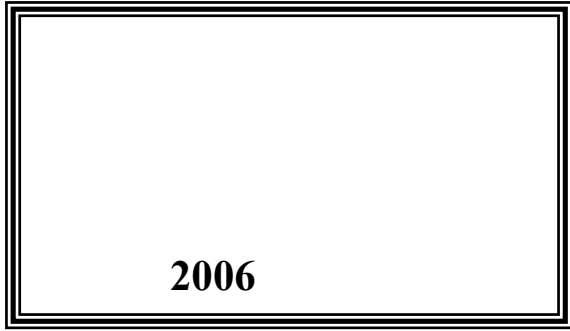




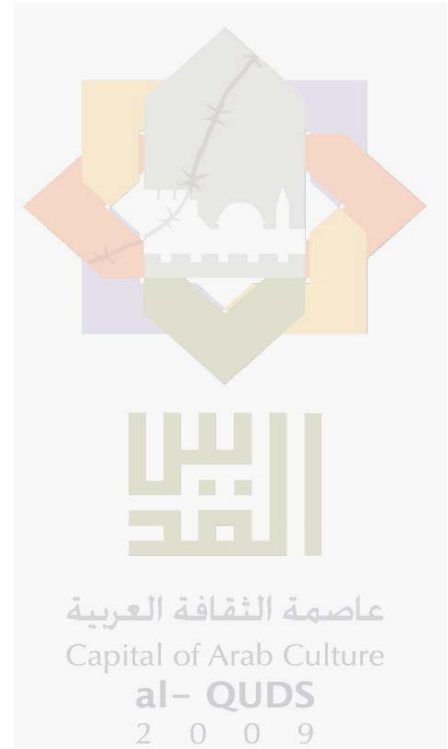
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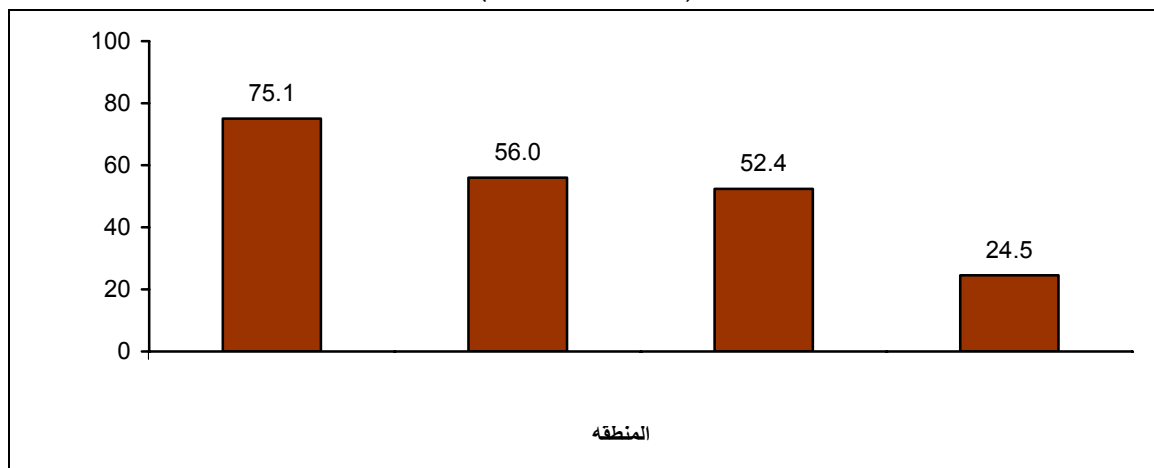
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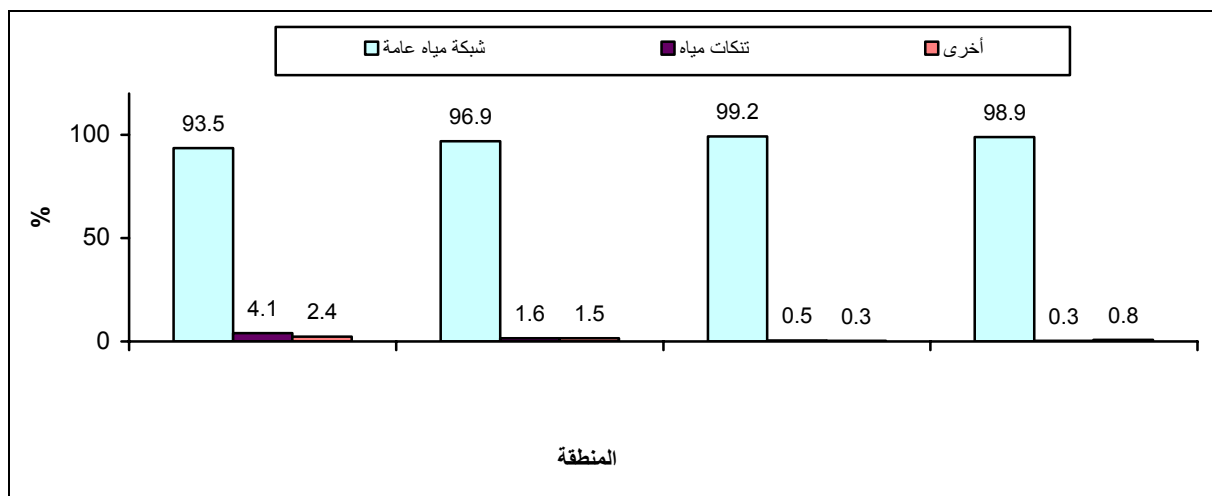
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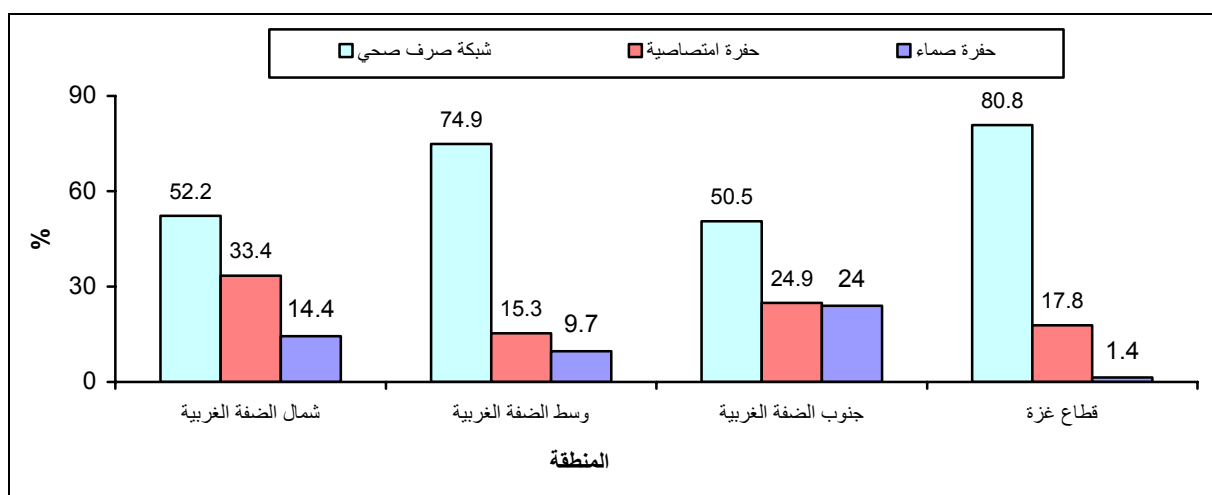


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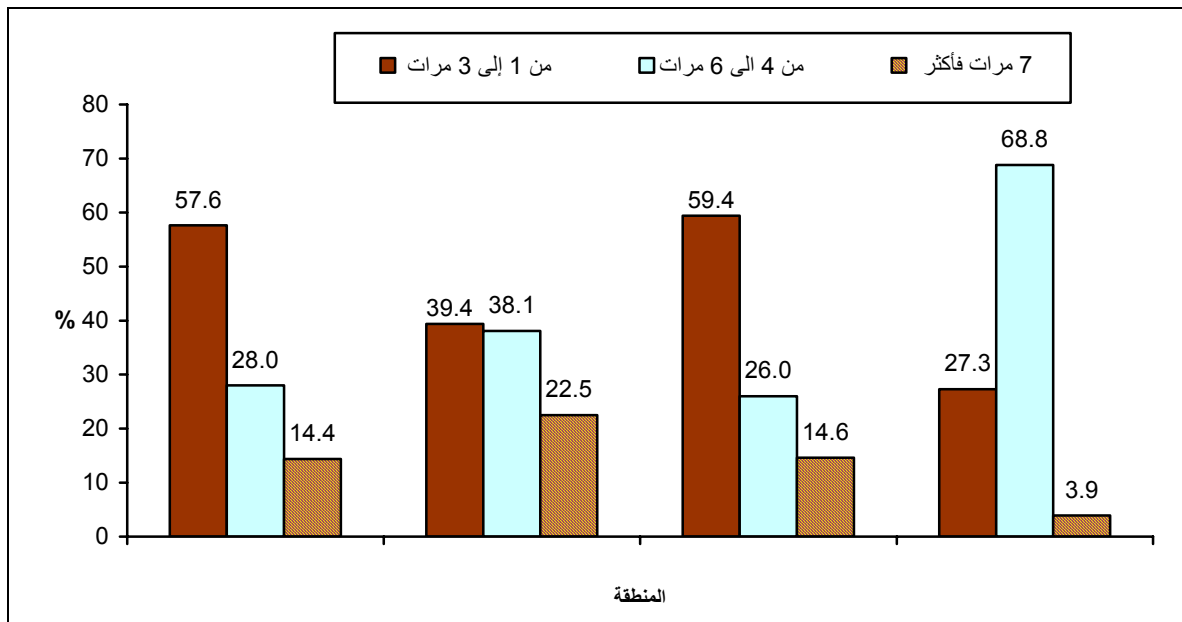
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Tables

Table1: Main Selected Indicators About the Activity of the Health Care Centers in the Palestinian Territory From Environmental Sides for the Years, 2008- 2009

Indicator	2009	2008	
Estimated Monthly Quantity of Water Consumed (1000 m3)	208.0	175.5	(³ 1000)
Percentage Distribution of Health Care Centers by Means of obtaining water			
Water network	96.6	94.0	
Water tanks	2.0	3.2	
Collection water well	0.9	2.6	
Others	0.5	0.2	
Percentage Distribution of Health Care Centers by Wastewater disposal method			
Wastewater network	61.1	60.0	
Tight cesspit	13.9	12.5	
Porous cesspit	24.9	27.5	
Others	0.1	0.0	
Percentage Distribution of Health Care Centers by Doer of Solid Waste Disposal			
The health care center	6.3	16.5	
Local Authority	83.5	74.0	
Private contractor	0.3	3.8	
UNRWA	9.8	2.4	
Others	0.1	3.3	

2009

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Table 2: Estimated Monthly Quantity of Water Consumed by Health Care Centers in the Palestinian Territory by Region, 2009

Units in cubic meter/month

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Region	Quantity of consumed water	
Palestinian Territory	207,966	
West Bank	132,866	
North of West Bank	52,428	
Middle of West Bank	55,926	
South of West Bank	24,512	
Gaza Strip	75,100	

2009

:3

Table 3: Percentage Distribution of Health Care Centers in the Palestinian Territory by the Means of Obtaining Water and Region, 2009

Region	Means of obtaining water					
	Total	Others	Water tanks	Collection water well	Water network	
Palestinian Territory	100	0.5	2.0	0.9	96.6	
West Bank	100	0.5	2.3	1.1	96.1	
North of West Bank	100	0.0	4.1	2.4	93.5	
Middle of West Bank	100	1.5	1.6	0.0	96.9	
South of West Bank	100	0.0	0.5	0.3	99.2	
Gaza Strip	100	0.8	0.3	0.0	98.9	

2009

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Table 4: Percentage Distribution of Health Care Centers in the Palestinian Territory by Wastewater Disposal Method and Region, 2009

Region	Wastewater disposal method					
	Total	Others	Porous cesspit	Tight cesspit	Wastewater network	
Palestinian Territory	100	0.1	24.9	13.9	61.1	
West Bank	100	0.2	26.3	16.4	57.1	
North of West Bank	100	0.0	33.4	14.4	52.2	
Middle of West Bank	100	0.1	15.3	9.7	74.9	
South of West Bank	100	0.6	24.9	24.0	50.5	
Gaza Strip	100	0.0	17.8	1.4	80.8	

2009

Table 5: Percentage Distribution of Health Care Centers in the Palestinian Territory by Existence of Wastewater Treatment, Method of Treatment and Region, 2009

Region	Wastewater treatment method				Existence of wastewater treatment	
	Total	Biological treatment	Chemical treatment	Mechanical treatment		
Palestinian Territory	100	19.3	54.3	26.4	1.7	
West Bank	100	19.9	65.0	15.1	1.9	
North of West Bank	100	0.0	45.3	54.7	0.3	
Middle of West Bank	100	57.3	24.9	17.8	2.5	
South of West Bank	100	3.7	89.0	7.3	3.6	
Gaza Strip	100	16.6	1.8	81.6	0.7	

2009

:6

Table 6: Estimated Monthly Quantity of Produced Solid Waste From Health Care Centers in the Palestinian Territory by Region, 2009

Quantities by Ton

Region	Monthly estimated quantity	
Palestinian Territory	1,201.9	
West Bank	472.4	
North of West Bank	120.4	
Middle of West Bank	178.2	
South of West Bank	173.8	
Gaza Strip	729.5	

2009

:7

Table 7: Percentage Distribution of Health Care Centers in the Palestinian Territory by the Solid Waste Collection Place and Region, 2009

Region	Waste collection place				
	Total	Outside the center	Inside the center square	Inside the center building	
Palestinian Territory	100	22.1	17.4	60.5	
West Bank	100	16.2	19.8	64.0	
North of West Bank	100	17.0	12.6	70.4	
Middle of West Bank	100	18.4	14.8	66.8	
South of West Bank	100	13.6	33.0	53.4	
Gaza Strip	100	50.5	5.9	43.6	

2009

:8

Table 8: Percentage Distribution of Health Care Centers in the Palestinian Territory by the Distance Between Health Care Center and Waste Collection Place and Region, 2009

Region	() Distance between health care center and waste collection place(m)				
	Total	150 More than 150	150 -51	50 Less than 50	
Palestinian Territory	100	4.7	18.2	77.1	
West Bank	100	4.6	19.4	76.0	
North of West Bank	100	0.0	6.9	93.1	
Middle of West Bank	100	14.9	13.0	72.1	
South of West Bank	100	2.0	47.0	51.0	
Gaza Strip	100	4.8	12.6	82.6	

2009

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Table 9: Percentage Distribution of Health Care Centers in the West Bank by the Volume of the Used Container and Region, 2009

Region	Volume of the used container in cubic meter				
	Total	7 فأكثر 7 and More	6-4	3-1	
West Bank	100	2.4	29.5	68.1	
North of West Bank	100	4.4	16.7	78.9	
Middle of West Bank	100	2.0	45.7	52.3	
South of West Bank	100	0.3	34.8	64.9	

2009

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Table 10: Percentage Distribution of Health Care Centers in the Palestinian Territory by the Material of Construction of the Used Container and Region, 2009

Region	Material of construction of the used container				
	Total	others	Plastic	Metal	
Palestinian Territory	100	0.4	5.1	94.5	
West Bank	100	0.3	3.9	95.8	
North of West Bank	100	0.3	1.3	98.4	
Middle of West Bank	100	0.0	8.9	91.1	
South of West Bank	100	0.3	4.1	95.6	
Gaza Strip	100	0.8	11.0	88.2	

Table 11: Percentage Distribution of Health Care Centers in the Palestinian Territory by the Solid Waste Collection Mean Inside the Health Care Center and Region, 2009

Region	Collection mean					
	Total	Health care center closed container	Health care center open container	Local authority closed container	Local authority open container	
Palestinian Territory	100	4.6	3.0	9.6	82.8	
West Bank	100	4.0	2.7	10.6	82.7	
North of West Bank	100	4.2	4.3	8.7	82.8	
Middle of West Bank	100	4.2	3.9	30.8	61.1	
South of West Bank	100	3.6	0.2	0.7	95.5	
Gaza Strip	100	7.2	4.4	5.0	83.4	

Table 12: Percentage Distribution of Health Care Centers in the Palestinian Territory by the Doer of Transporting Solid Waste and Region, 2009

Region	Doer of transporting the waste						
	Total	Others	UNRWA	Private contractor	Local Authority	The health care centers	
Palestinian Territory	100	0.1	9.8	0.3	83.5	6.3	
West Bank	100	0.0	11.0	0.0	82.9	6.1	
North of West Bank	100	0.0	3.6	0.0	91.9	4.5	
Middle of West Bank	100	0.0	30.2	0.0	63.4	6.4	
South of West Bank	100	0.0	6.5	0.0	85.5	8.0	
Gaza Strip	100	0.1	4.0	1.8	86.6	7.5	

2009

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Table 13: Percentage Distribution of Health Care Centers in the Palestinian Territory by the Waste Final Disposal Place and Region, 2009

Region	Waste Final Disposal Place					
	Total	Others	Disposed randomly	Private dumping site	Local authority dumping site	
Palestinian Territory	100	2.7	0.5	19.1	77.7	
West Bank	100	3.1	0.6	21.2	75.1	
North of West Bank	100	0.4	0.5	23.9	75.2	
Middle of West Bank	100	7.6	1.4	22.4	68.6	
South of West Bank	100	3.4	0.2	16.5	79.9	
Gaza Strip	100	0.6	0.0	8.9	90.5	

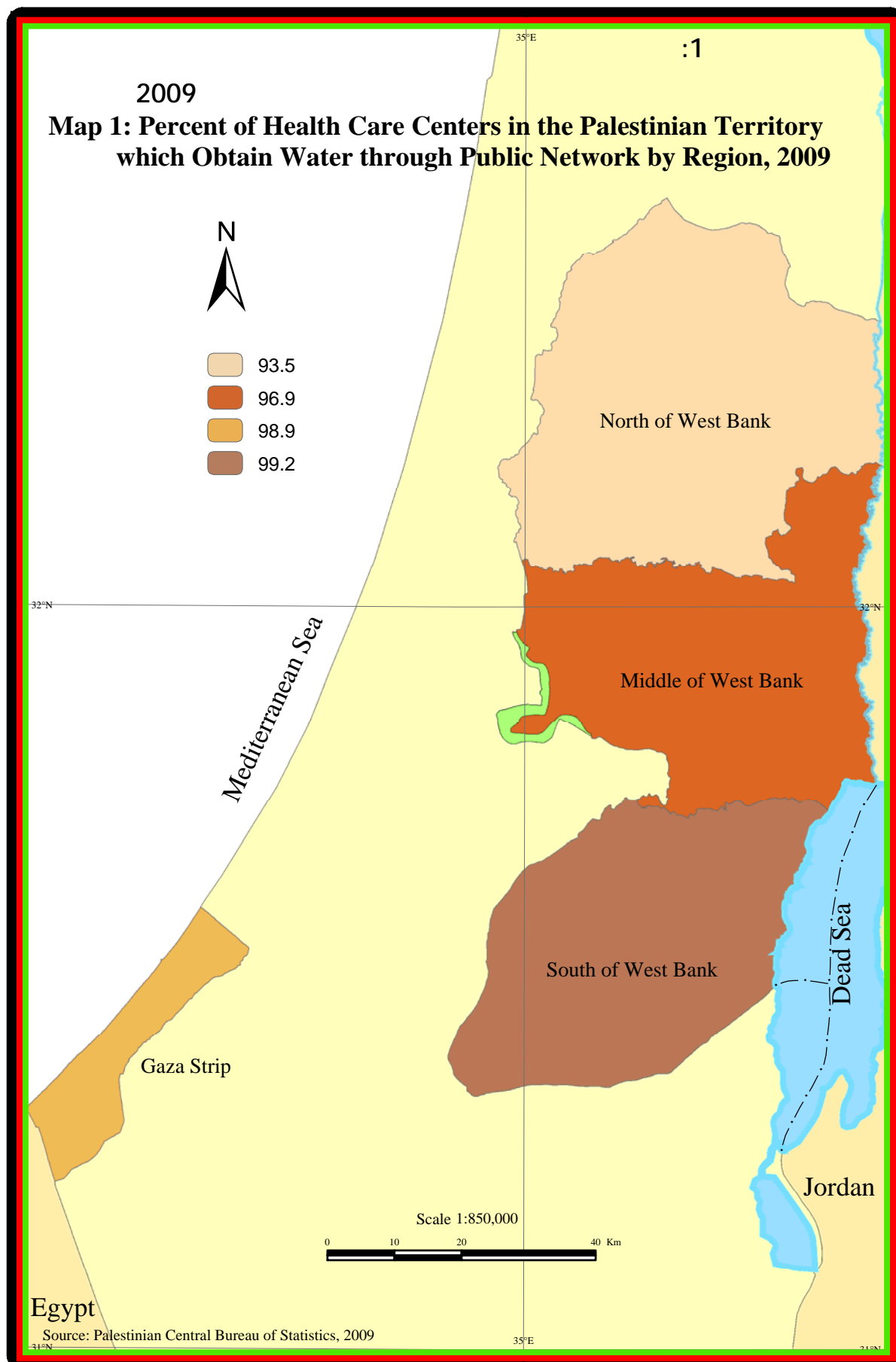
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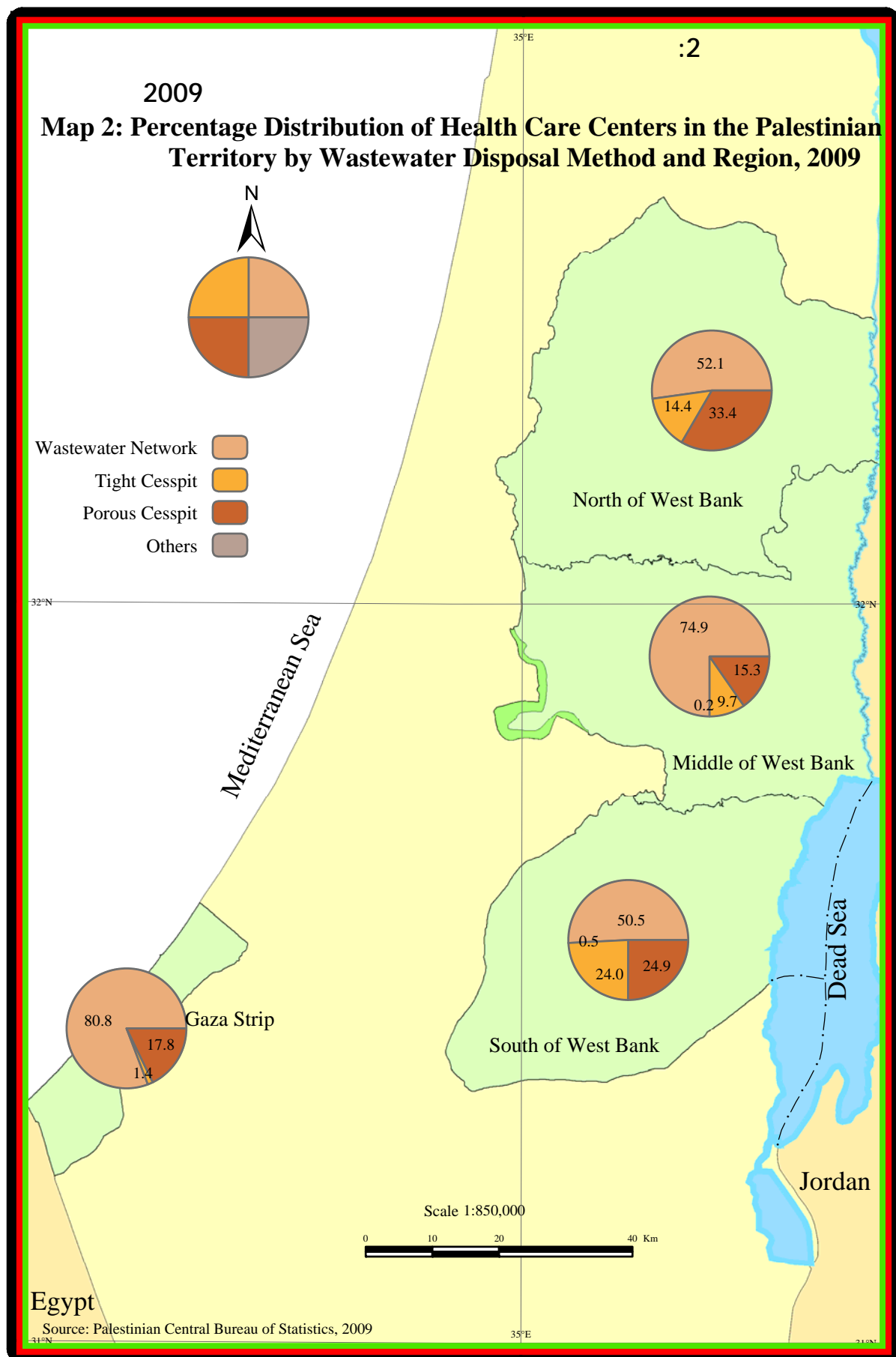
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Table 14: Percentage Distribution of Health Care Centers in the Palestinian Territory by the Weekly Periodicity of Final Disposal Waste and Region, 2009

Region	Periodicity				
	Total	7 times or more	6-4 times	3 1 From 1 to 3 times	
Palestinian Territory	100	14.3	36.4	49.3	
West Bank	100	16.4	29.8	53.8	
North of West Bank	100	14.4	28.0	57.6	
Middle of West Bank	100	22.5	38.1	39.4	
South of West Bank	100	14.6	26.0	59.4	
Gaza Strip	100	3.9	68.8	27.3	

Maps







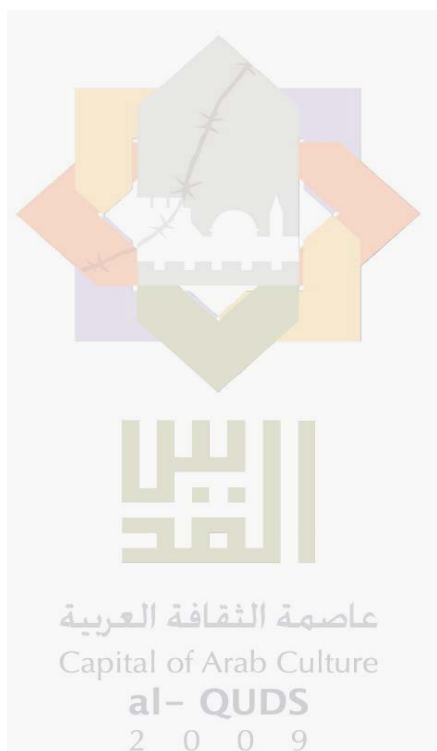
**Palestinian National Authority
Palestinian Central Bureau of Statistics**

**Environmental Survey for Health Care
Centers, 2009 Main Findings**

December, 2009

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TABLES ARE PRINTED IN THE ARABIC ORDER (FROM RIGHT TO LEFT)



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All correspondence should be directed to:
Palestinian Central Bureau of Statistics.
P.O. Box 1647, Ramallah - Palestine.

Tel: (972/970) 2 298 2700
Fax: (972/970) 2 298 2710
E-Mail: diwan@pcbs.gov.ps
Web-site: <http://www.pcbs.gov.ps>

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The Palestinian Central Bureau of Statistics (PCBS) would like to thank all the cooperating Palestinian Organizations and appreciates their commitment to bring this achievement into light.

The funding for the Environmental Survey for Health Care Centers was provided by the Palestinian National Authority (PNA) and the Core Funding Group (CFG) for 2008. CFG members include the Representative Office of Norway to the PNA; the Representative Office of Netherlands to PNA; and the Swiss Agency for Development and Cooperation (SDC).

Printing of this document was funded by the European Union. The content of this document are the sole responsibility of the PCBS.

On this occasion, PCBS extends special thanks to the members of the CFG and the EU for their support.

Important Remarks

Due to the siege imposed on the Gaza Strip, the Environmental Survey for Health Care Centers was conducted in the West Bank, and the data of Gaza Strip were estimated from the data of the 2004-2008 surveys. For further information about the data estimation please refer to the methodology chapter in this report.

Team Work

- **Report Preparation**
Zahran Ikhlaif
- **Maps Design**
Amal Jaber
- **Graphic Design**
Ahmad Sawalmeh
- **Dissemination Standard**
Hanan Janajreh
- **Preliminary Review**
Mahmoud Abd-Alrahman
- **Final Review and Overall Supervision**
Inaya Zidan
Ola Awad

Preface

There is increased attention around the world concerning the provision of environmental statistics for the health care sector. Providing such data can aid policy making and legislation designed to reduce the pressure on the environment. Attention has greatly increased in the Palestinian Territory as elsewhere, about providing such data after many years of environmental negligence and the absence of standards and rules during the period of the Israeli occupation.

We are pleased to publish this specialized statistical report about the environmental situation in the health care centers in the Palestinian Territory. This report presents the main findings of the Health Care Environmental Survey 2009. This survey is part of our official effort at creating and establishing the National Statistical System, and providing the necessary statistics to Palestinian policy-planners and decision-makers in the environment and natural resources sector.

PCBS conducted the Health Care Environmental Survey during the period 20/03/2009 to 01/10/2009. The main objective of the survey was to provide reliable data on the environmental reality on the health care centers in the Palestinian Territory, including the methods used to handle solid waste and wastewater. It also included the role of the local authority in providing the suitable environment to reduce the negative effect of the different types of pollution on the health care centers.

This report presents the main findings of the Health Care Environmental Survey. It is one of a series of reports scheduled to be published by PCBS on the environment and natural resources in Palestine according to the plan for the Environment Statistical Department, as a tool for describing the status of environment in the Palestinian Territory.

This report presents statistical data for water consumption in the health care centers by water source, the methods of solid waste disposal and their main components, and the disposal of wastewater.

PCBS hopes that the main findings of this survey will contribute to improving the environmental status and minimizing the random depletion of natural resources, in addition to providing reliable and useful statistics for Palestinian planners and decision makers.

December, 2009

**Ola Awad
Acting President**

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Executive Summary

The estimated quantity of water consumed by the health care centers in the Palestinian Territory was 208.0 thousand cubic meters/month in 2008, of which 132.9 thousand cubic meters/month in the West Bank and 75.1 thousand cubic meters/month in Gaza Strip. In 2008, estimated quantity of water consumed by the health care centers in the Palestinian Territory was estimated at 175.5 thousand cubic meters/month.

The results in 2009 showed that 96.6% of the health care centers in the Palestinian Territory obtain water from the water network, whereas during 2008 this percentage was 94.0%.

The results showed that 61.1% of the health care centers in the Palestinian Territory in 2009 dispose of their wastewater using a public network, 13.9% of the health care centers use tight cesspit, and 24.9% of the health care centers use a porous cesspit.

The monthly estimated quantities produced by the health care centers in the Palestinian Territory in 2009 were about 1,202 tons, distributed into 472 tons in the West Bank, and 730 in Gaza Strip.

82.8% of the health care centers collected waste in a local authority open container, 9.6% of the health care centers in local authority closed containers, and 3.0% of the health care centers in health care center open containers, while 4.6% of the health care centers in health care center closed container.

Chapter One

Introduction

1.1 Introduction

Environmental statistics in the health care centers are an important instrument for decisions, planning, and drawing the framework for environment. Responding to the lack of data about this subject in the Palestinian Territory, the Palestinian Central Bureau of Statistics (PCBS) builds up and develops a database about the environment in the health care centers.

For this, PCBS implemented specialist surveys on the environmental of the governmental sector and non-governmental organizations health sector through administrative records during the period 20/03/2009 to 01/11/2009; for the private health sector the environmental economic survey was implemented during the period 22/03/2009 to 28/05/2009.

1.2 Survey Objectives

The main objective of this survey is to provide statistical data about the health care centers for the following indicators:

- Water consumption and water sources
- Wastewater
- Medical waste management

1.3 Report Structure

This report is divided into five chapters; the first chapter contains the introduction, aims and report structure. The second chapter contains the concepts and definitions in this report. The third chapter defines the main findings of the report. The fourth chapter explains the methodology of collecting and tabulation. The fifth chapter handles data quality by presenting the main notes on the data and estimations of the data sources of this report.

Chapter Two

Concepts and Definitions

Biological Treatment

Wastewater treatment employing aerobic and anaerobic microorganisms that results in decanted effluents and Separate sludge containing microbial mass together with pollutants. Biological treatment processes are also used in combination or in conjunction with mechanical and advanced unit operations.

Cesspit

A well or a pit in which night soil and other refuse is stored, constructed with either tight or porous walls.

Clinical Waste (Health Care Waste)

Any waste coming out of health Care provided in hospitals or other health care centers. However the definition does not include health Care waste resulting from health care at home.

Dumping Site

Site used to dispose of solid wastes without environmental control.

Wastewater Mechanical Treatment

Wastewater treatment of physical and mechanical nature that results in decanted effluents and Separate Sludge. Mechanical treatment processes are also used in combination with biological and advanced unit operations. Mechanical treatment includes Processes such as sedimentation and flotation.

Primary Health Care Center

Health center offers preventive care (diagnostic and curative) before illness case is complicated.

Secondary Health Care Center

Health center offers curative and nursing health care for illness case exceeding Primary Health Care.

Separation (Segregation)

The system separation of solid waste into designated categories

Sewage Network

System of collectors, pipelines, conduits and pumps to evacuate wastewater (rainwater, domestic and other wastewater) from any of the location paces generation either to municipal sewage treatment plant or to a location place where wastewater is discharged.

Solid Waste Disposal

Ultimate deposition or placement of refuse that is not salvaged or recycled.

Solid Waste

Useless and sometimes hazardous material with low liquid content, solid wastes include municipal garbage, industrial and commercial waste, sewage sludge, wastes resulting from agricultural and animal husbandry operations and other connected activities, demolition wastes and mining residues.

Transport of the Health Care Waste

The movement of the health care waste from the point of generation to any intermediate point and finally to the point of treatment or disposal. Transport does not include the movement of health care waste from a health facility or agency to another health facility or agency for the purposes of testing and research.

Waste Collection

Collection or transport of waste to the place of treatment or discharge by municipal services or similar institutions, or by public or governmental and non-governmental corporations, specialized enterprises or general government. Collection of municipal waste may be selective, that's to say carried out for a specific type of product, or undifferentiated, in other words, covering all kinds of waste at the same time.

Wastewater Treatment

Process to render wastewater fit to meet environmental standards or other quality norms. Three broad types of treatment may be distinguished mechanical, biological, and advanced.

Wastewater

Used water, typically discharged into the sewage system. It contains matter and bacteria in solution or suspension.

A set of special symbols was used in the tables of this report

(-): Nil

(0): The value is less than (0.05)

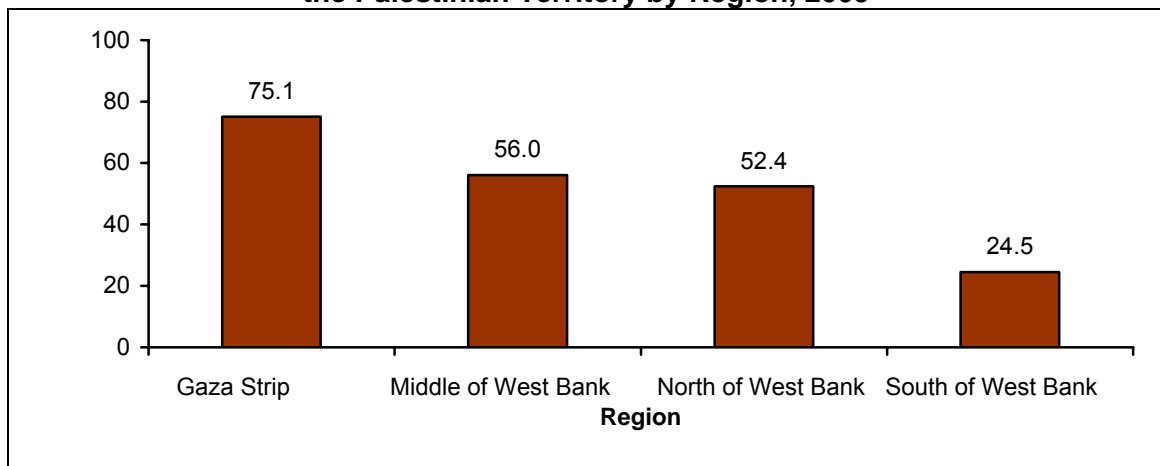
Main Findings

This chapter presents the main findings of the health care environment survey 2009 which were collected using two methods: the first method is administrative records which are used to collect data about governmental and non-governmental health care centers, and the second method is the sampling survey which is used to collect data about private health care centers. Statistical results are classified according to the main components of environmental elements in health care centers, including water, wastewater, and health care waste.

3.1 Water Consumption and Water Sources

The estimated quantity of water consumed by the health care centers in the Palestinian Territory was 208.0 thousand cubic meters/month in 2008, of which 132.9 thousand cubic meters/month in the West Bank and 75.1 thousand cubic meters/month in Gaza Strip. In 2008 it was estimated at 175.5 thousand cubic meters/month in the Palestinian Territory.

Figure 1: Estimated Monthly Quantity of Water Consumed by Health Care Centers in the Palestinian Territory by Region, 2009



Sources of Water Supply

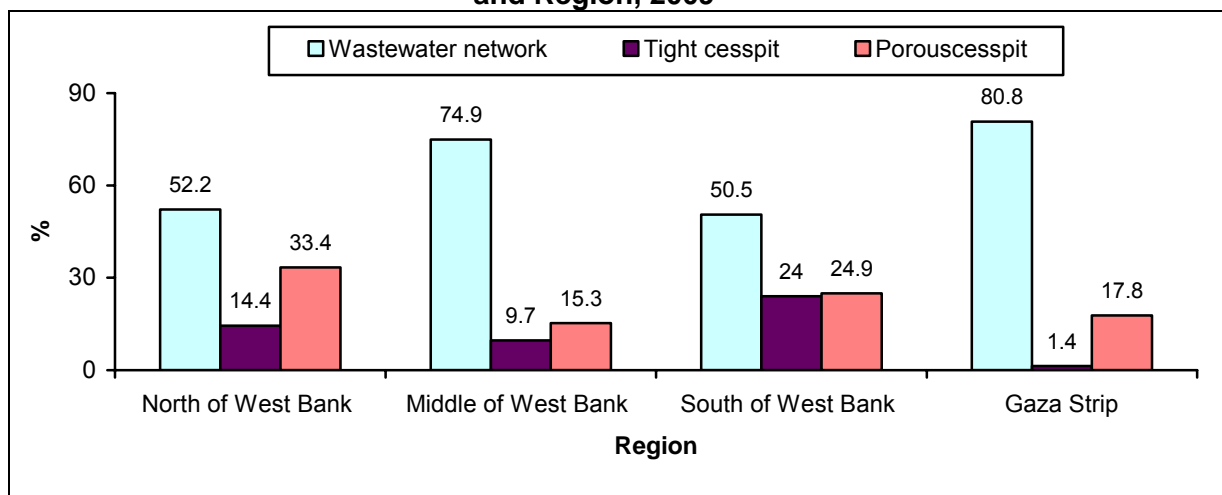
The results in 2009 showed that 96.6% of the health care centers in the Palestinian Territory obtain water from the water network, whereas during 2008, this percentage was 94.0%.

3.2 Wastewater

Disposal Methods

The results showed that 61.1% of the health care centers in the Palestinian Territory in 2009 dispose of their wastewater using a public network, 13.9% of the health care centers use a tight cesspit, and 24.9% of the health care centers use a porous cesspit.

Figure 2: Percentage of Health Care Centers by the Method of Wastewater Disposal and Region, 2009



Treatment of Wastewater

1.7% of the health care centers in the Palestinian Territory treated their wastewater. The main treatment methods used were the mechanical, chemical, and biological treatments.

3.3 Health Care Waste Management

Quantity of produced waste

The monthly estimated quantities produced by the health care centers in the Palestinian Territory in 2009 were about 1,202 tons, distributed into 472 tons in the West Bank, and 730 in Gaza Strip.

Collecting Health Care Waste

82.8% of the health care centers collected waste in a local authority open container, 9.6% of the health care centers in the local authority closed containers, and 3.0% of the health care centers in health care center open containers, while 4.6% of the health care centers in health care center closed containers.

Periodicity of waste final disposal

The periodicity of waste final disposal was 1 to 3 times per week for 49.3% of the health care centers in the Palestinian Territory, and 4 to 6 times per week for 36.4% of the health care centers, whereas the periodicity of waste final disposal for 14.3% of the health care centers was 7 times or more.

Chapter Four

Methodology

This chapter presents the scientific methodology used in the planning and implementation of the environmental survey for the health care sector including the design of the survey tools and methods of collecting, processing and analysis of data.

Estimation of Gaza Strip data:

Due to the difficulty of collecting data of Gaza Strip in 2009, data were estimated for 2009 by using the results of the surveys carried out in the years 2004 to 2008 for the same sector. Due to the absence of long time series, the estimations of 2009 is considered as an average of the results of 2004-2008 for all indicators.

4.1 The Survey Questionnaire

The environmental questionnaire was designed in accordance with similar country experiments and according to international standards and recommendations for the most important indicators, taking into account the special situation of the Palestinian Territory.

4.2 Sampling and Sampling Frame

Target Population:

The target population of this survey is all health care centers in the Palestinian Territory, divided into:

1. Governmental health care centers (Ministry of Health, Health Care Military Service, and Lijan Azakah).
2. Non-governmental health care centers (Health Union Committees, Union of Palestine Health Care Relief Committees, Patients Friends Benevolent Society, UNRWA, Red Crescent Society, and Red Cross) in the Palestinian Territory.
3. Private health care sector.

Sampling Frame

The sampling frame was based on by type of health care centers:

1. **Governmental and Non-governmental Health care centers:** The frame of all centers which work in sector of health care which are owned by Governmental and Non-governmental health care centers updated annually by the administration records in the PCBS.
2. **Private Health Care Sector:** The general frame for the establishments found in the Establishment Census 2008.

Sample size

The sample size was 141 private health care centers in the West Bank, and 380 Governmental and Non-governmental Health care centers.

Sample Design

The sample of the survey is a single-stage stratified cluster random sample.

4.3 Fieldwork

The fieldwork is necessary to obtain the required data from the primary source, and guarantee a good orthopedist for this stage is the main affair which works on in this stage.

The data in this report come from two sources and each one has a method for collecting data about the health care centers.

The data which comes from administrative records source, involved apportioning the questionnaires to the respondents to be filled by themselves, during 20/03/2009 to 01/11/2009.

Concerning the data which comes from the sampling survey collected by fieldworkers during 20/04/2008 to 03/08/2009, this type of collection method must pass two stages:

1. Training fieldworkers on the main skills before the start of data collection.
2. Distribution of the team of fieldworkers into groups.

4.4 Data Processing

The data processing stage consists of the following operations:

Editing before data entry

All questionnaires were edited again in the office using the same instructions adopted for editing in the field.

Data entry

Then data was entered into the computer, using Microsoft Access. The data entry program was prepared to satisfy a number of requirements such as:

- Duplication of the questionnaire on the computer screen.
- Logical and consistency check of data entered.
- Possibility for internal editing of questions answered.
- Maintaining a minimum of digital data entry and fieldwork errors.
- User-friendly handling.
- Possibility of transferring data into another format to be used and analyzed using other analytical statistical systems such as SAS and SPSS.

Chapter Five

Data Quality

The concept of data quality consists of many aspects starting from the planning, to the survey and on to the publishing method and data analysis. The main principles of statistical quality are accuracy, comparability, and data quality assurance procedures.

5.1 Accuracy of the Data

Two types of errors affected the quality of the report's data, sampling and non sampling errors. Sampling errors are measurable and very limited in this report. The non-sampling errors could not be determined easily, due to the diversity of sources (e.g., the interviewers, respondents, editors, coders, data entry operators, etc). To minimize such errors data was edited before and after the entry process.

Comprehensiveness

One of the most important goals in publishing annual reports for the statistics of the environment for the health care sector is to create time series tables for the most important indicators relating to environmental conditions and circumstances of this important sector in the Palestinian Territory.

This report covers the most important environment-related indicators for the health care sector in 2009.

As for the geographic database, this notes that health care centers are covered in all governorates, noting that the published data has been deployed in the region include the West Bank (North of West Bank, Middle of West Bank, South of West Bank), and Gaza Strip.

5.2 Comparison of the Data

Surveys were carried out from 2001 to 2009 (except 2003), so the previous data is used to compare with 2009 data.

5.3 Data Quality Assurance Procedures

There are two sources of data in this report, in the first source (health care environmental survey 2009) several measures were made to ensure quality control such as the survey question was designed in an easy form for the respondents and it was ensured that the questionnaire included a list of definitions of terms and manual for each question. There was also direct follow up by project management and administrative records division in the Surveys and Fieldwork Directorate. An audit of questionnaires was carried out before data entry, and then a program was used that does not allow any mistakes during the process of data entry. Data was examined to ensure that they were free from errors not previously discovered. After the receipt of the raw data file, cleaning and inspection of the anomalous values was made, and also inspection of the consistency between the different questions on the questionnaire.

For the second source (Environmental Economic Survey 2009) several measures were made to ensure quality control in the survey, such as the training of the fieldworkers on main skills before the start of data collection, and conducting field visits to field researchers to ensure the integrity of data collection, in addition to conducting a re-interview for 5% of the establishments. Audit of questionnaires was carried out before data entry, and then a program

was used that does not allow any mistakes during the process of data entry. Data was examined to ensure that they were free from errors not previously discovered. After the receipt of the raw data file, cleaning and inspection of the anomalous values was made, and also inspection of the consistency between the different questions on the questionnaire.

5.3 Special Technical Notes

This part presents the important technical notes on the indicators presented in the results of the survey:

- Data from the Gaza Strip should be handled carefully because it is an estimation from the previous cycles of survey (2004-2007).
- The table of water quantity (table 2), and table of solid waste quantity (table 6) were based on the respondents' estimations.
- Non-statistical errors sources during the implementation of the survey were:
 1. Differentiation on understanding the questionnaires.
 2. Variation in individual measurements of some different issues such as the amount of water consumed and the amount of solid waste generated has been appreciated, in addition to questions relating to estimates of sizes, distances and time periods.

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