (SNF Beds)					
CHEMICAL DEPENDENCY –DETOX		Speech –Language Pathology		AMBULATORY SERVICES	
Alcohol		Sports care Medicine		Adult Day Health Care Center	
Drug		Stress Testing		Ambulatory Surgery Services	
CHEMICAL DEPENDENCY – Rehabilitation		Therapeutic Radioisotope		Comprehensive Outpatient Rehab. Facility	

	Offer		Offer		Off.
Alcohol		X-ray Radiology Therapy		Observation (short stay) care	X
Drug		PSYCHIATRIC SERVICES		Satellite Ambulatory Surgery Services	
PSYCHIATRIC SERVICES		Clinic Psychologist Services	X	Satellite Clinic Services	
Psychiatric Acute –Adult	X	Child Care Services			
Psychiatric – Adolescent and child	X	Electro convulsive Therapy (shock)		OTHER SERVICES	
Psychiatric Intensive (Isolation) care		Milieu Therapy		Diabetic Training class	X
Psychiatric long term care		Night care		Diabetic Counseling	X
		Psychiatric Therapy		Drug Reaction Information	
OBSTETRIC SERVICES		Psychopharmacological Therapy		Family Planning	X
Abortion Services	X	Sheltered Workshop		Genetic Counseling	X
Combined labor / Delivery birthing Room	X	RENAL DIALYSIS		Medical Research	
Delivery Room Service	X	Hemodialysis	X	Parent training Class	
Infertility Services	X	Home dialysis support services		Patient Representative	
Labor Room Service	X	Peritoneal	X	Public Health Class	
SURGERY SERVICES		Self –Dialysis Training		Social Work Service	
Dental		Organ Acquisition		Toxicology / Antidote Information	
General	X	Blood bank	X	Vocational Services	

Gynecologic	X	Extracorporeal Membrane Oxygenation			
Heart		Pharmacy		MEDICAL EDUCATIONAL PROGRAMS	
Kidney				Approved Residency	
Neurosurgical		EMERGENCY SERVICES		Approved Fellowship	
Open heart		Emergency Communication system	X	Non –Approved Residency	
Ophthalmologic		Emergency Helicopter Service		Associate Records Technician	
Organ transplant		Emergency Observation Service	X	Diagnostic Radiologist Technologist	
Orthopedic		Emergency Room Service	X	Dietetic Intern Program	
Otolaryngologic		Heliport		Emergency Medical Technician	
Pediatric		Medical transportation		Hospital Administration Program	
Plastic		Mobile Cardiac Care Service		Licensed Vocational Nurse	X
Podiatry		Orthopedic Emergency Services		Medical Technologist Program	
Thoracic		Psychiatric Emergency Services		Medical Records Administrator	X
Urologic		Radioisotope Decontamination Room		Nurse Anesthetist	
Anesthesia Services	X	Trauma Treatment E.R		Nurse Practitioner	X
				Nurse Midwife	X
LABORATORY SERVICES		CLINIC SERVICES		Occupational therapist	
Anatomical Pathology	X	Aids		Pharmacy Intern	X
Chemistry	X	Alcoholism		Physician `s Assistant	
Clinical pathology	X	Allergy		Physical Therapist	X
Cyto-genetics		Cardiology		Registered Nurse	X
Cytology	X	Chest Medical		Respiratory Therapist	
Hematology	X	Child Diagnosis		Social Worker Program	
Histocompatibility		Child treatment			
Immunology		Communicable Disease			

Annex C: Fixed Assets (Equipment and Furniture Inventory) of Al Karak

Medical Equipment or Devices /Laboratory Department

Items with Replacement of JD 100 (\$140) or more

Item No.	Name of the Medical Equipment/ Device	Number	Cost		Total cost	Date of receipt
			Dinars	Fils		
1	Microscope	5	1000		5000	
2	Spectrophotometer	2	2500		5000	
3	Water bath	3	400		1200	
4	Flame photometer	2	2000		4000	
5	Autoclave	1	800		800	
6	Oven	1	600		600	
7	Incubator	1	600		600	
8	Cell Count	2	4000		8000	
9	Centrifuge Tube	5	1000		5000	
10	Hematocrit Centrifuge	3	700		2100	
11	Bilirubin Meter	2	600		1200	
12	Paraffin Section	1	500		500	
13	Tissue Check Procedure	1	600		600	
14	Biochemistry Analyzer	1	3000		3000	
15	Eliza Random (Device for checking Aids)	2	3000		6000	
16	Coagulometer	1	2000		2000	
17	Bio-mixer	2	300		600	
18	Tube sealer	1	200		200	
19	Thermo-rack	2	200		400	
20	Multi-channel	3	300		900	
21	Distiller	1	1000		1000	
22	Sensitive Balance	2	800		1600	
23	Chair for taking blood for checking	2	1000		2000	
24	Lavofuge (like centrifuge)	1	5000		5000	
25	Incubator shaker	1	500		500	
26	Leuco-form apparatus	1	100		100	
27	Laboratory hood	2	500		1000	
28	Hot plate	1	100		100	

Medical tools / Gynecology Department

Items with Replacement of JD 100(\$140) or more

Item No.	Name of the Medical Tool	Number	Cost		Total cost	Date of receipt
			Dinars	Fils		
1	Stretcher Trolley	1	200		200	
2	Mayo table (Mayo tray)	1	300		300	
3	Wheel chair	1	300		300	

Medical Equipment / Gynecology Department

Items with Replacement of JD 100(\$140) or more

Item No.	Name of the Medical Equipment/ Device	Number	Cost		Total cost	Date of receipt
			Dinars	Fils		
1	Defibrillator with DC Shock	1	3500		3500	
2	Sphygmomanometer stand	1	200		200	
3	Diagnostic set	1	150		150	
4	Emergency trolley	1	1000		1000	
5	E.C.G monitor with DC Shock	1	5000		5000	
6	Manual suction	1	300		300	

Medical Equipment / Men's Department (Male Department)

Items with Replacement of JD 100(\$140) or more

Item No.	Name of the Medical equipment/ device	Number	Cost		Total cost	Date of receipt
			Dinars	Fils		
1	Diagnostic set	1	150		150	
2	DC Shock apparatus	1	3500		3500	
3	Laryngoscope	1	120		120	
4	Sphygmomanometer Stand	1	200		200	
5	Infusion pump	1	800		800	

Medical Tools / Men's Department (Male Department)

Items with Replacement of JD 100(\$140) or more

Item No.	Name of the Medical Tool	Number	Cost		Total cost	Date of receipt
			Dinars	Fils		
1	Hot air oven	2	400		800	
2	Wheel chair	1	300		300	

Medical Tools / Post – Mortem Room (Autopsy Room)

Items with Replacement of JD 100(\$140) or more

Item No.	Name of the Medical equipment/ device	Number	Cost		Total cost	Date of receipt
			Dinars	Fils		
1	Autopsy table	1	2000		2000	1996
2	Mortuary chambers (two place)	1	6000		6000	1996
3	Incinerator	1	1000		1000	1996
4	Refrigerator deep freezer	1	2000		2000	1996
5	Mortuary chambers (four places)	1	10,000		10,000	1996
6	Giant incinerator	1	64,130		64,130	

Medical Equipment / Obstetrics Department

Items with Replacement of JD 100(\$140) or more

Item No.	Name of the Medical equipment/ device	Number	Cost		Total cost	Date of receipt
			Dinars	Fils		
1	Obstetrics table	1	3000		3000	
2	Fetal heart detector sonicaid	1	150		150	
3	Fetal monitor	2	1500		3000	
4	Sphygmomanometer stand	2	200		400	
5	Sonicaid	2	150		300	
6	Anesthesia apparatus	1	6000		6000	
7	Suction theatre with bottle	1	300		300	
8	Vacuum set	4	1500		6000	
9	Resuscitation kit pediatric in case	1	3000		3000	
10	Infant resuscitation	1	3000		3000	
11	U/S scanner	1	5000		5000	
12	Hot air oven	1	400		400	
13	Obstetric table	1	3000		3000	
14	Operating table	1	2000		2000	
15	Densometry	1	10,000		10,000	

Medical Tools / Obstetrics Department

Items with Replacement of JD 100(\$140) or more

Item No.	Name of Medical Tools	Number	Cost		Total cost	Date of receipt
			Dinars	Fils		
1	Examination trolley	1	100		100	
2	Structure trolley	2	200		400	
3	Wheel chair	1	300		300	

Medical Equipment / Physical Therapy Department

Items with Replacement of JD 100(\$140) or more

Item No.	Name of the Medical Equipment/ Device	Number	Cost		Total cost	Date of receipt
			Dinars	Fils		
1	Fixed bicycle	1	600		600	
2	Hand finger table	1	2500		2500	
3	Wall pulley	1	100		100	
4	Quadriceps bench	1	1800		1800	
5	Tilt table mobile	1	200		2000	
6	Standing firm table	2	300		600	
7	Suspension frame	1	2000		2000	
8	Short wave	3	3000		9000	
9	Akron- rythmatic traction	3	2000		6000	
10	Hydro collator	3	3000		9000	
11	Paraffin wax therapy	3	1000		3000	
12	Parallel bar	2	200		400	
13	Massage machine vibrator	2	500		1000	
14	Dynatron 438	1	2000		2000	
15	Therasonic five (US)	1	1500		1500	
16	Interferential med frequency (current with vacuum)	2	2500		5000	
17	Combined US and ES machine	1	2800		2800	
18	Whirl pool	2	4000		8000	
19	Cold pack machine	1	1000		1000	
20	BR2 export pulse	1	2000		2000	
21	Cervical traction machine- Electra 471	1	2000		2000	
22	Mobile traction firm for retraction	1	1000		1000	
23	Shoulder wheel	2	1000		2000	

Medical Tools / Emergency Department

Items with Replacement of JD 100(\$140) or more

Item No.	Name of the Medical Tool	Number	Cost		Total cost	Date of receipt
			Dinars	Fils		
1	Stretcher on trolley	4	100		400	
2	Drum holder	5	300		1500	
3	Mayo table	3	300		900	
4	Wheel chair	2	300		600	

Medical Equipment / Emergency Department
Items with Replacement of JD 100(\$140) or more

Item No.	Name of the Medical Equipment/ Device	Number	Cost		Total cost	Date of receipt
			Dinars	Fils		
1	Hot air oven	1	400		400	
2	Operating light	1	2000		2000	
3	Minor operating table	1	2000		2000	
4	Orthopedic plastering bed	2	2500		5000	
5	Anesthetics apparatus	1	6000		6000	
6	Electro surgical unit	1	3000		3000	
7	Suction theater 2 bottle	1	300		300	
8	Sphygmomanometer stand	4	200		800	
9	Diagnostic set	2	150		300	
10	E.C.G Machine	3	800		2400	
11	Ventilator Nebulizer	1	300		300	
12	DC Shock	1	3500		3500	
13	Autoscope standard	1	250		250	
14	Ophthalmoscope	1	10,000		10,000	

Medical Equipment / Anesthesia Department
Items with Replacement of JD 100(\$140) or more

Item No.	Name of the Medical Equipment/ Device	Number	Cost		Total cost	Date of receipt
			Dinars	Fils		
1	Anesthesia device (North American dragger)	2	15,000		30,000	
2	Anesthesia device (Tricomed)	1	15,000		15,000	
3	Anesthesia device (Saire)	4	15,000		60,000	
4	Royal anesthesia device	1	15,000		15,000	
5	Laryngoscope	6	120		720	
6	Sphygmomanometer monitor	2	1000		2000	
7	E.C .G with DC Shock	1	3500		3500	
8	E.C.G (Protoscope)	1	800		800	
9	Capnography (O2 Monitor)	1	1500		1500	
10	Pulse oximeter	3	1000		3000	
11	Capno- check pulse oximeter	1	1000		1000	
12	Capno- meter portable	1	1000		1000	

Medical Equipment / Operation Room
Items with Replacement of JD 100(\$140) or more

Item No.	Name of the Medical Equipment/ Device	Number	Cost		Total cost	Date of receipt
			Dinars	Fils		
1	Hot air oven	1	400		400	
2	Formaline electro sterilizer	2	150		300	
3	Operating sky light	4	2000		8000	
4	Electro surgical unit	5	2000		10,000	
5	Operating table	3	5000		15000	
6	Suction theatre with two bottle	2	300		600	
7	Plaster cast	2	300		600	
8	Horizontal auto clave	1	6000		6000	
9	Cryo- surgical unit	1	1000		1000	
10	Gypoco-labroscope system	2	70 000		140 000	
11	Chair for ophthalmic	1	4000		4000	
12	Infant resuscitation table	1	2000		2000	
13	Cystscope	1	150		150	
14	Microscope	1	1000		1000	
15	Esophagus-scope	2	300		600	
16	Eleck- evacuator	2	100		200	
17	Sterilizer device	5	50 000		250 000	

Medical Tools / Operation Room
Items with Replacement of JD 100(\$140) or more

Item No.	Name of the Medical Tool	Number	Cost		Total cost	Date of receipt
			Dinars	Fils		
1	Drum holder	6	300		1800	
2	Post mortem set	1	400		400	
3	Sigmoid set	1	500		500	
4	Suction bepools unit	10	1000		10000	
5	Varicose	10	100		1000	
6	Nail extractor	3	100		300	
7	Compression tourniquet	1	200		200	
8	Manual hand drill	3	200		600	
9	Wire cutter double art	3	100		300	
10	Counter sink	1	500		500	
11	Blood infusion warmer	1	100		100	
12	Infant resuscitation table	1	200		200	
13	Head mirror	1	100		100	
14	Side lamp	3	100		300	
15	Head light	1	150		150	
16	Oxygen cylinder	20	150		3000	
17	Nitrous cylinder	20	150		3000	

Medical Tools / Pediatrics Department

Items with Replacement of JD 100(\$140) or more

Item No.	Name of the Medical Tool	Number	Cost		Total cost	Date of receipt
			Dinars	Fils		
1	Stretcher trolley	1	100		100	
2	Rectangular instrument trolley	2	150		300	
3	Hot air oven	1	400		400	

Medical Equipment / Pediatrics Department

Items with Replacement of JD 100(\$140) or more

Item No.	Name of the Medical Equipment or device	Number	Cost		Total cost	Date of receipt
			Dinars	Fils		
1	Hot air oven	1	400		400	
2	Laryngoscope	1	120		120	
3	Nebulizer	2	300		600	
4	Infusion pump	1	775		775	

Medical Equipment / I.C.U Department

Items with Replacement of JD 100(\$140) or more

Item No.	Name of the Medical Equipment or device	Number	Cost		Total cost	Date of receipt
			Dinars	Fils		
1	Defibrillator with monitor	4	3500		14000	
2	Intensive care bed	4	3000		12000	
3	E.C.G Machine	2	800		1600	
4	Infusion pump	5	600		3000	
5	E.C.G Monitor	2	5000		10,000	
6	Sphygmomanometer stand	2	200		400	
7	Laryngoscope	3	150		450	
8	Ventilator baby board	1	1300		1300	
9	Ventilator	4	13000		52000	
10	Blood gases machine	1	25000		25000	
11	Mini -doplar	1	1000		1000	
12	Echo cardiograph	1	20,000		20,000	
13	Tridmil (stress test machine)	1	15,000		15,000	
14	Bedside E.C.G Monitor	2	17,500		35,000	
15	Oxygen regular	4	100		400	
16	Respirator and anesthesia	2	3000		6000	

Medical Tools / I.C.U Department

Items with Replacement of JD 100(\$140) or more

Item No.	Name of the Medical Tool	Number	Cost		Total cost	Date of receipt
			Dinars	Fils		
1	Mayo table	2	300		600	
2	Wheel chair	1	300		300	

Medical Equipment / Premature Department

Items with Replacement of JD 100(\$140) or more

Item No.	Name of the Medical Equipment or device	Number	Cost		Total cost	Date of receipt
			Dinars	Fils		
1	Laryngoscope	3	150		450	
2	Photo-therapy	5	2500		12,500	
3	Infant incubator	10	4000		40,000	
4	Infant resuscitation	2	3000		6000	
5	Portable suction	1	2000		2000	
6	Portable infant incubator	3	2000		6000	
7	Air compressor	1	3000		3000	
8	Hot air oven	1	400		400	
9	Defibrillator monitor	1	3500		3500	
10	Respiratory monitor	1	300		300	
11	Fetal monitor	1	1500		1500	
12	Infant warmer	1	600		600	
13	Infusion pump	1	500		500	
14	Ventilator	4	13,000		52,000	

Medical Tools / Premature Department

Items with Replacement of JD 100(\$140) or more

Item No.	Name of the Medical Tools	Number	Cost		Total cost	Date of receipt
			Dinars	Fils		
1	Small heater	1	100		100	

Medical Equipment / X –Ray Department
Items with Replacement of JD 100(\$140) or more

Item No.	Name of the Medical Device	Number	Cost		Total cost	Date of receipt
			Dinars	Fils		
1	C.T scan	1	250,000		250,000	
2	Colored X-ray device	1	25,000		25,000	
3	Non colored X-ray device	1	20,000		20,000	
4	Ultra –sound	2	8000		16,000	
5	Processor	3	10,000		30,000	
6	Mammogram	1	15,000		15,000	
7	Uterine X-ray device	1	600		600	
8	Portable x-ray	5	10,000		50,000	

Medical Gases (Tools and equipment)/Shared by Departments

Item with Replacement of JD 100 (\$140) or more

No.	Department	Quantity	Cost per item	Overall cost	Date of receipt
1	Pediatrics		16849	16849	
2	I.C.U		5751	5751	
3	Obstetrics		11989	11989	
4	Emergency		9928	9928	
5	X-ray		372	372	
6	Surgery		8045	8045	
7	Internal medicine		7424	7424	
8	Operation		18942	18942	

Furniture / Physical Therapy Department

Items with Replacement of JD 100(\$140) or More

Item No.	Item Name / Description	Number	Cost		Total Cost	
			Dinars	Fils	Dinars	Fils
1	Metallic table with four drawers		100		100	
2	Refrigerator “8 feet “		175		175	

Furniture / Laboratory Department
Items with Replacement of JD 100(\$140) or More

Item No.	Item Name / Description	Number	Cost		Total Cost	
			Dinars	Fils	Dinars	Fils
1	Metallic office table (melanin coated)		150		450	
2	Metallic cabinet with two doors and open shelves	3	150		450	
	S.S Refrigerator (capacity of 700 liters)		1500		6000	
	Deep stainless steel freezer		2000		2000	

Furniture / Male Surgery Department
Items with Replacement of JD 100(\$140) or More

Item No.	Item Name / Description	Number	Cost		Total Cost	
			Dinars	Fils	Dinars	Fils
1	Large Metallic office table (melanin coated)		150		300	
2	Metallic closet with movable shelves		150		1200	
3	Wooden closet with two doors		250		500	
4	Wooden closet with six doors	4	450		1800	
5	Metallic locker located beside the patient bed		100		2600	
6	Opened metallic closet (unclosed shelves and without a door)		150		750	
7	Wooden counter		600		600	
8	Patient bed		500		13,000	

Furniture / Operation Room
Items with Replacement of JD 100 (\$140) Or more

Item No.	Item Name / Description	Number	Cost		Total Cost	
			Dinars	Fils	Dinars	Fils
1	Multi- purpose cabinet		100		700	
2	Wooden closet with two doors	4	250		1000	
3	Large office desk	1	150		150	

Furniture / Pharmacy Department
Items with Replacement of JD 100 (\$140) Or more

Item No.	Item Name / Description	Number	Cost		Total Cost	
			Dinars	Fils	Dinars	Fils
1	Metallic large office desk (melanin coated)	1	150		150	
2	Medium size metallic office desk (melanin coated)	1	100		100	
	Electric refrigerator	1	650		650	
4	Drugs refrigerator (for preserving drugs)		1200		1200	
5	Metallic cabinet with two doors		150		150	
6	Metallic closet with exposed (non ±closed) shelves	1	150		150	

Furniture / Gynecology Department
Items with Replacement of JD 100 (\$140) Or more

Item No.	Item Name / Description	Number	Item Cost		Total Cost	
			Dinars	Fils	Dinars	Fils
1	Metallic large office desk (melanin coated)	1	150		150	
2	Medium size metallic office desk (melanin coated)	1	100		100	
3	Metallic closet with movable shelves	8	150		1200	
4	Opened metallic closet with exposed opened shelves		150		900	
5	Wooden closet with two doors	2	250		500	
6	Wooden closet with six doors	4	450		1800	
7	Metallic closet located beside the patient bed		100		2600	
8	Patient bed		500		13000	
9	Electrical refrigerator "3 feet"		110		110	
10	Aluminum counter	1	280		280	
11	Television set		250		250	

Furniture / Emergency Department
Items with Replacement of JD 100 (\$140) Or more

Item No.	Item Name / Description	Number	Item Cost	Total Cost		
				Dinars	Fils	Fils
1	Metallic large office desk (melanin coated)	3	150		450	
2	Medium size metallic office desk (melanin coated)	1	100		100	
3	Metallic closet with movable shelves		150		1350	
4	Metallic closet with two doors and movable shelves	2	150		300	
5	Wooden closet with 4 doors		450		1800	
6	Metallic closet inserted beside the patient bed	8	100		800	
7	Laced metallic low back, fixed base chair		300		1500	
8	Metallic closet with opened shelves and without a door	8	150		1200	
9	Wooden counter		600		1800	
10	Patient bed		500		4000	
11	Electrical Refrigerator 3 feet		110		110	

Furniture / I.C.U Department
Items with Replacement of JD 100 (\$140) Or more

Item No.	Item Name / Description	Number	Item Cost	Total Cost		
				Dinars	Fils	Fils
1	Metallic large office desk (melanin coated)	3	150		450	
2	Medium size metallic office desk (melanin coated)	1	100		100	
	Metallic closet with movable shelves	5	150		750	
	Metallic closet with two doors and movable shelves	5	150		750	
5	Metallic cabinet inserted beside the patient bed	4	100		400	
6	Electric Refrigerator "3 feet "	1	110		110	
7	Television set	1	250		250	

Furniture / Obstetrics Department
Items with Replacement of JD 100 (\$140) Or more

Item No.	Item Name / Description	Number	Item Cost		Total Cost	
			Dinars	Fils	Dinars	Fils
1	Metallic large office desk (melanin coated)	3	150		450	
2	Metallic closet with movable shelves	5	150		750	
3	Multi- purpose cabinet	2	100		200	
4	Metallic cabinet with opened shelves (without a door)	4	150		600	
5	Wooden closet with two doors	3	250		750	
6	Wooden closet with six doors	4	600		2400	
7	Metallic closet inserted beside the patient bed	21	100		2100	
8	Wooden counter	1	600		600	
9	Patient `s bed	21	500		10500	
10	Television set	3	250		750	
11	Aluminum counter	1	280		280	

Furniture / Premature and Pediatrics Department
Items with Replacement of JD 100 (\$140) Or more

Item No.	Item Name / Description	Number	Item Cost		Total Cost	
			Dinars	Fils	Dinars	Fils
1	Metallic large office desk (melanin coated)	3	150		450	
2	Medium size metallic office desk (melanin coated)	1	100		100	
3	Metallic closet with movable shelves		150			
4	Metallic closet (unlocked opened shelves with two doors)	1	150		150	
5	Metallic closet with opened exposed shelves (without a door)	4	150		600	
6	Wooden closet with two doors	3	250		750	
7	Wooden closet with six doors	3	450		1350	
8	Locker inserted beside the patient bed	21	100		2100	
9	Wooden counter	1	600		600	
10	Patient bed (for adults)	15	500		7500	
11	Children `s bed	6	150		900	
12	Newly born infant bed	12	100		1200	
13	Electric refrigerator "3 feet "	1	110		110	
14	Television set	3	250		750	

Furniture / X-Ray Department

Items with Replacement of JD 100 (\$140) Or more

Item No.	Item Name / Description	Number	Item Cost		Total Cost	
			Dinars	Fils	Dinars	Fils
1	Metallic large office desk (melanin coated)	1	150		150	
2	Medium size metallic office desk (melanin coated)	3	100		300	
3	Metallic closet with movable shelves	5	150		750	

Administrative Department / Kitchen Utensils

Items with Replacement of JD 100 (\$140) Or more

Item No.	Item Name / Description	Number	Cost		Total Cost	
			Dinars	Fils	Dinars	Fils
1	Filter or ventilator (stainless steel)	1	180		180	
2	Refrigerator with freezer (Italian type)	1	1400		1400	
3	Electric refrigerator (capacity 32 liters "12 feet")	4	350		1400	
4	Electric refrigerator (8 feet)	4	250		1000	
5	Electric refrigerator (6 feet)	3	210		630	
6	Electric refrigerator (12 feet)	2	350		700	
7	Electric refrigerator (feet)	1	700		700	
8	Electric refrigerator (20 feet)	1	1500		1500	
9	Gas stove (5 burners or hot plates with grill)	4	325		1300	
10	Electric Refrigerator ("8 feet" type National)	3	230		690	
11	Tea heater or steamer (stainless steel)	2	100		200	
12	Electric refrigerator "12 feet"	1	350		350	
13	Gas stove with oven or furnace	1	270		270	
14	Gas stove with four burners or hot plates	1	140		140	

Furniture (Non Medical Items) / Administration Department

Items with Replacement of JD 100 (\$140) Or more

Item No.	Item Name / Description	Number	Item Cost	Total Cost			
				Dinars	Fils	Dinars	Fils
1	Wooden counter	3	600			1800	
2	Wardrobe for the employees with six drawers	28	100			2800	
3	Metallic closet with opened exposed shelves	21	150			3150	
4	Metallic large office desk (melanin coated)	21	150			3150	
5	Medium size metallic office desk (melanin coated)	11	100			1100	
6	Metallic closet with shelves (without a door)	4	150			600	
7	Fixed base, waiting metallic filigreed chair	7	250			1750	
8	Computer sets	7	500			3500	
9	Electrical printer	4	450			1800	
10	Photocopy machine (large –size)	2	750			1500	
11	Photocopy machine (small–size)	2	500			1000	
12	Fax machine	2	450			900	
13	Electrical sewing machine	3	150			450	
14	Large panel meeting room table	1	250			250	
15	Electrical washer (capacity 5 kilograms)	2	120			240	
16	Iron sharp cutter	3	165			495	
17	Aluminum closet	4	150			600	
18	Wooden wardrobe with three drawers	10	198			1980	
19	Aluminum closet with glass facet	6	250			1500	
20	B.C .F fire extinguisher (12 kgm)	12	100			1200	
21	Drug trolley	1	150			150	
22	Loudspeaker	1	300			300	
23	Air conditioner	3	2000			6000	
24	Electronic switchboard	1	1800			1800	
25	Stainless steel unit with four drawers	3	200			600	
26	Line for distributing food consisting of (tray holder , fork holder, knife holder, spoons, bread keeper, cold and hot containers, etc.)	1	6000			6000	
27	Steam iron with a base	4	750			3000	
28	Iron for ironing the sheets (2 meters)	1	5000			5000	1996
29	Iron for ironing the sheets (measurement of 160 cms)	1	4000			4000	1996
30	Stainless steel washing machine	1	5000			5000	1996

	(capacity of 30 kgm)					
31	Stainless steel washing machine (capacity of 10 kgm)	1	3000		3000	1996
32	Electrical dryer (10-12 kgm)	2	1500		3000	1996
33	Electrical dryer (25 kgm)	1	3500		3500	1996
34	Trolley for holding the fire pipe extinguisher	1	100		100	1996
35	Colored TV Set	6	250		1500	
36	Computer set	1	400		400	
37	Aluminum counter	4	250		1000	
38	Aluminum file cabinet with glass facet	1	200		200	
39	Vacuum cleaner	1	120		120	
40	Wooden closet with two doors	20	180		3600	
41	Electrical washing machine with two wash basins (Capacity - 5 kgm)	1	120		120	
42	Recorder and radio set	1	100		100	

Furniture (Non Medical Items) / Administration Department / Kitchen Utensils

Items with Replacement of JD 100 (\$140) Or more

Item No.	Item Name / Description	Number	Item Cost		Total Cost	
			Dinars	Fils	Dinars	Fils
1	Stainless steel kitchen table with shelves (190x 70)	3	300		900	
2	Stainless steel kitchen table with shelves (140x 70)					
3	Multi-purpose table for preparing food equipped also with shelves (stainless steel)	6	300		1800	
4	Stainless steel kitchen table (140 x 70)	2	250		500	
5	Steam ironing table	2	1300		2600	
6	Potato peeler equipped with a base (stainless steel)	1	800		800	
7	A special vegetable washer and dryer (stainless steel)	1	800		800	
8	Vegetable chopper with different blades (for chopping with different shapes)	1	800		800	
9	Meat slicer with two blades	1	750		750	
10	Electrical meat slicer	1	800		800	
11	Stainless steel dessert oven	1	850		850	
1	Electrical oil fryer with grill(stainless steel)	1	150		150	
1	Electrical steak grill stainless steel)	1	150		150	
1	Electric oven with four hot burners (tainless steel)	1	150		150	

1	Electrical cooking pan grilled rice (stainless steel)	2	1000		2000	
1	Deep electrical steamer for the meat and soups	2	1200		2400	
1	Ventilator or filter (stainless steel with dimensional size 420 x 180)	1	2000		2000	
1	Stainless steel refrigerator with drawers and shelves	1	900		900	
19	Multipurpose stainless steel refrigerator with two doors (24 feet)	1	2000		2000	
20	Electrical food heater trolley with three trays (S.S)	2	400		800	
21	Trolley for food distribution (S.S)	2	250		500	
22	Stainless steel ,dishwasher with two shelves	1	1000		1000	
23	Plates rack with three shelves	1	250		250	
24	Large size central refrigerator with deep freezer	1	10,000		10,000	
25	Stereo and recorder	1	300		300	
26	Small ventilator (filter)	1	1200		1200	
27	Stainless steel two wash basins	1	500		500	
28	Balance (300 kgm)	2	400		800	
29	Stainless steel trolley for holding food (with two shelves)	1	250		250	
30	Wooden block for cutting and slicing meat	1	250		250	
31	Stainless steel trolley with two shelves	1	250		250	
32	Kitchen utensils rack (stainless steel)	1	200		200	

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