Partners for Health Reform*plus*

Findings from the Health Facility Survey 2004-05, Amran Governorate, Yemen

September 2005

Prepared by:

Partners for Health Reform*plus*

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

In collaboration with:
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Mission

Partners for Health Reformplus is USAID's flagship project for health policy and health system strengthening in developing and transitional countries. The five-year project (2000-2005) builds on the predecessor Partnerships for Health Reform Project, continuing PHR's focus on health policy, financing, and organization, with new emphasis on community participation, infectious disease surveillance, and information systems that support the management and delivery of appropriate health services. PHRplus will focus on the following results:

- *Implementation of appropriate health system reform.*
- *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
Health Systems Division
Office of Health, Infectious Disease and Nutrition
Center for Population, Health and Nutrition
Bureau for Global Programs, Field Support and Research
United States Agency for International Development

Abstract

The 2004-2005 Amran Health Facility Survey, supported by USAID/Yemen through the Partners for Health Reform*plus* (PHR*plus*) Project, inventoried all private and public health facilities in the governorate. The purpose of the survey was to collect and summarize detailed information on infrastructure, ownership, health services provided, medical equipment, and financing of all facilities in the governorate. In addition, survey teams used handheld global positioning system units to pinpoint the exact geographic locations of villages and health facilities and digital cameras to document interior and exterior conditions of all facilities. The survey identified a total of 218 facilities in Amran; the interview was completed in all 169 facilities that were open and operational at the time of the survey. PHR*plus* is using the data from this survey to develop district maps and a health facility atlas for health officials to better understand health care conditions, allocation of resources, location of each health care alternative, and proximity to and within communities of each health facility relative to others. In addition, PHR*plus* is creating a health facility viewer CD-ROM application to allow governorate and district health management teams to quickly review, query, and compare survey data. Survey results will be combined with demographic and geospatial data in a geographic information system to provide evidence-based analyses and results to increase the efficiency and equity of the Yemen health care system.

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Acronyms

AIDS	Acquired Immune Deficiency Syndrome
B.Sc.	Bachelor of Science
CT	Computed Tomography
DPT	Diphtheria, Pertussis, and Tetanus Vaccine
ENT	Ear, Nose and Throat
GIS	Geographic Information Systems
GPS	Global Positioning System
GTZ	German Technical Cooperation
HIV	Human Immunodeficiency Virus
HTML	Hypertext Markup Language
ICU	Intensive Care Unit
IUD	Intrauterine Device
MoPHP	Ministry of Public Health and Population
MRI	Magnetic Resonance Imaging
PC	Personal Computer
PHR*plus*	Partners for Health Reform*plus*
SD	Standard Deviation
SFD	Social Fund for Development
STD	Sexually Transmitted Disease
TB	Tuberculosis
TT	Tetanus Toxoid
UNICEF	United Nations Children's Fund
USAID	U.S. Agency for International Development

Acknowledgments

The PHR*plus*/Yemen project wishes to express its appreciation to USAID/Yemen for its support to the health facility survey in the five target governorates of Amran, Al Jawf, Shabwah, S'adah, and Mareb. In particular, we wish to thank Dr. Ahmed Attieg, Senior Health Advisor in Sana'a, for his prudent guidance and his commitment to establishing a credible health information system and global information system (GIS) for Yemen's health sector.

The survey was conducted in collaboration with the Ministry of Public Health and Population (MOPHP) and the Governorate Health Office. Special thanks to His Excellency, Dr. Mohammed Al-Noami, Minister of Public Health and Population, for his vision and recognition of the importance of health information and GIS; Dr. Abdul Majed Al Kholaidi for his leadership role in heading the Technical Committee responsible for approving and getting the survey initiated; and Dr. Abdullah Al Ashwal for his continued support and for his initiative in conducting this survey nationwide.

For the Amran survey, we would like to extend our appreciation to Dr. Abdul Ghani Al Ghozi, Amran Director of Health; his deputy, Mr. Nasser Badi; and the district health managers and facility managers who participated in making this survey a success. We are also grateful to the survey teams who climbed the highest mountains, traveled on what we call "no roads" to reach the most remote facility, take the GPS readings, snap photos, and interview health facility staff.

The core team has spent the past year managing all aspects of the larger survey (for the five USAID target governorates), from pre-testing the survey instrument; cleaning and preparing codes; names, and initial maps in preparation of the survey to conducting the survey; entering the data; cleaning the data; and writing this report. The work and experiences of the PHR*plus* team will be passed to other MoPHP survey teams that are being funded through other donors. Hopefully, the results will form the basis of a national information database complete with GIS tools and applications. The PHR*plus*/Yemen team included: Dr. Abdul Jabbar Al Ghaithi, survey manager from the MoPHP; Mr. Abdulkader Nueman, database expert; Khalil Gobran, GIS expert; Mr. Abdulwahed Thabet, technical advisor; Mr. Abdul Salam Al Kohlani, financial manager; Ms. Rila Al Domini, technical assistant; Ms. Dalia Al Eryani, technical assistant and translator; Ms. Bilqis Al Rimi, data entry; Mr. Mohamed Hani, administration/driver; and Ms. Cheri Rassas, Chief of Party.

The team greatly appreciates the technical guidance from Dr. Kathy Banke who spent two weeks in Yemen with the team to work out the detailed outline for the technical report. She then spent two months reviewing, revising, and emailing her comments to the team on almost a daily basis. The various electronic versions of this report have been zipped and unzipped on both sides of the world to complete this important final report. Last but not least we must recognize the encouragement, enthusiasm, vision, and hard work that Mr. Mark Landry has provided – the propeller behind all of this work.

Executive Summary

The 2004-2005 Amran Health Facility Survey is the first survey of all health facilities in Amran Governorate since the Yemen Health Facility Survey was conducted in 1998. The survey, supported by USAID/Yemen through the Partners for Health Reform*plus* (PHR*plus*) Project, inventoried all private and public health facilities in each of the 20 districts and included the use of handheld global positioning system (GPS) units to pinpoint the exact geographic locations of villages and health facilities. Ten survey teams, including team leaders from the Ministry of Public Health and Population (MoPHP) and surveyors from governorate and district health teams, took digital photos of the facilities in order to document their condition. An operations center was set up in the Governorate Health Office to receive and verify incoming data from the teams on a daily basis.

The main purpose of the survey was to collect and summarize detailed information on infrastructure, ownership, health services provided, medical equipment, and financing of all facilities in the governorate. The methodology – collaborating with central, governorate- and district-level staff – assured a participatory process that focused on capacity building and consultation for and with the end users of the data. Survey results will be combined with demographic and geospatial data in a geographic information system (GIS) to develop capacity for evidence-based planning and budgeting decisions.

The survey identified a total of 218 facilities in Amran; the interview was completed in all 169 facilities that were open and operational at the time of the survey. Primary findings for each of the survey subject areas are presented below.

General Background

A total of 10 hospitals, 51 health centers/clinics, and 157 health units were located in Amran. Interviews were completed in nine hospitals, 39 health centers/clinics, and 121 health units. Amran has seen a dramatic increase in the number of health facilities opening in the last 10 years, with the most notable growth occurring in private facilities since 2001. All hospitals were located in urban areas, while virtually all health units served rural populations. Health centers and clinics were more evenly distributed in urban and rural areas, though private health clinics were more likely to be found in urban areas.

Infrastructure

All private facilities had clean water, electricity, ground telephone lines, and sewage systems. Public facilities, however, were often lacking in these areas – clean water was only available in 72 percent, toilets in 78 percent, electricity in 41 percent, and ground telephone lines in 10 percent of all public facilities. Health units were least likely to have each of these basic services available. Of particular concern is the lack of electricity, clean water, and toilets in 71 percent, 36 percent, and 29 percent of all health units, respectively. In addition, one rural hospital had neither clean water nor electricity.

Most facilities with clean water depended on water tanks to provide the supply, and facilities with electricity received service from the government, their own generators, or a combination of the two. Sewage systems were most likely to be in the form of pits, though 17 facilities reported sewage systems to be in the open. Systems for separating medical waste and garbage existed in less than a quarter of all facilities in Amran, and were less common in private facilities than public facilities.

Health and Medical Services

The services provided by the largest number of public facilities included general medicine (100 percent), immunization (96 percent), health education (90 percent), and laboratory services (77 percent). Basic radiology services were available in 10 hospitals and health centers, but no public facilities in Amran provided echocardiograms, computed tomography (CT) scans, magnetic resonance imaging (MRI), or endoscopy.

All private facilities provided general medicine and laboratory services, while none provided any immunization services, and very few (15 percent) provided any type of health education. Endoscopy and echocardiograms were available at one private facility in Amran. No facilities, private or public, provided CT scans, MRIs, or had laboratory services for processing tissues, cultures, or hormones. HIV testing was performed in just 12.5 percent of all hospitals and clinics (two public hospitals, one private hospital, and three private health clinics).

Other Activities and Services

The proportion of facilities offering services for the control of epidemic diseases ranged from 8 percent for tuberculosis to 14 percent for bilharzia, with hospitals most likely to offer these disease control services. Approximately half of all facilities did not have a referral system for delivery emergencies, with public facilities less likely than private facilities to have this in place. The survey revealed that the Guidelines for Emergency Delivery Services were used in just 14 percent of all public facilities and none of the private facilities. However, 71 percent of the public hospitals did use the guidelines. The Guidelines for Infection Prevention in Safe Motherhood Services were used by 21 percent of all public health facilities and by 15 percent of all private health facilities. However, 57 percent of the public hospitals did use these guidelines.

Inpatient

Inpatient sections were available in 14 hospitals and health centers in Amran and were more common in private than public facilities. No public facilities or private facilities performed cataract surgeries, and no public facilities provided kidney stone operations. Caesarean deliveries were performed by just two public hospitals and two private hospitals. One hospital in Amran, a private facility, had intensive care inpatient rooms.

Health Cadre

The facilities surveyed enumerated a total of 1117 health staff (908 in public facilities and 209 in private facilities). Of these, approximately two-thirds were males, both in public and private facilities. In public facilities, female staff were most likely to be either counselors (42 percent) or midwives (39 percent). In private facilities, the largest proportions of female staff were nurses (25 percent), administrative or support staff (24 percent), or midwives (21 percent). Specialists were more common

in private facilities than public, and private facilities had a larger proportion of foreign staff than public facilities (21 percent vs. 2 percent, respectively).

Medical Equipment

The survey conducted an inventory of equipment in public health facilities. Very few facilities had ophthalmoscopes or auriscopes, while most had examination beds, sphygmomanometers, stethoscopes, mobile curtains, and thermometers. Just 75 percent of examination beds in hospitals were functional. Microscopes and centrifuges were available at all hospitals and health centers, but not all of these items were functional. Just two hospitals had refrigerators and sterilization machines, and only half of the available refrigerators actually functioned.

Drug Availability

The availability of any drugs was assessed for all 156 public health facilities, and 93 percent stated that they had at least one type of drug available. However, two of the hospitals reported not having any drugs available at all. The district was the primary source of drugs for all public facilities.

Financial Allocations

Just 34 percent of public facilities reported regular delivery of operational expenses during the previous year. Health units were most likely to report incomplete delivery of operational expenses and were the least likely to receive regular deliveries. Exemption systems were available in all public hospitals and most health centers and health units, with the leading types of systems providing either free or reduced cost services for patients who cannot afford the costs.

Next Steps

Results from the survey can inform governorate and district health management teams. For example, the data can be used for planning, justifying budgets and future investments, and addressing resource gaps. Additional products and tools are being created to maximize the use of the survey data. Namely, PHR*plus* is developing district maps and a health facility atlas for health officials to better understand health care conditions, allocation of resources, location of each health care alternative, and proximity to and within communities of each health facility relative to others. Additionally, the project is creating a health facility viewer, a CD-ROM application to allow governorate and district health management teams to quickly review, query, and compare survey results. The survey data can be readily updated and maintained with each substantive change in facility conditions. The data stored electronically in the health facility database and health facility viewer can be updated to reflect future changes. Lastly, the survey results are a critical input to the health GIS applications being developed to provide evidence-based analyses and results to increase the efficiency and equity of the Yemen health care system.

1. Background

1.1 Amran Governorate

Amran Governorate was established after Yemeni Unity in 1990. It is located in the northwestern corner of Yemen, approximately 50 kilometers north of the capital of Sana'a. Amran shares borders with five governorates and contains 20 districts (Table 1-1). In the last national census (2004), the population of Amran was estimated to be 872,789 people, ranking ninth in population size among all 21 governorates. The district is 7680 square kilometers in size and characterized by very challenging topography and roads that are often impassable, making access to the most remote facilities quite difficult.

Table 1-1. Districts in Amran Governorate, Yemen

Al Ashah	**Huth**
Al Madan	**Iyal Surayh**
Al Qaflah	**Jabal Iyal Yazid**
Amran	**Khamir**
As Sawd	**Kharif**
As Sudah	**Maswar**
Bani Sarim	**Raydah**
Dhi Bin	**Suwayr**
Habur Zulaymah	**Shaharah**
Harf Sufyan	**Thula**

The following maps show the location of Amran Governorate (Figure 1-1) and its districts (Figure 1-2).

Figure 1-1. USAID target governorates highlighted

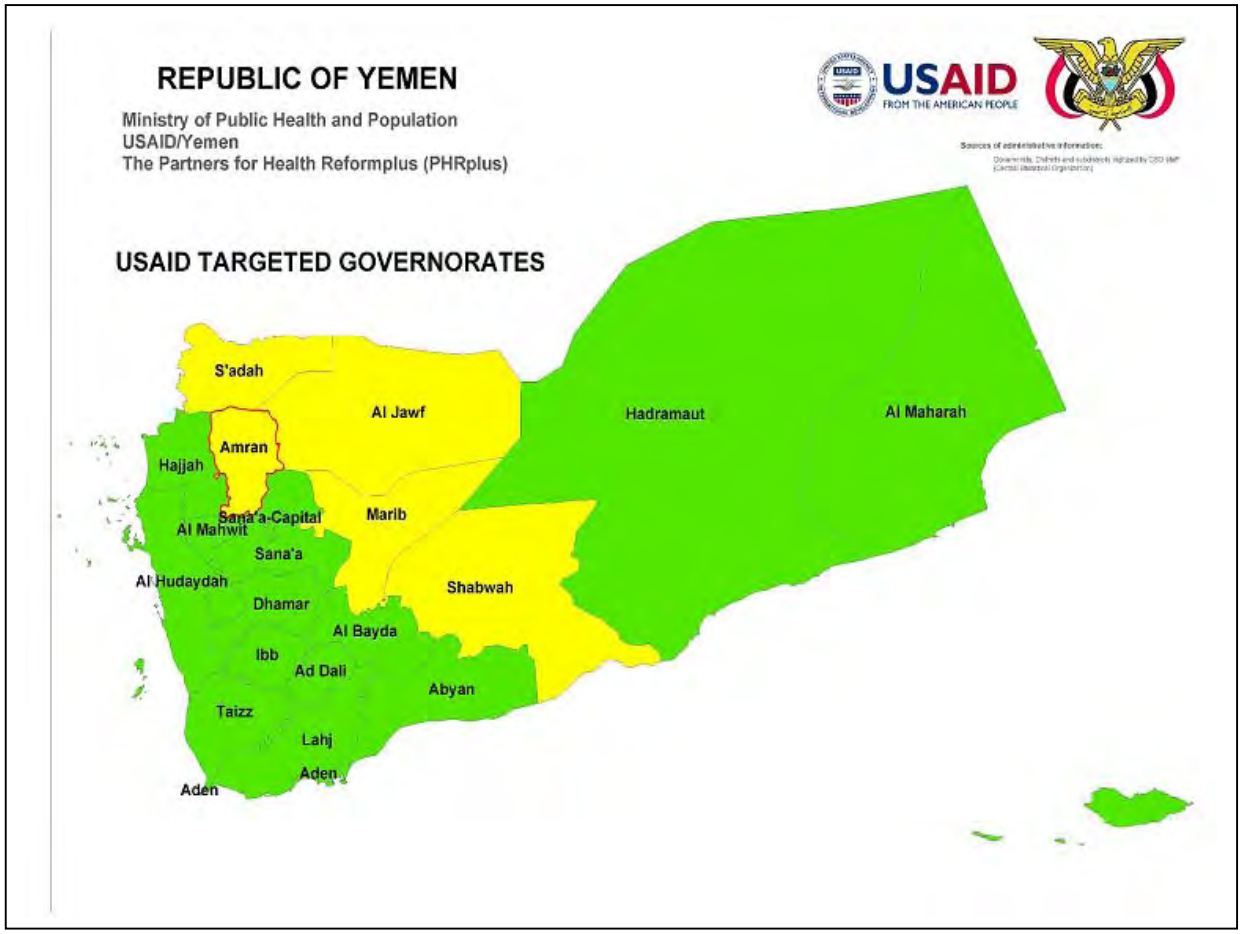
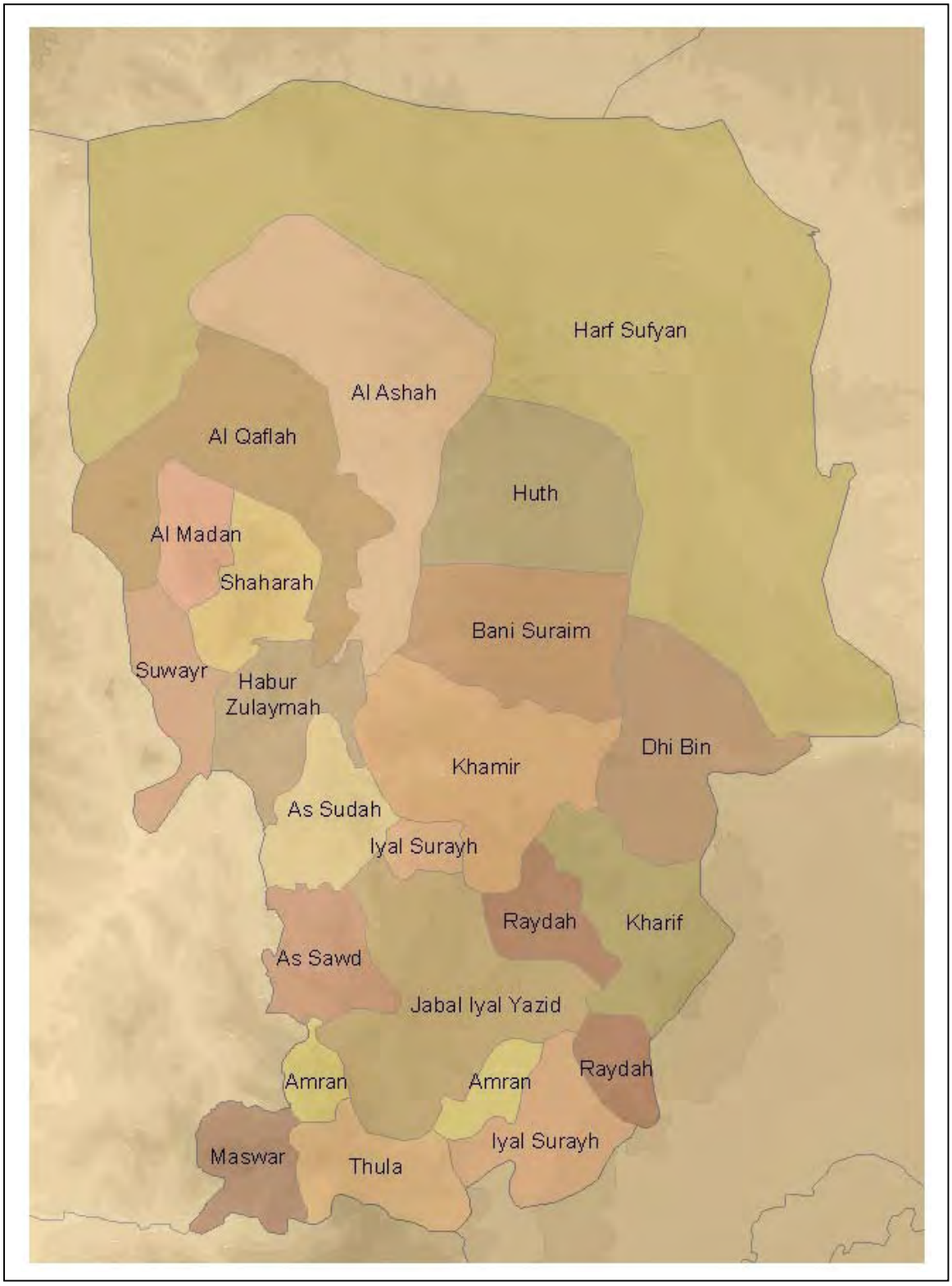


Figure 1-2. Amran Governorate, Yemen



1.2 Health Facility Survey

1.2.1 Overview

In close collaboration with the Republic of Yemen's Ministry of Public Health and Population's (MoPHP) General Directorate of Health Information and Statistics, USAID/Yemen's Partners for Health Reform*plus* Project (PHR*plus*) conducted a health facility survey in the five USAID/Yemen targeted governorates of Amran, Al-Jawf, Mareb, S'adah, and Shabwah during a 12-month period beginning in September 2004. (This report covers Amran governorate.) The survey inventoried all private and public health facilities in each district of the five governorates and used handheld global positioning system (GPS) units to pinpoint the exact geographic locations of villages and health facilities. In addition, the 10 survey teams took digital photos of the facilities in order to document their condition. Each team included a team leader from the MoPHP and surveyors from the governorate. These teams were trained in the use of GPS, digital cameras, and how to administer the survey and record the data. Information collected included data on facility type, location, infrastructure, staffing, services provided, equipment, records kept, availability of drugs, budgets and resources, and problems and obstacles.

Survey results were analyzed at the governorate level; the information will be disseminated to each governorate through workshops, which will include governorate and district health management teams and select facility managers. Additional products and tools are being created to maximize the use of the survey data. Namely, PHR*plus* is developing district maps and a health facility atlas for health officials to better understand health care conditions, allocation of resources, location of each health care alternative, and proximity to and within communities of each health facility relative to others. Additionally, PHR*plus* is creating a health facility viewer (a CD-ROM application) to allow governorate and district health management teams to quickly review, query, and compare survey results. The survey data can be readily updated and maintained with each substantive change in facility conditions. The data stored electronically in the health facility database and health facility viewer can be updated or modified to reflect future changes. Lastly, the survey results are a critical input to the health global information system (GIS) applications being developed to provide evidence-based analyses and results to increase the efficiency and equity of the Yemen health care system.

1.2.2 Survey Objectives

The Health Facility Survey is a subcomponent of the Yemen Family Health Survey that was conducted in 2003. This survey provides an inventory of all private and public health facilities. The objective is to establish reliable and accurate baseline data for the health information system. These data can be used by the MoPHP, other ministries, governorate and district health teams, health facility managers, organizations working in the health sector, and donors to plan and to improve services and make evidence-based decisions on health sector investments.

2. Methodology

(See also Annexes A and B.)

2.1 Health Facility Survey Management and Structure

2.1.1 Health Facility Survey Management

The Health Facility Survey operations were organized to facilitate all aspects of survey conduct, from field work to data analysis. The survey was overseen at the central level by a survey manager (appointed by the Minister of Health). The survey manager was responsible for:

- Running all the survey field activities;
- Daily follow-up of team performance;
- Solving all problems and obstacles;
- Coordination with Governorate Health Office;
- Daily contacts with PHR*plus* and MoPHP; and,
- Daily reporting about performance and problems as well as solutions taken to solve problems.

At the central level, the survey manager worked closely with the financial manager and four additional staff (survey designer, database designer, GIS/GPS expert, and technical assistant). In addition to the central team, the survey included 44 persons conducting data verification, cleaning, and analysis (Table 2-1). The complete list of survey staff is provided in Annex A.

Table 2-1. Yemen Health Facility Survey Staff

Job Title	Place of work	Number
Survey manager	**PHRplus**	1
Financial manager	**PHRplus**	1
Revision department	**PHR*plus* & MoPHP**	5
Data processing unit	**PHR*plus* & MoPHP**	10
Field work teams	**MoPHP and health office**	27
Total staff		**44**

Central-level staff coordinated activities with five support and control units, one located in each of the health offices of each of the governorates. The Governorate Health Office provided space and assistance in establishing a Health Facility Survey office. PHR*plus* supplied a computer network, printers and supplies to support the operations. These field offices in each governorate were responsible for reviewing, coding, entering, and cleaning data collected in the governorate before sending the data to the central level for verification and analysis.

2.1.2 Health Facility Survey Teams

Ten survey teams were assembled to conduct the survey. Each team consisted of a team leader from the MoPHP and a surveyor from the governorate. The team leader was responsible for supervising the team and for working with the GPS unit and digital camera. The surveyor collected the survey data. Each team traveled with a driver from the governorate/district who guided them to the health facilities.

2.1.3 Instruments

The survey consisted of 17 pages divided into the following sections:

- General information
- Facility infrastructure
- Health services performed
- Disease surveillance
- Staffing
- Common diseases
- Medical equipment
- Drugs availability
- Financial resources

Each team was provided with a survey kit, which included a reference manual for conducting the survey. In addition, each team was supplied with a GPS unit and digital camera. The GPS unit was used to record the precise latitude and longitude map coordinate of each health facility. The digital camera was used to take photos documenting the exterior and interior conditions of each facility. The survey was conducted in Arabic. See Annex B for the English version of the survey instrument.

2.1.4 Pre-test

The pre-test was conducted in three districts of Amran Governorate (Amran, Khamir, and Huth districts) during September 2004. A total of three hospitals, three health centers and four health units

were selected for the pre-test. Based on the pre-test experience, modifications were made to the survey instrument. The manual was also revised to solve problems encountered during the pre-test.

2.1.5 Training

Two training courses were held during November 2004. The first course, held in Sana'a, focused on training team leaders to use GPS to determine the position of health facilities and to use digital cameras to take and save photos of facilities.

The second training, for team leaders and surveyors, took place in Amran and lasted four days. The teams received intensive instruction on how to conduct the survey and record answers. The last two days of training were devoted to evaluating the trainees and then selecting 13 team leaders and 15 surveyors. The three surveyors with the strongest skills were selected to work in the control section, leaving 10 to conduct the field work. The two remaining surveyors were kept as alternates.

2.1.6 Implementation Timeline

Amran was the first of the five governorates in which the survey was conducted. It is important to note that the MoPHP intends to conduct the survey nationwide. USAID/Yemen financed the five target governorates and assisted, through PHR*plus*, in the design of the survey instrument approved by the MoPHP Technical Committee. The project developed the training materials, reference manuals, and methodology. Survey development began in April 2004, and the survey in Amran was completed in December 2004. Data verification was done in July 2005. The timeline for key survey elements is presented in Table 2-2.

Table 2-2. Implementation activities and time period

Activity	Time period
Survey development	April – September 2004
Pre-test	September 2004
Survey revision	September-October 2004
Team leader training	November 2004
Team training	November 2004
Survey conducted	November-December 2004
Data verification	July 2005

2.2 Data Verification/Quality Control

To verify data quality, a data audit was done in a random selection of 10 percent of all health facilities in each governorate. The random sample was allocated proportionally to represent the percentage of facilities in each of the following four categories: 1) facilities under construction (5 percent), 2) facilities temporarily closed at the time of the survey (12 percent), 3) facilities permanently closed (4 percent), and 4) facilities open (78 percent) (Table 2-3).

Table 2-3. Number of facilities selected for data verification

Category	Number of facilities selected randomly for data verification
Under construction	1
Temporarily closed	3
Permanently closed	1
Open	17
Total	**22**

Four facilities located in the most remote districts were not visited for re-verification due to inaccessibility (long travel time required). Each of these four facilities was open, so there was no need to verify their operating status, and none of these facilities had questionable data or characteristics leading to a reason to believe that their accuracy rates would be any different from the rest of the facilities.

During the random data verification visits, teams attempted to re-interview the same person who had completed the interview at the initial visit. If this person was not available, teams were instructed to conduct the interview either with the original person's replacement or with the person in charge of the facility. The data verification survey consisted of a subset of 28 questions from the original survey, with a focus on general health facility data, infrastructure, waste and sewage, health and medical services provided, as well as selected questions related to health cadre and medical equipment.

Data collected during the random data verification visits were entered into tables using Microsoft Access and were compared to the original data collected using the Data Compare utility in Epi Info version 3.2.2. Each difference identified was further scrutinized to determine whether it was a "real" difference or a difference likely due to changes over time or factors other than actual data errors; the differences in the second category were removed from the verification analysis. When the number of "real" discrepancies was noted and expressed as a percentage of the total number of data points compared, overall data accuracy was estimated to be 94 percent.

In addition to the random data verification process, 13 facilities that were permanently or temporarily closed during the initial survey and that had questionable or missing data for one or more variables were re-visited to verify their status and to update the database with information that had been missing at the first visit.

2.3 Data Processing and Analysis

Data were coded and entered into a database developed in Microsoft Access. Analysis was done with Microsoft Excel, SPSS and Epi Info. Data are presented as proportions and means plus or minus (+/-) standard deviations (SD).

Results are presented by health facility type and by sector of ownership (public/private). Government-owned (public sector) health facilities in Yemen are divided into three categories: hospitals, health centers, and health units. Table 2-4 summarizes the types of services provided by each category of facility.

Table 2-4. Health services provided, by public facility type and level

Level	Type of facility	Services Provided
Fourth	Specialized hospital	Rare specialized services – Cancer – Heart disease – Kidney disease – Endocrine
Third	General governorate hospital	Caesarean sections – Stomach pain emergencies – Casualties – Sexually transmitted diseases (STDs) – Intensive care unit (ICU) for children – Pediatrics – Heart & chest disease – Non-communicable diseases – Chronic diseases – Anesthesia – Blood transfusion – Laboratory – X-ray – Training medical students, doctors and nurses
	General district hospital	Caesarian sections – Stomach pain emergencies – Casualties – STDs – ICU for children – Pediatrics – Heart & chest disease – Non-communicable diseases – Chronic diseases – Anesthesia
Second	Health center	Immunization - Diarrhea and respiratory problems – Malnutrition – Malaria & tuberculosis (TB) – Family planning – General health development – Prenatal & postnatal care – Anemia – Delivery – Dilation & curettage – Casualties – Pregnancy test – Testing complications of TB – Blood Types – Hemoglobin – X-rays (some facilities)
First	Health unit – Permanent	Immunization – Prevention of diarrhea and respiratory problems – Malnutrition – Malaria & TB – Family planning – General health development – Prenatal & women's care
	Health unit – Temporary	Prevention of diarrhea and respiratory problems – Malnutrition – Malaria & TB – Family planning – General health development – Prenatal care – Anemia

Figures 2-1 through 2-3 are photos taken during the survey to demonstrate the three types of health facilities: health units, health centers/clinics, and hospitals. Figure 2-4 provides an example of the challenging terrain that must be traversed to reach many of the most remote facilities.

Figure 2-1. Ban Ahkam Health Unit, As Sudah District, Amran Governorate

Figure 2-2. Thula Health Center, Thula District, Amran Governorate

Figure 2-3. Amran General Hospital, Amran District, Amran Governorate

Figure 2-4. Encountering poor road conditions en route to a facility

In addition to government-owned (public sector) facilities, a number of private sector health facilities operate in Amran. Two types of private sector facilities exist: hospitals and health clinics (which are equivalent to health centers in the public sector). Private sector facilities are classified based on the following definitions:

- Public hospital: Must have the equipment and qualified cadres to do diagnostic and curative services. Must contain at least 30 beds and have all the basic medical services (general surgery, pregnancy care, internal medicine, and pediatrics).
- Specialized hospital: Must contain at least 20 beds and have the equipment and qualified cadres for at least one specialization.
- Clinic: Must have at least 10 beds and perform diagnostic and curative services.

This technical report focuses on providing a governorate-level overview of health resources, with an emphasis on exploring differences between public and private sector facilities and between facility types. It is not meant to comprehensively cover every variable collected during the survey, but rather to present key findings and to stimulate additional research and analysis with the goal of providing an information base for planning and action. The survey database will be provided to the MoPHP and to the governorate health offices. Technical reports will be published on the MoPHP website.

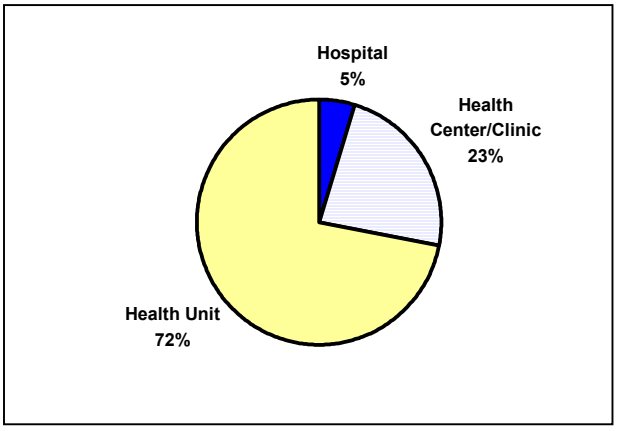
3. Characteristics of Facilities

(See also Tables C-3-1 through C-3-7 in Annex C.)

3.1 Facilities and Respondents

Amran Governorate provided the survey office with a master list of 208 facilities in Amran, the official complete inventory of all facilities in the governorate as of the end of 2003. Of these 208 facilities, four could not be found by survey teams even after asking the district health office officials and conducting a second visit several months later for verification. The survey team also identified an additional 14 facilities not on the master list, so that in total 218 facilities were located in Amran in 2004. The survey documented 10 hospitals, 51 health centers/clinics, and 157 health units as of December 2004 (Figure 3-1).

Figure 3-1. Distribution of facility types in Amran, 2004



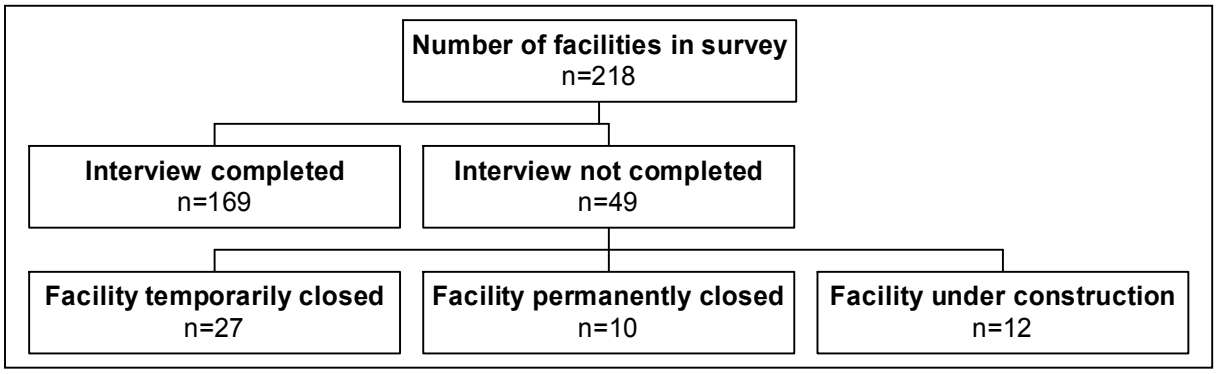
Of the 218 total facilities located by the survey, 193 (89 percent) were public and 23 (11 percent) were private (Table 3-1). In addition, one health center was owned by a local aid cooperative and one health center was jointly owned by both the government and private sources. The latter two facilities were classified as belonging to the public sector for the remaining analyses. The private sector accounted for 41 percent of the health centers in Amran and 20 percent of the hospitals. By definition, all health units belonged to the public sector.

Table 3-1. Distribution of health facility ownership, by facility type

Ownership	Hospital		Health center		Health unit		Total	
	n	(%)	n	(%)	n	(%)	n	(%)
Public	8	(80.0)	28	(54.9)	157	(100)	193	(88.5)
Private	2	(20.0)	21	(41.2)	0	(0.0)	23	(10.6)
Local aid	0	(0.0)	1	(2.0)	0	(0.0)	1	(0.5)
Government/Private	0	(0.0)	1	(2.0)	0	(0.0)	1	(0.5)
Foreign aid	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Total	10	(100)	51	(100)	157	(100)	218	(100)

The survey team found that not all of the 218 facilities were actually open and operating at the time of the survey. Ten facilities were permanently closed, 27 were temporarily closed, and 12 were under construction (Figure 3-2). The survey was completed for 169 facilities that were open at the time of the survey. Only these 169 facilities are included in the remainder of the analyses in this report. A complete summary of the number of facilities in each district is included in Annex C (Table C-3-1). Figure 3-3 shows the distribution of all facilities in the governorate.

Figure 3-2. Facility survey results, Amran Governorate, 2004



Most (73 percent) of the survey respondents were the managers or deputy managers of the health facilities, though respondents also included facility staff in other positions (Figure 3-4). The majority of respondents for public facilities were health facility managers (78 percent), nurses (10 percent), and *murshid*/*murshida* (counselors) (8 percent). Among private facilities, 46 percent of the respondents were health facility managers, 23 percent were deputy managers, and 15 percent were general practitioners.

Figure 3-3. Distribution of facilities in Amran, 2004, by facility type and status

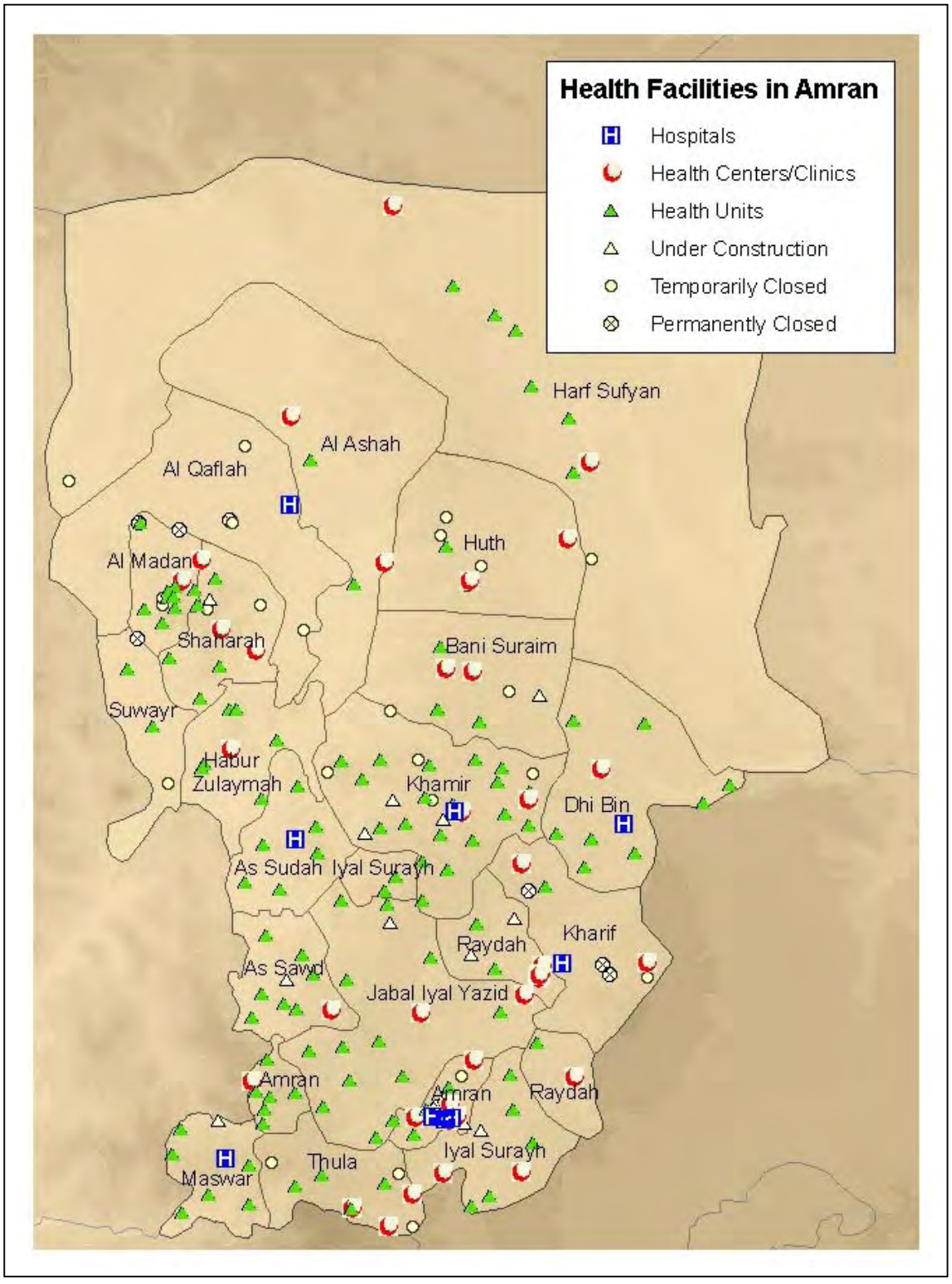
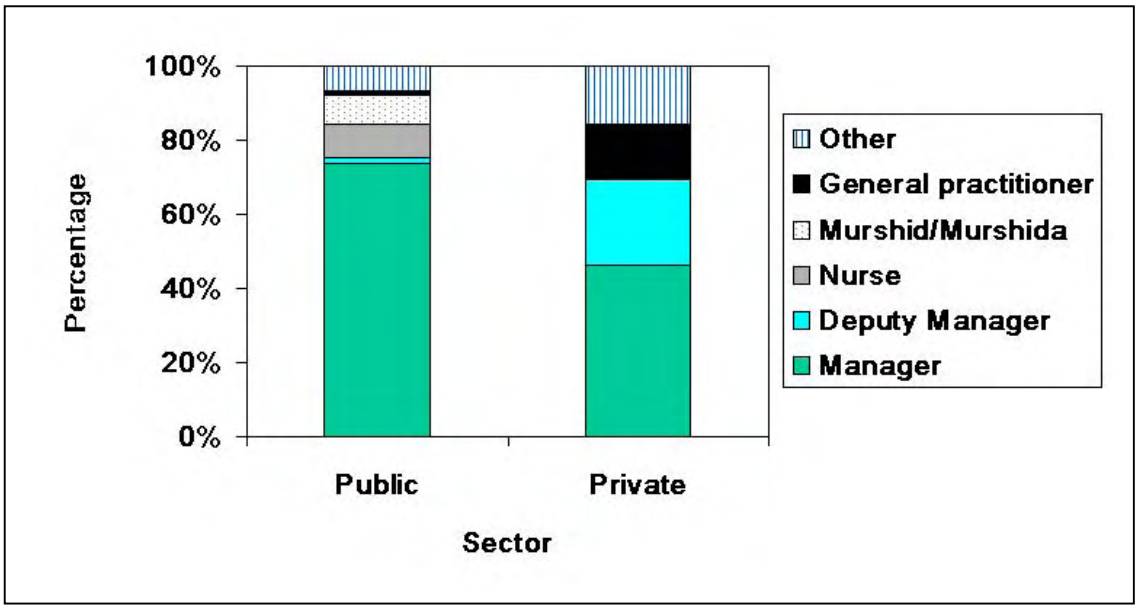


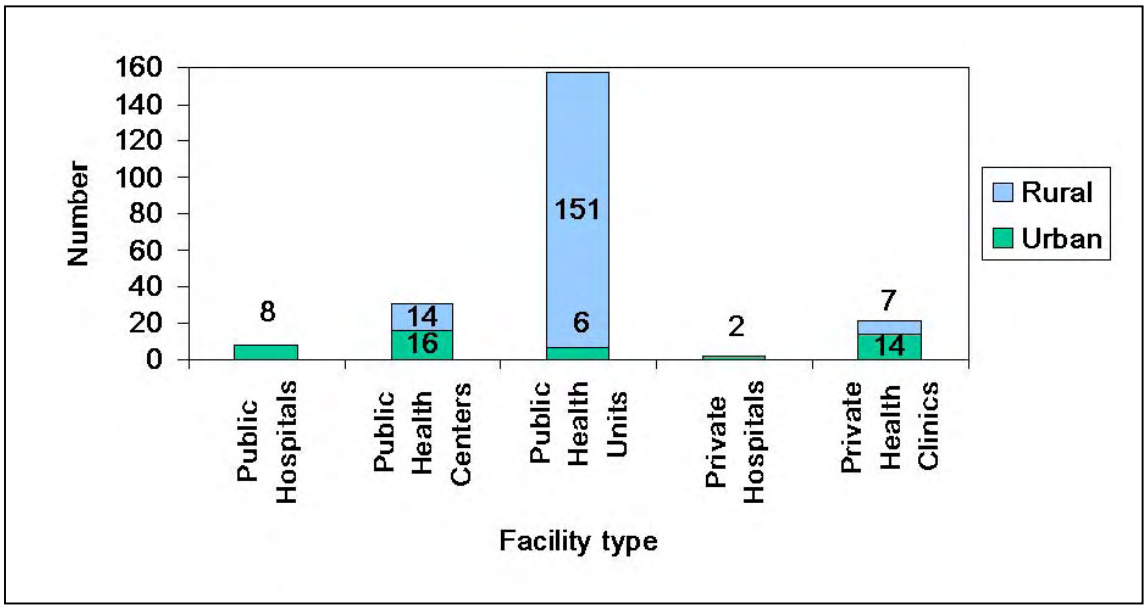
Figure 3-4. Positions of survey respondents, by sector



3.2 Facility Location

All hospitals, public and private, were located in urban areas (Figure 3-5). A greater proportion of public sector health centers were located in rural areas compared to private sector clinics (82 percent vs. 15 percent, respectively). The vast majority (96 percent) of health units were located in rural areas.

Figure 3-5. Distribution of health facilities by sector and facility type and urban/rural location



3.3 Facility Ownership and Funding

All hospitals, both public and private sector, owned the buildings in which they operated (Figure 3-6). Among health centers, 59 percent of those in the public sector were in owned buildings, compared to 69 percent of those in the private sector. Private sector health clinics were more likely to be leased than public sector health centers. Approximately one-third of the health units in Amran were housed in temporary ("on loan") locations.

Figure 3-6. Ownership of facilities, by facility type and sector

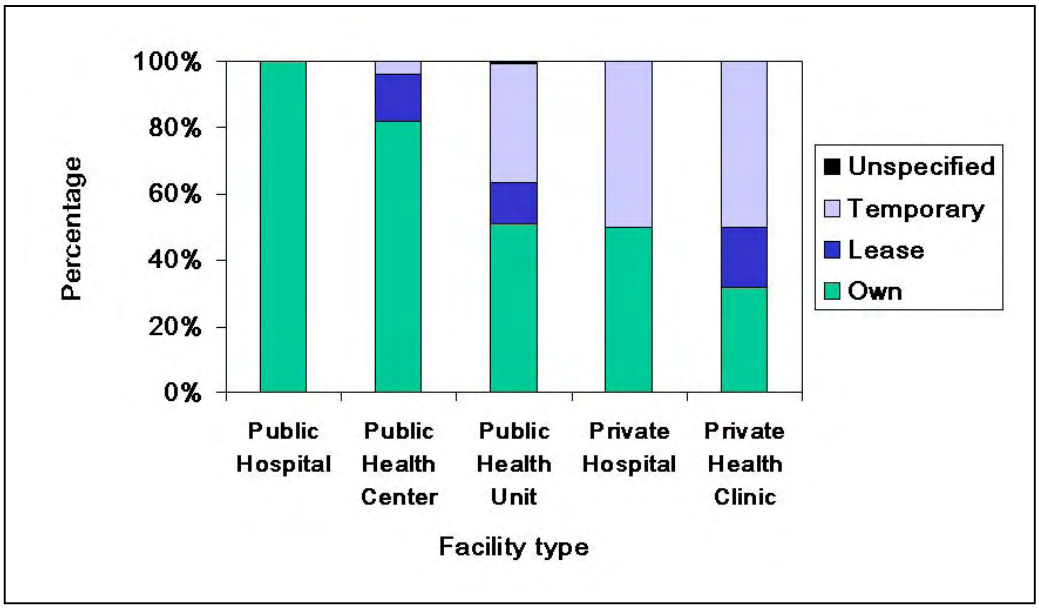


Figure 3-7 shows all sources of funding for 92 public health facilities that reported owning their own buildings. The government was the primary source of construction funding for public hospitals and health centers. Foreign aid and government funding were the most common sources of construction funding for health units.

Figure 3-7. Primary construction funding sources of public facilities, by facility type

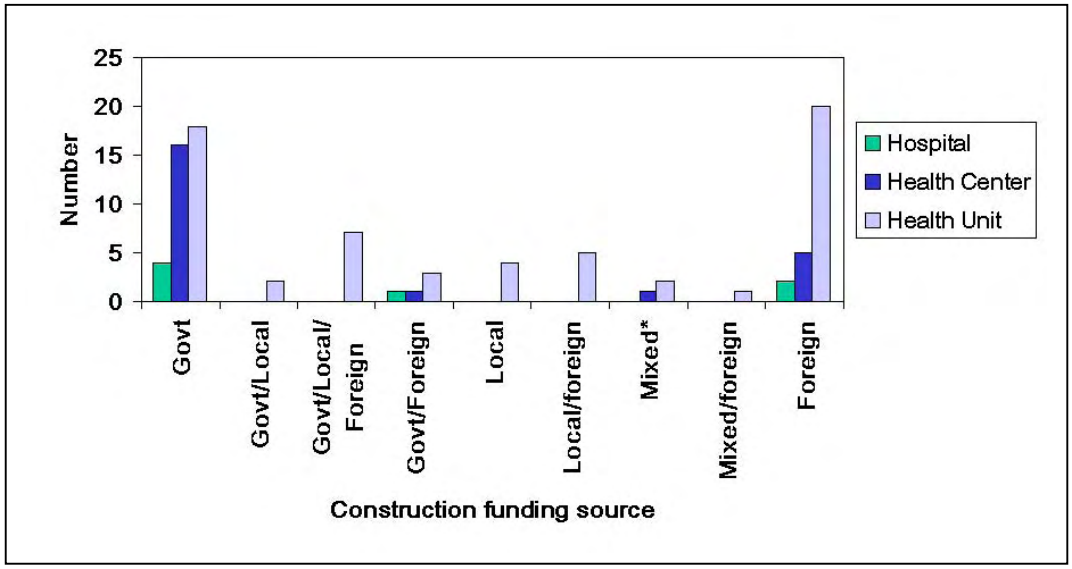
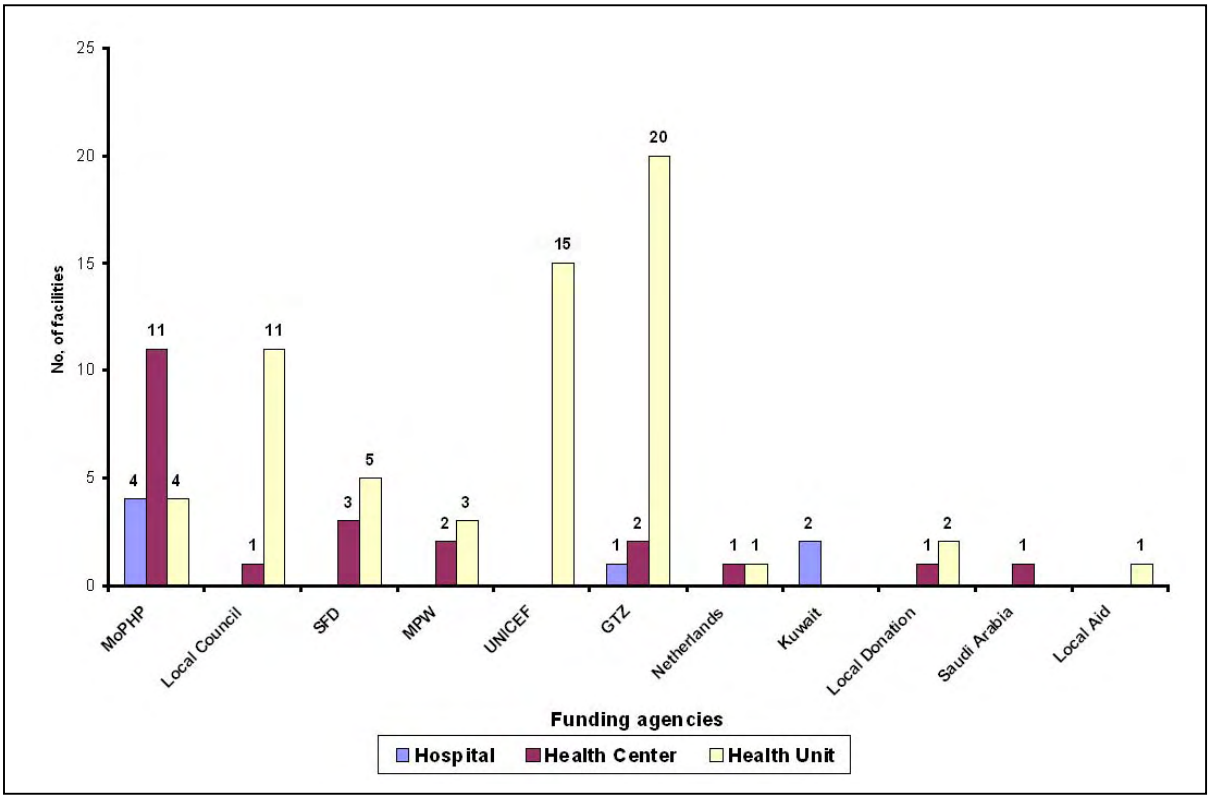


Figure 3-8 shows the primary funding agencies (i.e., funding agencies that paid for at least 50 percent of the construction costs) for the 92 public facilities that owned their own buildings. The MoPHP was the dominant source of funding for all public hospitals and health centers. The primary funding agency was unknown for more than one-fifth of the health centers and for nearly half of the health units.

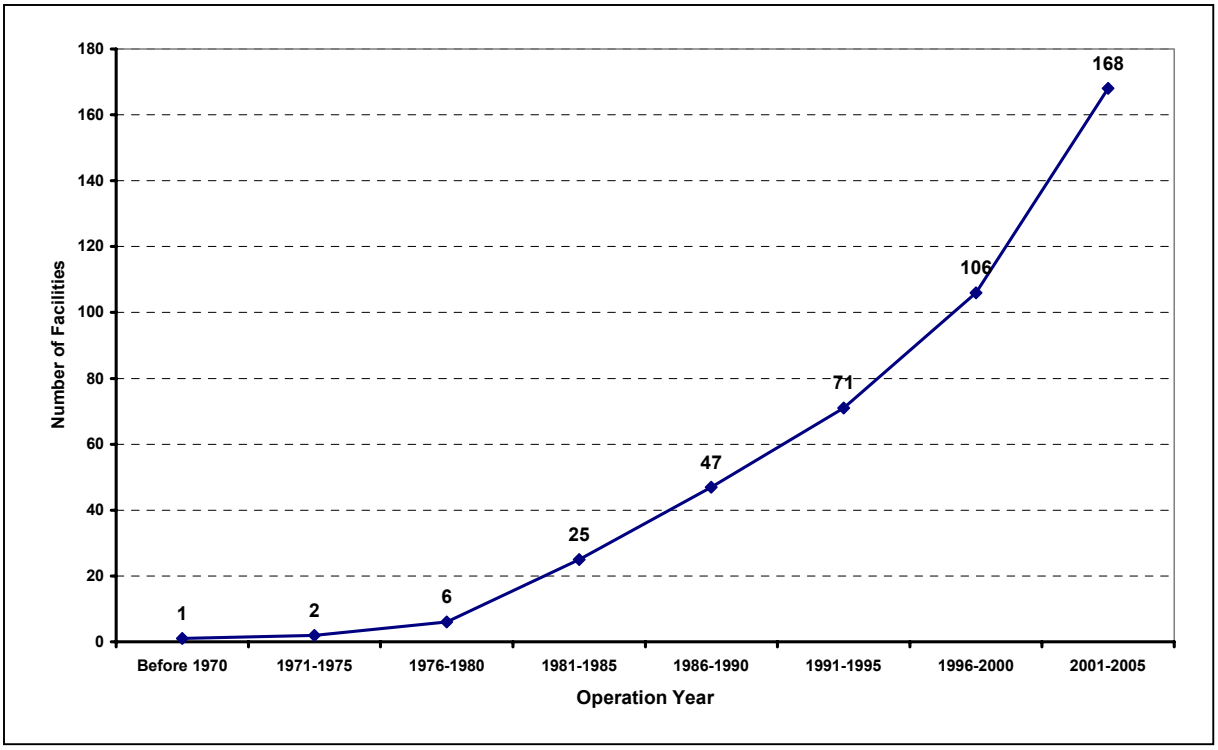
Figure 3-8. Primary funding agencies for public facilities



3.4 Time Trends

Figure 3-9 shows the cumulative number of facilities open during five-year periods from before 1970 to 2004 (one facility with missing data was excluded). There has been a substantial proliferation of both public and private facilities since 1991, with the largest proportion of the facilities surveyed opened during 2001-2004. This is especially true for private facilities: six (46 percent) of the 13 private facilities in Amran opened during 2001-2004. Among the 156 public facilities, 56 (36 percent) opened during 2001-2004. Among the recently opened facilities (2001-2004), 41 percent of the public facilities and 33 percent of the private facilities had just opened in 2004.

Figure 3-9. Cumulative number of facilities open from before 1970 to 2005, Amran Governorate



3.5 Working Hours and Accommodations

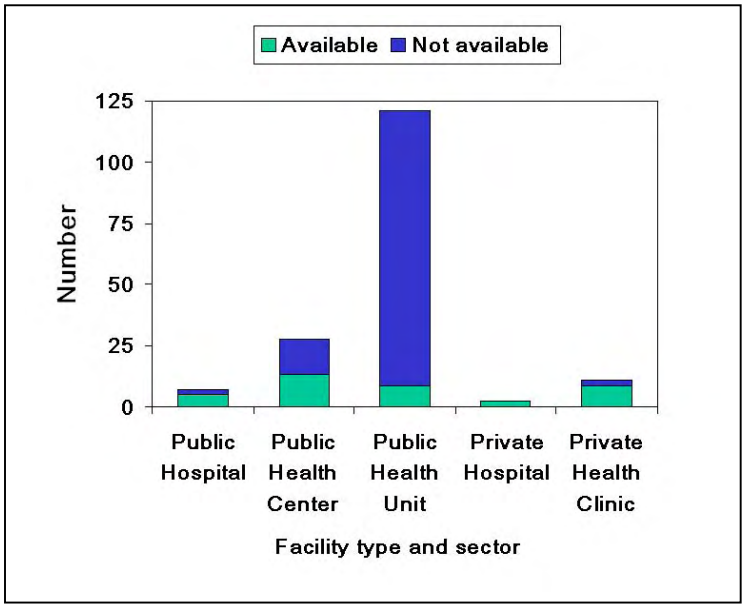
The average number of daily working hours for outpatient departments is summarized in Table 3-2. Overall, private hospitals and clinics had a larger average number of daily working hours than private hospitals and health centers. This was particularly true for private hospitals compared to public hospitals (16.0 vs. 6.7 hours, respectively). However, it is important to note that these data are based on a small number (n=13) of private facilities and therefore there is a fair amount of variation in the data. Among all public facilities, the average number of working hours per day was 5.6 hours, compared to 10.8 hours for all private facilities.

Table 3-2. Average number of daily working hours (outpatient sections)

Facility type	Public		Private		Total	
	n	mean ± SD (min-max)	n	mean ± SD (min-max)	n	mean ± SD (min-max)
Hospital	7	6.7 ± 2.8 (5-13)	2	16.0 ± 11.3 (8-24)	9	8.8 ± 6.2 (5-24)
Health Clinic/Center	28	6.0 ± 1.5 (4-12)	11	9.8 ± 2.3 (5-12)	39	7.1 ± 2.5 (4-12)
Health unit	121	5.4 ± 0.7 (3-9)	0	0	121	5.4 ± 0.7 (3-9)
Total	**156**	**5.6 ± 1.1 (3-13)**	**13**	**10.8 ± 4.5 (5-24)**	**169**	**6.0 ± 2.1 (3-24)**

The availability of on-site accommodations for facility staff is important for attracting and retaining staff, particularly in remote areas. Figure 3-10 shows the number of facilities with accommodations available. Accommodations were more likely to be available among private hospitals and health clinics than among public hospitals and health centers (85 percent vs. 51 percent, respectively). As expected, the availability of accommodations at health units (7 percent) was quite low.

Figure 3-10. Availability of accommodations attached to health facilities, by facility type and sector



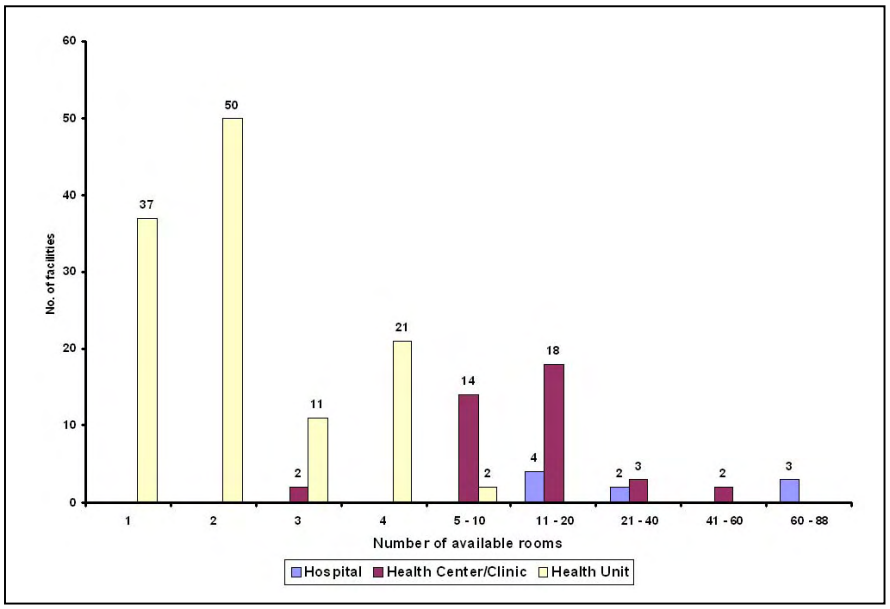
4. Facility Infrastructure

(See also tables C-4-1 through C-4-11 in Annex C.)

4.1 Rooms

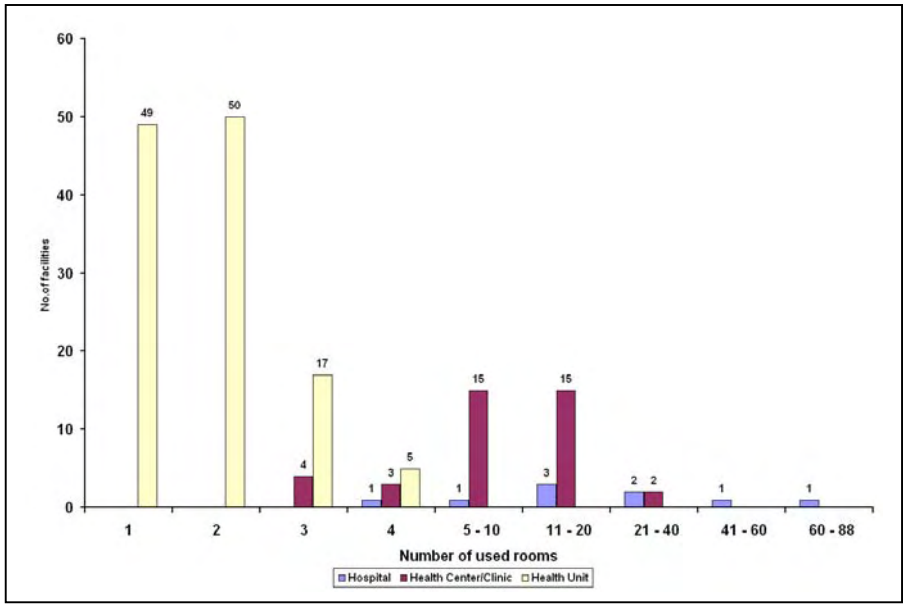
Figure 4-1 shows the number of total rooms available for each facility type. All hospitals had at least 11 rooms. Most (82 percent) health centers and clinics had from 5 to 20 rooms, with the two largest health centers having 42 and 43 rooms. Virtually all health units (97 percent) had four or fewer rooms. The three largest hospitals in Amran, Al Salam Khamr, Amran General, and Al Makhathi General, had 88, 84, and 73 rooms available, respectively.

Figure 4-1: Distribution of number of facility rooms available, by facility type



The number of rooms actually used to provide health services is presented in Figure 4-2. Most (82 percent) health units used one or two rooms to provide health services. Most (77 percent) health centers and clinics reported using from five to 20 rooms, and hospitals reported using from four to 70 rooms. Of the three hospitals that reported having 60 or more rooms available, none actually used that many rooms.

Figure 4-2: Distribution of number of rooms used to provide health services, by facility type



4.2 Infrastructure

Large differences were found between public and private facilities with respect to the availability of basic infrastructure items such as clean water, electricity, ground telephone lines, and sewage systems, with all of the 13 private facilities in the survey having each of these items compared to 72percent or fewer of public facilities (Table 4-1). The difference was greatest for ground telephone lines, which only 10 percent of the public facilities had available. Only two of 121 (2 percent) public health units, 36 percent of the public health centers, and 57 percent of the public hospitals had ground telephone lines available.

Clean water was available in just 72 percent of the public facilities, with health units having the lowest availability (65 percent). One hospital, Al Qaflah Rural Hospital, had no clean water available. This hospital also had no electricity.

All public sector hospitals and health centers had toilets available, compared to just 71 percent of health units. Toilets were available in all private sector facilities in the survey. Sewage systems were in place in all of the public hospitals and health centers, and in just 64 percent of health units. Electricity was available in only 41 percent of all public health facilities, and only 29 percent of the health units. One hospital (Al Qaflah, mentioned above) did not have electricity.

See Annex C (Table C-4-1) for a district-level summary of facilities with various infrastructure items available. Maps showing the proportion of facilities in each district with clean water, electricity, usable toilets, and separation of medical waste and garbage are also located in Annex C (Figures C-4-1 through C-4-4).

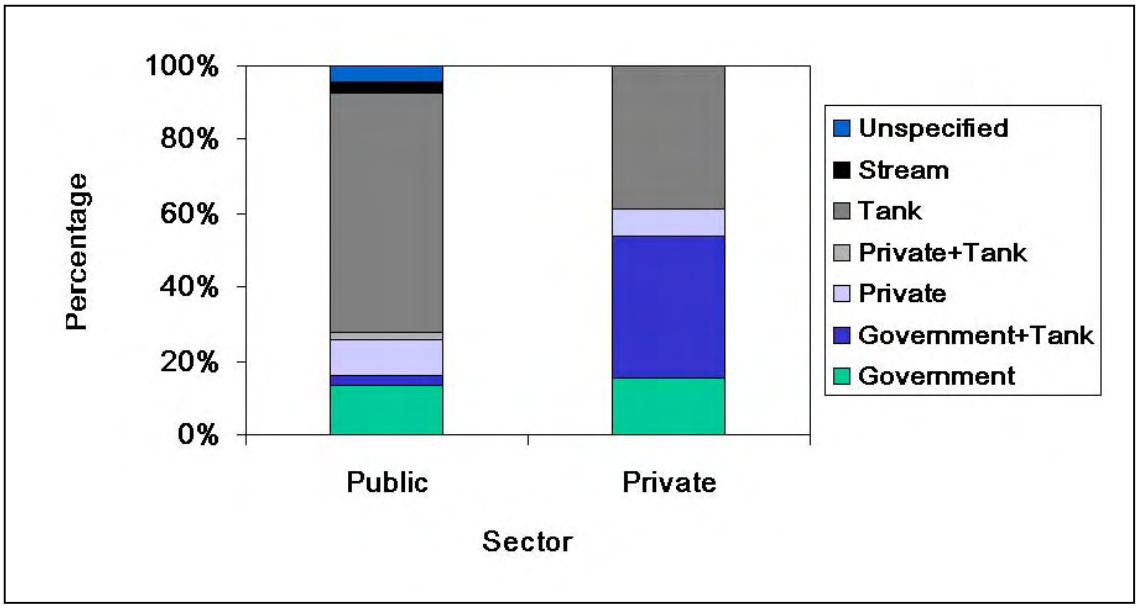
Table 4-1. Availability of clean water, electricity, ground telephone lines, toilets, sewage systems, and transportation in public and private sector facilities

	Sector													
	Public								Private					
	Hospital		Health Center/Clinic		Health Unit		Total		Hospital		Health Center/Clinic		Total	
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
Clean Water														
Available	6	(85.7)	28	(100)	78	(64.5)	112	(71.8)	2	(100)	11	(100)	13	(100)
Not	1	(14.3)	0	(0.0)	43	(35.5)	44	(28.2)	0	(0.0)	0	(0.0)	0	(0.0)
Electricity														
Available	6	(85.7)	23	(82.1)	35	(28.9)	64	(41.0)	2	(100)	11	(100)	13	(100)
Not	1	(14.3)	5	(17.9)	86	(71.1)	92	(59.0)	0	(0.0)	0	(0.0)	0	(0.0)
Telephone Lines														
Available	4	(57.1)	10	(35.7)	2	(1.7)	16	(10.3)	2	(100)	11	(100)	13	(100)
Not	3	(42.9)	18	(64.3)	119	(98.3)	140	(89.7)	0	(0.0)	0	(0.0)	0	(0.0)
Toilets														
Available	7	(100)	28	(100)	86	(71.1)	121	(77.6)	2	(100)	11	(100)	13	(100)
Not	0	(0.0)	0	(0.0)	35	(28.9)	35	(22.4)	0	(0.0)	0	(0.0)	0	(0.0)
Sewage system														
Available	7	(100)	28	(100)	77	(63.6)	112	(71.8)	2	(100)	11	(100)	13	(100)
Not	0	(0.0)	0	(0.0)	42	(34.7)	42	(26.9)	0	(0.0)	0	(0.0)	0	(0.0)
Unspecified	0	(0.0)	0	(0.0)	2	(1.7)	2	(1.3)	0	(0.0)	0	(0.0)	0	(0.0)
Transportation														
Available	2	(28.6)	1	(3.6)	0	(0.0)	3	(1.9)	1	(50.0)	1	(5.1)	2	(0.0)
Not	5	(71.4)	27	(96.4)	121	(100)	153	(98.1)	1	(50.0)	10	(94.9)	11	(100)
Total	**7**	**(100)**	**28**	**(100)**	**121**	**(100)**	**156**	**(100)**	**2**	**(100)**	**11**	**(100)**	**13**	**(100)**

4.2.1 Clean water

Water tanks were the major source (67 percent) of clean water for public facilities, while the two leading sources of clean water for private sources were either water tanks alone (39 percent) or water tanks combined with governmental sources (39 percent) (Figure 4-3). Three public facilities reported using streams as their clean water source.

Figure 4-3. Sources of clean water, by sector

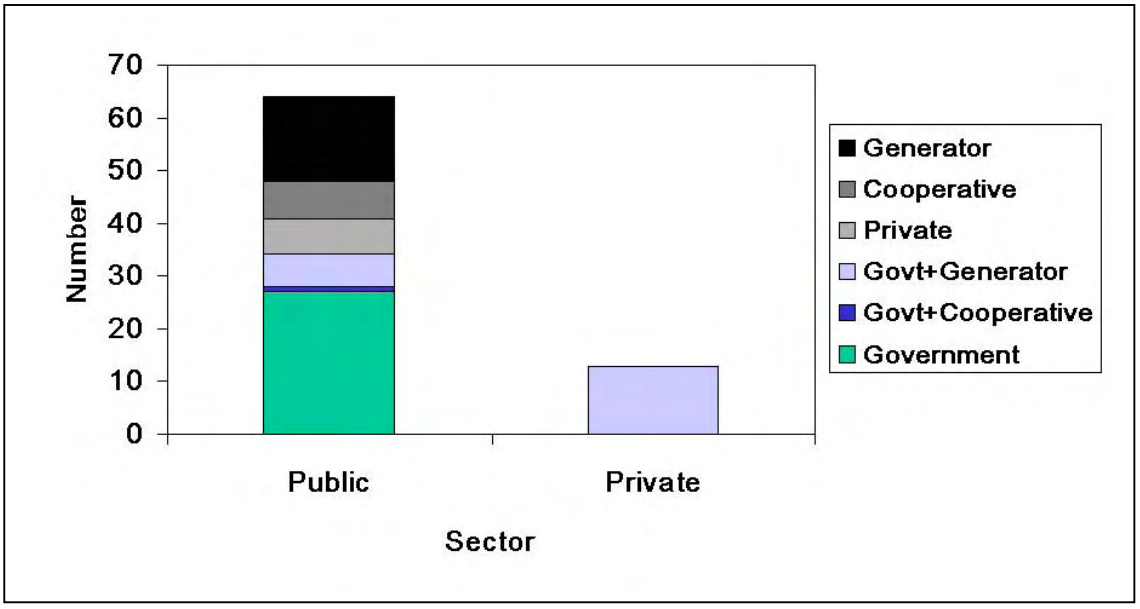


4.2.2 Electricity

A total of 77 facilities reported having electricity available. All 13 private facilities reported that their main sources of electricity were a combination of government and their own generators (Figure 4-4). The most common electricity source for public facilities was the government, followed by their own generators.

Among facilities with electricity, the average number of hours that electricity operated each day was higher for private facilities than for public facilities (21.3 hours vs. 12.8 hours, respectively). For both public and private facilities, hospitals had operating electricity for slightly more hours per day than health centers, clinics, and health units.

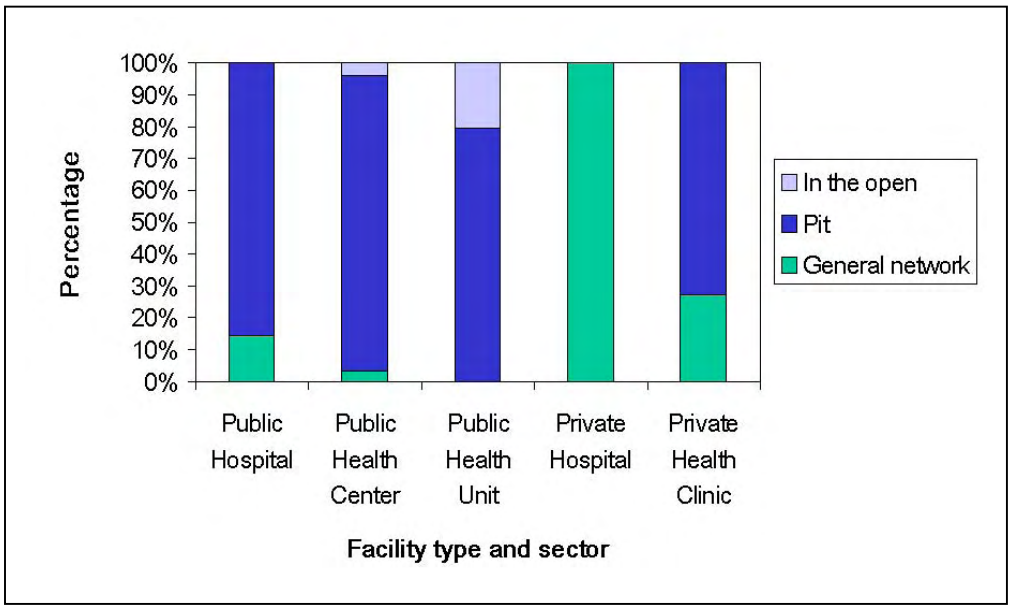
Figure 4-4. Sources of electricity, by sector



4.2.3 Sewage systems

Of the 169 facilities surveyed, 125 (74 percent) had sewage systems available (72 percent of public facilities vs. 100 percent of private facilities). Of those with sewage systems available, pit systems were most common (81 percent) in all facility types (Figure 4-5). Private facilities were more likely than public facilities to use the general sewage network (39 percent vs. 2 percent, respectively).

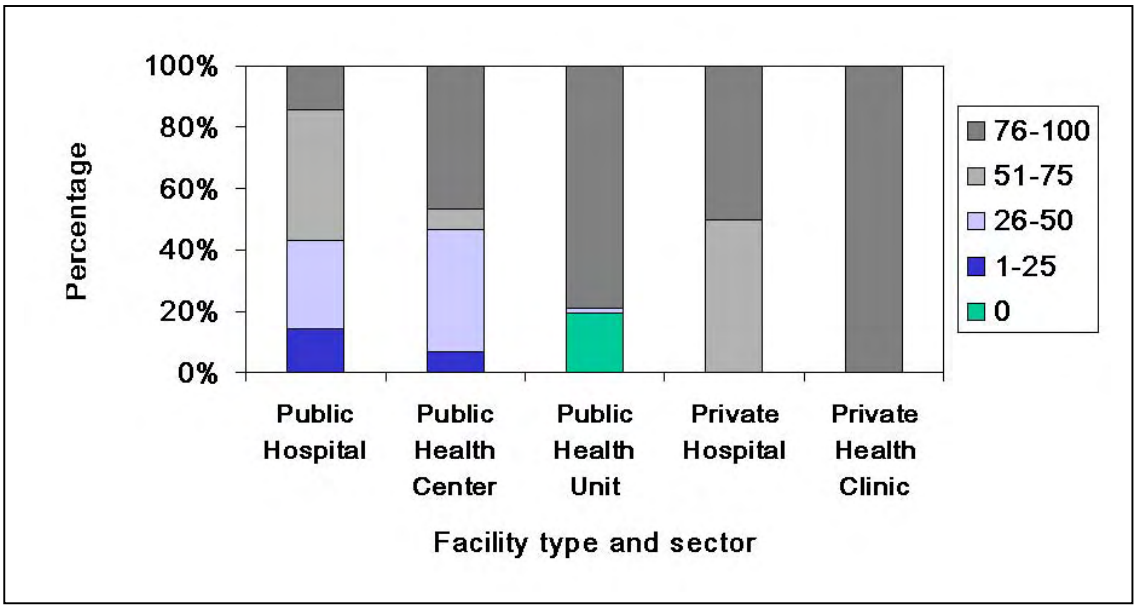
Figure 4-5. Types of sewage systems, by facility type and sector



4.2.4 Toilets

The proportion of available toilets that were actually usable was higher among private sector facilities than public sector facilities. Almost one-third of public sector facilities had less than 76 percent of their available toilets usable, compared to 8 percent of private facilities (Figure 4-6). Approximately one-fifth of the health units had no usable toilets.

Figure 4-6. Proportion of usable toilets, by facility type and sector



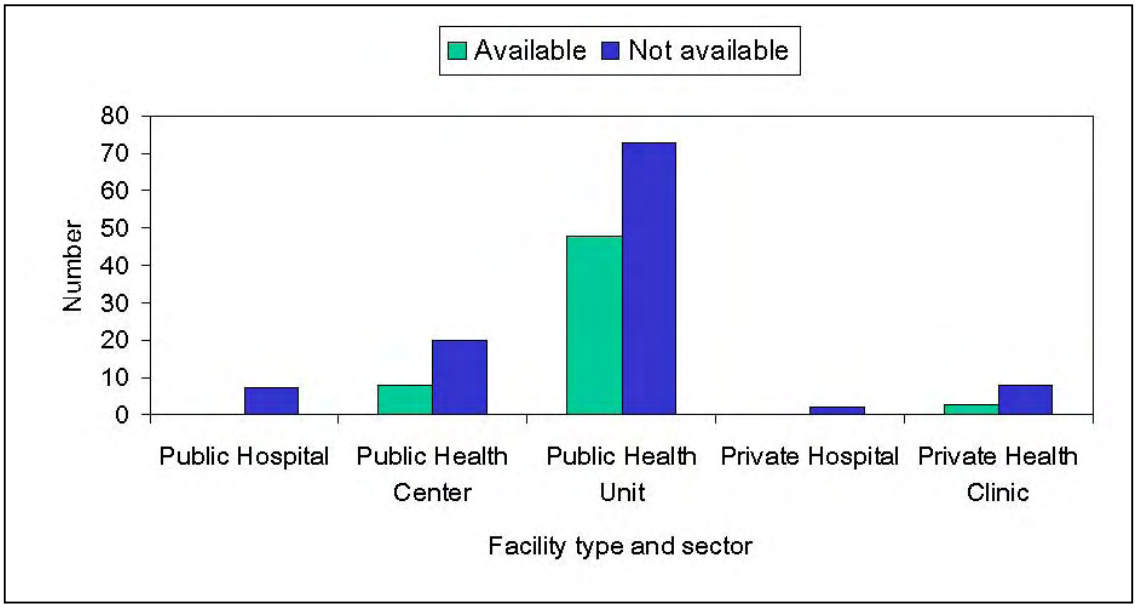
4.3 Transportation

Transportation availability was very low (3 percent overall) for both public and private facilities. Just three of 156 (2 percent) of public facilities and two of 13 (15 percent) private facilities reported having transportation available. None of the health units had their own transportation.

4.4 Medical Waste and Garbage Separation and Disposal

Just over one-third of the facilities in Amran had a means available to separate medical waste from other garbage. Public facilities were more likely than private facilities to separate medical waste (36 percent vs. 23 percent, respectively). Of all health facility types, health units were most likely to separate medical waste (40 percent). Interestingly, none of the nine public or private hospitals separated medical waste, while 28.6 percent of public health centers and 27 percent of private health clinics did so (Figure 4-7).

Figure 4-7. Separation of medical waste and garbage, by facility type and sector



Among the 110 facilities reporting that they did not separate the medical waste and garbage, public facilities were most likely to burn the two, while private facilities were most likely to use garbage barrels for disposal. Of the 59 facilities separating medical waste and garbage, most disposed of garbage by burning it (80 percent of public facilities, 67 percent of private facilities). Of note, five health units reported that garbage was disposed of by throwing it in the street. Most (95 percent) of these 59 facilities reported that medical waste was either burned or burned and then buried; however, there were significant differences between public and private facilities. Virtually all (98 percent) of the 56 public facilities separating medical waste disposed of it by burning it, and many then buried the waste. However, two of the three private facilities separating medical waste reported that they then disposed of it using garbage barrels.

4.5 Equipment Sources

Among 156 public facilities with data on the main sources of equipment, the primary sources were the government and a combination of government plus foreign aid (Table 4-2). Most (57 percent) hospitals reported that the government and foreign aid were the primary sources of equipment. Approximately half of the health centers and health units reported that the main equipment source was the government, and about a quarter reported that equipment was supplied by a combination of government and foreign sources.

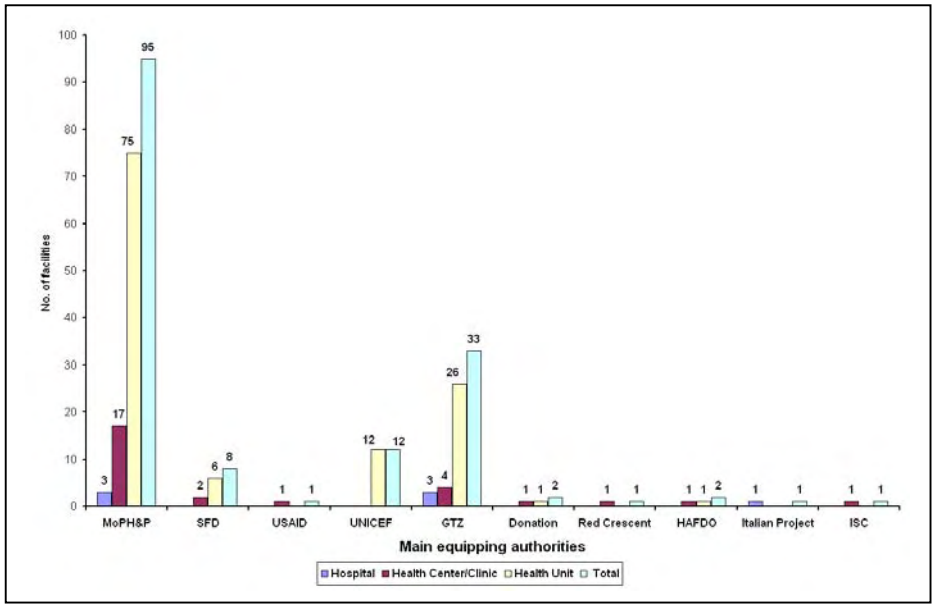
Table 4-2. Sources of equipping health facility building (public sector)

Equipment Source	Facility Type						Group Total	
	Hospital		Health Center		Health Unit			
	n	(%)	n	(%)	n	(%)	n	(%)
Government	2	(28.6)	14	(50.0)	63	(52.1)	79	(50.6)
Government & Private	0	(0.0)	0	(0.0)	2	(1.7)	2	(1.3)
Government & Local	0	(0.0)	2	(7.1)	1	(0.8)	3	(1.9)
Government & Foreign	4	(57.1)	7	(25.0)	32	(26.4)	43	(27.6)
Local	0	(0.0)	1	(3.6)	2	(1.7)	3	(1.9)
Government & Non Government*	1	(14.3)	2	(7.1)	2	(1.7)	5	(3.2)
Foreign	0	(0.0)	2	(7.1)	19	(15.7)	21	(13.5)
Total	**7**	**(100)**	**28**	**(100)**	**121**	**(100)**	**156**	**(100)**

*Combination of government and one or more of private, local, and/or foreign sources

As Figure 4-8 shows, the MoPHP was the primary source for equipping public sector health facilities. However, among hospitals, an equal number were equipped by the German Technical Cooperation (GTZ), which also was the primary source for 14 percent of health centers and 22 percent of health units.

Figure 4-8. Main authorities for equipping public sector health facility buildings



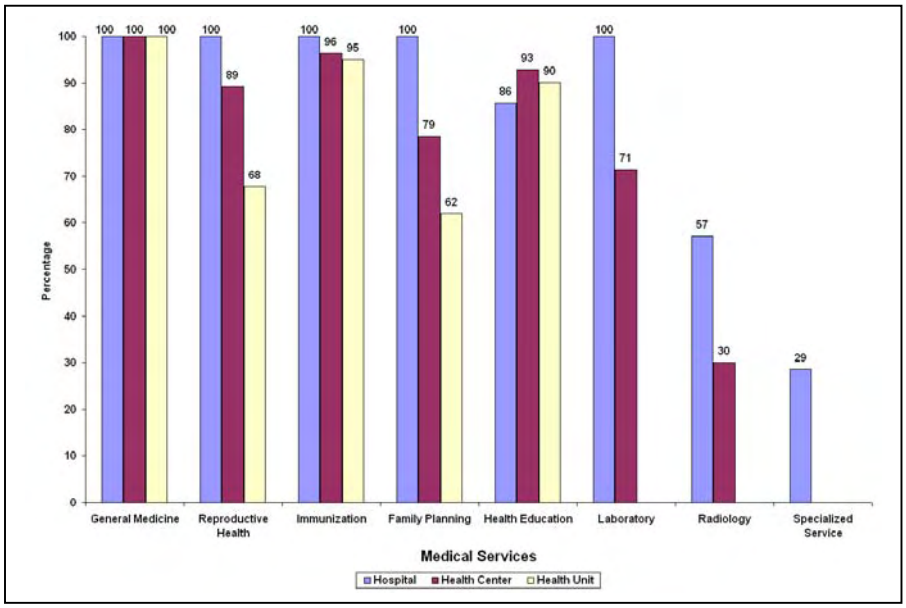
5. Health and Medical Services Provided

(See also Tables C-5-1 through C-5-5 in Annex C.)

5.1 Medical Services Available – Public Sector

Figure 5.1 shows the number and proportion of public sector facilities providing at least one medical service related to general medicine, reproductive health, immunization, family planning, and health education, as well as laboratory, radiology, and other specialized services (the latter three for hospitals and health centers only). All 156 public sector facilities provided at least one general medicine service, and nearly all (96 percent) provided at least one immunization service. Health education was provided by 91 percent of all public facilities, and health education on immunization was the most common type of health education provided. Just two-thirds of the facilities offered family planning services. Hospitals were more likely than health centers and health units to offer reproductive health and family planning services, while health education was more commonly provided by health centers and units than by hospitals.

Figure 5-1. Proportion of public sector facilities providing health and medical services, by facility type



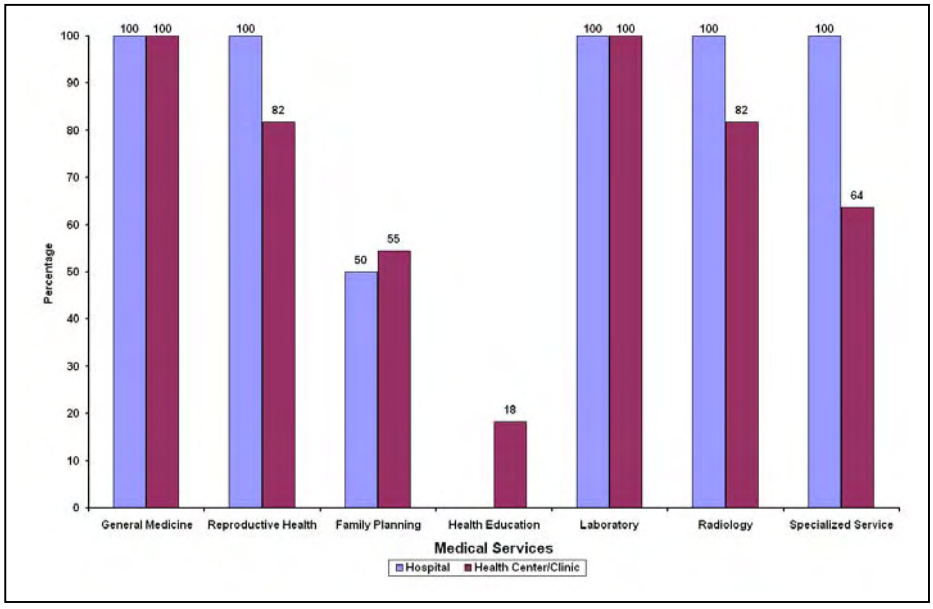
Additional details regarding the types of medical services provided in public facilities are provided in Annex C (Table C-5-1). Every hospital offered at least one laboratory service, compared to 71 percent of health centers. All facilities providing at least one laboratory service were able to do blood and urine laboratory testing, and most were also able to malaria and bilharzia tests. Radiology services were provided by only four (57 percent) hospitals and six (30 percent) of health centers; normal x-rays and ultrasounds were the most common radiology services available in these facilities. Just two of the seven hospitals offered at least one specialized service such as obstetrics/gynecology, pediatrics, surgery, ophthalmology, and dental services.

The services offered by the fewest facilities included after delivery care and child growth monitoring, family planning services such as intrauterine devices (IUDs) and tying of tubes, and health education on Acquired Immune Deficiency Syndrome (AIDS), sexually transmitted diseases (STDs) and female circumcision; hospitals were more likely than other facilities to offer these services. No public facilities provided echocardiograms, computed tomography (CT) scans, magnetic resonance imaging (MRI), or endoscopy.

5.2 Medical Services Available – Private Sector

All of the 13 private sector facilities provided the three main general medicine services, and 85 percent provided at least one reproductive health service (Figure 5-2). In contrast to the public sector facilities, all private facilities offered at least one laboratory service, and all had laboratory capacity for blood, urine, and stool testing as well as diagnostic capacity for malaria and bilharzia. In addition, most (80 percent) private facilities (including both hospitals) provided at least one radiology service and 69 percent provided at least one specialized service.

Figure 5-2: Availability of health and medical services in private sector facilities



All 13 private hospitals and clinics provided the full range of general medicine services including injections and wound dressing, and both private hospitals provided all reproductive health services. Family planning services were provided by just over half of the private facilities. Among the facilities providing family planning, the IUD and pill were the most common forms of contraception offered. Health education services were only provided by two of the 13 private facilities, and none of the private facilities provided health education on AIDS, STDs, family planning, or female circumcision.

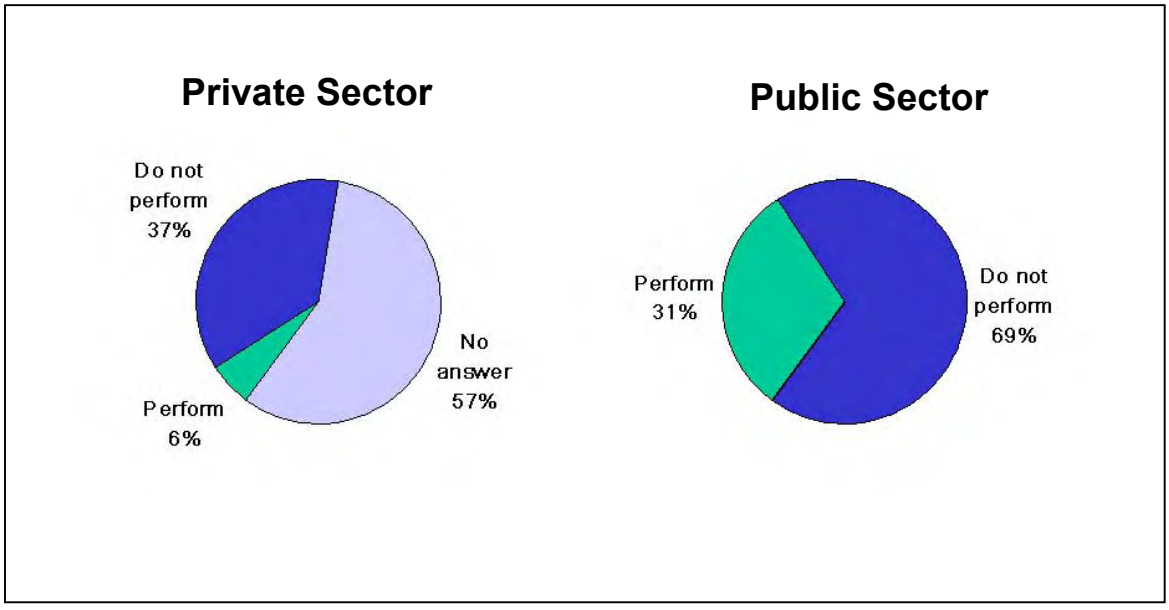
All private facilities had laboratory services for urine, blood, and general blood testing, as well as malaria and bilharzia diagnostic testing. Both private hospitals provided normal and color x-rays and ultrasound, one hospital (Al Zohrah) provided echocardiograms, and one hospital (Al Makathy) provided endoscopy.

Specialized services were provided by both private hospitals and included everything except dermatology, ear nose and throat (ENT), and ophthalmology services. Most (86 percent) private health clinics also provided obstetrics and gynecologic services. For more details, see Annex C (Table 5-2-C).

5.3 HIV Testing

Public and private hospitals and health centers or clinics were asked whether they performed testing for human immunodeficiency virus (HIV). Of 48 total facilities, six (13 percent) performed HIV tests. Private facilities were more likely than public facilities to perform HIV tests (Figure 5-3). It should be noted that 20 facilities (all public sector) did not provide an answer to this question, so the actual prevalence of HIV testing in Amran is unknown. The two public facilities performing HIV testing were both hospitals, while three of the four private facilities performing HIV testing were health clinics. Of the facilities that did not perform HIV tests, none had referral systems for HIV tests to be done at other facilities.

Figure 5-3. Proportion of hospitals and health centers/clinics providing HIV testing, by sector



6. Other Activities and Services

(See also Table C-6-1 in Annex C.)

6.1 Control of Epidemic Diseases

Of the 169 facilities with completed interviews, the proportion offering services for control of important epidemic diseases ranged from 8 percent for tuberculosis (TB) to 14 percent for bilharzia (Table 6-1). For each disease, hospitals were most likely to offer control services, followed by health centers/clinics and health units. However, malaria was the exception, with just 3 percent health centers/clinics reporting malaria control services, compared to 10 percent of health units.

Table 6-1. Number and proportion of facilities offering services for control of epidemic diseases

Epidemic diseases	Hospitals (n=9)		Health Centers / Clinics (n=39)		Health Units (n=121)		Total (n=169)	
	n	(%)	n	(%)	n	(%)	n	(%)
Malaria	4	(44.4)	1	(2.6)	12	(9.9)	17	(10.1)
Bilharzia	4	(44.4)	7	(17.9)	13	(10.7)	24	(14.2)
Diarrhea	3	(33.3)	5	(12.8)	13	(10.7)	21	(12.4)
TB	2	(22.2)	6	(15.4)	6	(5.0)	14	(8.3)
Acute respiratory infections	2	(22.2)	4	(10.3)	10	(8.3)	16	(9.5)

6.2 Delivery Emergencies

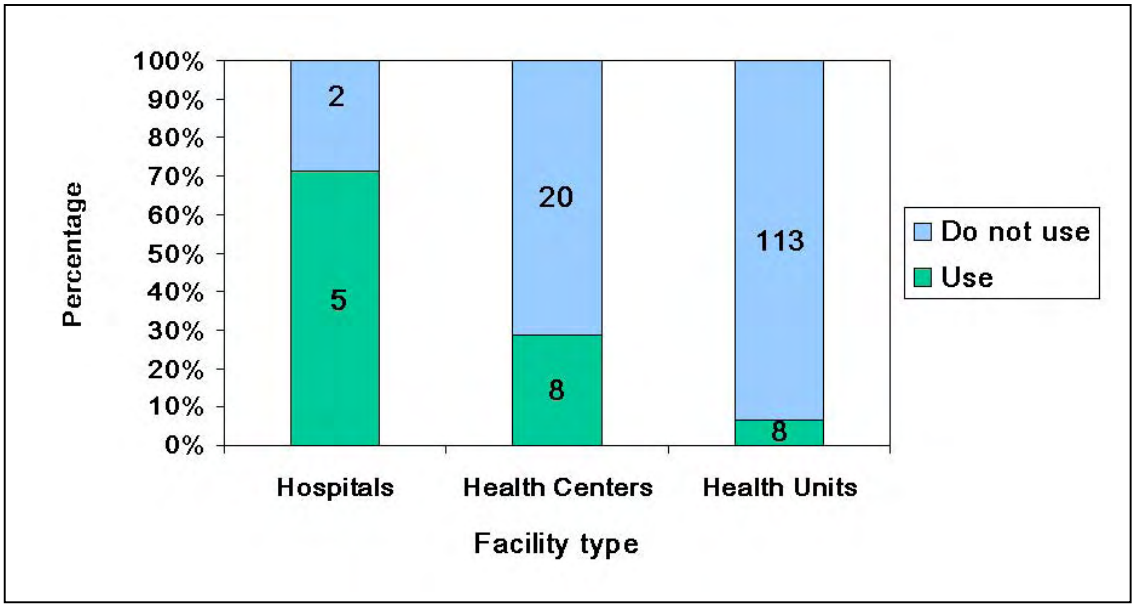
Approximately half of all facilities had a referral system for delivery emergencies. Private sector facilities were more likely than public sector facilities to have a referral system in place (69 percent vs. 49 percent, respectively). Among public facilities, hospitals were most likely to have delivery emergency referral systems, while among private facilities, referral systems were more common at health centers than at hospitals.

Table 6-2. Number and proportion of facilities with referral system for delivery emergencies available, by facility type and public/private sector

Facility Type	Public			Private			Total		
	n	Total	(%)	n	Total	(%)	n	Total	(%)
Hospital	6	**7**	(85.7)	1	**2**	(50.0)	7	**9**	(77.8)
Health Center	17	**28**	(60.7)	8	**11**	(72.7)	25	**39**	(64.1)
Health Unit	53	**121**	(43.8)				53	**121**	(43.8)
Total	**76**	**156**	**(48.7)**	**9**	**13**	**(69.2)**	**85**	**169**	**(50.3)**

In 2002, the Reproductive Health and Family Planning Department of the MoPHP issued Guidelines for Emergency Delivery Services to support doctors in dealing with issues related to emergency deliveries. The guide outlines complications that may occur during the pre-delivery, delivery, and postpartum stages, as well as during Caesarean sections. It also covers symptoms, prevention methods, and treatments for complications at each stage. The delivery emergencies guide was used in 14 percent of the public facilities and none of the private facilities. Hospitals were most likely to use the guide (71 percent), followed by health centers (29 percent) and health units (7 percent) (Figure 6-1). When questioned during the survey, some facilities reported that they had never received the guide.

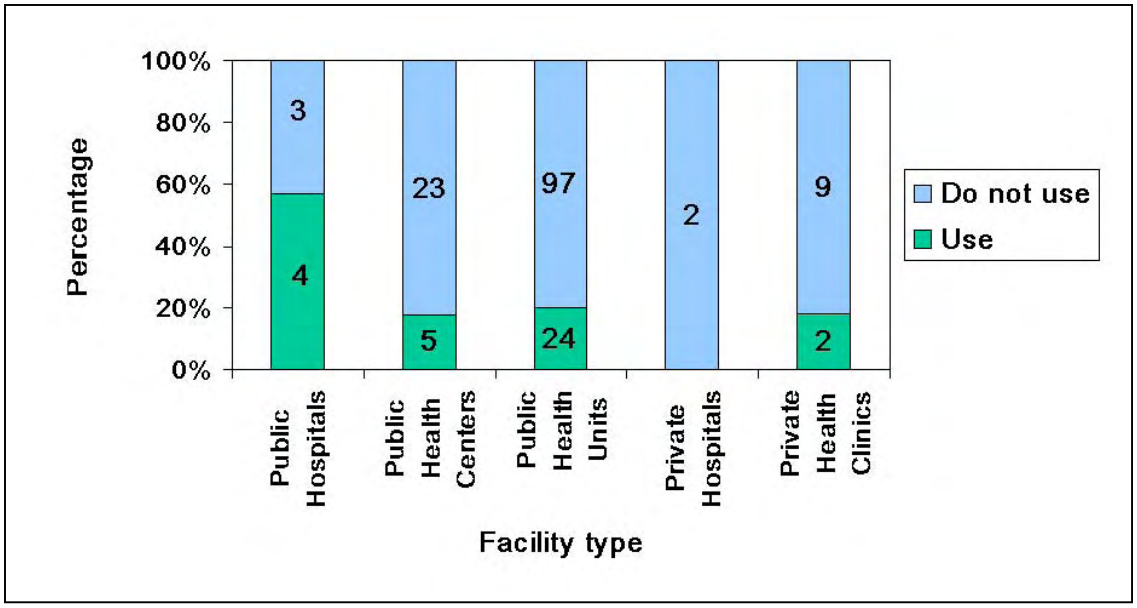
Figure 6-1. Proportion of public facilities using Guidelines for Emergency Delivery Services, by facility type



6.3 Guidelines for Infection Prevention in Safe Motherhood Services

The Reproductive Health and Family Planning Department in the MoPHP issued Guidelines for Infection Prevention in Safe Motherhood Services in July 2001.The guide focuses on instrument sterilization procedures and other infection prevention methods for health facilities. This guide was used by 33 (21 percent) of the public health facilities and two (15 percent) of the private health facilities (Figure 6-2). Both of the private facilities using the guide were health clinics. Among public facilities, more than half of the hospitals used the guide, compared to 18 percent of health centers and 20 percent of health units.

Figure 6-2. Proportion of public facilities using Guidelines for Infection Prevention, by facility type and sector



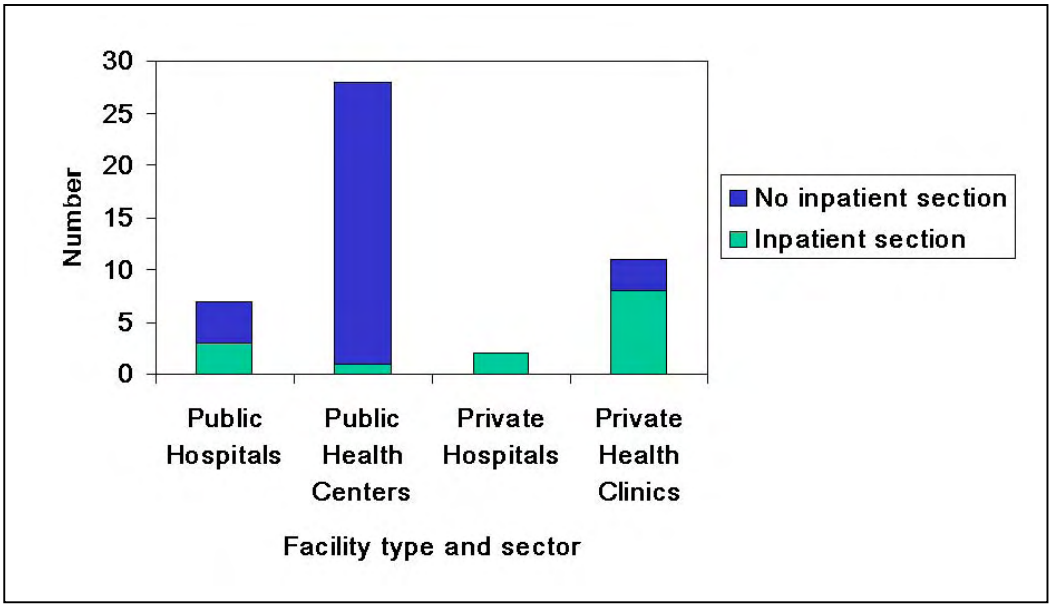
7. Inpatient Sections

(See also Tables C-7-1 through C-7-5 in Annex C.)

7.1 Inpatient Sections

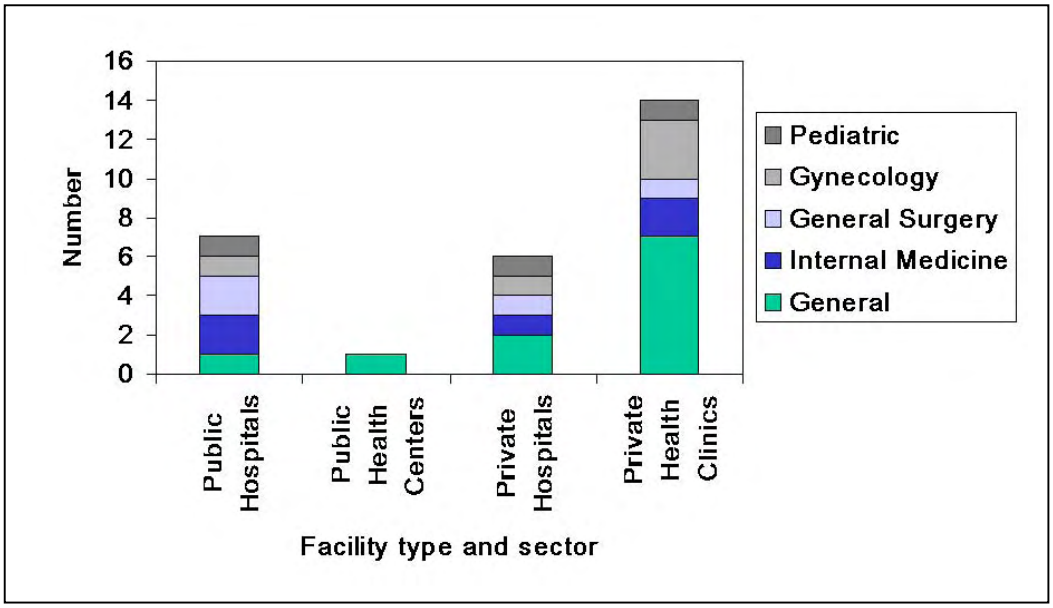
Out of all hospitals and health centers in Amran, 14 had inpatient sections. Of these, 10 (77 percent) were private facilities. Out of all nine hospitals, five (56 percent) had inpatient facilities (43 percent of seven public hospitals and 100 percent of two private hospitals) (Figure 7-1). Inpatient facilities were available in 23 percent of health centers or clinics (4 percent of 28 public health centers and 73 percent of 11 private health clinics).

Figure 7-1. Facilities with inpatient sections, by facility type and sector



General inpatient sections, internal medicine inpatient sections, and general surgery sections were available for half of the four public facilities providing inpatient services, while just one public hospital had gynecology and one had pediatric inpatient sections (Figure 7-2). Among private facilities with inpatient sections, 90 percent had general inpatient sections, 40 percent had gynecology inpatient sections, and 30 percent had internal medicine sections. In addition, 20 percent had general surgery or pediatric inpatient sections. See Annex C (Table C-7-2) for the average number of inpatient beds by facility type and sector.

Figure 7-2. Types of inpatient sections available, by facility type and sector



7.2 Operations

Table 7-1 shows the types of operations performed in the four public facilities and 10 private facilities with inpatient sections. Note that the one public health center with an inpatient section did not perform any operations. Both public and private facilities provided appendectomies, hernia operations, gall bladder removal, urinary bladder stone removal, and Caesarean deliveries. Kidney stone operations were performed by the two private hospitals, and no facilities in Amran provided cataract surgeries.

Table 7-1. Proportion of facilities with inpatient sections performing specific operations

Sections	Public				Private					
	Hospital n=3		Total n=4		Hospital n=2		Clinic n=8		Total n=10	
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
Appendectomy	2	(66.7)	2	(50.0)	2	(100)	2	(25.0)	4	(40.0)
Hernia	2	(66.7)	2	(50.0)	2	(100)	2	(25.0)	4	(40.0)
Gall bladder removal	2	(66.7)	2	(50.0)	2	(100)	1	(12.5)	3	(30.0)
Cataract	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Urinary bladder stones	2	(66.7)	2	(50.0)	2	(100)	1	(12.5)	3	(30.0)
Kidney stones	0	(0.0)	0	(0.0)	2	(100)	1	(12.5)	3	(30.0)
Caesarean delivery	2	(66.7)	2	(50.0)	2	(100)	1	(12.5)	3	(30.0)

Table C-7-3 in Annex C shows the average cost (in Yemeni riyals) of specific operations performed at inpatient sections in Amran facilities. The cost of each type of operation was higher in private facilities than in public facilities. Among private sector facilities, prices for all operations, except for Caesarean deliveries, were slightly higher at hospitals than health clinics.

7.3 Rooms

Public sector facilities with inpatient sections were most likely to offer common rooms for patients, though one hospital did offer individual rooms (Table 7-2). Both of the two private sector hospitals offered individual rooms, while the private health clinics were more likely to have common rooms. Only one hospital in Amran offered intensive care rooms. See Table C-7-4 in Annex C for the average number of discharges during previous month for each inpatient section type (among facilities with inpatient sections) and Table C-7-5 for the average nightly costs (in Yemeni riyals) for inpatient rooms.

Table 7-2. Availability of different types of inpatient rooms among health facilities with inpatient sections

Rooms	Public						Private					
	Hospital n=3		Health Center n=1		Total n=4		Hospital n=2		Clinic n=8		Total n=10	
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
Individual	1	(33.3)	0	(0.0)	1	(25.0)	2	(100)	1	(12.5)	3	(30.0)
Common	3	(100)	1	(100)	4	(100)	1	(50.0)	5	(62.5)	6	(60.0)
Intensive care	0	(0.0)	0	(0.0)	0	(0.00)	1	(50.0)	0	(0.0)	1	(10.0)

8. Health Cadre

Table 8-1 summarizes the number of health staff in the 169 public and private sector facilities with completed interviews. A total of 1,117 health staff (908 in public facilities and 209 in private facilities) were categorized by cadre, gender, and whether they were local or foreign staff. Approximately two-thirds of staff were males in both public and private facilities. In public facilities, female staff were most likely to be either counselors (42 percent) or midwives (39 percent). In private facilities, the largest proportions of female staff were nurses (25 percent), administrative or support staff (24 percent), or midwives (21 percent). Specialists were more common in private facilities than public, and private facilities had a larger proportion of foreign staff than public facilities (21 percent vs. 2 percent, respectively).

Table 8-1. Health staff, by cadre, gender, local/foreign and sector

Occupation/ Profession		Public						Total	Private						Total
		Local		Foreign		Total			Local		Foreign		Total		
		M	F	M	F	M	F		M	F	M	F	M	F	
Specialist	#	6	2	4	3	10	5	15	2	0	9	8	11	8	19
	%	40.0	13.3	26.7	20.0	66.7	33.3	100	10.5	0.0	47.4	42.1	57.9	42.1	100
General Practitioner	#	45	2	2	0	47	2	49	9	0	5	2	14	2	16
	%	91.8	4.1	4.1	0.0	95.9	4.1	100	56.3	0.0	31.3	12.5	87.5	12.5	100
Dentist	#	4	0	0	0	4	0	4	3	0	0	1	3	1	4
	%	100.0	0.0	0.0	0.0	100.0	0.0	100	75.0	0.0	0.0	25.0	75.0	25.0	100
Pharmacist	#	5	0	0	0	5	0	5	5	0	0	0	5	0	5
	%	100.0	0.0	0.0	0.0	100.0	0.0	100	100.0	0.0	0.0	0.0	100.0	0.0	100
Laboratory (B.Sc.)	#	7	2	0	0	7	2	9	1	0	0	1	1	1	2
	%	77.8	22.2	0.0	0.0	77.8	22.2	100	50.0	0.0	0.0	50.0	50.0	50.0	100
Medical Assistant	#	27	1	1	0	28	1	29	3	1	1	0	4	1	5
	%	93.1	3.4	3.4	0.0	96.6	3.4	100	60.0	20.0	20.0	0.0	80.0	20.0	100
Nurse	#	189	17	1	2	190	19	209	7	7	0	9	7	16	23
	%	90.4	8.1	0.5	1.0	90.9	9.1	100	30.4	30.4	0.0	39.1	30.4	69.6	100
Midwife	#	0	115	0	1	0	116	116	0	13	0	0	0	13	13
	%	0.0	99.1	0.0	0.9	0.0	100.0	100	0.0	100.0	0.0	0.0	0.0	100.0	100
Medical technician	#	84	2	1	0	85	2	87	35	1	1	4	36	5	41
	%	96.6	2.3	1.1	0.0	97.7	2.3	100	85.4	2.4	2.4	9.8	87.8	12.2	100
Murshid / Murshida (counselor)	#	57	127	0	0	57	127	184	0	1	0	0	0	1	1
		31.0	69.0	0.0	0.0	31.0	69.0	100	0.0	100.0	0.0	0.0	0.0	100.0	100
Admin. and other support staff	#	174	26	1	0	175	26	201	63	15	2	0	65	15	80
	%	86.6	12.9	0.5	0.0	87.1	12.9	100	78.8	18.8	2.5	0.0	81.3	18.8	100
Total	#	598	294	10	6	608	300	908	128	38	18	25	146	63	209
	%	65.9	32.4	1.1	0.7	67.0	33.0	100	61.2	18.2	8.6	12.0	69.9	30.1	100

9. Medical Equipment – Public Sector Facilities

9.1 General Medical Equipment

The 156 public health facilities that completed the survey were asked to provide information on the availability and quantity of key types of equipment. Results of this inventory are presented in Table 9-1. Facilities were asked to report the quantity available of each piece of equipment along with the quantity actually functioning or usable. Results are presented by facility type. Note that facilities were not asked to determine the number and proportion of functioning tongue depressors, desks, or chairs, for it was assumed that all of these items were functioning.

Table 9-1. General medical equipment in public health facilities: availability, quantity, and proportion functioning

Equipment Name	Hospital n = 7				Health Center n = 28				Health Unit n = 121			
	Available*	Quantity	Functioning (n)	Functioning (%)	Available	Quantity	Functioning (n)	Functioning (%)	Available	Quantity	Functioning (n)	Functioning (%)
Examination bed	7	48	36	(75.0)	28	50	45	(90.0)	80	94	86	(91.5)
Sphygmomanometer	7	27	23	(85.2)	28	64	44	(68.8)	109	149	138	(92.6)
Stethoscope	7	26	23	(88.5)	28	55	52	(94.6)	112	152	149	(98.0)
Thermometer	6	54	54	(100)	26	153	134	(87.6)	99	329	318	(96.7)
Tongue depressor	6	43			27	62			72	117		
Scale+ height measure[1]	5	11	10	(90.9)	24	34	28	(82.4)	73	82	61	(74.4)
Scale+ height measure[2]	6	9	8	(88.9)	25	32	27	(84.4)	68	70	63	(90.0)
Mobile curtains	7	21	15	(71.4)	20	50	49	(98.0)	35	44	36	(81.8)
Desk	7	31			25	57			26	33		
Chairs	7	93			28	271			112	617		
Ophthalmoscope	1	1	0	(0.0)	8	8	6	(75.0)	5	5	5	(100)
Diagnostic set auriscope	4	6	3	(50.0)	13	13	12	(92.3)	5	5	5	(100)

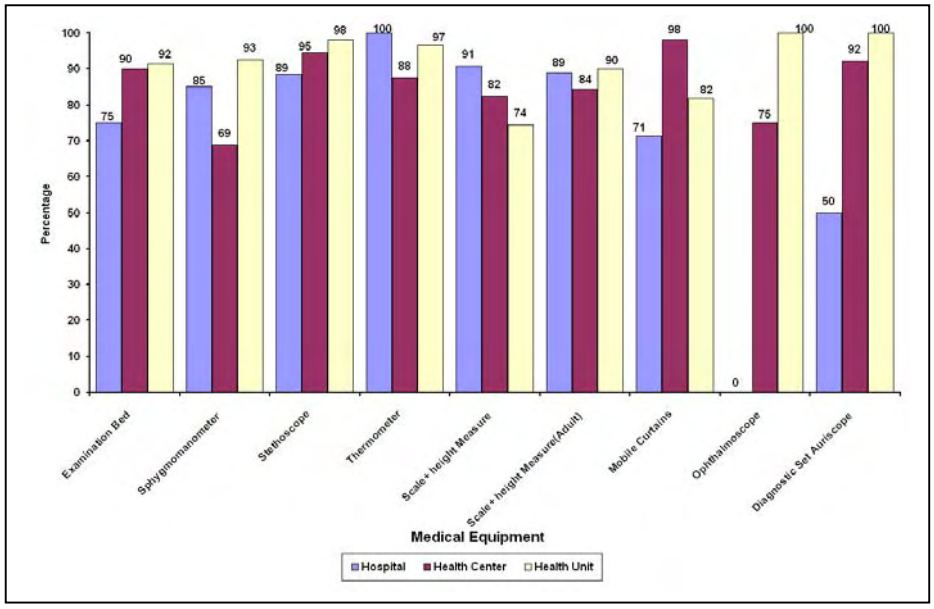
[1]Child

[2]Adult

*"Available" refers to the number of facilities with the equipment available

All hospitals and health centers had examination beds, sphygmomanometers, stethoscopes, and chairs, with most facilities reporting at least 75 percent of these pieces of equipment functioning (Figure 9-1). No hospitals had functioning ophthalmoscopes, which were available in just eight of the health centers but only six were actually functioning. Just 69 percent of the sphygmomanometers in health centers were functional, compared to 93 percent of those in health units. Among health units, the most common types of equipment available were stethoscopes, chairs, sphygmomanometers, and thermometers, and most of these items were reported as functioning.

Figure 9-1. Proportion of functioning general medical equipment in public health facilities



9.2 Laboratory Equipment

In addition to general medical equipment, public health facilities were asked to inventory laboratory equipment; the results are presented in Table 9-2. All seven public hospitals had microscopes and centrifuges, though just 75 percent of the microscopes and centrifuges were actually functioning (Figure 9-2). Only two hospitals had sterilization machines and refrigerators, and just 50 percent of the refrigerators were functioning.

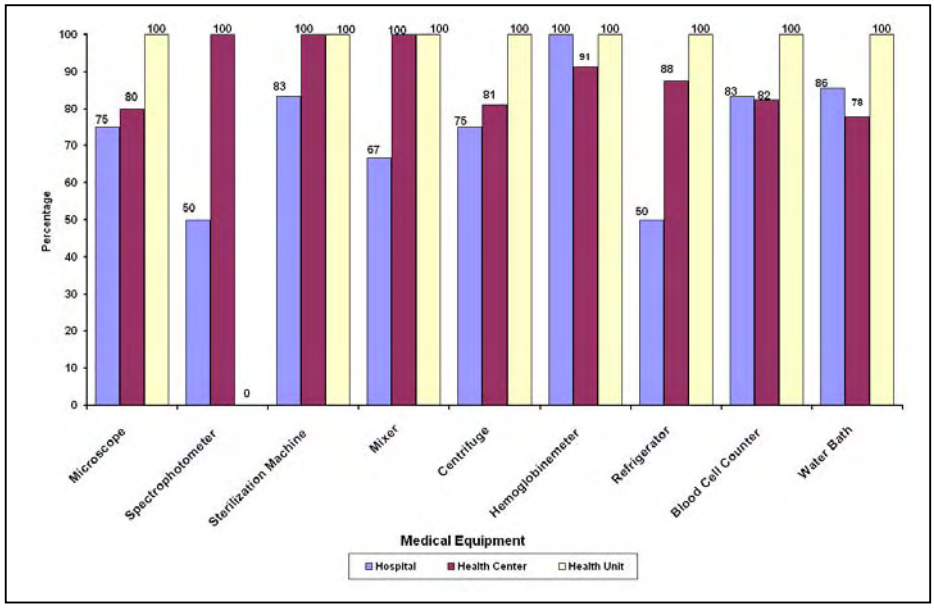
Microscopes were the most common type of laboratory equipment available in health centers (79 percent), followed by hemoglobinometers, centrifuges and blood cell counters. Refrigerators and sterilization machines were present in just eight and two health centers, respectively. Laboratory equipment was available in very few health units, but all laboratory equipment in the health units was reported functioning. It should be noted that health units do not typically provide laboratory services. The health units with lab equipment were built and furnished by SFD and the Ministry of Public Works, which have a budget for this type of equipment.

Table 9-2. General laboratory equipment in public health facilities: availability, quantity, and proportion functioning

Equipment Name	Hospital n = 7				Health Center n = 28				Health Unit n = 121			
	Available*	Quantity	Functioning (n)	Functioning (%)	Available	Quantity	Functioning (n)	Functioning (%)	Available	Quantity	Functioning (n)	Functioning (%)
Microscope	7	16	12	(75.0)	22	30	24	(80.0)	6	6	6	(100)
Spectrophotometer	2	2	1	(50.0)	5	5	5	(100)	0	0	0	(0.0)
Sterilization machine	2	6	5	(83.3)	2	2	2	(100)	1	1	1	(100)
Mixer	2	3	2	(66.7)	4	4	4	(100)	1	1	1	(100)
Centrifuge	7	12	9	(75.0)	17	21	17	(81.0)	2	2	2	(100)
Hemoglobinometer	7	12	12	(100)	20	23	21	(91.3)	6	6	6	(100)
Refrigerator	2	6	3	(50.0)	8	8	7	(87.5)	1	1	1	(100)
Blood cell counter	5	6	5	(83.3)	17	17	14	(82.4)	3	3	3	(100)
Water bath	2	7	6	(85.7)	9	9	7	(77.9)	1	1	1	(100)

- "Available" refers to the number of facilities with the equipment available

Figure 9-2. Proportion of functioning general laboratory equipment in public health facilities



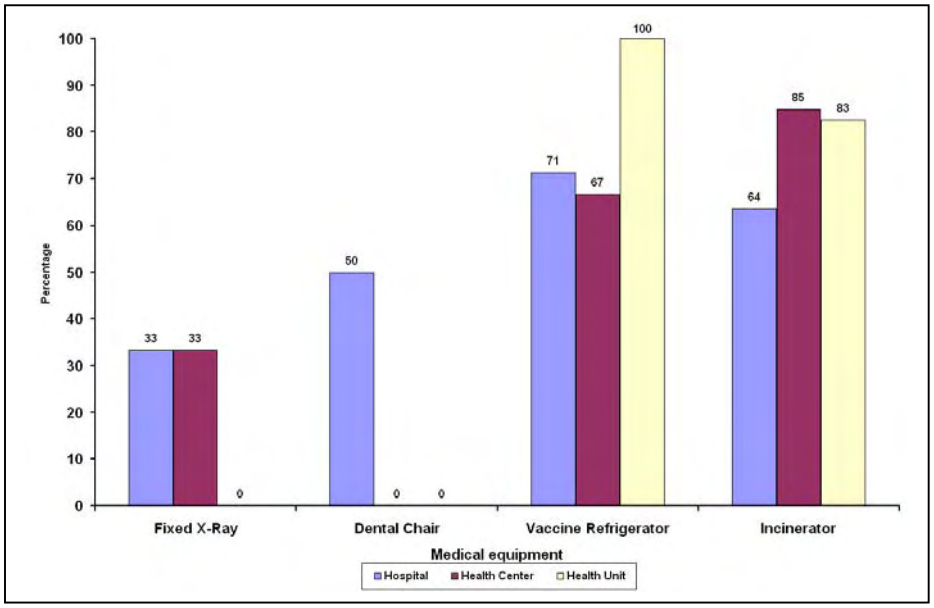
9.3 Other Medical Equipment

Table 9-3 and Figure 9-3 show the availability and functional status of other equipment available at public facilities in Amran. Vaccine refrigerators were available in 86 percent of hospitals, 54 percent of health centers, and 2 percent of health units, though just 71 percent of those in hospitals and two-thirds of those in health centers were functioning. Fixed x-ray machines were available in most hospitals but just one-third were functioning. Fixed x-ray machine functionality was equally poor in the five health centers with the machines. Incinerators were available in all public hospitals and health centers and just over half of the health units, but the proportion actually functioning ranged from 64 percent in hospitals to 85 percent in health centers.

Table 9-3. Availability and functional status of other medical equipment in public health facilities

Equipment Name	Hospital n = 7				Health Center n= 28				Health Unit n = 121			
	Available	Quantity	Functioning (n)	Functioning (%)	Available	Quantity	Functioning (n)	Functioning (%)	Available	Quantity	Functioning (n)	Functioning (%)
Fixed X-ray	5	6	2	(33.3)	5	6	2	(33.3)	0	0	0	(0.0)
Dental chair	2	2	1	(50.0)	0	0	0	(0.0)	0	0	0	(0.0)
Vaccine refrigerator	6	7	5	(71.4)	15	18	12	(66.7)	2	1	1	(100)
Incinerator	7	11	7	(63.6)	28	33	28	(84.9)	69	69	57	(82.6)

Figure 9-3: Proportion of functioning other medical equipment in public health facilities

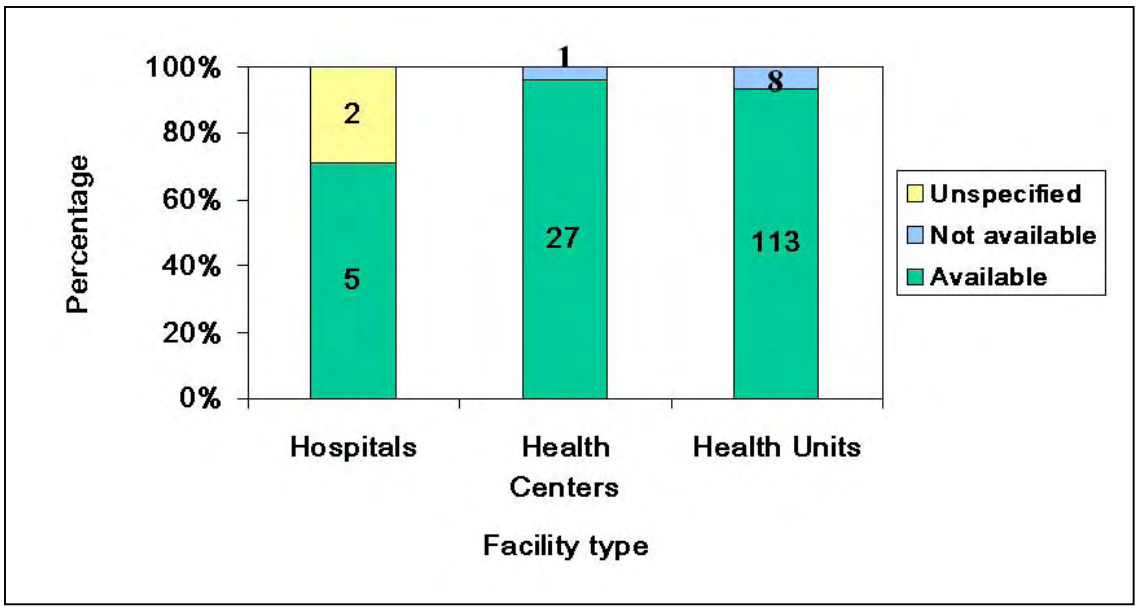


10. Drug Availability – Public Sector Facilities

(See also Table C-10-1 in Annex C.)

Among public sector facilities, 93 percent reported having any type of drugs available (Figure 10-1). This was highest among health centers (96 percent) and health units (93 percent), while just five of seven hospitals reported the availability of any types of drugs.

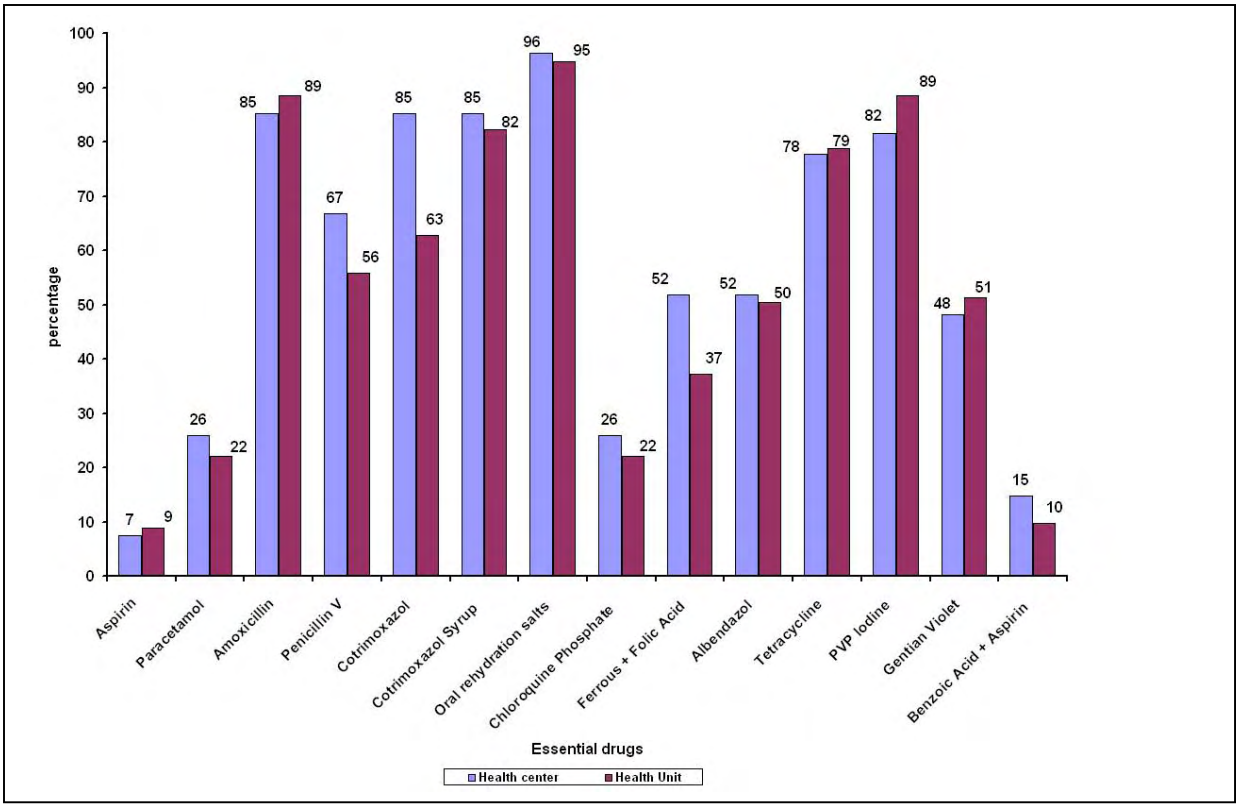
Figure 10-1. Availability of any type of drugs in public sector facilities, by facility type

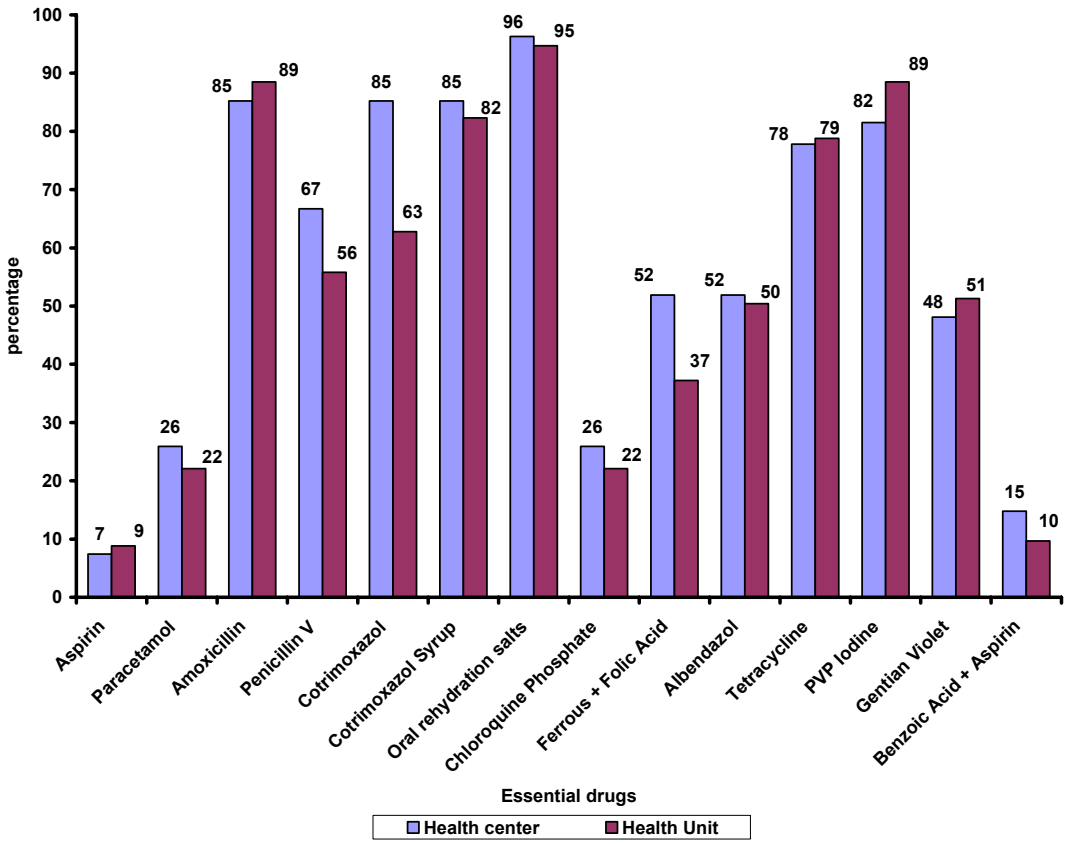


Among the 145 facilities that reported availability of any drugs, the districts were the primary sources. This was true for all facility types but especially so for health units, with 98 percent of their drug supplies coming from the districts, compared to 85 percent of health centers and 80 percent of hospitals. In addition, the MoPHP supplied drugs to one hospital, and private sources supplied two health centers. The governorate was the source of drugs for two health centers and one health unit.

Of the 140 public sector health centers and health units reporting the availability of any types of drugs, the drugs available in most facilities were oral rehydration salts, amoxicillin, PVP iodine, and Cotrimoxazol syrup (Figure 10-2). The least available drugs were aspirin and benzoic acid + aspirin and plain aspirin, with fewer than 10 percent of facilities having a supply of these drugs.

Figure 10-2: Proportion of public health centers and health units with essential drugs available




percentage
100
90
80
70
60
50
40
30
20
10
0
7
9
26
22
85
89
67
56
85
63
85
82
96
95
26
22
52
37
52
50
78
79
82
89
48
51
15
10
Aspirin
Paracetamol
Amoxicillin
Penicillin V
Cotrimoxazol
Cotrimoxazol Syrup
Oral rehydration salts
Chloroquine Phosphate
Ferrous + Folic Acid
Albendazol
Tetracycline
PVP Iodine
Gentian Violet
Benzoic Acid + Aspirin
Essential drugs
Health center
Health Unit

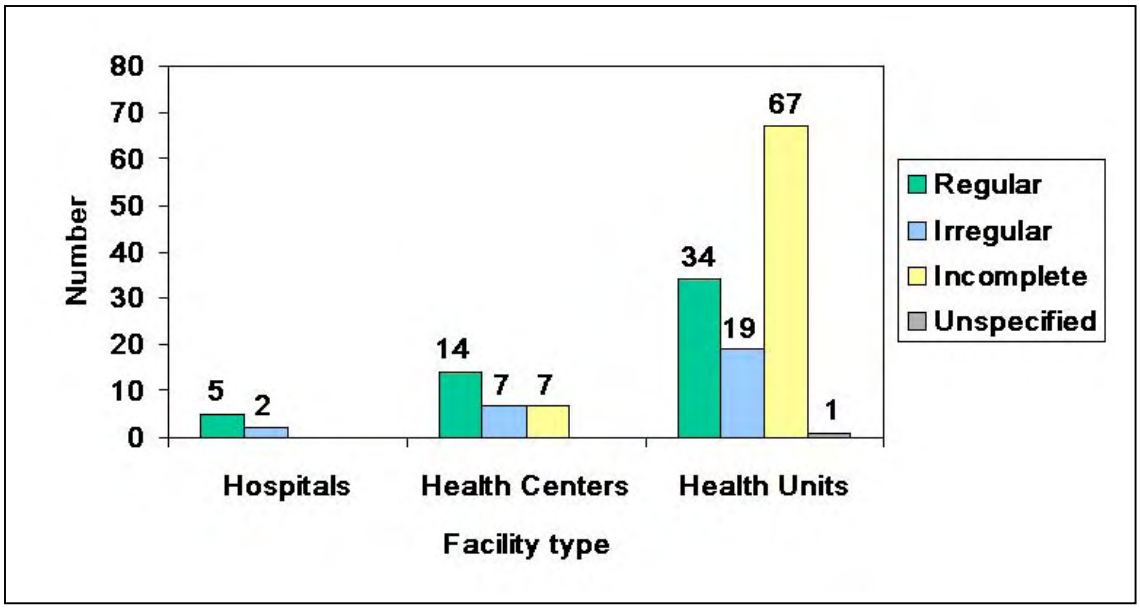
11. Financial Allocations – Public Sector

(See also Tables C-11-1 and C-11-2 in Annex C.)

Of the public facilities in the survey, just over one-quarter of the respondents knew their facility budgets. Facility budgets were more likely to be known by respondents from hospitals (86 percent) than respondents from health centers (25 percent) or health units (23 percent).

Just one-third of the public facilities reported regular delivery of operational expenses during the previous year. Most (47 percent) facilities reported that operational expenses had not been fully delivered. However, hospitals were most likely to report regular delivery (71 percent), and no hospitals reported that operating expenses had not been fully delivered (Figure 11-1). Health units were most likely to report incomplete delivery of operating expenses (55 percent) and least likely to report regular delivery (28 percent).

Figure 11-1. Periodicity of delivering operational expenses in public facilities in the last year

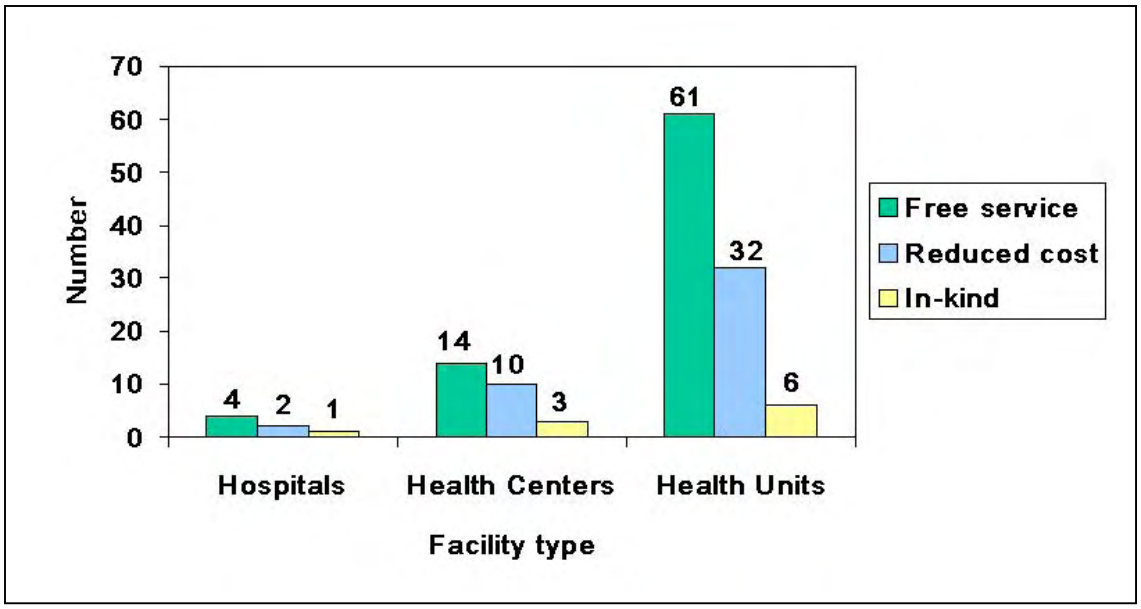


Most (85 percent) of the public facilities offered an exemption system for persons unable to pay; all hospitals and virtually all health centers offered exemptions (Table 11-1). Of the facilities with exemption systems, the most common type was to offer completely free services to those unable to pay (59 percent), followed by reduced cost services (33 percent) and provision of in-kind services (8 percent) (Figure 11-2).

Table 11-1. Number and proportion of public facilities with exemption systems for those unable to pay

Exemption system	Facility Type							
	Hospital		Health Center		Health Unit		Total	
	n	(%)	n	(%)	n	(%)	n	(%)
Available	7	(100)	27	(96.4)	99	(81.8)	133	(85.3)
Not available	0	(0.0)	1	(3.6)	22	(18.2)	23	(14.7)
Total	**7**	**(100)**	**28**	**(100)**	**121**	**(100)**	**156**	**(100)**

Figure 11-2. Types of exemptions available among public facilities with exemption systems in place



12. Conclusions and Next Steps

12.1 Conclusions

The keystone of evidence-based decision making is the availability of accurate and high-quality data for evaluation and planning. With the completion of the 2005 Yemen Health Facility Survey in Amran, data on facilities and services have been updated for the first time since 1998. The data in this report, supplemented by more refined or in-depth analyses, will be useful for a variety of stakeholders at all levels as they strive to improve access to and quality of care in the Governorate of Amran. The eventual compilation of these data with those from other governorates will provide the most accurate, complete, and current data for decision makers at the national level and will provide a solid base upon which to continue efforts to improve the health of the citizens of Amran as well as the rest of Yemen.

As with any survey of this nature, the results represent the health care infrastructure situation in Amran at a specific point in time. Facilities close and open, health staff shift positions and leave, equipment breaks down or is repaired, and availability of water and electricity may not be constant. While no dataset of this magnitude is completely perfect, every effort was made during the survey design and implementation to maximize accuracy and to provide the most up-to-date and complete inventory of the current situation in Amran. Mechanisms to update these data on a regular basis are planned and will ensure the continuing usefulness of the data over time. The production of the initial survey results and reports represents close and continued collaboration between a number of partners, led by the MoPHP and USAID/Yemen, and provides baseline data to serve as a stepping stone for more in-depth analyses as needed.

An important preliminary result of the Amran Health Facility Survey was the verification of the existence and operational status of all facilities in the initial inventory (dated 2003) provided by the governorate. Four of the 208 facilities provided in the inventory were not located by survey teams despite repeated attempts. The survey teams then identified an additional 14 facilities that did not appear on the initial list. These results demonstrate the importance of regularly updating official counts and inventory of resources to ensure an accurate picture of the governorate's health care system infrastructure and capacity.

The data from this survey should be evaluated keeping in mind limitations inherent to this type of undertaking. Time and resources were limited, and it was not always possible to survey the person with the most knowledge about the facility. Most (74 percent) of the respondents were either the health facility managers or deputy managers. However, survey respondents also included other staff such as nurses (9 percent), murshid/murshida (counselors) (8 percent), or qualified midwives (4 percent). Re-visits were only possible for a small proportion of all facilities, and these were conducted primarily for verification of operational status as well as a random data verification check. Facility staff mobility, availability, and turnover meant that on these data verification visits, it was not always possible to re-interview the same staff member who had completed the initial interview, and this could lead to differing results. In addition, data on certain elements, such as costs of operations and inpatient rooms, were available for only a small proportion of facilities and may not be representative. However, the survey staff conducted numerous checks for internal consistency of the data and verified figures that

appeared unusual, so the final data used for this report represent the most accurate and up-to-date data available and provide a strong baseline for the governorate. Additional analyses or follow-up data collection can expand upon these initial findings.

The survey revealed several areas that suggest a positive trend in the capacity of Amran Governorate to meet the health care needs of its population. First, the rapid increase of both public and private facilities in the past 10 years indicates an improvement in the average number of persons served per facility, a crude measure of accessibility. Basic services such as general medicine, immunization, and health education were provided by most public facilities. All public hospitals had laboratory capacity, as did all private facilities. Fourteen facilities (10 private, four public) had inpatient sections; of these, a few public and private facilities had the capacity to perform different types of basic operations such as appendectomies, hernia repair, Caesarean deliveries, and gall bladder removal. Between the public and private facilities, there was at least one working member of each health cadre, though the total numbers of dentists, pharmacists, and laboratory technicians were relatively low. Female staff represented approximately one-third of all health staff in both public and private facilities. In addition to serving as midwives, female staff made up a significant proportion of counselors and nurses (more so in private facilities), and females accounted for 38 percent of all specialists in Amran. Finally, it is important to note that all public hospitals, as well as most public health centers and health units, offered exemption systems (free or reduced services) for patients who could not otherwise afford services.

Despite these positive findings, the health facility survey demonstrated that there are still many areas for improvement in Amran. Given the location of all hospitals in urban areas, additional analysis should be done to review accessibility of rural populations to the specialized services provided in hospitals. The health facility viewer application and GIS analyses described earlier in this report will facilitate this type of evaluation and allow better visualization of gaps in facility catchment areas. A key concern is the reported lack of basic operating necessities such as clean water, toilets, and electricity in a substantial proportion of public facilities. This is particularly an issue for health units, which were least likely to have each of these items – just 65 percent had clean water, 29 percent had electricity, 71 percent had toilets, and 2 percent had ground telephone lines. It is important to note that one hospital reported no clean water source or electricity at the time of the survey, raising questions about its ability to provide basic services to its patients.

Another area requiring further analysis for planning purposes is a review of where functioning equipment is available and where it needs to be installed or replaced. The lack of sterilization machines in some hospitals, for example, may contribute to poor infection prevention and control, while the lack of refrigerators indicates inadequate capacity to store vaccines for basic immunization services. An assessment of the needs of specific facilities, using the health facility survey results as a starting point, could pinpoint the most urgent areas requiring attention and ensure that these facilities are provided with necessary equipment.

Finally, it should be noted that the health facility survey documented very low availability of certain essential drugs in health centers and health units – particularly aspirin, benzoic acid + aspirin, chloroquine phosphate, and paracetamol. To address the various factors related to this problem will require additional analysis which should pinpoint issues related to pharmaceutical logistics and supply chains as well as stock management.

The data presented in this report provide a starting point for planning and decision making in Amran. Regular review and systematic updates, comparison of the data with other sources as they become available, and continued support for these activities will ensure that these data improve over time and become more and more useful for planning and monitoring and evaluation.

12.2 Next Steps

Ensuring adequate access of rural populations to health care is an important goal of health systems strengthening in Yemen. The MoPHP Health Facility Survey has generated up-to-date information on the current conditions and services offered at Yemeni health facilities. Dissemination of survey results is an important next step towards empowering decision makers. Baseline data will need to be maintained and updated periodically to ensure continued value and uses of the facility data. This can be done through training of key governorate health office staff and by establishing procedures for retrieving new information, updates, and changes to health facility conditions and modifying the health facility database accordingly. By incorporating this information into a GIS, decision makers can have instant access to critical information and not only see where all facilities are located, but also focus on a subset of facilities that meet certain criteria (e.g., facilities that offer immunization services, or have an electricity source available to run equipment). This "filtering" approach helps decision makers better understand how localized populations are currently being served. All of these next steps are described in more detail below.

12.2.1 Workshops, Database Management, and Training

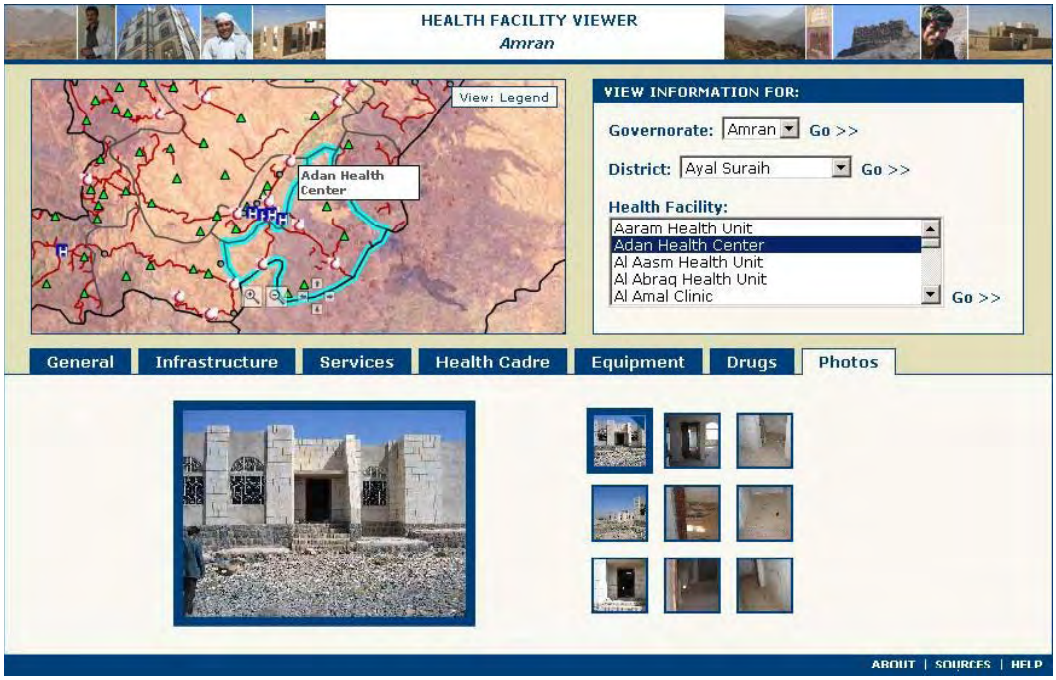
One of the most effective ways to disseminate technical information, such as the health facility survey results, is to hold a workshop to provide an opportunity for stakeholders to better understand the data and its implications and have the chance to have questions answered and issues resolved through open discussion. A workshop will be scheduled in the coming months for governorate and district health officials. In addition to discussing the survey results and implications, the workshop will be a forum to introduce stakeholders to specific analyses, tools, and techniques to maximize the use of the data.

Subsequent training and development of database management and maintenance will be provided. Regular updates, modifications, and revisions to the health facility database are necessary and critical. Procedures will be established to facilitate periodic reporting by facilities on changes in conditions (e.g., equipment, health cadre, infrastructure). The updated health facility database will be used to power tools, applications, and further analyses.

12.2.2 Health Facility Viewer

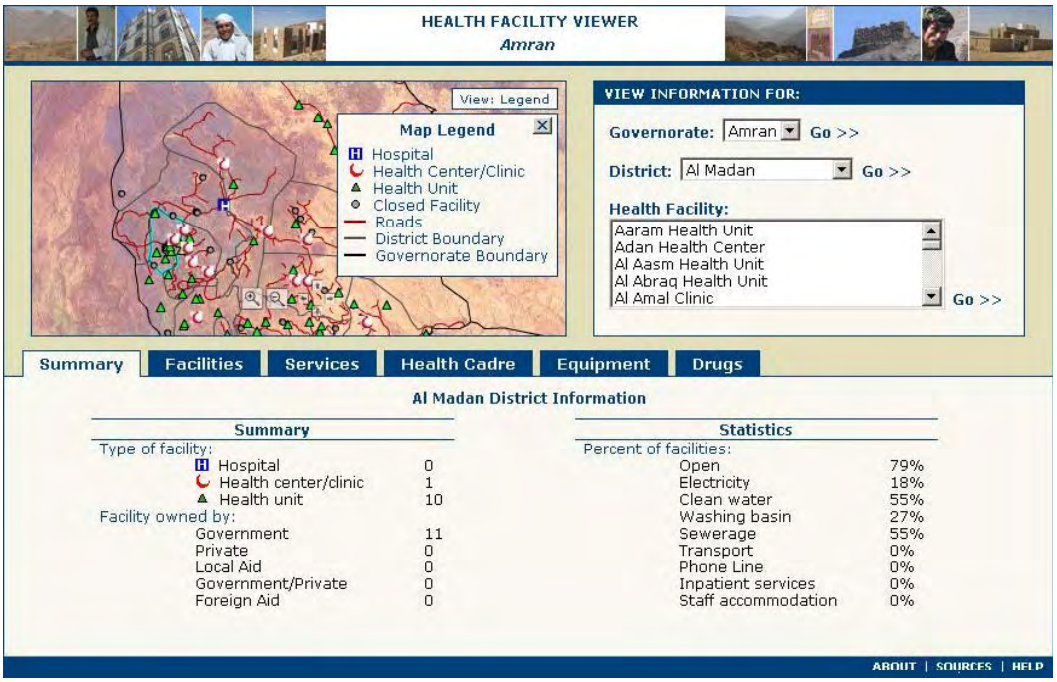
The survey data is being used in the health facility viewer as an informational tool that is available to users with no specific GIS knowledge. It provides a user-friendly interface for viewing the results of the MoPHP Health Facility Survey through map-based navigation (Figure 12-1). The survey gathered three types of information: the GPS coordinates of the facility, digital photographs of the building's exterior and interior conditions, and information on the facility's staff, conditions, available services, utilities, and financing.

Figure 12-1. Health facility viewer – sample district summary screen



The user can zoom into a district of interest, and then use the map to select a facility (hospital, health center, or health unit). This pulls up the survey information for that facility, including a 'photo viewer' that allows the user to flip through the set of facility photos gathered during the survey, as well as tables of information and statistics about the particular facility (Figure 12-2). At any time, the user can step back to select a different facility within the district, or view a new district.

Figure 12-2. Health facility viewer – sample facility screen



District and governorate health office officials are able to query and examine the conditions, status, and needs of all health facilities under their management. In the past, remote access to and inaccurate reports from health facilities have inhibited the ability of district and governorate health offices to plan and budget according to the specific needs of each facility. The health facility viewer provides a baseline assessment of each facility and provides evidence-based rationale for future facility-based health care service availability, equipment, staffing, and other decisions.

The health facility viewer is being developed as a standalone product that does not require users to have expensive GIS software on their own computers. It is being implemented in Flash and Hypertext Markup Language (HTML), so it is adaptable to the web, but can also be delivered on a CD-ROM and run locally on a desktop personal computer (PC) without internet access.

12.2.3 Health GIS Applications

As health data from surveys, government statistics, and donor projects are linked into the health GIS, an expanding set of customized health applications can be developed that utilize the best available demographics and the cleaned, georeferenced, and enhanced GIS base map data layers. These GIS tools are improving the capacity of MoPHP and governorate health office officials to visualize, understand, and make decisions more easily. Integration of these data into a relational database with a GIS interface facilitates efficient use of limited health care resources through encouraging data sharing and reducing duplication of effort among different Yemeni health-focused agencies and organizations.

GIS-driven applications are being developed for a variety of end users, including those with no specific GIS training. The aim is to bring the benefits of GIS to as wide an audience as possible. On

the basic level, the GIS can provide map-based ("point and click") access to view information about a particular feature, such as a district or facility, while more advanced users can employ spatial analysis techniques to answer questions related to their health sector concerns.

For example, facility locations can be displayed along with the existing road network, the complexity of the terrain, and other geographic features that may assist or prohibit access to a particular location. PHR*plus* is currently developing a three-tiered approach to measure accessibility based on travel time estimates to account for the unique needs of Yemen's rural population, particularly those that live in mountainous terrain or outlying areas with minimal road networks. In Yemen's rural areas, most people travel by foot, thus pedestrian access to health facilities is the first accessibility tier. The second accessibility tier is equal to the spatial extent to which health care workers based at a facility can reach the surrounding population and the third accessibility tier is based on the reasonable travel time to the health facility using motorized transportation.

The travel time/distance measure capabilities of a GIS can assist decision makers in several ways. It can be used as an exploratory data analysis tool, answering questions, such as, "What is the average distance to a facility from a populated area?" Or, if a policy is aiming to ensure that all villages have access to health care within a particular distance, the GIS can be used to select populations that currently fall outside of a pre-determined "suitable distance." In this way, health care planners can quickly determine populated areas that should be targeted for new facility construction or mobile clinic visits.

Annex A. Survey Staff

PHR*plus* Staff

Name	Position
Dr. Abdul Jabbar Ali Al Ghaithi	Survey manager
Abdulwahed Thabet	Technical advisor
Khalil Gobran	Gis expert
Abdulkader Nueman	Database expert
Abdul Salam Al Kohlani	Financial manager
Rila Al Domini	Technical assistant
Dalia Al Eryani	Technical assistant
Bilqis Al Rimi	Data entry
Mohamed Hani	Administrative support/Driver

MoPHP Staff (Central & Governorate Levels)

Name	Position
Nabil Nasr	Team leader
Abdul Majed Al Wada'i	Team leader
Abdullatif Al Nono	Team leader
Abdul Salam Hanash	Team leader
Ali Drhm	Team leader
Jamal Al Sruri	Team leader
Ahmed Al Azazi	Team leader
Adil Al Sama'i	Team leader
Walid Abdul Malik	Team leader
Abdul Karim Mohamed Abdullah	Team leader
Ilham Al Surihi	Surveyor
Mansuor Abo Talib	Surveyor
Haddi Al Amadi	Surveyor
Ali Al Afiri	Surveyor
Yahia Al Zohiri	Surveyor
Salah Tshan	Surveyor
Mohamed Al Mrhbi	Surveyor
Mohamed Al Mokair	Surveyor

Name	Position
Abdul Rahman Al Msna'i	Surveyor
Dahsh Ali Yahia	Surveyor
Nasser Badi	Revision department
Salah Atif	Revision department
Abdullah Al Ashwal	Revision department
Adel Rbbad	Data processing
Ahlam Ali Kassem	Data processing
Salwa Al Haddi	Data processing
Balqis Abdullah	Data processing
Mona Ali Akbat	Data processing
Abdul Rahman Al Hrathi	Data processing
Nabil Nasr	Team leader/data verification/field work
Abdul Majed Al Wada'i	Team leader/data verification/field work
Abdul Karim Salah	Team leader/data verification/field work
Nasser Badi	Surveyor/data verification/field work
Salah Atif	Surveyor/data verification/field work
Abdullah Al Ashwal	Surveyor/data verification/field work

Annex B. Survey Instrument

Republic of Yemen
Ministry of Public Health and Population
Planning and Development Sector
General Administration for Statistics and
Information Systems

Public and Private Health Facilities Survey

Health Facilities Questionnaire

No. of Questionnaire ☐☐ - ☐☐ - ☐☐☐

Name of Governorate: _____

Name of District: _____

Name of Health Facility: _____

Identification Data				Coding Categories
01	Serial number of health facility (record its no. inside box)			__ __ __ __
02	Name of health facility:_____			
03	Name of Governorate:_____			
04	Name of District:_____			
05	Name of Ozlah:_____			
06	Name of City/Village:_____			
07	Type of Area	Urban		1
		Rural		2
08	Geographic Coordinates	N	__ __ . __ __ . __ __ __	
		E	__ __ . __ __ . __ __ __	
		Alt	__ __ __ __	

Details of Employee giving the Data (Respondent)			
09	Full name of employee giving the data (Respondent): Record in writing	Name:_____	
010	Respondent Occupation? (Circle the appropriate number)	Health facility manager	1
		Health Facility Deputy manager	2
		Administrator	3
		Specialized doctor	4
		General practitioner	5
		Nurse	6
		Qualified midwife	7
		Other occupation (specify):_____	9
011	Telephone Number: ( ) ( ) ( )		
012	Fax Number: ( ) ( ) ( )		

General Data of Health Facility				
No.	**Questions**	**Coding Categories**		**Go To…**
013	Type of health facility	Hospital	1	
		Health center/clinic	2	
		Health unit	3	
		Other (specify):_____	9	
014	Owner health facility	Government	1	
		Private	2	
		Local Aid	3	
		Government/Private	4	
		Foreign Aid	5	
015	Ownership of the building?	Own	1	
		Lease	2	**018**
		On Loan	3	
		Other (specify)	9	
016	For the researcher: Don't ask 16,17 in private sector : What is the funding source for building the health facility? (multiple responses are permitted)	Government Funding	1	
		Private Funding	2	
		Local Donations	3	
		Government/Private Funding	4	
		Foreign Funding	5	
017	State the main funding authority for building the facility.	Name of authority: _____		
018	Is the building temporary or permanent?	Temporary	1	
		Permanent	2	
019	What year did the health facility start its operations?	Operating Year (Gregorian date)	___ ___	
020	What is the number of daily working hours at the health facility(outpatient)?	No. of hours.	___ ___	
021	For the researcher: this is for Hospitals What is the number of daily shifts per month?	No. of days	___ ___	
022	Is there accommodation attached to the health facility?	Yes	1	
		No	2	

Infrastructure of Facility				
No.	**Questions**	**Coding Categories**		**Go To…**
023	What is the number of rooms in the health facility building? (record by number)	Total number of rooms	___ ___ ___	
024	What is the number of rooms used in the health facility building to provide services? (record by number)	Number of rooms used	___ ___ ___	
025	Are there toilets in the health facility?	Yes	1	
		No	2	028
026	What is the number of toilets at the health facility building?	Number of toilets	___ ___	
027	What is the number of toilets that are suitable for use? (record by number)	Number of suitable toilets	___ ___	
028	Are there any sources of clean water at the health facility?	Yes	1	
		No	2	030
029	What are the sources of clean water at the health facility building? (multiple responses are permitted)	Public network	1	
		Private network	2	
		Well owned by health facility	3	
		Water tank	4	
		Other (specify)	9	
030	Is there electricity in the health facility?	Yes	1	
		No	2	033
031	What are the sources of electricity at the building of the health facility? (multiple responses permitted)	Public network	1	
		Private network	2	
		Cooperative network	3	
		Generator owned by the facility	4	
032	What is the number of daily operating hours for electricity at the health facility building? (record by number)	No. of hours	___ ___	
033	Are there any ground telephone lines fixed in the health facility?	Yes	1	
		No	2	035

034	What is the number of ground telephone lines used in the health facility?	No. of used lines	___ ___	
035	Are there any means of transportation available at the health facility?	Yes	1	
		No	2	037
036	In case of Yes, what is the number of vehicles owned by the facility?	No. of transportation vehicles used	___ ___	
		No. of vehicles used for transporting employees	___ ___	
		No. of ambulances used	___ ___	
		Other	___ ___	
		Total No. of vehicles	___ ___	
037	For the researcher: Don't ask 37,38 at private sector What is the source of equipping the health facility building? (multiple responses allowed)	Government Funding	1	
		Private Funding	2	
		Local Donations	3	
		Government/Private Funding	4	
		Foreign Funding	5	
038	State the main authority for equipping the health facility building	Name of authority: _____	___ ___	

Waste and Sewage System				
No.	Questions	Coding Categories		Go To…
039	Are there means of waste disposal at the health facility?	Yes	1	
		No	2	041
040	What means of sewage system is used at the health facility building?	Public network	1	
		Pit	2	
		In the open	3	
		Other (specify)	9	
041	Are there ways of separating medical waste from garbage?	Yes	1	
		No	2	**043**
042	How is garbage disposed of at the health facility?	Garbage barrels (collected by municipality)	1	
		Burned	2	
		Buried within the fence of the facility	3	
		Buried outside the fence of the facility	4	
		Thrown in the street	5	
		Other (specify)	9	
043	How is medical waste disposed of at the health facility?	Garbage barrels (collected by municipality)	1	
		Medical incinerator	2	
		Burned in open area	3	
		Burned and buried within the fence of the facility	4	
		Burned and buried outside the fence of the facility	5	
		Thrown in the street	6	
		Other (specify)	9	

Health and Medical Services Provided by the Health Facility:

(1) = Circle 1 or 2 showing the availability or unavailability of the service at this facility.
(2) = Circle 1 or 2 showing the availability or unavailability of records at this facility.
(3) = Please record the number of frequent visits to the service during the last month.
(4) = Record service fee

	Service Type			(1) Available		(2) Record		(3)	(4)
				Yes	No	Yes	No	Number of beneficiaries last month	Service cost for beneficiary
044	General Medicine			1	2				
		1	General Medicine	1	2	1	2		
		2	Injections	1	2	1	2		
		3	Wound Dressing	1	2	1	2		
045	Reproductive Health			1	2				
	If Yes:-	1	Antenatal Care	1	2	1	2		
		2	Normal Delivery	1	2	1	2		
		3	Postnatal Care	1	2	1	2		
		4	Child Growth Monitoring	1	2	1	2		
046	Immunization			1	2				
	If Yes:-	1	Immun. of women of reproductive age (second dose)	1	2	1	2		
		2	Immun. of pregnant women (2nd dose)	1	2	1	2		
		3	Tuberculosis	1	2	1	2		
		4	Polio + DPT (3rd dose)	1	2	1	2		
		5	Measles	1	2	1	2		
		6	Hepatitis B (3rd dose)	1	2	1	2		
047	Family Planning			1	2				
	If Yes:-	1	Pill	1	2	1	2		
		2	Condom	1	2	1	2		
		3	IUD – the loop	1	2	1	2		
		4	Injection	1	2	1	2		
		5	Norplant	1	2	1	2		
		6	Tuba- legation	1	2	1	2		
048	Health Education			1	2			No.of sessions in last 3 months	
	If Yes:-	1	Immunization	1	2				
		2	Nutrition	1	2				
		3	Education on AIDs	1	2				
		4	Education on STDs	1	2				
		5	Family Planning	1	2				
		6	Antenatal Care	1	2				
		7	Natural Breastfeeding	1	2				
		8	Female Circumcision	1	2				

Health and Medical Services (Continued)

	Service Type			(1) Available		(2) Record		(3)	(4)
				Yes	No	Yes	No	Number of beneficiaries last month	Service cost for beneficiary
049	Laboratory			1	2				
	If Yes:-	1	Urine	1	2	1	2		
		2	Stool	1	2	1	2		
		3	General Blood	1	2	1	2		
		4	Blood Chemistry	1	2	1	2		
		5	Tissues	1	2	1	2		
		6	Culture	1	2	1	2		
		7	Hormones	1	2	1	2		
		8	Malaria	1	2	1	2		
		9	Bilharzia	1	2	1	2		
050	Radiology			1	2				
	If Yes:-	1	Normal X-Ray	1	2	1	2		
		2	X-Ray with contrast	1	2	1	2		
		3	Ultrasound	1	2	1	2		
		4	Echocardiogram	1	2	1	2		
		5	CT Scan	1	2	1	2		
		6	MRI	1	2	1	2		
		7	Endoscopy	1	2	1	2		
051	Specialized Services			1	2				
	If Yes:-	1	Internal	1	2	1	2		
		2	Obstetrics / Gynecology	1	2	1	2		
		3	Pediatrics	1	2	1	2		
		4	Dermatology	1	2	1	2		
		5	ENT	1	2	1	2		
		6	Ophthalmology	1	2	1	2		
		7	Surgery	1	2	1	2		
		8	Orthopedics	1	2	1	2		
		9	Dental	1	2	1	2		
		10	Emergency	1	2	1	2		

Control of Epidemic Diseases								
	Type of Service	Control available		No. of female participants last year	Type of Control			
		Yes	No		Spraying	Filling Up	Field Treatment	Awareness
052	Malaria	1	2		1	2	3	4
053	Bilharzias	1	2		1	2	3	4
054	Diarrhea	1	2				3	4
055	Tuberculosis	1	2					4
056	Acute Respiratory Infections	1	2					4

Inpatient Sections			
No.	**Questions**	**Coding Categories**	**Go To ....**
057	Are there inpatient sections at the health facility?	Yes 1	
		No 2	061

058 What are the inpatient sections available at the facility? What is the no.of beds and the total number of admissions, discharges, and death cases in each section during the last month?

Type of Section	Availability		No.of beds	No.of admissions and discharges during last month		No. of mortalities during last month
	Yes	No		Admission	Release	
General	1	2	__ __ __	__ __ __ __	__ __ __ __	__ __ __ __
Internal medicine	1	2	__ __ __	__ __ __ __	__ __ __ __	__ __ __ __
General surgery	1	2	__ __ __	__ __ __ __	__ __ __ __	__ __ __ __
Gynecology	1	2	__ __ __	__ __ __ __	__ __ __ __	__ __ __ __
Pediatric	1	2	__ __ __	__ __ __ __	__ __ __ __	__ __ __ __
Orthopedics	1	2	__ __ __	__ __ __ __	__ __ __ __	__ __ __ __
Eye surgery	1	2	__ __ __	__ __ __ __	__ __ __ __	__ __ __ __
ENT	1	2	__ __ __	__ __ __ __	__ __ __ __	__ __ __ __
Urology	1	2	__ __ __	__ __ __ __	__ __ __ __	__ __ __ __
Psychological /neurological	1	2	__ __ __	__ __ __ __	__ __ __ __	__ __ __ __
Dermatology	1	2	__ __ __	__ __ __ __	__ __ __ __	__ __ __ __
Other (specify)	1	2	__ __ __	__ __ __ __	__ __ __ __	__ __ __ __

059	Does the facility carry out the following operations?			Available Service		Cost of Operation
				Yes	No	
	If the answer is Yes:	1	Appendectomy	1	2	
		2	Hernia	1	2	
		3	Removal of gall bladder	1	2	
		4	Cataract	1	2	
		5	Urinary bladder stones	1	2	
		6	Kidney stones	1	2	
		7	Cesarean delivery	1	2	
060	How much does each type of room cost?					Cost for one night
	1		Individual Room	1	2	
	2		Common Room	1	2	
	3		Intensive Care	1	2	

No.	Questions	Coding Categories		Go To…
061	Does the facility test for HIV?	Yes	1	
		No	2	065
062	What is the number of cases that were tested during last year? (record by number)	No. of cases tested	__ __ __	
063	Did the facility register positive cases out of the tested cases?	Yes	1	
		No	2	065
064	If the answer is yes, what is the number of cases registered last year?	No, of registered cases	__ __ __	
065	Does the facility have a referral system for testing HIV at another health facility?	Yes	1	
		No	2	
066	For the researcher: Refer to the answer of question 45-2. If the answer was yes answer this question, if not go to 069. Does the facility have a referral system for delivery emergencies?	Yes	1	
		No	2	068
067	How many referrals occurred last month?	No. of referrals	__ __ __	
068	Is the emergency delivery guide used in delivery emergencies?	Yes	1	
		No	2	
069	Is the infection prevention and treatment guide used?	Yes	1	
		No	2	

Widespread Diseases and Problems:

070	Mention more than five diseases that are spreading in the locality, and the most important three diseases related to children, women, and men. The diseases are determined by placing a tick in the appropriate square.	Problems	Five most important diseases	The most important three diseases relating to:		
				Children	Women	Men
		1. Malaria				
		2. Bilharzias				
		3.Diarrhea				
		4. Tuberculosis				
		5. Acute Resp. Infections				
		6. Malnutrition				
		7. Complications of preg. and postpartum problems				
		8.Accidents and injuries				
		9.Hepatitis				
		10.AIDS				
		11.Leprosy				

Health Cadre

071	What is the number of health workers at the facility?										
No.	Categories	Yemenis				Volunteers		Foreigners		Total	
		Permanent		Contracted							
		M	F	M	F	M	F	M	F	M	F
1	Specialists										
2	General practitioner										
3	Dentist										
4	Medical assistant										
5	BSc Pharmacist										
6	Pharmacy technician										
7	BSc laboratory										
8	Lab technician										
9	BSc Radiology										
10	X-ray technician										
11	Anesthesia technician										
12	Physiotherapy Technician										
13	Qualified nurse										
14	Experienced nurse										
15	Community midwife										
16	Nurse midwife										
17	Diploma midwife										
18	Midwife supervisor										
19	Murshid /Murshida (counselors)										
20	Public health										
21	Technicians/Assistants										
22	Administrators										
23	Asst. laborers										
24	Other										

Medical Equipment

Functionality Status:

1 = Functioning Well
2 = Partially Functioning and needs maintenance
3 = Out of Order and needs maintenance
4 = Out of order and cannot be maintained

	Equipment Name	Available		Quantity	Functional Status			
		Yes	No		1	2	3	4
072	**Medical Examination Room Equipment**							
1	Examination Bed	1	2					
2	Sphygmomanometer	1	2					
3	Stethoscope	1	2					
4	Thermometer	1	2					
5	Tongue Depressor	1	2					
6	Scale+ height Measure (children)	1	2					
7	Scale+ height Measure (adults)	1	2					
8	Mobile Curtains	1	2					
9	Desk	1	2					
10	Chairs	1	2					
11	Otto-Ophthalmoscope	1	2					
12	Ophthalmoscope	1	2					
13	Diagnostic Set Auriscope	1	2					
073	**Delivery Room Equipment**							
1	Gynecological Labor Bed	1	2					
2	Fetoscope	1	2					
3	Delivery Set	1	2					
4	Oxygen Cylinder	1	2					
5	Vaginal Speculum	1	2					
6	Vacuum	1	2					
7	Suction Machine	1	2					
8	Sterilization Machine	1	2					
9	Lamp							
074	**Pharmacy Equipment**							
1	Air-condition	1	2					
2	Fans	1	2					
3	Refrigerator	1	2					
4	Cupboard	1	2					
5	Shelves	1	2					
6	Chairs	1	2					
7	Desk	1	2					

Medical Equipment (Continued)

	Equipment Name	Available		Quantity	Functional Status			
		Yes	No		1	2	3	4
075	**Laboratory**							
1	Microscope	1	2					
2	Spectrophotometer	1	2					
3	Sterilization Machine	1	2					
4	Mixer	1	2					
5	Centrifuge	1	2					
6	Hemoglobin	1	2					
7	Refrigerator	1	2					
8	Blood Cell Counter	1	2					
9	Water Bath	1	2					
076	**Radiology Equipment**							
1	Fixed X-ray	1	2					
2	Mobile X-ray	1	2					
3	Ultrasound	1	2					
4	CT Scan	1	2					
5	Echocardiogram	1	2					
6	ECG	1	2					
7	Endoscope	1	2					
8	Dark room	1	2					
077	**Dental Equipment**							
1	Dental Chair	1	2					
2	Dental set	1	2					
3	Dental X-ray	1	2					
4	Sterilization Machine	1	2					
078	**Drug Storage**							
1	Air-condition	1	2					
2	Fans	1	2					
3	Refrigerator	1	2					
4	Cupboard	1	2					
5	Shelves	1	2					
6	Chairs	1	2					
7	Desk	1	2					
079	**Inpatient Sections**							
1	Hospital bed + mattress	1	2					
2	Mobile Curtain	1	2					
3	Speculum Machine	1	2					
4	Trolley Stretcher For Patient	1	2					
5	Oxygen Cylinder	1	2					
6	Thermometer	1	2					
7	Sphygmomanometer	1	2					
8	Stethoscope	1	2					

Medical Equipment (Continued)

	Equipment Name	Available		Quantity	Functional Status			
		Yes	No		1	2	3	4
080	**Operating Room**							
1	Operating Bed	1	2					
2	Anesthesia Machine	1	2					
3	Small Surgical Set	1	2					
4	Large Surgical Set	1	2					
5	Cauterization	1	2					
6	Patient Monitor	1	2					
7	Defibrillator	1	2					
8	Fixed Lamp	1	2					
9	Mobile Lamp	1	2					
10	Boiling Sterilizer	1	2					
11	Steam Autoclave	1	2					
12	Hot air Sterilizer	1	2					
081	**Other Equipment**							
1	Generator	1	2					
2	Emergency Generator	1	2					
3	Vaccine Refrigerator	1	2					
4	Washing Machine	1	2					
5	Kitchen	1	2					
6	Incinerator	1	2					

(Don't direct to private sector)

Medicine Available at the Health Facility:

No.	Questions	Coding Categories		Go To ...
082	Are there any types of medicines available at the health facility?	Yes	1	
		No	2	086
083	What is the source of medicine to the health facility?	Governorate	1	
		District	2	
		Ministry	3	
		Private	4	
		Other (specify)	9	
084	What is the period for delivering medicine to the health facility?	Monthly	1	
		Every three months	2	
		Every six months	3	
		Yearly	4	
		Irregularly	5	

(This question should only be directed to government health units and centers)

085 Which of the following medicines are available at the health facility?

Serial	Name of medicine	Form of medicine	Availability	
			Yes	No
1	Aspirin	Tab	1	2
2	Paracetamol	Tab	1	2
3	Amoxicillin	Syrup	1	2
4	Penicillin V	Syrup	1	2
5	Cotrimoxazol	Tab	1	2
6	Cotrimoxazol	Syrup	1	2
7	ORS	Powder	1	2
8	Chloroquin Phosphate	Tab	1	2
9	Ferrous + Folic Acid	Tab	1	2
10	Albendazol	Tab	1	2
11	Tetracycline	Eye ointment	1	2
12	PVP Iodine	Solution	1	2
13	Gentian Violet	Solution	1	2
14	Benzoic Acid + Aspirin	Ointment	1	2

(Don't direct to private sector)

Financial Allocations				
No.	Questions	Coding Categories		Go To ...
086	Do you know the financial allocations for the health facility?	Yes	1	
		No	2	
087	Have the allocations for operating expenses been delivered for last year?	Yes	1	
		No	2	089
088	Is the operating budget delivered regularly or irregularly?	Regularly	1	
		Irregularly	2	
089	Is there support in the operating budget by donors?	Yes (If yes, in what amount)	__ __ __ __ __	
		No	2	
090	Is there a system of exemption for the poor?	Yes	1	
		No	2	092
091	What is the type of these exemptions?	Total free service	1	
		Reduction in cost of service	2	
		Provision of in kind service	3	

For the Researcher:				
No.	Questions		Coding Categories	Go To ...
092	Result of the interview.	Fulfilled	1	
		Partially fulfilled	2	
		Temporarily closed	3	
		Completely closed	4	
		Rejected	5	
		Under construction	6	
		Other (specify)	9	
093	The facility was stated in the list	Yes	1	
		No	2	
094	Note: Are there any wash basins in the examination and wound treatment rooms?	Yes	1	
		No	2	
095	Note: Observe the standard of cleanliness inside the health facility.	Good	1	
		Average	2	
		Poor	3	
096	Note: Observe the standard of cleanliness outside the health facility.	Good	1	
		Average	2	
		Poor	3	
097	Note: Is there a fence around the facility?	Yes	1	
		No	2	
098	Write the number of photograph	From	__ __ __	
		To	__ __ __	
	Obtain the employee affairs form			

Remarks of the Researcher

Employee Data:

	Researcher	Team Leader	References	Coding	Data entry
Name					
Signature					
Date					

Annex C. Supplemental Data Tables

Table C-3-1. Number of health facilities completing survey, by district, facility type, and sector

District	Public				Private		
	Hospitals	Health Centers/ Clinics	Health Units	Total	Hospitals	Health Clinics	Total
Al Ashah	0	2	2	4	0	0	0
Al Qaflah	1	0	0	1	0	0	0
Almadan	0	1	10	11	0	0	0
Amran	1	4	10	15	2	3	5
As Sawd	0	1	7	8	0	0	0
As Sudah	1	0	6	7	0	0	0
Bani Sarim	0	2	4	6	0	0	0
Dhi Bin	1	1	8	10	0	0	0
Habur Zulaymah	0	1	6	7	0	0	0
Harf Sufyan	0	1	7	8	0	0	0
Huth	0	1	2	3	0	0	0
Iyal Surayh	0	2	7	9	0	0	0
Jabal Iyal Yazid	0	1	14	15	0	2	2
Khamir	1	1	18	20	0	1	1
Kharif	1	2	1	4	0	0	0
Maswar	1	0	6	7	0	0	0
Raydah	0	2	3	5	0	3	3
Shaharah	0	3	4	7	0	0	0
Suwayr	0	0	2	2	0	0	0
Thula	0	3	4	7	0	1	1
Total	**7**	**28**	**121**	**156**	**2**	**11**	**13**

Table C-3-2. Positions of survey respondents, by sector

Respondent position	Public		Private		Total	
	n	(%)	n	(%)	n	(%)
Health facility manager	122	(78.2)	6	(46.2)	118	(69.8)
Deputy manager	3	(1.9)	3	(23.1)	6	(3.6)
Administrator	1	(0.6)	0	(0.0)	1	(0.6)
General practitioner	2	(1.3)	2	(15.4)	4	(2.4)
Nurse	15	(9.6)	0	(0.0)	15	(8.9)
Qualified midwife	5	(3.2)	1	(7.7)	6	(3.6)
Murshid/Murshida (counselor)	13	(8.3)	0	(0.0)	13	(7.7)
Medical Assistant	3	(1.9)	0	(0.0)	3	(1.8)
B.Sc. Laboratory	1	(0.6)	0	(0.0)	1	(0.6)
Laboratory Technician	0	(0.0)	1	(7.7)	1	(0.6)
Volunteer	1	(0.6)	0	(0.0)	1	(0.6)
Total	**156**	**(100)**	**13**	**(100)**	**169**	**(100)**

Table C-3-3. Distribution of health facilities by sector, facility type and urban/rural

Facility Type	Public						Private					
	Urban		Rural		Total		Urban		Rural		Total	
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
Hospital	7	(100)	0	(0.0)	7	(100)	2	(100)	0	(0.0)	2	(100)
Health Center/Clinic	16	(57.1)	12	(42.9)	28	(100)	9	(81.8)	2	(18.2)	11	(100)
Health Unit	5	(4.1)	116	(95.9)	121	(100)	--	--	--	--	--	--
Total	**28**	**(17.9)**	**128**	**(82.1)**	**156**	**(100)**	**11**	**(84.6)**	**2**	**(15.4)**	**13**	**(100)**

Table C-3-4. Ownership/leasing of facilities, by facility type and sector

Facility Type	Public										Private					
	Own		Lease		Temp		Unspec-ified		Total		Own		Lease		Total	
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
Hospital	7	(100)	0	(0.0)	0	(0.0)	0	(0.0)	7	(100)	2	(100)	0	(0.0)	2	(100)
Health Center/Clinic	23	(82.1)	4	(14.3)	1	(3.6)	0	(0.0)	28	(100)	7	(63.6)	4	(36.4)	11	(100)
Health Unit	62	(51.2)	15	(12.4)	43	(35.5)	1	(0.8)	121	(100)	--	--	--	--	--	--
Total	**92**	**(59.0)**	**19**	**(12.2)**	**44**	**(28.2)**	**1**	**(0.6)**	**156**	**(100)**	**9**	**(69.2)**	**4**	**(30.8)**	**13**	**(100)**

Table C-3-5. Distribution of building types, by facility type and sector

Facility Type	Public						Private					
	Fixed		Temp		Total		Fixed		Temp		Total	
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
Hospital	7	(100)	0	(0)	7	(100)	2	(100)	0	(0)	2	(100)
Health Center/Clinic	23	(82.1)	5	(17.9)	28	(100)	8	(72.7)	3	(27.3)	11	(100)
Health Unit	60	(49.6)	61	(50.4)	121	(100)	--	--	--	--	--	--
Total	90	(57.7)	66	(42.3)	156	(100)	10	(76.9)	3	(23.1)	13	(100)

Table C-3-6. Funding sources of public health facilities, by facility type

Construction funding source	Hospital		Health Center		Health Unit		Total	
	n	(%)	n	(%)	n	(%)	n	(%)
Government	4	(57.1)	16	(69.6)	18	(29.0)	38	(41.3)
Government/local	0	(0.0)	0	(0.0)	2	(3.2)	2	(2.2)
Government/local/foreign	0	(0.0)	0	(0.0)	7	(11.3)	7	(7.6)
Government/foreign	1	(14.3)	1	(4.3)	3	(4.8)	5	(5.4)
Local	0	(0.0)	0	(0.0)	4	(6.5)	4	(4.3)
Local/foreign	0	(0.0)	0	(0.0)	5	(8.1)	5	(5.4)
Mixed*	0	(0.0)	1	(4.3)	2	(3.2)	3	(3.3)
Mixed/foreign	0	(0.0)	0	(0.0)	1	(1.6)	1	(1.1)
Foreign	2	(28.6)	5	(21.7)	20	(32.3)	27	(29.3)
Total	**7**	**(100)**	**23**	**(100)**	**62**	**(100)**	**92**	**(100)**

*Mixed refers to combination of government and non-government sources

Table C-3-7: Availability of accommodations attached to health facilities, by facility type and sector

Facility Type	Public						Private					
	Available		Unavailable		Total		Available		Unavailable		Total	
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
Hospital	5	(71.4)	2	(28.6)	7	(100)	2	(100)	0	(0.0)	2	(100)
Health Center/Clinic	13	(46.4)	15	(53.6)	28	(100)	9	(81.8)	2	(18.2)	11	(100)
Health Unit	9	(7.4)	112	(92.6)	121	(100)	--	--	--	--	--	--
Total	**27**	**(17.3)**	**129**	**(82.7)**	**156**	**(100)**	**11**	**(84.6)**	**2**	**(15.4)**	**13**	**(100)**

Table C-4-1. District-level summary of number of facilities with various infrastructure items available

District	Number of facilities with completed survey	Electricity		Usable Toilet(s)		Clean Water		Accommodation		Telephone Line		Garbage / Medical waste separation	
	Total	Y	N	Y	N	Y	N	Y	N	Y	N	Y	N
Al Ashah	4	3	1	1	3	3	1	1	3	0	4	0	4
Al Qaflah	1	0	1	0	1	0	1	0	1	0	1	0	1
Almadan	11	2	9	5	6	6	5	0	11	0	11	3	8
Amran	20	19	1	2	18	18	2	8	12	9	11	1	19
As Sawd	8	2	6	2	6	5	3	1	7	0	8	2	6
As Sudah	7	1	6	3	4	6	1	2	5	0	7	2	5
Bani Sarim	6	4	2	3	3	4	2	2	4	1	5	0	6
Dhi Bin	10	3	7	4	6	4	6	1	9	1	9	2	8
Habur Zulaymah	7	1	6	3	4	2	5	0	7	1	6	0	7
Harf Sufyan	9	2	7	3	6	8	1	0	9	2	7	4	5
Huth	3	1	2	0	3	3	0	1	2	1	2	1	2
Iyal Surayh	9	4	5	3	6	8	1	2	7	1	8	1	8
Jabal Iyal Yazid	17	7	10	4	13	14	3	3	14	2	15	13	4
Khamir	21	11	10	11	10	11	10	3	18	2	19	15	6
Kharif	4	1	3	0	4	4	0	2	2	1	3	3	1
Maswar	7	3	4	3	4	7	0	1	6	0	7	5	2
Raydah	8	5	3	1	7	7	1	3	5	4	4	4	4
Shaharah	7	3	4	1	6	7	0	3	4	1	6	0	7
Suwayr	2	0	2	1	1	1	1	0	2	0	2	0	2
Thula	8	5	3	2	6	7	1	5	3	3	5	3	5
Total	**169**	**77**	**92**	**52**	**117**	**125**	**44**	**38**	**131**	**29**	**140**	**59**	**110**

Table C-4-2. Sources of clean water among facilities with clean water available, by facility type and sector

Water Source	Sector														Total	
	Public								Private							
	Hospital		Health Center/Clinic		Health Unit		Total		Hospital		Health Center/Clinic		Total			
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
Government	0	(0.0)	5	(17.9)	10	(12.8)	15	(13.4)	0	(0.0)	2	(18.2)	2	(15.4)	17	(13.6)
Government & Water Tank	2	(33.3)	1	(3.6)	0	(0.0)	3	(2.7)	1	(50.0)	4	(36.4)	5	(38.5)	8	(6.4)
Private	0	(0.0)	2	(7.1)	9	(11.5)	11	(9.8)	0	(0.0)	1	(9.1)	1	(7.7)	12	(9.6)
Private & Water Tank	0	(0.0)	2	(7.1)	0	(0.0)	2	(1.8)	0	(0.0)	0	(0.0)	0	(0.0)	2	(1.6)
Water Tank	4	(66.7)	17	(60.7)	52	(66.7)	73	(65.2)	1	(50.0)	4	(36.4)	5	(38.5)	78	(62.4)
Stream	0	(0.0)	1	(3.6)	2	(2.6)	3	(2.7)	0	(0.0)	0	(0.0)	0	(0.0)	3	(2.4)
Unspecified	0	(0.0)	0	(0.0)	5	(6.4)	5	(4.5)	0	(0.0)	0	(0.0)	0	(0.0)	5	(4.0)
Total	**6**	**(100)**	**28**	**(100)**	**78**	**(100)**	**112**	**(100)**	**2**	**(100)**	**11**	**(100)**	**13**	**(100)**	**125**	**(100)**

Table C-4-3. Sources of electricity among facilities with electricity available, by facility type and sector

Electricity Source	Sector														Total	
	Public								Private							
	Hospital		Health Center/Clinic		Health Unit		Total		Hospital		Health Center/Clinic		Total			
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
Government	0	(0.0)	7	(30.4)	20	(57.1)	27	(42.2)	0	(0.0)	0	(0.0)	0	(0.0)	27	(35.1)
Government & Cooperative	0	(0.0)	1	(4.3)	0	(0.0)	1	(1.6)	0	(0.0)	0	(0.0)	0	(0.0)	1	(1.3)
Government & own generator	4	(66.7)	2	(8.7)	0	(0.0)	6	(9.4)	2	(100)	11	(100)	13	(100)	19	(24.7)
Private	0	(0.0)	0	(0.0)	7	(20.0)	7	(10.9)	0	(0.0)	0	(0.0)	0	(0.0)	7	(9.1)
Cooperative	1	(16.7)	1	(4.3)	5	(14.3)	7	(10.9)	0	(0.0)	0	(0.0)	0	(0.0)	7	(9.1)
Own Generator	1	(16.7)	12	(52.2)	3	(8.6)	16	(25.0)	0	(0.0)	0	(0.0)	0	(0.0)	16	(20.8)
Total	**6**	**(100)**	**23**	**(100)**	**35**	**(100)**	**64**	**(100)**	**2**	**(100)**	**11**	**(100)**	**13**	**(100)**	**77**	**(100)**

Table C-4-4. Type of sewage system (among facilities with sewage systems)

Sewage system used	Sector														Total	
	Public								Private							
	Hospital		Health Center/ Clinic		Health Unit		Total		Hospital		Health Center/ Clinic		Total			
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
General network	1	(14.3)	1	(3.6)	0	(0.0)	2	(1.8)	2	(100)	3	(27.3)	5	(38.5)	7	(5.6)
Pit	6	(85.7)	26	(92.9)	61	(79.2)	93	(83.0)	0	(0.0)	8	(72.7)	8	(61.5)	101	(80.8)
In the open	0	(0.0)	1	(3.6)	16	(20.8)	17	(15.2)	0	(0.0)	0	(0.0)	0	(0.0)	17	(13.6)
Total	**7**	**(100)**	**28**	**(100)**	**77**	**(100)**	**112**	**(100)**	**2**	**(100)**	**11**	**(100)**	**13**	**(100)**	**125**	**(100)**

Table C-4-5. Average number of daily operating hours for electricity in facilities with electricity

	Public				Private			Total
	Hospital	Health Center / Clinic	Health Unit	Total	Hospital	Health Center / Clinic	Total	
Number	6	23	35	64	2	11	13	77
Mean	15.3	11.9	13.0	12.8	24.0	20.8	21.3	14.2
SD	9.5	8.5	9.8	9.2	0.0	7.1	6.6	9.4
Range	18	21	24	24	0	19	19	24
(Min - Max)	(6 - 24)	(3 - 24)	(0 - 24)	(0 - 24)	(24 - 24)	(5 - 24)	(5 - 24)	(0 - 24)

Table C-4-6. Proportion of usable toilets, by health facility type and sector

% of toilets usable	Sector													
	Public								Private					
	Hospital		Health Center/Clinic		Health Unit		Total		Hospital		Health Center/Clinic		Total	
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
0	0	(0.0)	0	(0.0)	17	(19.8)	17	(14.0)	0	(0.0)	0	(0.0)	0	(0.0)
1-25	1	(14.3)	2	(7.1)	0	(0.0)	3	(2.5)	0	(0.0)	0	(0.0)	0	(0.0)
26 - 50	2	(28.6)	11	(39.3)	1	(1.2)	14	(11.6)	0	(0.0)	0	(0.0)	0	(0.0)
51 - 75	3	(42.9)	2	(7.1)	0	(0.0)	5	(4.1)	1	(50.0)	0	(0.0)	1	(7.7)
76 - 100	1	(14.3)	13	(46.4)	68	(79.1)	82	(67.8)	1	(50.0)	11	(100)	12	(92.3)
Total	**7**	**(100)**	**28**	**(100)**	**121**	**(100)**	**156**	**(100)**	**2**	**(100)**	**11**	**(100)**	**13**	**(100)**

Table C-4-7. Availability of transportation, by health facility type and sector

Transportation availability	Facility Type						Total	
	Hospital		Health Center/Clinic		Health Unit			
	n	(%)	n	(%)	n	(%)	n	(%)
Public								
Available	2	(28.6)	1	(3.6)	0	(0.0)	3	(1.9)
Not	5	(71.4)	27	(96.4)	121	(100)	153	(98.1)
Total	7	(100)	28	(100)	121	(100)	156	(100)
Private								
Available	1	(50.0)	1	(9.1)	--	--	2	(15.4)
Not	1	(50.0)	10	(90.9)	--	--	11	(84.6)
Total	2	(100)	11	(100)	--	--	13	(100)
All								
Available	3	(33.3)	2	(5.1)	0	(0.0)	5	(3.0)
Not	6	(66.7)	37	(94.9)	121	(100)	164	(97.0)
Total	**9**	**(100)**	**39**	**(100)**	**121**	**(100)**	**169**	**(100)**

Table C-4-8. Availability of means to separate medical waste and garbage

Separation of medical waste and garbage	Sector													
	Public								Private					
	Hospital		Health Center/Clinic		Health Unit		Total		Hospital		Health Center/Clinic		Total	
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
Available	0	(0.0)	8	(28.6)	48	(39.7)	56	(35.9)	0	(0.0)	3	(27.3)	3	(23.1)
Not Available	7	(100)	20	(71.4)	73	(60.3)	100	(64.1)	2	(100)	8	(72.7)	10	(76.9)
Total	**7**	**(100)**	**28**	**(100)**	**121**	**(100)**	**156**	**(100)**	**2**	**(100)**	**11**	**(100)**	**13**	**(100)**

Table C-4-9. Means of garbage and medical waste disposal among facilities not separating medical waste and garbage

Disposal Method	Sector													
	Public								Private					
	Hospital		Health Center/Clinic		Health Unit		Total		Hospital		Health Center/ Clinic		Total	
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
Garbage barrels	1	(14.3)	2	(10.0)	0	(0.0)	3	(3.0)	2	(100)	6	(75.0)	8	(80.0)
Medical incinerator	0	(0.0)	1	(5.0)	2	(2.7)	3	(3.0)	0	(0.0)	0	(0.0)	0	(0.0)
Burned in open area	4	(57.1)	7	(35.0)	44	(60.3)	55	(55.0)	0	(0.0)	1	(12.5)	1	(10.0)
Burned and buried within facility fence	1	(14.3)	3	(15.0)	2	(2.7)	6	(6.0)	0	(0.0)	0	(0.0)	0	(0.0)
Burned and buried outside facility fence	1	(14.3)	7	(35.0)	25	(34.2)	33	(33.0)	0	(0.0)	1	(12.5)	1	(10.0)
Total	**7**	**(100)**	**20**	**(100)**	**73**	**(100)**	**100**	**(100)**	**2**	**(100)**	**8**	**(100)**	**10**	**(100)**

Table C-4-10. Means of normal garbage disposal among facilities separating medical waste and garbage

Disposal Method for Separated Garbage	Public						Private			
	Health Center/Clinic		Health Unit		Total		Health Center/Clinic		Total	
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
Garbage barrels	0	(0.0)	0	(0.0)	0	(0.0)	1	(33.3)	1	(33.3)
Burned	7	(87.5)	38	(79.2)	45	(80.4)	2	(66.7)	2	(66.7)
Buried outside facility fence	1	(12.5)	5	(10.4)	6	(10.7)	0	(0.0)	0	(0.0)
Thrown in street	0	(0.0)	5	(10.4)	5	(8.9)	0	(0.0)	0	(0.0)
Total	**8**	**(100)**	**48**	**(100)**	**56**	**(100)**	**3**	**(100)**	**3**	**(100)**

Table C-4-11. Means of medical waste disposal among facilities separating medical waste and garbage

Disposal Method for Separated Medical Waste	Public						Private				Total	
	Health Center/Clinic		Health Unit		Total		Health Center /Clinic		Total			
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
Garbage barrels	0	(0.0)	0	(0.0)	0	(0.0)	2	(66.7)	2	(66.7)	2	(3.4)
Medical incinerator	1	(12.5)	0	(0.0)	1	(1.8)	0	(0.0)	0	(0.0)	1	(1.7)
Burned in open area	3	(37.5)	38	(79.2)	41	(73.2)	1	(33.3)	1	(33.3)	42	(71.2)
Burned and buried within facility fence	1	(12.5)	0	(0.0)	1	(1.8)	0	(0.0)	0	(0.0)	1	(1.7)
Burned and buried outside facility fence	3	(37.5)	10	(20.8)	13	(23.2)	0	(0.0)	0	(0.0)	13	(22.0)
Total	**8**	**(100)**	**48**	**(100)**	**56**	**(100)**	**3**	**(100)**	**3**	**(100)**	**59**	**(100)**

Figure C-4-1. Proportion of facilities with clean water, by district

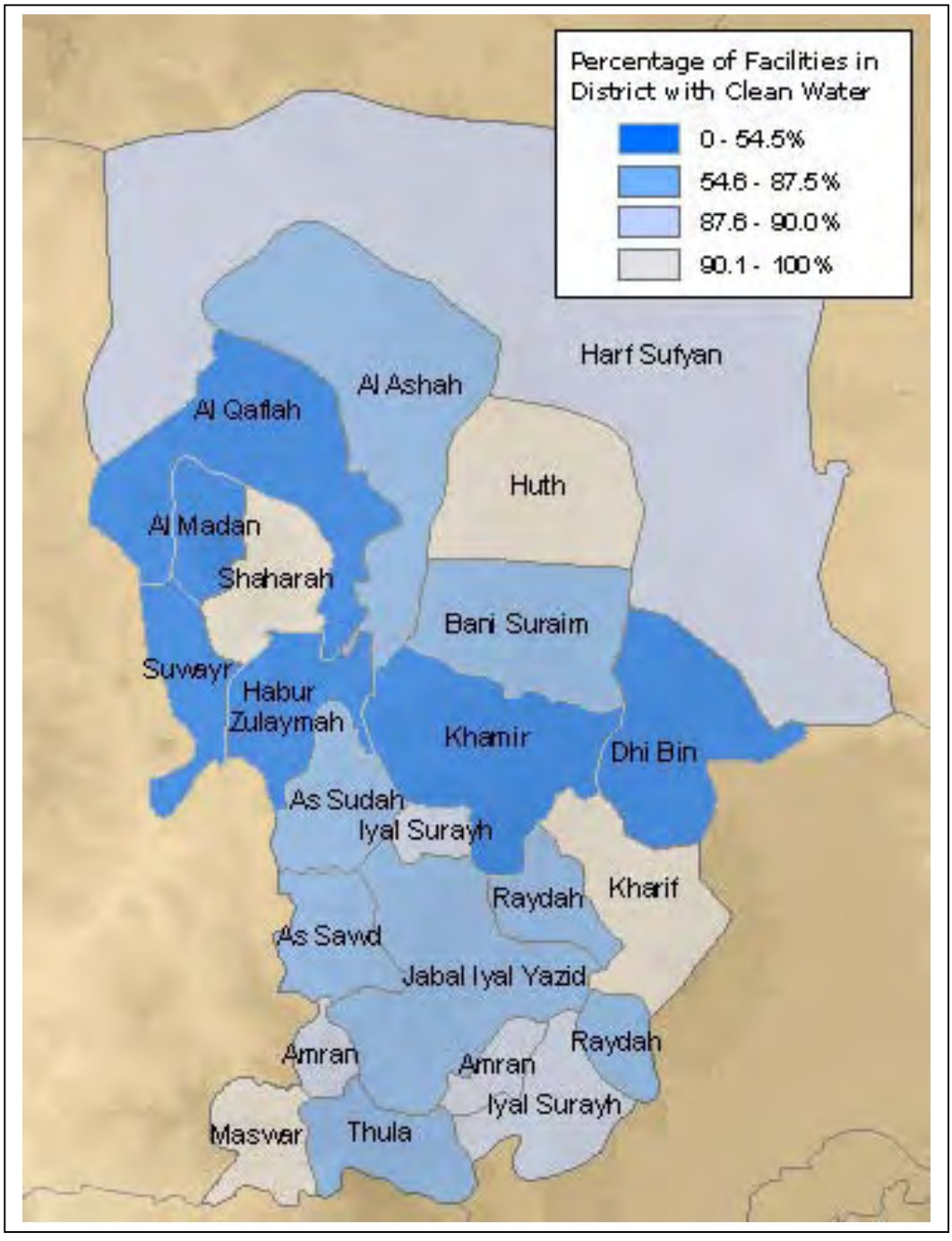


Figure C-4-2 Proportion of facilities with electricity, by district

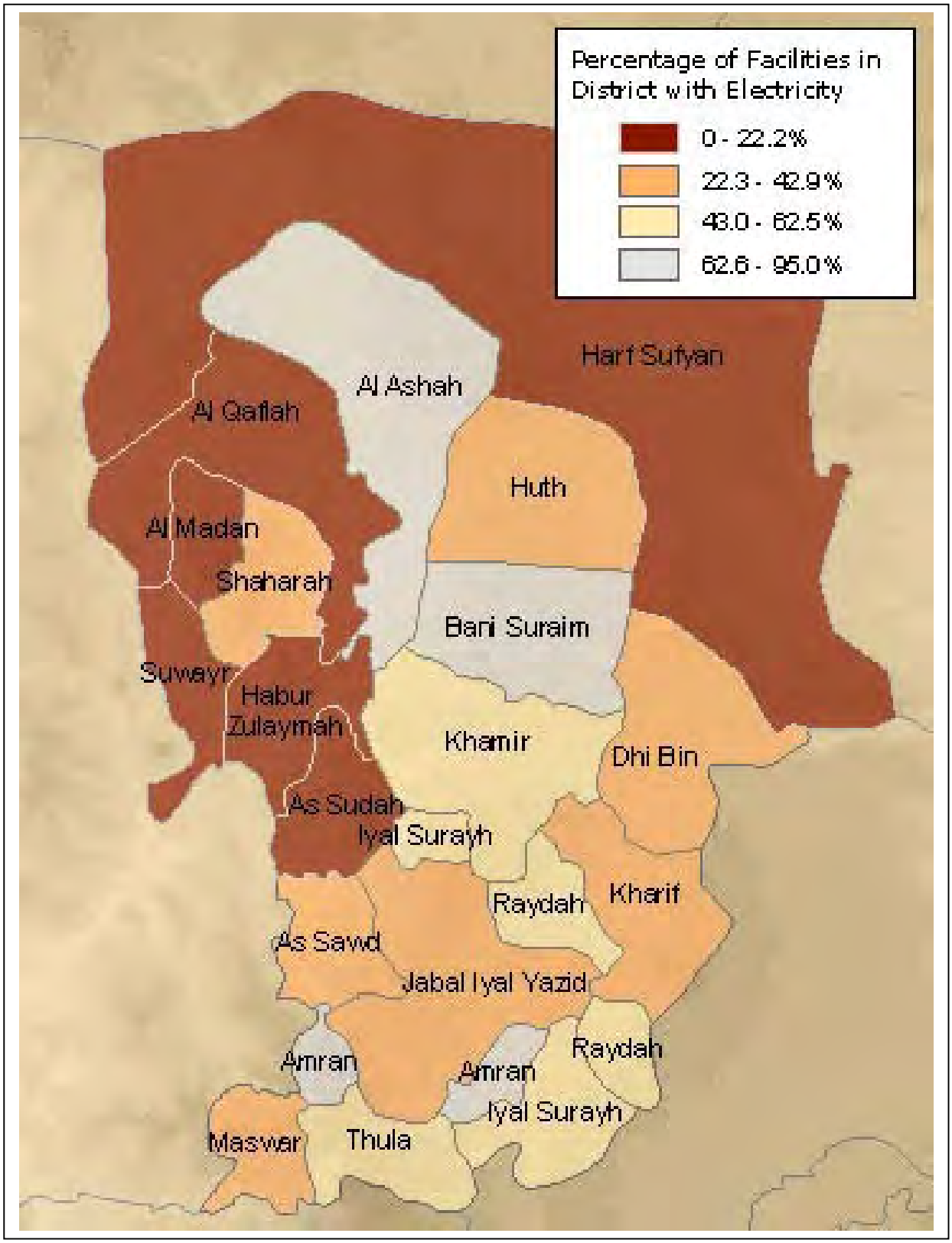


Figure C-4-3 Proportion of facilities with useable toilets, by district

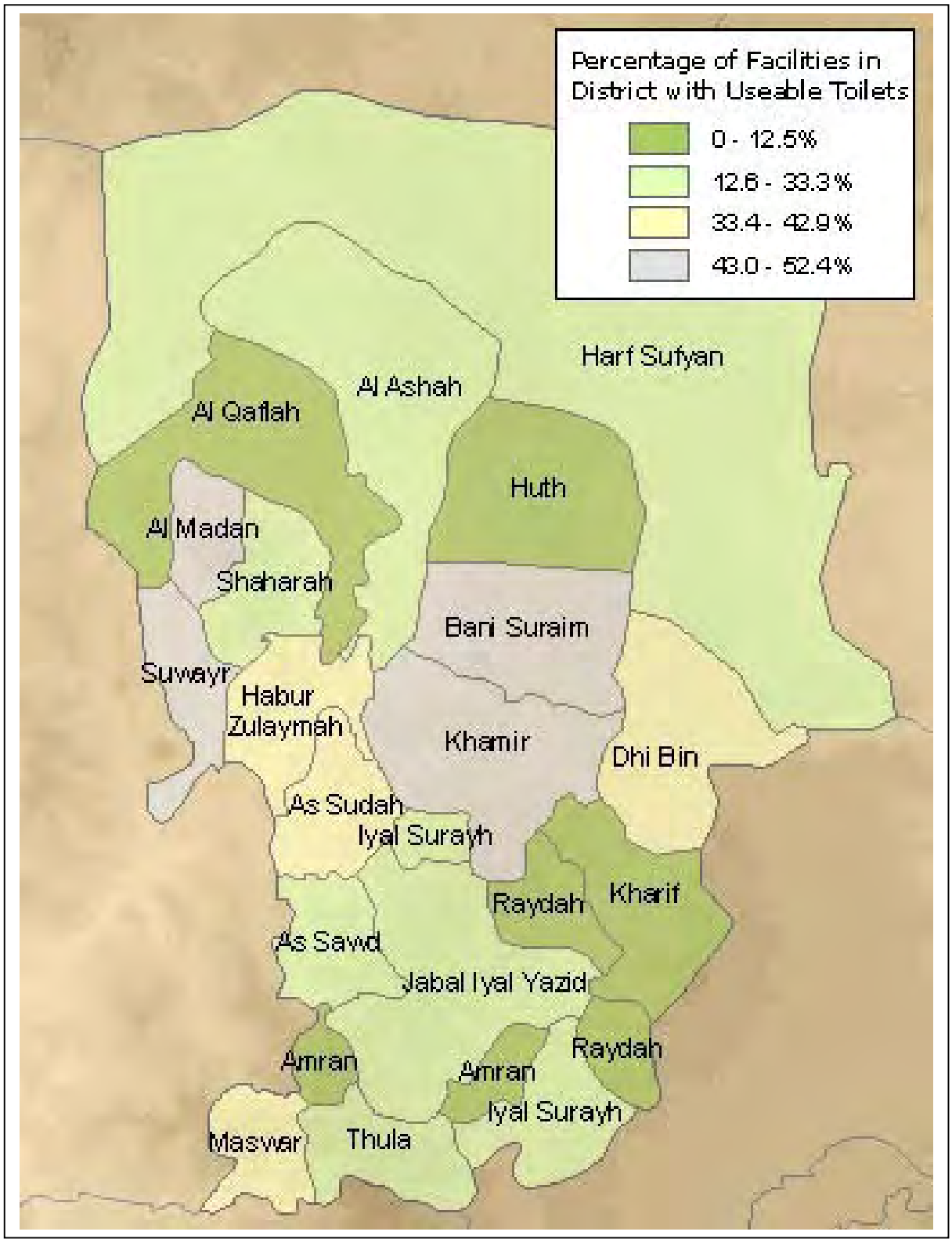


Figure C-4-4 Proportion of facilities separating medical waste and garbage, by district

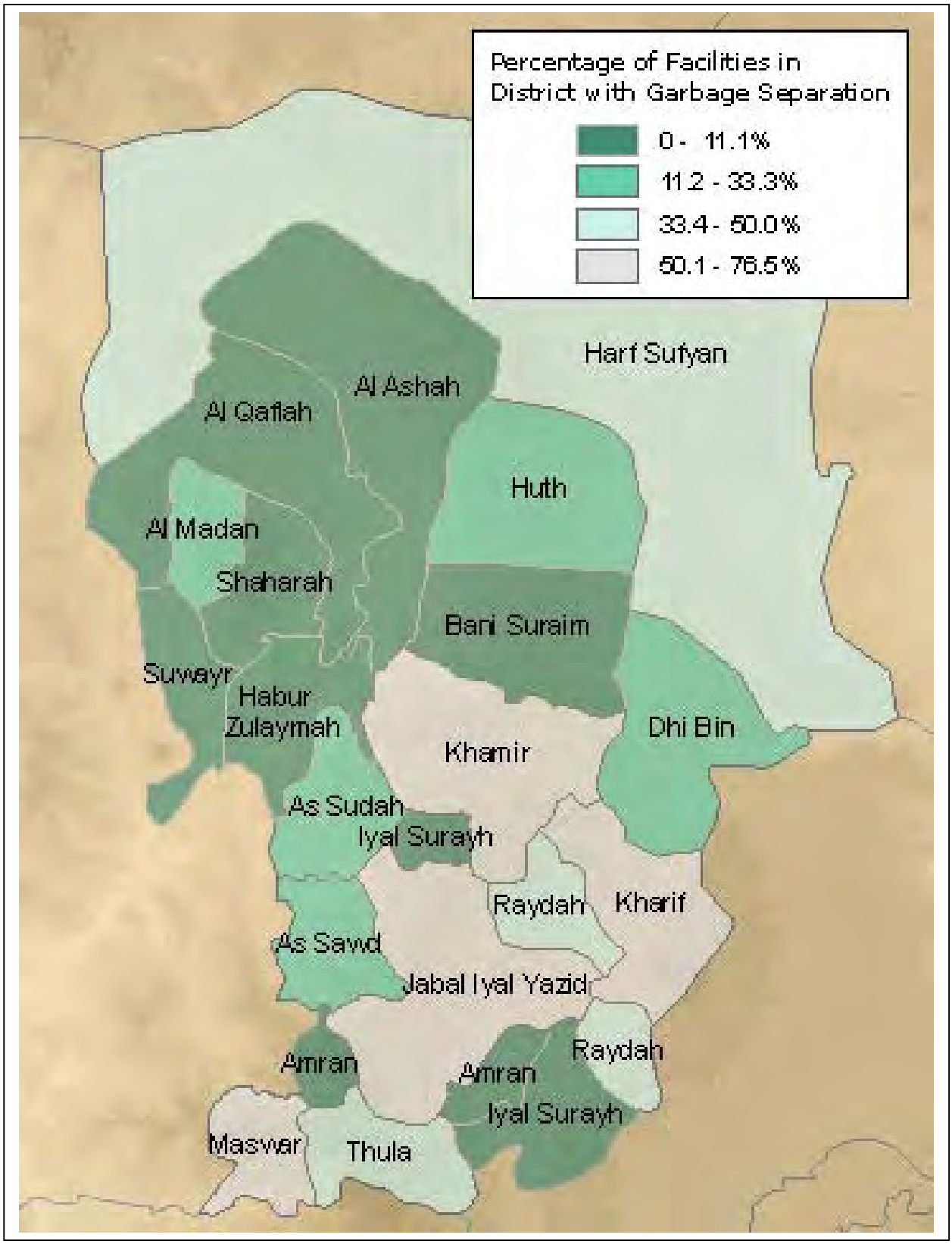


Table C-5-1. Availability of health and medical services in public sector facilities

Medical Service	Hospital n=7		H. Center n=28		H. Unit n=121		Total n=156	
	n	(%)	n	(%)	n	(%)	n	(%)
General Medicine	7	(100)	28	(100)	121	(100)	156	(100)
General Medicine	7	(100)	28	(100)	119	(98.3)	154	(98.7)
Injections	7	(100)	28	(100)	121	(100)	156	(100)
Wound Dressing	7	(100)	27	(96.4)	120	(99.1)	155	(99.3)
Reproductive Health	7	(100)	25	(89.2)	82	(67.8)	114	(73.1)
Pregnancy Care	6	(85.1)	24	(96.0)	75	(91.5)	105	(92.1)
Normal Delivery	7	(100)	22	(88.0)	76	(92.7)	105	(92.1)
After Delivery Care	6	(85.1)	15	(60.0)	42	(51.2)	63	(55.3)
Child Growth Monitoring	5	(71.4)	15	(60.0)	42	(51.2)	62	(54.4)
Immunization	7	(100)	27	(96.4)	115	(95.0)	149	(95.5)
Women of repro. age 2nd dose of TT	7	(100)	26	(96.2)	103	(89.6)	136	(91.3)
Pregnant women 2nd dose of TT	7	(100)	26	(96.2)	104	(90.4)	137	(91.9)
Tuberculosis	7	(100)	26	(96.2)	112	(97.4)	145	(97.3)
Polio + DPT 3rd dose	7	(100)	27	(100)	113	(98.3)	147	(98.7)
Measles	7	(100)	27	(100)	114	(99.1)	148	(99.3)
Hepatitis B 3rd dose	7	(100)	27	(100)	113	(98.3)	147	(98.7)
Family Planning	7	(100)	22	(78.6)	75	(62.0)	104	(66.7)
Pill	7	(100)	22	(100)	73	(97.3)	102	(98.1)
Condom	7	(100)	21	(95.5)	53	(70.7)	81	(66.9)
IUD – the loop	3	(42.9)	6	(27.3)	0	(0.0)	9	(8.7)
Injection	7	(100)	17	(77.3)	37	(49.3)	61	(58.7)
Norplant	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Tying of tubes	2	(28.6)	0	(0.0)	1	(1.3)	3	(2.9)
Health Education	6	(85.7)	26	(92.9)	109	(90.1)	141	(90.4)
Immunization	6	(100)	24	(92.3)	101	(92.7)	131	(92.9)
Nutrition	4	(66.7)	20	(76.9)	95	(87.2)	119	(84.4)
Education on AIDS	5	(83.3)	11	(42.3)	21	(19.3)	37	(26.2)
Education on STDs	3	(50.0)	11	(42.3)	28	(25.7)	42	(29.8)
Family Planning	5	(83.3)	24	(92.3)	82	(75.2)	111	(78.7)
Pregnancy Care	6	(100)	22	(84.6)	72	(66.1)	100	(70.9)
Natural Breastfeeding	6	(100)	24	(92.3)	89	(81.7)	119	(84.4)
Female Circumcision	0	(0.0)	0	(0.0)	1	(0.9)	1	(0.7)
Laboratory*	7	(100)	20	(71.4)	NA	NA	27	(77.1)
Urine	7	(100)	20	(100)	–	–	27	(100)
Stool	7	(100)	20	(100)	–	–	27	(100)
General Blood	7	(100)	18	(90.0)	–	–	25	(92.6)
Blood Chemistry	2	(28.6)	2	(10.0)	–	–	4	(14.8)
Tissues	0	(0.0)	0	(0.0)	–	–	0	(0.0)

Medical Service	Hospital n=7		H. Center n=28		H. Unit n=121		Total n=156	
	n	(%)	n	(%)	n	(%)	n	(%)
Culture	0	(0.0)	0	(0.0)	–	–	0	(0.0)
Hormones	0	(0.0)	0	(0.0)	–	–	0	(0.0)
Malaria	7	(100)	19	(95.0)	–	–	26	(96.3)
Bilharzia	7	(100)	19	(95.0)	–	–	26	(96.3)
Radiology*	4	(57.1)	6	(30.0)	NA	NA	10	(28.6)
Normal X-ray	4	(100)	5	(83.3)	–	–	9	(90.0)
Color X-ray	0	(0.0)	1	(16.7)	–	–	1	(10.0)
Ultrasound	2	(50.0)	2	(33.3)	–	–	4	(40.0)
Echocardiogram	0	(0.0)	0	(0.0)	–	–	0	(0.0)
CT Scan	0	(0.0)	0	(0.0)	–	–	0	(0.0)
MRI	0	(0.0)	0	(0.0)	–	–	0	(0.0)
Endoscopy	0	(0.0)	0	(0.0)	–	–	0	(0.0)
Specialized Service* **	2	(28.6)	0	(0.0)	NA	NA	2	(5.7)
Internal medicine	1	(50.0)	–	–	–	–	1	(50.0)
Obstetrics / Gynecology	2	(100)	–	–	–	–	2	(100)
Pediatrics	1	(50.0)	–	–	–	–	1	(50.0)
Dermatology	1	(50.0)	–	–	–	–	1	(50.0)
ENT	0	(0.0)	–	–	–	–	0	(0.0)
Ophthalmology	2	(100)	–	–	–	–	2	(100)
Surgery	2	(100)	–	–	–	–	2	(100)
Orthopedics	1	(50.0)	–	–	–	–	1	(50.0)
Dental	2	(100)	–	–	–	–	2	(100)
Emergency	2	(100)	–	–	–	–	2	(100)

* No health unit offered these services

** No health center reported offering special services.

Table C-5-2. Availability of health and medical services in private sector facilities

Medical Service	Hospital n=2		Clinic n=11		Total n=13	
	n	(%)	n	(%)	n	(%)
General Medicine	2	(100)	11	(100)	13	(100)
General Medicine	2	(100)	11	(100)	13	(100)
Injections	2	(100)	11	(100)	13	(100)
Wound Dressing	2	(100)	11	(100)	13	(100)
Reproductive Health	2	(100)	9	(81.8)	11	(84.6)
Pregnancy Care	2	(100)	5	(55.6)	7	(63.6)
Normal Delivery	2	(100)	9	(100)	11	(100)
After Delivery Care	2	(100)	1	(11.1)	3	(27.3)
Child Growth Monitoring	2	(100)	0	(0.0)	2	((18.2)
Immunization*	0	(0.0)	0	(0.0)	0	(0.0)
Women of repro. age 2nd dose of TT	–	–	–	–	–	–
Pregnant women 2nd dose of TT	–	–	–	–	–	–
Tuberculosis	–	–	–	–	–	–
Polio + DPT 3rd dose	–	–	–	–	–	–
Measles	–	–	–	–	–	–
Hepatitis B 3rd dose	–	–	–	–	–	–
Family Planning	1	(50.0)	6	(54.5)	7	(53.8)
Pill	1	(100)	4	(66.7)	5	(71.4)
Condom	0	(0.0)	2	(33.3)	2	(28.6)
IUD – the loop	1	(100)	5	(83.3)	6	(85.7)
Injection	0	(0.0)	2	(33.3)	2	(28.6)
Norplant	0	(0.0)	0	(0.0)	0	(0.0)
Tying of tubes	1	(100)	0	(0.0)	1	(14.3)
Health Education**	0	(0.0)	2	(18.2)	2	(15.4)
Immunization	–	–	1	(50.0)	1	(50.0)
Nutrition	–	–	1	(50.0)	1	(50.0)
Education on AIDS	–	–	0	(0.0)	0	(0.0)
Education on STDs	–	–	0	(0.0)	0	(0.0)
Family Planning	–	–	0	(0.0)	0	(0.0)
Pregnancy Care	–	–	1	(50.0)	1	(50.0)
Natural Breastfeeding	–	–	1	(50.0)	1	(50.0)
Female Circumcision	–	–	0	(0.0)	0	(0.0)
Laboratory	2	(100)	11	(100)	13	(100)
Urine	2	(100)	11	(100)	13	(100)
Stool	2	(100)	11	(100)	13	(100)
General Blood	2	(100)	11	(100)	13	(100)
Blood Chemistry	2	(100)	6	(54.5)	8	(61.5)

Medical Service	Hospital n=2		Clinic n=11		Total n=13	
	n	(%)	n	(%)	n	(%)
Tissues	0	(0.0)	0	(0.0)	0	(0.0)
Culture	0	(0.0)	0	(0.0)	0	(0.0)
Hormones	0	(0.0)	0	(0.0)	0	(0.0)
Malaria	2	(100)	11	(100)	13	(100)
Bilharzia	2	(100)	11	(100)	13	(100)
Radiology	2	(100)	9	(81.8)	11	(84.6)
Normal X-ray	2	(100)	8	(88.9)	10	(90.9)
Color X-ray	2	(100)	2	(22.2)	4	(36.4)
Ultrasound	2	(100)	7	(77.8)	9	(81.8)
Echocardiogram	1	(50.0)	1	(9.0)	2	(18.2)
CT Scan	0	(0.0)	0	(0.0)	0	(0.0)
MRI	0	(0.0)	0	(0.0)	0	(0.0)
Endoscopy	1	(50.0)	0	(0.0)	1	(9.1)
Specialized Service	2	(100)	7	(63.6)	9	(69.2)
Internal	2	(100)	2	(28.6)	4	(44.4)
Obstetrics / Gynecology	2	(100)	6	(85.7)	8	(88.9)
Pediatrics	2	(100)	0	(0.0)	2	(22.2)
Dermatology	0	(0.0)	0	(0.0)	0	(0.0)
ENT	0	(0.0)	0	(0.0)	0	(0.0)
Ophthalmology	0	(0.0)	0	(0.0)	0	(0.0)
Surgery	2	(100)	2	(28.6)	4	(44.4)
Orthopedics	2	(100)	0	(0.0)	2	(22.2)
Dental	1	(50.0)	2	(28.6)	3	(33.3)
Emergency	2	(100)	2	(28.6)	4	(44.4)

* No private facility offered immunization services.

** No private hospital offered health education.

Table C-5-3. Percentage of hospitals and health centers/clinics performing HIV testing, by facility type and sector

HIV testing	Public						Private					
	Hospitals		Health Centers		Total		Hospitals		Health Clinics		Total	
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
Perform	2	(28.6)	0	(0.0)	2	(5.7)	1	(50.0)	3	(27.3)	4	(30.8)
Do not perform	5	(71.4)	8	(28.6)	13	(37.1)	1	(50.0)	8	(72.7)	9	(69.2)
No answer	0	(0.0)	20	(71.4)	20	(57.1)	0	(0.0)	0	(0.0)	0	(0)
Total	**7**	**(100)**	**28**	**(100)**	**35**	**(100)**	**2**	**(100)**	**11**	**(100)**	**13**	**(100)**

Table C-6-1. Number and proportion of facilities using infection prevention and treatment guide, by facility type and public/private sector

Facility Type	Public			Private			Total		
	n	Total	(%)	n	Total	(%)	n	Total	(%)
Hospital	4	7	(57.1)	0	2	(0.0)	4	9	(44.4)
Health Center	5	28	(17.9)	2	11	(18.2)	7	39	(17.9)
Health Unit	24	121	(19.8)	--	--	--	24	121	(19.8)
Total	**33**	**156**	**(21.2)**	**2**	**13**	**(15.4)**	**35**	**169**	**(20.7)**

Table C-7-1. Types of inpatient sections available (among facilities with inpatient sections

Sections	Public						Private					
	Hospital n=3		Health Center n=1		Total n=4		Hospital n=2		Clinic n=8		Total n=10	
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
General	1	(33.3)	1	(100)	2	(50.0)	2	(100)	7	(87.5)	9	(90.0)
Internal medicine	2	(66.7)	0	(0.0)	2	(50.0)	1	(50.0)	2	(25.0)	3	(30.0)
General surgery	2	(66.7)	0	(0.0)	2	(50.0)	1	(50.0)	1	(12.5)	2	(20.0)
Gynecology	1	(33.3)	0	(0.0)	1	(25.0)	1	(50.0)	3	(37.5)	4	(40.0)
Pediatric	1	(33.3)	0	(0.0)	1	(25.0)	1	(50.0)	1	(12.5)	2	(20.0)
Orthopedic	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Eye surgery	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
ENT	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Urology	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Psych/Neuro	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)
Dermatology	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)	0	(0.0)

Table C-7-2. Average number of beds available for each inpatient section type

Inpatient section type	Statistics	Public			Private		
		Hospital	Health Center	Total	Hospital	Health Center	Total
Number of facilities with inpatient sections		3	1	4	2	8	10
General	**Number**	1	1	2	2	7	9
	Mean	9.0	8.0	8.5	14.5	10.3	11.2
	Median	9.0	8.0	8.5	14.5	10.0	10.0
	Standard Dev.	--	--	0.7	4.9	5.6	5.4
	(Min-Max)	(9-9)	(8-8)	(8-9)	(11-18)	(5-22)	(5-22)
Internal medicine	**Number**	2	0	2	1	2	3
	Mean	22.0	--	22.0	8.0	4.0	5.3
	Median	22.0	--	22.0	8.0	4.0	5.0
	Standard Dev.	0.0	--	0.0	--	1.4	2.5
	(Min-Max)	(22-22)	--	(22-22)	(8-8)	(3-5)	(3-8)
General surgery	**Number**	2	0	2	1	1	2
	Mean	24.0	--	24.0	16.0	3.0	9.5
	Median	24.0	--	24.0	16.0	3.0	9.5
	Standard Dev.	14.1	--	14.1	--	--	9.2
	(Min-Max)	(14-34)	--	(14-34)	(16-16)	(3-3)	(3-16)
Gynecology	**Number**	1	0	1	1	3	4
	Mean	18.0	--	18.0	16.0	5.0	7.8
	Median	18.0	--	18.0	16.0	5.0	5.5
	Standard Dev.	--	--	--	--	1.0	5.6
	(Min-Max)	(18-18)	--	(18-18)	(16-16)	(4-6)	(4-16)
Pediatric	**Number**	1	0	1	1	1	2
	Mean	16.0	--	16.0	8.0	5.0	6.5
	Median	16.0	--	16.0	8.0	5.0	6.5
	Standard Dev.	--	--	--	--	--	2.1
	(Min-Max)	(16-16)	--	(16-16)	(8-8)	(5-5)	(5-8)
Total	**Number**	7	1	8	6	14	20
	Mean	19.3	8.0	17.9	12.8	7.4	9.0
	Median	18.0	8.0	17.0	13.5	5.5	8.0
	Standard Dev.	7.9	--	8.4	4.4	4.9	5.3
	(Min-Max)	(9-34)	(8-8)	(8-34)	(8-18)	(3-22)	(3-22)

Table C-7-3. Average cost (Yemeni riyals) of operations, by facility type and sector

Operation	Statistics	Public		Private		
		Hospital	Total	Hospital	Health Clinic	Total
Number of facilities performing operations		2	2	2	2	4
Appendicitis	Number	2	2	2	2	4
	Mean	6500	6500	15000	4500	9750
	Median	6500	6500	15000	4500	11500
	SD	707	707	0	4950	6702
	(Min - Max)	(6000-7000)	(6000-7000)	(15000-15000)	(1000-8000)	(1000-15000)
Hernia	Number	2	2	2	2	4
	Mean	7500	7500	15000	11500	13250
	Median	7500	7500	15000	11500	15000
	SD	707	707	0	4950	3500
	(Min - Max)	(7000-8000)	(7000-8000)	(15000-15000)	(8000-15000)	(8000-15000)
Gall bladder removal	Number	2	2	2	1	3
	Mean	13500	13500	30000	25000	28333
	Median	13500	13500	30000	25000	25000
	SD	2121	2121	7071	--	5774
	(Min - Max)	(12000-15000)	(12000-15000)	(25000-35000)	(25000-25000)	(25000-25000)
Urinary bladder stones	Number	2	2	2	1	3
	Mean	10000	10000	17500	15000	16667
	Median	10000	10000	17500	15000	15000
	SD	0	0	3536	--	2887
	(Min - Max)	(10000-10000)	(10000-10000)	(15000-20000)	(15000-15000)	(15000-20000)
Kidney stones	Number	0	0	2	1	3
	Mean	--	--	30000	15000	25000
	Median	--	--	30000	15000	30000
	SD	--	--	0	--	8660
	(Min - Max)	--	--	(30000-30000)	(15000-15000)	(15000-15000)
Caesarean delivery	Number	2	2	2	1	3
	Mean	11000	11000	20000	30000	23333
	Median	11000	11000	20000	30000	25000
	SD	1414	1414	7071	--	7638
	(Min - Max)	(10000-12000)	(10000-12000)	(15000-25000)	(30000-30000)	(15000-30000)
Group Total	Number	2	2	2	2	4
	Mean	9700	9700	21250	14625	18600
	Median	10000	10000	17500	15000	15000
	SD	2791	2791	7424	9395	8690
	(Min - Max)	(6000-15000)	(6000-15000)	(15000-35000)	(1000-30000)	(1000-30000)

Table C-7-4. Average number of discharges during previous month for each inpatient section type (among facilities with inpatient sections)

Inpatient Section	Statistics	Sector						Group Total		
		Public			Private					
		Facility Type		Group Total	Facility Type		Group Total	Facility Type		Group Total
		Hospital	Health Center/ Clinic		Hospital	Health Center/ Clinic		Hospital	Health Center/ Clinic	
General	Count	1	1	2	2	7	9	3	8	11
	Mean	0.0	0.0	0.0	3.5	14.0	11.7	2.3	12.3	9.5
	SD	--	--	0.0	4.9	24.2	21.5	4.0	22.9	19.8
	Min	0	0	0	0	0	0	0	0	0
	Max	0	0	0	7	62	62	7	62	62
Internal medicine	Count	2	0	2	1	2	3	3	2	5
	Mean	35.5	--	35.5	0.0	0.0	0.0	23.7	0.0	14.2
	SD	20.5	--	20.5	--	0.0	0.0	25.1	0.0	22.0
	Min	21	--	21	0	0	0	0	0	0
	Max	50	--	50	0	0	0	50	0	50
General surgery	Count	2	0	2	1	1	2	3	1	4
	Mean	49.5	--	49.5	0.0	10.0	5.0	33.0	10.0	27.3
	SD	44.5	--	44.5	--	--	7.1	42.5	--	36.6
	Min	18	--	18	0	10	0	0	10	0
	Max	81	--	81	0	10	10	81	10	81
Gynecology	Count	1	0	1	1	3	4	2	3	5
	Mean	6.0	--	6.0	0.0	3.0	2.3	3.0	3.0	3.0
	SD	--	--	--	--	5.2	4.5	4.2	5.2	4.2
	Min	6	--	6	0	0	0	0	0	0
	Max	6	--	6	0	9	9	6	9	9
Pediatric	Count	1	0	1	1	1	2	2	1	3
	Mean	51.0	--	51.0	0.0	0.0	0.0	25.5	0.0	17.0
	SD	--	--	--	--	--	0.0	36.1	--	29.4
	Min	51	--	51	0	0	0	0	0	0
	Max	51	--	51	0	0	0	51	0	51
Group Total	Count	7	1	8	6	14	20	13	15	28
	Mean	32.4	0.0	28.4	1.2	8.4	6.2	18.0	7.8	12.5
	SD	29.2	--	29.3	2.9	17.7	15.1	26.3	17.2	22.1
	Min	0	0	0	0	0	0	0	0	0
	Max	81	0	81	7	62	62	81	62	81

Table C-7-5. Average nightly cost (Yemeni riyals) for different types of rooms (among facilities with inpatient sections)

Operation	Statistics	Public			Private		
		Hospital	Health Center	Total	Hospital	Health Center	Total
Individual Room	Number	1	0	1	2	1	3
	Mean	1000.0	--	1000.0	2000.0	1500.0	1833.3
	Median	1000.0	--	1000.0	2000.0	1500.0	1500.0
	SD	--	--	--	707.1	--	577.4
	Min-Max	(1000-1000)	--	(1000-1000)	(1500-2500)	(1500-1500)	(1500-2500)
Common Room	Number	3	1	4	1	5	6
	Mean	200.0	200.0	200.0	1500.0	440.0	616.7
	Median	200.0	200.0	200.0	1500.0	300.0	400.0
	SD	0.0	--	0.0	.	336.2	526.9
	Min-Max	(200-200)	(200-200)	(200-200)	(1500-1500)	(200-1000)	(200-1500)
Intensive Care	Number	0	0	0	1	0	1
	Mean	--	--	--	3500.0	--	3500.0
	Median	--	--	--	3500.0	--	3500.0
	SD	--	--	--	--	--	--
	Min-Max	--	--	--	(3500-3500)	--	(3500-3500)
Total	Number	4	1	5	4	6	10
	Mean	466.7	200	400	2250	616.7	1270
	Median	200	200	200	2000	400	1250
	SD	461.9	--	400	957.4	526.9	1082.2
	Min-Max	(200-1000)	(200-200)	(200-1000)	(1500-3500)	(200-1500)	(200-3500)

Table C-10-1. Sources of drugs in public sector facilities (among those that had drugs available)

Source	Hospital		Health Center		Heath Unit		Total	
	n	(%)	n	(%)	n	(%)	n	(%)
Governorate	0	(0.0)	2	(7.4)	1	(0.9)	3	(100)
District	4	(80.0)	23	(85.2)	111	(98.2)	138	(100)
MoPHP	1	(20.0)	0	(0.0)	0	(0.0)	1	(100)
Private	0	(0.0)	2	(7.4)	0	(0.0)	2	(100)
Other/Cooperative	0	(0.0)	0	(0.0)	1	(0.9)	1	(100)
Total	**5**	**(100)**	**27**	**(100)**	**113**	**(113.0)**	**145**	**(100)**

Table C-11-1. Periodicity of delivering operational expenses in public facilities in the last year

Delivery of operational expenses	Facility Type							
	Hospital		Health Center		Health Unit		Total	
	n	(%)	n	(%)	n	(%)	n	(%)
Regular	5	(71.4)	14	(50.0)	34	(28.1)	53	(34.0)
Irregular	2	(28.6)	7	(25.0)	19	(15.7)	28	(17.9)
Incomplete	0	(0.0)	7	(25.0)	67	(55.4)	74	(47.4)
Unspecified	0	(0.0)	0	(0.0)	1	(0.8)	1	(0.6)
Total	**7**	**(100)**	**28**	**(100)**	**121**	**(100)**	**156**	**(100)**

Table C-11-2. Types of exemptions available among public facilities with exemption systems in place

Exemption type	Facility Type							
	Hospital		Health Center		Health Unit		Total	
	n	(%)	n	(%)	n	(%)	n	(%)
Free service	4	(57.1)	14	(51.9)	61	(61.6)	79	(59.4)
Reduced cost	2	(28.6)	10	(37.0)	32	(32.3)	44	(33.1)
In-kind	1	(14.3)	3	(11.1)	6	(6.1)	10	(7.5)
Total	**7**	**(100)**	**27**	**(100)**	**99**	**(100)**	**133**	**(100)**