

Assessment of the Reality of Medical Waste in Governmental and Private Hospitals in Dhi Qar Governorate

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Abstract:

The study aims to examine the reality of medical waste generated by governmental and private hospitals in Dhi Qar Governorate and to identify the key factors influencing its spatial variations. This is to determine the extent of the problem, propose appropriate solutions, and reveal the current methods of waste treatment and disposal.

The study employs a descriptive and analytical approach, relying on data from relevant entities, particularly the Dhi Qar Health Department and the Dhi Qar Statistics Office.

The research concludes that the study area suffers from the issue of medical waste generated by hospitals, with noticeable spatial variations in its quantities across districts and depending on the type of hospital ownership. Furthermore, the treatment of medical waste faces several challenges.

Keywords: Medical Waste, Governmental and Private Hospitals, Dhi Qar Governorate

Introduction

Waste, in general, is one of the problems that leaves harmful effects on both living and non-living components of the environment. Medical waste, in particular, is considered one of the most dangerous sources, as it contains hazardous sharp materials, whether chemical or metallic.

This issue varies spatially under the influence of several environmental factors, especially differences in population density, the number of hospitals, and the number of patients. It requires the adoption of safe treatment methods that comply with environmental regulations.

First: The Research Problem

The governorate includes several governmental and private hospitals that generate varying quantities of medical waste. Therefore, this research aims to study the problem, which is framed by a primary question:

What is the reality of medical waste generated by hospitals in Dhi Qar Governorate?

This main question branches into the following sub-questions:

1. What is the quantity of medical waste produced by hospitals in Dhi Qar Governorate?
2. Is there a spatial variation in medical waste across the Dhi Qar Governorate?
3. What are the most significant environmental factors related to the variation in medical waste in Dhi Qar Governorate?
4. What is the current state of medical waste treatment in hospitals in Dhi Qar Governorate?

Second: The Research Hypothesis

The primary hypothesis of the research is that Dhi Qar Governorate suffers from the issue of accumulating medical waste generated by governmental and private hospitals. The quantities of waste vary spatially depending on the districts and the ownership of the hospitals, and there are significant challenges in waste treatment.

This hypothesis branches into the following points:

1. Hospitals generate considerable amounts of medical waste in Dhi Qar Governorate.
2. There is a spatial variation in the medical waste generated by hospitals across the Dhi Qar Governorate.
3. Human environmental factors play a role in the spatial variation of medical waste quantities in Dhi Qar Governorate.
4. The treatment of medical waste in hospitals faces numerous challenges in Dhi Qar Governorate.

Third: Research Objective

The research aims to determine the quantities of medical waste generated by governmental and private hospitals in Dhi Qar Governorate, identify spatial variations and differences, and analyze the main factors related to these variations. The ultimate goal is to propose the necessary steps to mitigate the impacts of these variations, address the environmental problems resulting from the disparity in medical waste, and reveal the current state of medical waste treatment.

Fourth: Research Significance

The significance of the research lies in its focus on an extremely important topic: the study of medical waste generated by hospitals, which is one of the most hazardous types of waste. The research sheds light on the reality of medical waste

quantities and their spatial variations in Dhi Qar Governorate, aiming to develop suitable solutions to minimize their environmental impacts and overcome the challenges of waste treatment.

Fifth: Research Methodology

The research relies on established scientific methods in environmental studies and research. It adopts the **descriptive method**, which focuses on presenting facts and realities, and the **analytical method**, which involves case study analysis and examining the results obtained.

Sixth: Research limits

1. Spatial

limits:

The spatial boundaries are represented by the borders of Dhi Qar Governorate for the year 2023, with a total area of **12,900 km²**. The governorate is located in southern Iraq, stretching between latitudes **30°37'N–32°00'N** and longitudes **45°39'E–47°10'E**. Wasit Governorate borders it to the north, Maysan Governorate to the east, Al-Muthanna and Al-Qadisiyyah Governorates to the west, and Basra Governorate to the south. Map (1) outlines the study area, defined based on the administrative divisions provided in the 2017 statistical report. These divisions include five districts and fifteen sub-districts ⁽¹⁾.

2. Temporal limits:

The temporal boundaries focus on the year **2023**, with references to previous years as needed and depending on the availability of data.

3. Thematic limits:

The study is confined to the examination of **solid medical waste** generated by governmental and private hospitals in the Dhi Qar Governorate.

Seventh: Structure of the Research

The research begins with a theoretical framework, including the definition of medical waste. It is divided into three main Chapters:

- 1. The First chapter:** Examines the reality of medical waste in hospitals in Dhi Qar Governorate and its spatial variations.
- 2. The Second chapter:** Analyzes the environmental factors influencing the variation in the quantities of medical waste.
- 3. The Third chapter:** Focuses on the treatment of medical waste.

The research concludes with the most important findings and recommendations.

Source: Republic of Iraq, Ministry of Water Resources, General Directorate of Survey, Department of Map Production, Digital Unit, Administrative Map of Dhi Qar Governorate, Scale 1:10,000, Baghdad, 2023.

Eighth: Definition of Medical Waste

Many studies and research have focused on medical waste, and there are various definitions of the concept. Some have defined medical waste as waste generated from contaminated sources or that has the potential to be contaminated by infectious, chemical, or radioactive agents, posing a risk to individuals, society, and the environment during its production, collection, storage, transportation, or disposal (2). The World Health Organization defines it as all waste produced by healthcare institutions, including waste from primary, secondary, or scattered sources, as well as waste from the treatment of individuals at home (3). The United Nations describes medical waste as waste that is infectious, toxic, or burned, which can accumulate in the body or cause allergies and cancer (4). The Environmental Protection Agency in the United States defines it as any medical waste produced or generated in diagnosis or treatment, as well as at centers conducting human and animal experiments and biological tests (5).

Chapter One: The Reality of Waste

Understanding the distribution of medical waste in the study area and its spatial and temporal variations is essential for decision-makers in order to identify the major environmental issues, especially in urban areas. This knowledge is necessary to take appropriate actions that can contribute to improving public health and the environment and to solving some of the problems.

Studying this distribution is important as it provides a comprehensive view of the issue, enabling analysis and the identification of relationships between the study problem and other environmental factors. The spatial trends of medical waste in hospitals were studied using data from the Dhi Qar Health Directorate, statistical departments, and infection control units in private hospitals.

It can be seen from Table (1) that the total weight of solid medical waste generated by governmental and private hospitals in the study area for the year 2023 amounted to **60,160 kg**. According to the referenced table and Map (2), it is observed that the waste is distributed unevenly across the districts, with **Al-Nassiriyah District** occupying the first rank, accounting for **58.9%** of the total medical waste from hospitals in the study area for the year 2023. The reason for

this high percentage can be attributed to the high population proportion of the district, as well as the increased number of healthcare facilities.

Table (1)

Quantitative and Relative Distribution of Medical Waste Weights by Districts in Dhi Qar Governorate for the Year 2023

No.	Districts	Weight of Medical Waste (kg)	%
1	Al-Nassiriyah	35,429	58.9
2	Al-Shatra	9,450	15.7
3	Al-Rifa'i	8,370	14
4	Suq Al-Shuyukh	2,009	3.3
5	Al-Jubayish	4,902	8.1
Total		60,160	100

Source: The researcher, based on: Republic of Iraq, Ministry of Health, Dhi Qar Health Directorate, Department of Planning and Human Development, Infection Control Unit, 2023.

The district of **Al-Nassiriyah** is home to most of the healthcare institutions, including numerous doctors' clinics, making it a primary destination for patients from both the district and other districts. As a result, it ranked first, accounting for **58.9%** of the total medical waste in the study area for 2023.

The district of **Al-Shatra** ranked second with **15.7%**, while **Al-Rifa'i** ranked third with **14%**. **Al-Jubayish** occupied fourth place with **8.1%**, and **Suq Al-Shuyukh** ranked last with **3.3%** of the total medical waste from hospitals in the study area for 2023.

Regarding the spatial variation based on the ownership of hospitals, according to the data in Table (2) and Figure (1), it is observed that **governmental hospitals** generated the largest proportion of medical waste, accounting for **97.9%**, while **private hospitals** produced only **2.1%** of the total medical waste in the study area.

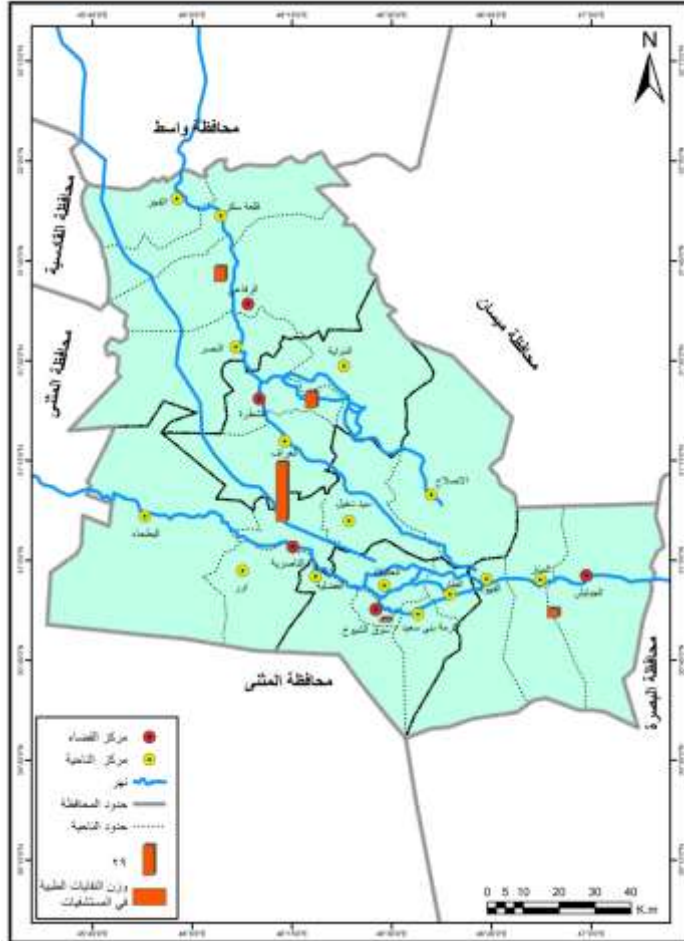
Table (2)

Quantitative and Relative Distribution of Medical Waste Weights Based on Hospital Ownership in Dhi Qar Governorate for the Year 2023

Hospital Ownership	Weight of Medical Waste (kg)	%
Governmental Hospitals	58,859	97.7
Private Hospitals	1,301	2.1
Total	60,160	100

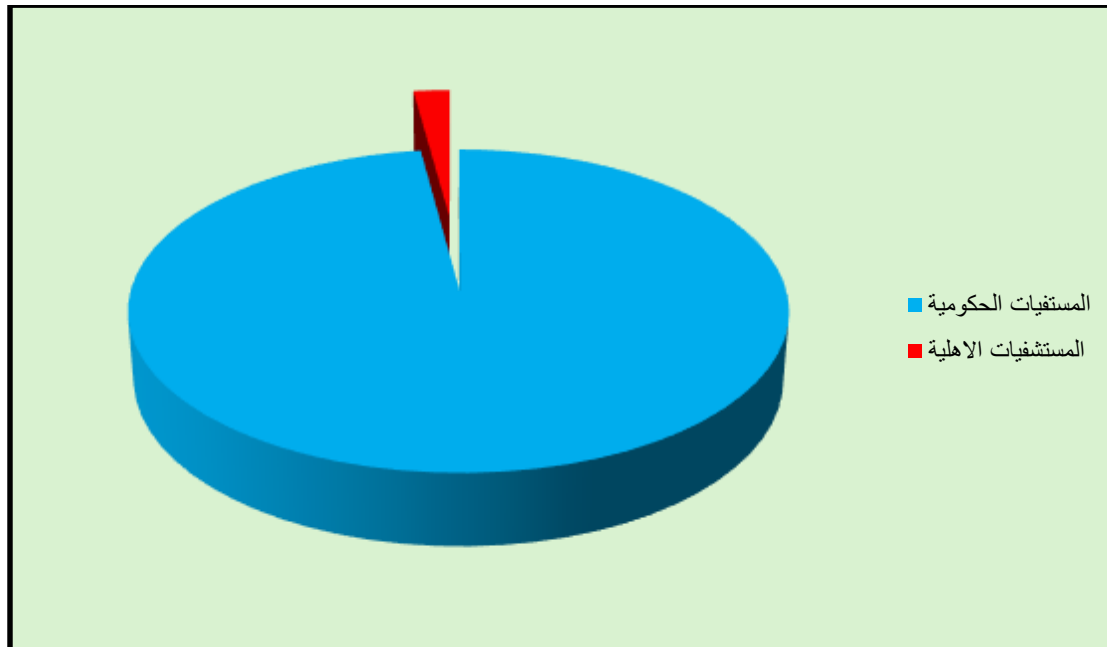
Source: The researcher, based on: Republic of Iraq, Ministry of Health, Dhi Qar Health Directorate, Department of Planning and Human Development, Infection Control Unit, 2023.

Map (2) Relative Distribution of Medical Waste Weights for Governmental and Private Hospitals in Dhi Qar Governorate for the Year 2023



Source: The researcher, based on the data from Table (1).

Figure (1) Relative Distribution of Medical Waste Weights for Hospitals in Dhi Qar Governorate for the Year 2023



Source: The researcher, based on the data from Table (2).

Chapter Two: Environmental Factors Related to Spatial Variations in Medical Waste

First: Numerical and Relative Distribution of the Population

The study of population distribution and density in a given area is an important focus for geographers, as it reveals variations in the population size across administrative units and natural regions, based on geographical population movements and the reasons behind these distributions. (6)

According to the data in Table (3), the total population in the study area for the year 2023 was **2,380,943** individuals. The distribution of the population across the districts, as shown in the table and Map (3), is characterized by variation. **Al-Nassiriyah District** ranked first with a population of **885,408** individuals, accounting for **37.2%** of the total population. **Al-Shatra** ranked second with **532,935** individuals, making up **22%** of the population. **Al-Rifa'i** ranked third with **491,754** individuals, representing **20.7%** of the total population. **Suq Al-Shuyukh** ranked fourth with **363,031** individuals, accounting for **15.2%** of the population. Finally, **Al-Jubayish** ranked last with **116,815** individuals, representing the lowest population percentage in the governorate at **4.9%** of the total population.

Table (3)

Numerical and Relative Distribution of the Population in Dhi Qar Governorate by Districts for the Year 2023

Administrative Units	Population Number	%
Al-Nassiriyah	885,408	37.2

Al-Shatra	523,935	22.1
Al-Rifa'i	491,754	20.6
Suq Al-Shuyukh	363,031	15.2
Al-Jubayish	116,815	4.9
Total	2,380,943	100

Source: The researcher, based on: Republic of Iraq, Ministry of Planning and Development Cooperation, Central Statistical Organization and Information Technology, Dhi Qar Statistics Directorate, Population Estimates for the period 2013-2023, unpublished data.

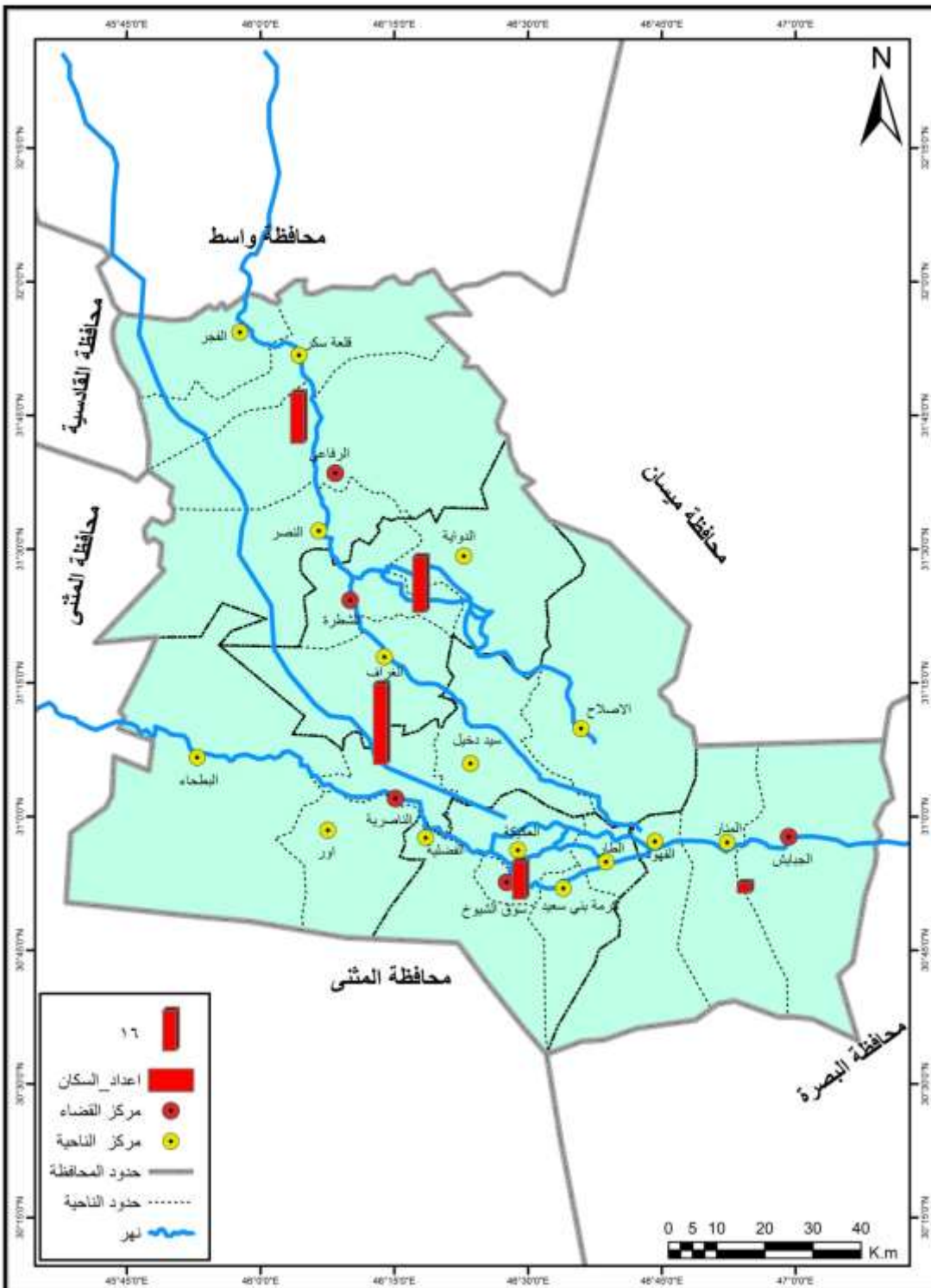
Based on the table, map, and graphical representation, it is clear that the population is not evenly distributed across the administrative units of the governorate. This variation in distribution can be attributed to several natural and human factors, such as differences in area size, administrative rank, and the availability of resources and natural endowments. These factors lead to migration from some districts to others and differences in the availability of services, institutions, and other facilities. The numerical variation in population distribution directly contributes to the variation in medical waste, as the amount of medical waste is directly proportional to population size.

Second: Geographic Distribution of Hospitals (Governmental and Private)

A hospital is defined as a healthcare institution that encompasses a variety of medical specialties, skills, and professions. It provides health services, medications, and materials, which are organized in a specific manner to serve patients, whether they are outpatients or inpatients. Additionally, hospitals play a significant role in facilitating education in medical and nursing colleges and institutes, as well as promoting health research that benefits the community's overall health (7).

Map (3)

The Relative Distribution of the Population in Dhi Qar Governorate by Districts for the Year 2023



Source: The researcher, based on the data from Table (3)

Hospitals are classified into public hospitals, which are the most common type of hospitals worldwide, and private hospitals, which are owned and managed by individuals, who could be doctors, investors, or charitable institutions. Private hospitals provide healthcare services in exchange for fees determined by the hospital management. Hospitals are also classified based on the type of service they offer. General hospitals provide medical and treatment services across all specialties, and they tend to serve a larger number of patients compared to other types of hospitals. Specialized hospitals focus on treating specific diseases, such as pulmonary diseases or heart diseases, and the quantity of medical waste they generate is usually lower than that produced by general hospitals (8).

Private hospitals are considered one of the important healthcare services in the study area, especially during the period of the blockade, as they filled the gap in public hospitals, albeit to a limited extent. The emergence of private hospitals began after the issuance of the Public Health Law No. (89) of 1981 and the Law for the Establishment of Private Hospitals No. (25) of 1984 (9).

It is clear from Table (4) that the total number of hospitals in the study area for the year 2023 is 15 hospitals, including 10 government hospitals, which are distributed as follows: 2 specialized hospitals, namely Al-Nassiriya Heart Center and Muhammad Al-Mousawi Children's Hospital; 4 educational hospitals, namely Al-Hussein, Bint Al-Huda for Obstetrics and Pediatrics, Al-Haboubi, and Al-Rifai educational hospitals; and 4 general hospitals, namely Al-Nassiriya General, Turkish, Al-Shatra General, and Al-Jubayish General hospitals. Additionally, the number of private hospitals in the study area for the same year is 5 hospitals, namely Al-Rabee, Al-Amal, Al-Rahman, Al-Hadharat, and Al-Azhar.

It is clear from the data in the previous table and Map (4) that the distribution of hospitals by districts shows variation. Al-Nassiriya district occupies the first rank with a total of 11 government and private hospitals, representing 73.3% of the total hospitals in the study area. Meanwhile, each of the districts of Al-Rifai, Al-Shatra, Al-Suq Al-Shuyukh, and Al-Jubayish has one government hospital, accounting for 6.7% of the total number of hospitals in the study area for the year 2023.

Table (4)

Numerical and Relative Distribution of Governmental and Private Hospitals and Beds by Districts in Dhi Qar Governorate for the Year 2023

District	Hospital	%	Beds	%	Occupancy Rate
Al-Nassiriya	Al-Nassiriya General (Turkish)		400	13.6	90%
	Al-Hussein Educational		694	23.7	50%

	Bint Al-Huda		334	11.4	53%
	Al-Haboubi General		203	6.9	36%
	Mohammad Al-Mousawi		134	4.6	57%
	Al-Nassiriya for the Heart		125	4.3	52%
	Al-Rabi' Al-Ahli		20	0.7	25%
	Al-Amal Al-Ahli		200	6.8	50%
	Al-Rahman Al-Ahli		50	1.7	65%
	Al-Hadharat Al-Ahli		50	1.7	65%
	Al-Azhar Al-Ahli		50	1.7	35%
Total	11	73.2%	2260	77.1%	
Al-Shatra	Al-Shatra General	6.7%	153	5.2	75%
Al-Rifa'i	Al-Rifa'i Educational	6.7%	169	5.7	36%
Suuq Al-Shuyukh	Suuq Al-Shuyukh General	6.7%	305	10.4	42%
Al-Jubayish	Al-Jubayish General	6.7%	46	1.6	36%
Total	15	100%	2933	100%	

Source: Researcher based on:

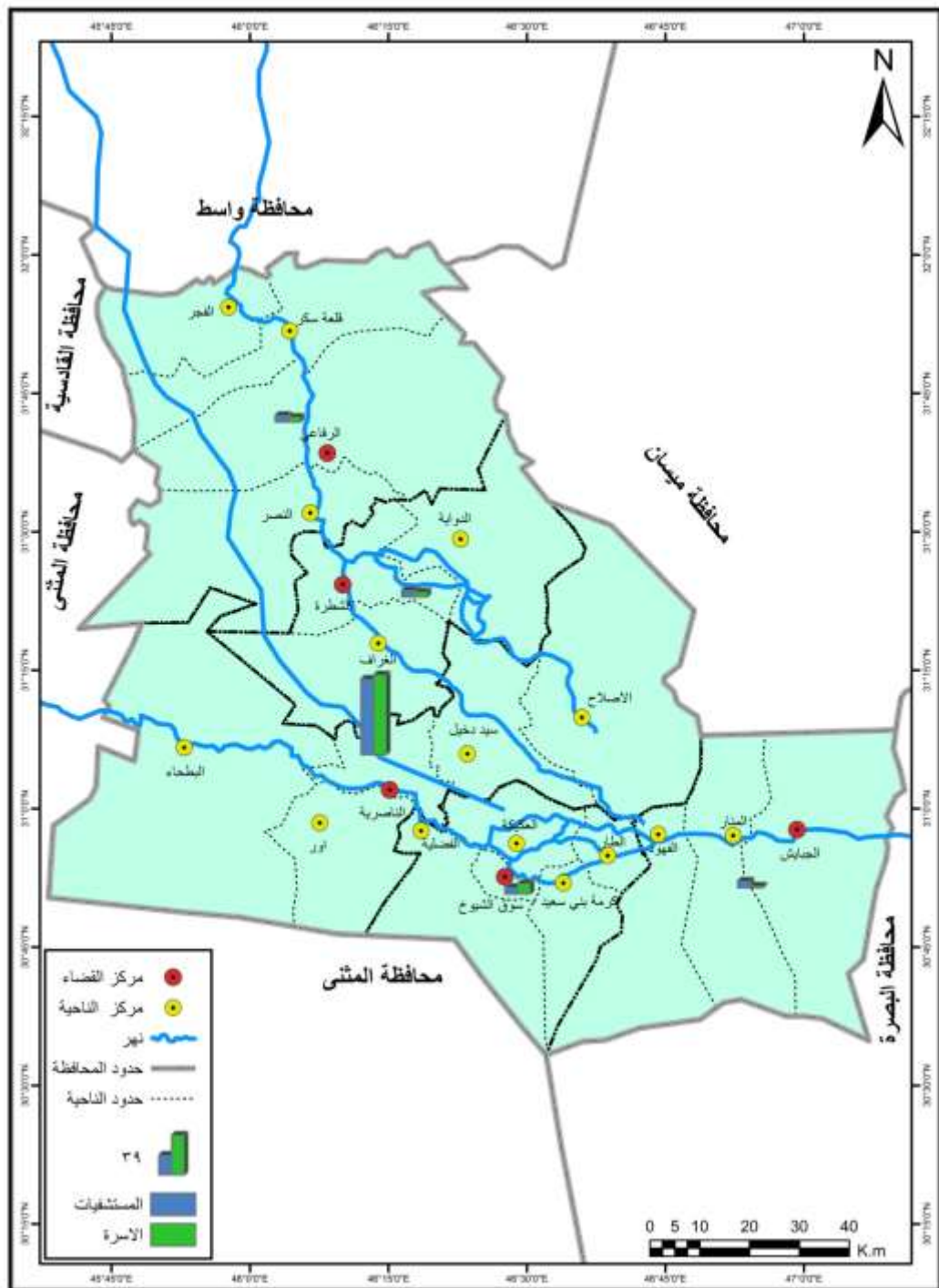
1. Ministry of Health and Environment, Dhi Qar Health Directorate, Planning and Human Development Department, Infection Control Department, 2023.
2. Ministry of Health and Environment, Dhi Qar Health Directorate, Planning and Human Development Department, Health Statistics Department, 2023.

B- Distribution of Beds in Public and Private Hospitals

It is evident from the data in the previous table and map that the total number of beds in hospitals reached (2933) beds, which were distributed unevenly across the districts. Al-Nassiriya district took the first place with (77%) of the total beds. Al-Suq al-Shuyukh district came second in terms of the number of beds with (10.4%) of the total beds in the study area. Al-Rifai district ranked third with (5.8%) of the beds, followed by Al-Shatra district with (5.2%). Al-Jabayish district recorded the lowest percentage of beds in the study area's hospitals with (1.6%). The bed occupancy rate varied across hospitals, with the highest occupancy rate recorded in Al-Nassiriya General Turkish Hospital at (90%), and the lowest rate in Al-Rabi'a private hospital at (25%).

Map (4)

Relative Distribution of Public and Private Hospitals and Beds in Dhi Qar Governorate for the Year 2023.



Source: Researcher, based on the data from Table (4).

It is evident that the variation in the amounts of medical waste was due to several factors, including differences in the distribution of hospitals, the variation in population numbers across districts, the differences in bed capacity in hospitals,

and the diversity of medical departments and specialties within hospitals, such as Mohammad Al-Mousawi Children's Hospital and Bint Al-Huda Maternity Hospital. Additionally, the ownership of the hospitals played a role, as private hospitals recorded lower percentages of medical waste, which can be explained by the fewer number of patients visiting these private hospitals compared to government hospitals.

It is clear from the above that the variation in the amounts of medical waste is due to several factors, including differences in the number of hospitals, bed capacity, the diversity of medical departments and specialties in the hospitals, as seen in Mohammad Al-Mousawi Children's Hospital and Bint Al-Huda Maternity Hospital. Additionally, the ownership of the hospital plays a role, as private hospitals recorded lower percentages of medical waste, which can be explained by the lower number of patients visiting these hospitals compared to government hospitals.

Chapter Three: Reality of Medical Waste Treatment

It is clear from Table (5) that most hospitals in the study area lack incinerators, shredding and sterilization devices, and wastewater treatment units for various reasons. Some of these reasons include the absence of such incinerators and equipment, their aging and deterioration, or non-compliance with local environmental regulations. Additionally, some hospitals experience frequent malfunctions. There are five incinerators in the study area for treating medical waste generated by all health institutions. However, it is noteworthy that four of these incinerators are out of service, either due to the deterioration of their components and constant breakdowns, such as the incinerator at Bint Al-Huda Hospital, or due to environmental violations, such as the incinerator at Al-Rifai Hospital, which is too close to neighboring residences and does not meet the required safe distance, as it is only separated by a 4-meter-wide street. For similar reasons, the incinerator at Al-Shoayb Hospital has also ceased to operate due to its age and non-compliance with environmental standards.

Table (5) - Medical Waste Treatment in Hospitals in Dhi Qar Governorate for the year 2023

Hospital	Incinerator	Shredding and Sterilization Device	Sewage Units	Remarks
Al-Nasiriya General Turkish	Not Available	Not Available	Not Available	Directly to sewage system
Al-Hussein	Functioning with Delay	Not Available	Functioning	Concrete basins / Septic tank
Al-Haboubi	Not Available	Not Available	Not Available	Directly to sewage system

Bint Al-Huda	Out of Service	Not Available	Not Available	Directly to sewer network
Mohamed Al-Mousawi	Not Available	Not Available	Not Available	Directly to sewage system
Heart Center	Not Available	Not Available	Not Available	Directly to sewer network
Al-Rabi'a (Private)	Not Available	Not Available	Not Available	Directly to sewer network
Al-Rahman (Private)	Not Available	Not Available	Functioning	Directly to sewer network
Al-Amal (Private)	Not Available	Not Available	Not Available	Directly to sewer network
Al-Hadharat (Private)	Not Available	Not Available	Not Available	Directly to sewer network
Al-Azhar (Private)	Not Available	Not Available	Not Available	Directly to sewage system
Al-Shatrah	Not Working	Not Working	Not Available	Directly to sewage system
Al-Rifai	Out of Service	Not Working	Not Available	Concrete basins / Septic tank
Souq Al-Shuyoukh	Out of Service	Not Working	Not Available	Directly to sewage system
Al-Jabayish	Not Available	Not Available	Not Available	Directly to sewage system

Source: Based on the researcher's reliance on:

1. Republic of Iraq, Ministry of Health, Dhi Qar Health Directorate, Planning and Human Development Department, Infection Control Department, 2023.
2. Republic of Iraq, Ministry of Environment, Dhi Qar Governorate Environmental Directorate, Urban Environment Department, Health Institution Survey Forms for 2023.

Through the previous table, it is noticeable that Al-Hussein Teaching Hospital is the only hospital that has an incinerator for burning hazardous medical waste. This incinerator is used to process waste sent from the hospital floors, which is handled with great caution. Ordinary medical waste is collected in regular bags and transported by municipal vehicles to sanitary landfill sites (one vehicle only, operated under an agreement with the Nasiriyah Municipality). On the other hand, hazardous medical waste is collected using yellow plastic bags or yellow bins, and then prepared for burning. The waste is incinerated daily, with the amount varying depending on the quantity of collected waste. After burning, it turns into white or black ash, which is collected in bags and disposed of in landfill sites.

According to the previous table, the incinerator is designated to burn medical waste that is expected to be sent from hospitals and primary health care centers in other

districts. However, this incinerator is insufficient to handle the volume of medical waste, causing frequent malfunctions. As a result, all waste is sent directly to the landfill without proper treatment.

Regarding the thermal treatment and sterilization devices, as shown in the previous table, the scope of the problem becomes apparent. There are five hospitals equipped with thermal and shredding devices: Al-Nasiriya General Turkish Hospital, Al-Hussein Teaching Hospital, Bint Al-Huda, Al-Shatra General Hospital, and Al-Rifai Teaching Hospital. These hospitals rank highest in terms of patient visits and medical waste production. However, none of these devices are operational, and thus, health institutions lack a crucial stage in the waste treatment process. As a result, most hospitals rely on landfilling to dispose of medical waste.

Regarding the landfill sites, there are 15 landfill sites in the study area. It is noteworthy that 9 of these sites do not have environmental approval, while only 6 sites have received environmental approval based on their location according to the 2021 master plan for the municipality and the governorate. These sites are distributed as follows: 5 sites are outside the master plan, and 1 site is located within the approved design.

Most of the landfill sites in the study area suffer from indicators that do not align with the location and environmental criteria set by the Iraqi Ministry of Environment.

It follows from the above that the study area suffers from poor management of the disposal of solid and liquid medical waste from hospitals. The region lacks primary sorting of waste according to its types and hazards, and it lacks accurate weight measurements. The archived data may not fully represent the environmental reality, as they rely on estimated data and weights. Hospitals also suffer from poor storage of waste within their premises, as there are no dedicated rooms for waste storage until they are transported to processing areas. Open courtyards at the hospital's periphery or corners are often used, and these may be close to residential areas or streets. Moreover, there is an inadequacy of waste transportation vehicles, with most hospitals relying on a single vehicle, which means that any breakdown results in waste accumulation for several days until municipal vehicles are brought in. Additionally, there is a lack of sufficient incinerators, and the existing ones face many issues, such as aging, worn-out parts, and frequent malfunctions, affecting their efficiency. Some incinerators violate environmental standards, as they are located near residential areas and do not take wind direction into account when selecting their sites. As for the personnel handling medical waste, most of them are contract workers with low wages and lack higher educational qualifications. As a

result, they lack awareness and environmental culture, and they have not participated in awareness programs regarding the risks of medical waste and proper disposal techniques.

Conclusions:

1. The amount of solid medical waste generated by both public and private hospitals in the study area was 60,160 kg in 2023.
2. The amounts of solid medical waste varied across districts, with the highest percentage in the Nasiriyah district at 58.9% and the lowest in the Souk Al-Shyoukh district at 3.3%.
3. The amount of solid medical waste also varied by the ownership of the hospitals, with public hospitals contributing 97.9% of the total medical waste, and private hospitals contributing 2.1%.
4. Human environmental factors played a significant role in the spatial variation of medical waste quantities. The population numbers varied across districts, with the highest percentage (37.23%) in the Nasiriyah district and the lowest (4.9%) in the Al-Jubayish district. The distribution of public and private hospitals also varied spatially across districts, with Nasiriyah district having the highest percentage (73.2%) of hospitals in the governorate, and districts like Al-Shatrah, Al-Rifa'i, Souk Al-Shyoukh, and Al-Jubayish each having 6.7%. Additionally, the distribution of hospital beds varied, with 77.1% in Nasiriyah and 1.6% in Al-Jubayish. The numbers of medical professionals also varied, with 68.8% in Nasiriyah and 2.2% in Al-Jubayish. The distribution of health professionals varied between 61.2% and 2% in Al-Jubayish. The number of patients, visitors, and hospitalizations were other human factors influencing the variation in medical waste quantities.
5. Medical waste management faces several challenges. Most hospitals lack thermal treatment and sterilization equipment, with many of them either having these systems out of order (such as in the Al-Hussein Teaching Hospital, Bint Al-Huda, Al-Shatrah, Al-Rifa'i, and Souk Al-Shyoukh) or lacking such equipment entirely (as in Nasiriyah General, Al-Haboubi, Mohammad Al-Mousawi, Nasiriyah Center, Al-Rabeeh Private, Al-Amal Private, Al-Hadharat Private, and Al-Azhar Private hospitals). Of the hospitals that have medical incinerators, only one incinerator is operational, and it works intermittently at the Al-Hussein Teaching Hospital.

Recommendations:

1. It is necessary to ensure an equitable distribution of hospitals across the study area by districts, and work on increasing the number of hospitals in the

districts of Al-Rifa'i, Al-Shatrah, Souk Al-Shyoukh, and Al-Jubayish, in proportion to the population increase in these areas.

2. Focus should be placed on the medical waste generated by public hospitals, as they contribute the largest share of the waste, in order to address the issues arising from it.
3. Hospitals must be required to resolve the issues of medical waste management, ensuring that each hospital is equipped with a thermal treatment and sterilization device. The incinerators that are out of order should be repaired and maintained regularly, and other hospitals should be provided with incinerators that meet environmental standards.

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