The Hashemite Kingdom of JordanMinistry of Health

Non-Communicable Diseases Directorate

National Registry of End Stage Renal Disease(ESRD)

16th Annual Report

2024

FOREWORD

More than six thousand people in Hashemite Kingdom of Jordan receive some forms of dialysis, which provide renal replacement therapy for end-stage renal disease (ESRD). The national registry of End Stage Renal Disease, which was established in 2007, collects case record data from patients with end stage renal disease treated in hospitals, which will enable calculating the incidence and prevalence rates for terminal renal disease and mortality rate for each governorate. The regional data are pooled to get national statistics for end stage renal disease in order to adapt prevention to main causes of renal failure.

I am pleased to present to you the sixteenth edition of the annual report on End Stage Renal Disease (ESRD) in Jordan for the year 2024, issued by the Cardiovascular and Diabetes Surveillance Division. This report provides revised and updated data to support the development of evidence-based plans aimed at improving the quality of life for dialysis patients.

I hope that this report will assist health care providers, public health officers and NGOs in their work to prevent and control renal disease in Jordan.

On behalf of the National Registry of End Stage Renal Disease, I would like to acknowledge the tremendous contributions of all those who fulfilled this report. Sincere appreciation and gratitude are extended to the members of the Working Group at the Ministry of Health for their great efforts.

The Ministry of Health will continue to support the National Registry of End Stage Renal Disease with all available resources.

Thank you.

Minister of Health

Dr. Ibrahim Bdour

ACKNOWLEDGMENT

We acknowledge with deep appreciation and gratitude all people who helped make this report possible.

We would like to thank, IT department stuff in MOH for their support and assistance in institutionalizing, development and solving technical problems for this program. We would like to thank all focal point in all renal dialysis centers, who contributed to the collection of renal data in the Kingdom for the timely collection and submission of renal patient's data.

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2	Dr. Saif Alfakhoury	Field visits, data analysis, report revision and editing, Monitoring of workflow.
3	Nahida Al Sharif	Responsible for registry, including data collection, cleaning, analysis and report writing
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Serial	Names	Focal Points at Hospitals / Facilities
Government Hospitals		
1.	Nidal Maghayrah	Al Basheer
2.	Mohammed Sami Al-Bashjawesh	Prince Hamza
3.	Khalid Al saudi	Jamil Totanji
4.	Ataa salah issa alqbelat	Princes Salma
5.	Ahmad Suleiman Abu Mattahna	Al Nadeem
6.	Ahmed Wahdan	Prince Faisal
7.	Ibrahim Al-Khawaldeh	Al Zarqa government
8.	Wisam Ahmad Jaber Al-Khawaldeh	Al-Hussein Hospital
9.	Fardous Khalifa	Prince Hussein Hospital
10.	Oudi Al-Rahman	Southern Shouneh Hospital
11.	Reema Mohammed Abu Zanemah	Princess Iman Hospital
12.	Mohammad Shuqair	Northern Badia Hospital
13.	Hayam Sahman Al-Hwidi	Mafraq Governmental Hospital
14.	Mohammad Al-Mashaqbah	Al-Ruwaished Hospital
15.	Manzuma Al-Yadak	Al-Yarmouk Hospital
16.	Fadi Al-Afifi	Princess Basma Hospital
17.	Suheer Ziyad Bayaderh	Abu Ubaida Hospital
18.	Abd Ismail Al Ibraheem	Muath Bin Jabal Hospital
19.	Musa Ahmed Al-Rababah	Princess Raya Hospital
20.	Rami Al-Hourani	Ramtha Governmental Hospital
21.	Hayat Al-Sabbagh	Jerash Governmental Hospital
22.	Bayan Frehat	Al-Iman Hospital
23.	Hussein Mohammed	Ma'an Governmental Hospital
24.	Fathiya al masha	Ghor Al-Safi Hospital
25.	Muntaha Saraeerah	Karak Governmental Hospital
26.	Ahmad Al-Hassanat	Queen Rania Hospital
27.	Mohammad Al Qatameen	Tafileh Governmental Hospital
Royal Medical Services		
1.	Nadia Hani Al-Maaitah	Al-Hussein Medical City
2.	Mohammad Bassam Al-Hourani	Queen Alia
3.	Waad Mohammed	Queen Rania Children's Hospital
4.	Ibrahim Ata Al-Jaraira	Al-Latroon
5.	Raslan Abou Ghazal	Prince Rashid bin Al-Hassan Hospital

Serial	Names	Focal Points at Hospitals / Facilities
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7.	Khalid Sulaiman Al-Hassanat	Prince Hashim bin Abdullah Hospital
8.	Rasha Youssef Al-Faraya	Prince Ali bin Al-Hussein Hospital
9.	Ahmad Al-Nayef	Princess Haya bint Al-Hussein
10.	Ibtehal Abdullah Salman	Shoubak Military Hospital
11.	Reem Awad Nasir	Al-Qweirah
12.	Khadija Abdelsalam Al-Tarawneh	Al-Hasa Hospital
13.	Hiba Al amoosh	Prince Hashim bin Al-Hussein Hospital
14.	Waleed Al-Zainat	Madaba Medical Center
15.	Rami Ali Khalifat	Azraq Medical Center
16.	Qasem Hajaj	King Talal Hospital
Private Hospitals		
1.	Heba Wageh Barakat	Jabal Al-Zaytoun Hospital
2.	Amal Jamal Khidr	Qasr Shubeib Hospital
3.	Nidaa Al-Nawati	Al-Delail Hospital
4.	Heba Al Wawi	Al Hekma Hospital
5.	Hikmat Al-Rababah	Irbid Specialty Hospital
6.	Alaa Oweidat	Al-Najah Hospital / Irbid
7.	Anwar Al-Alimi	Rosary Sisters Hospita
8.	Abdullah Al-Nahoud	Sara Hospital / Mafraq
9.	Suleiman Al-Saraira	Italian Hospital / Karak
10.	Malik Al-Tahat	Greek Catholic Hospital / Irbid
11.	Khaled Rababa’a	Al-Qawasmi Hospital
12.	Basem Ali Alian	Specialty Hospital / Amman
13.	Abdullah Anaswah	Al-Shmeisani Hospital
14.	Shaimaa Alsweer	Ibn Al-Haytham Hospital
15.	Ashraf Salem	Al-Israa Hospital
16.	Osama Al-Hunaiti	Jordan Hospital
17.	Wael Al Hasan	Arab Medical Center
18.	Rami Thalji	Tlaa Al-Ali Hospital
19.	Muhanad al Hourani	Al-Quds Hospital
20.	Ruqaya Salah	Al-Ahli Hospital
21.	Abdulrahim Al-Omari	Al-Jazeera Hospital
22.	Nasr Mahmoud Mahrouq	Al-Maqased Hospital
23.	Ahlam Al Manaseer	Philadelphia Hospital
24.	Aflin Hilal Batarsih	Al-Mahabba Hospital
25.	Ahmed Rasheed	Al-Hayat General Hospital
26.	Qusai Al-Daqamseh	Al-Khansa Hospital
27.	Waleed Malkawi	Saudi Hospital
28.	Leen ayyash	Red Crescent Hospital
29.	Mohammad Musleh	Amman Surgical Hospital
30.	Sana Hamad	Al-Hanan Hospital
31.	Ahmed Issa	Marka Specialty Hospital
32.	Khalil Matarneh	Luzmila Hospital
33.	Laith Al-Shawahin	Al-Istiqlal Hospital
34.	Nargis Abdullah	Islamic Hospital / Amman
35.	Ma'moun Mohammed Ismail	Aqleh Hospital

Serial	Names	Focal Points at Hospitals / Facilities
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37.	Asma Abu Dan	Islamic Hospital / Irbid
38.	Mohammad Arabiat	Al-Rasheed Hospital
39.	Waleed Al Obyaat	Gardens Hospital
40.	Waseem Nabeel	Istishari Hospital *(Consultant Hospital)*
41.	Khetam Hasan	Khalidi Hospital
Academic Hospitals		
1	Saleh Al-Rababah	King Abdullah I Hospital
2	Noor Bshara	Jordan University Hospital

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EXECUTIVE SUMMERY

Chronic Kidney Disease (CKD) remains a significant public health burden globally, with End-Stage Renal Disease (ESRD) representing its most severe and resource-intensive phase. This 16th Annual Report offers a comprehensive national overview of ESRD in Jordan for the year 2024, presenting key epidemiological trends, demographic and clinical characteristics, service distribution, and performance indicators.

In 2024, a total of 6,063 patients with End-Stage Renal Disease (ESRD) were recorded in Jordan. Among them, 5,960 patients 98.3% were receiving hemodialysis, while 103 patients 1.7% were on peritoneal dialysis.

The vast majority of ESRD total cases were Jordanian (5797 patients, 95.6%), followed by Palestinians (141 patients, 2.3%), Syrians (107 patients, 1.8%), and 18 individuals (0.3%) of other nationalities. The mean age of patients was 55 years, and the median age was 57 years, both aligning with the typical age profile of ESRD patients.

A total of 914 new cases of ESRD were documented in Jordan, corresponding to an incidence rate of 7.8 per 100,000 populations. The incidence rate among males was 9.0 per 100,000, compared to 6.4 per 100,000 among females. The male-to-female ratio among new ESRD cases was approximately 1.6:1, indicating a notably higher incidence among males.

Total number of ESRD patients in Jordan reached 6,063, resulting in an estimated national prevalence rate of 51.7 cases per 100,000 populations. The highest patient concentrations were observed in Amman, Irbid, and Zarqa.

The age distribution of ESRD patients revealed that 2% were under 18 years, 23% were aged 18–44, 55% fell within the 45–69 age group, and 20% were aged 70 years or older.

Regarding disease etiology, hypertension remained the most common cause of ESRD, accounting for 47% of all cases, followed by diabetes mellitus at 24%. Hypertension was notably more prevalent among male patients (28%) than females (20%), This points to the urgent need for improving early screening and implementing comprehensive preventive programs.

Dialysis services across Jordan were delivered through 86 hemodialysis units distributed among various sectors: 48% were operated by the private sector (41 units), 31% by the government (27 units), 19% by the military (16 units), and 2% by university-affiliated hospitals (2 units).

INTRODUCTION

The National Registry of End-Stage Renal Disease (ESRD) was established in 2007 under the Ministry of Health to systematically collect and manage data on patients with end stage of renal disease “stage five”. The primary goal of the registry is to provide a comprehensive database that supports understanding the national burden of ESRD, facilitates healthcare planning, and informs policy decisions related to renal replacement therapy (RRT).

This report includes ESRD patients who have received RRT—including hemodialysis, peritoneal dialysis, or kidney transplantation—and have undergone at least **three consecutive months** of dialysis to distinguish chronic ESRD cases from acute kidney injury. The registry collects key data on patient demographics (age, sex, nationality, and governorate of residence), clinical characteristics (dialysis modality, start date of dialysis, ESRD etiology, and comorbidities), laboratory screening results (hepatitis B, hepatitis C, HIV), and treatment updates such as modality changes, transplantation status, and mortality.

The information contained in this report aims to provide a clear picture of the ESRD situation in Jordan during 2024 and serve as a tool for monitoring trends, identifying gaps in care, and supporting evidence-based decision-making to improve patient outcomes.

METHODOLOGY

The National Registry of End-Stage Renal Disease (ESRD) utilizes the Jordan Interactive Electronic Reporting System (JIERS), a centralized platform through which data are collected from all healthcare sectors providing Renal Replacement Therapy (RRT) services, including governmental, private, military, and university-affiliated hospitals. Each participating facility designates a trained focal point responsible for data entry. These individuals are officially nominated by their institutions and receive structured training through national workshops to ensure accuracy and standardization of reporting.

- **Data Collection Methods**

Data were entered into JIERS through three structured electronic forms:

1. Dialysis Patient Registration Form: captures demographic and clinical variables such as dialysis start date, insurance type, hepatitis and other viral

screening results, comorbid conditions (e.g., hypertension, diabetes), and the primary cause of ESRD. The form is updated as needed to reflect changes in patient status, such as transplantation or a change in dialysis modality (e.g., from hemodialysis to peritoneal dialysis).

2. Mortality Form: completed upon patient death, documenting cause and date of death.
3. Annual Dialysis Unit Form: submitted once per year to document unit capacity, including total number of dialysis machines, reserved units, and isolation-designated machines.

To ensure that only chronic ESRD cases are included, patients are registered in the system only after completing at least three months of dialysis. Dialysis unit focal points can export aggregated data in Excel format to monitor completeness and validate patient lists.

- **Data Sources**

Data on hemodialysis and peritoneal dialysis were systematically collected from all healthcare sectors across the Kingdom including governmental, private, academic, and military hospitals through officially designated focal points within each sector, and in close coordination with the Ministry of Health, represented by the Directorate of Non-Communicable Diseases. Kidney transplant data were obtained from the Directorate of Organ Transplantation and cross-validated against data reported in JIERS to ensure consistency and accuracy.

- **Statistical Analysis**

Descriptive statistical analysis was conducted using Microsoft Excel. Pivot tables were used to summarize and cross-tabulate variables such as age group, sex, nationality, governorate, dialysis modality, and etiology. Measures such as frequencies, percentages, means, and medians were used to describe patient characteristics and dialysis service trends across sectors and regions.

- **Inclusion and Exclusion Criteria**

The data included in the report covers all individuals residing in Jordan who were diagnosed with End-Stage Renal Disease (ESRD) and received renal replacement therapy (RRT) during the reporting period (January 1 – December 31, 2024). Individuals who did not undergo RRT or who passed away within 90 days of diagnosis were excluded (not entered into JIERS).

- **Confidentiality**

Patient confidentiality is safeguarded through secure, password-protected electronic systems; unique user credentials for data entry personnel; role-based access restricted to designated ESRD registry focal points; and formal approval processes for any external data requests. These measures ensure the integrity, security, and ethical management of sensitive patient data, supporting high-quality surveillance and policy development.

Table 1: Jordan Population by End of 2024 [1].

Governorate	Male	Female	Total
Amman	2,643500	2,276600	4,920100
Balqa	324400	279300	603700
Zarqa	886600	789100	1,675700
Madaba	122900	109400	232300
Irbid	1,123700	1,049500	2,173200
Mafraq	348400	326800	675200
Jarash	151400	139600	291000
Ajloun	111400	104800	216200
Karak	203200	185500	388700
Tafiela	61900	56300	118200
Ma'an	101600	92900	194500
Aqaba	133500	111700	245200
Total	**6,212,500**	**5,521,500**	**11,734,000**

Source: Department of Statistics, Jordan, 2024.

RESULTS

- **Patient Demographics**

The demographic profile of End-Stage Renal Disease (ESRD) patients highlights key patterns in sex, age, and nationality. In terms of sex, the majority of patients were males (3,611), representing approximately 60% of the total dialysis population, while females accounted for 2,452 cases (40%).

The average (mean) age of patients was 55 years, with a median age of 57 years, indicating that the majority of patients fall within the middle-aged to elderly range.

With regard to nationality, the vast majority of ESRD total cases were Jordanian (5797 patients, 95.6%), followed by Palestinians (141 patients, 2.3%), Syrians

(107 patients, 1.8%), and 18 individuals (0.3%) of other nationalities. This distribution underscores the significant burden of chronic kidney disease within the local population.

Table 2 : Distribution of ESRD Patients by Age Group and Sex.

Age Group	Male	Male (%)	Female	Female (%)	Total	Total (%)
< 18	66	2	64	3	130	2
18–44	864	24	528	22	1,392	23
45–69	2,059	57	1,244	51	3,303	54
≥ 70	598	17	591	24	1,189	20
Unknown	24	1	25	1	49	1
Total	**3,611**	**100**	**2,452**	**100**	**6,063**	**100**

- **Patient Clinical and Behavioural Characteristics**

This section highlights key clinical and behavioral characteristics of the registered hemodialysis ESRD population, focusing on blood type distribution and smoking status. Detailed data are presented for hemodialysis patients (5960); however, information on blood type and smoking status was not available for peritoneal dialysis patients (103) and is therefore excluded from this analysis.

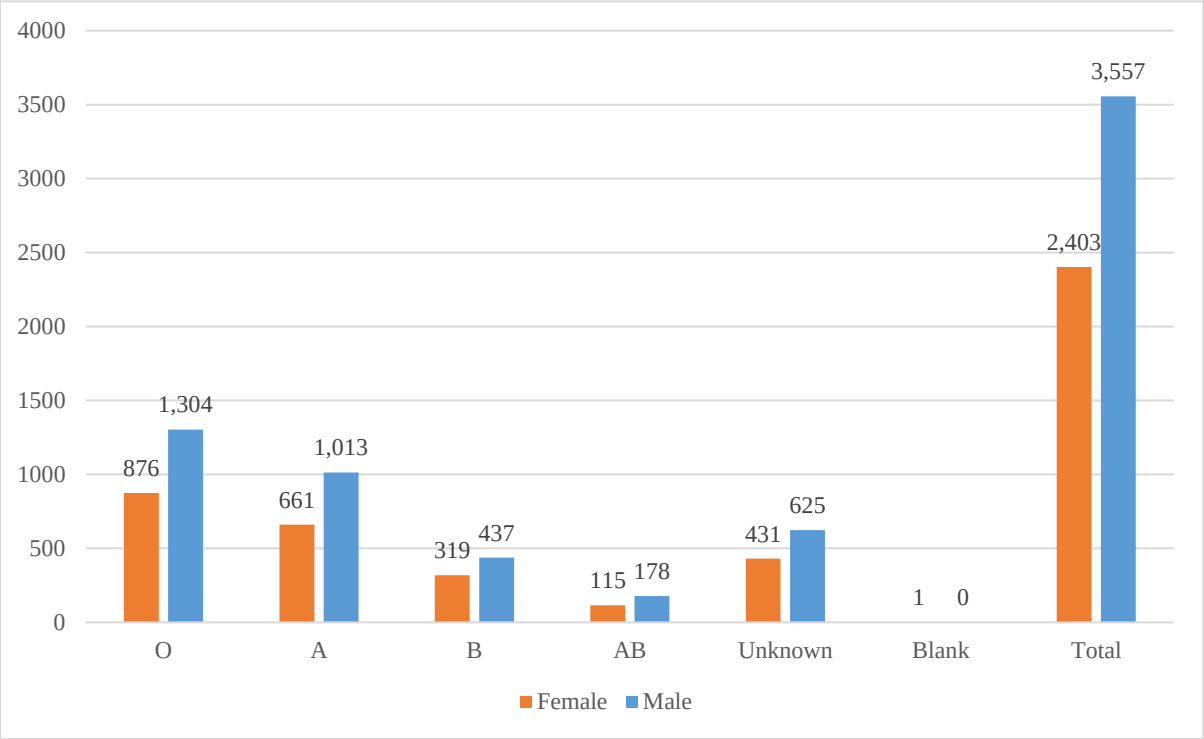
  - Blood Types

As shown in Table 3, the distribution of blood types among registered End-Stage Renal Disease (ESRD) patients undergoing hemodialysis is presented. The table displays the count and percentage of patients for each blood type, along with a breakdown by sex. Blood type O is the most common, accounting for 36.6% of patients, followed by blood type A at 28.1%. Blood types B and AB represent smaller proportions, at 12.7% and 4.9% respectively. Notably, 17.7% of patients have an unknown blood type, and a negligible number have missing data. The total number of patients is 5,960, including 2,403 females and 3,557 males.

Table 3 : Distribution of Blood Types among Hemodialysis ESRD Patients by Sex.

Blood Type	Male	Female	Total	% of Total
O	1,304	876	2,180	36.60
A	1,013	661	1,674	28.10
B	437	319	756	12.70
AB	178	115	293	4.90
Unknown	625	431	1,056	17.70
Blank	0	1	1	~0.0
Total	**3,557**	**2,403**	**5,960**	**100**

Figure 1: Distribution of Blood Types among Hemodialysis Patients by Sex.



- Smoking status

Out of the total 5,960 registered hemodialysis patients, smoking status was recorded for 3,350 individuals (56%). The remaining 2,610 patients (44%) had no recorded data. Of those with recorded information, 2,992 were non-smokers (50%), and 358 were current smokers (6%).

Table 4 : Smoking Status among Registered Hemodialysis ESRD Patients.

Smoking Status	Count	% of Total (n = 5,960)
Non-smoker	2,992	50
Current smoker	358	6
Blank	2,610	44
Grand Total	**5,960**	**100**

- Infectious Disease

Out of a total of 6,063 dialysis patients, 150 (2.5%) tested positive for Hepatitis C virus (HCV), and 73 (1.2%) tested positive for Hepatitis B virus (HBV). No HIV-positive cases were reported across all dialysis units during the reporting period. The distribution of hepatitis cases varied across facility types. Governmental centers reported the highest number, with 65 HCV and 33 HBV cases, accounting for 43.3% and 45.2% of the total cases, respectively. Private

centers followed, with 47 HCV and 26 HBV cases (31.3% and 35.6%), while military centers recorded 38 HCV and 14 HBV cases (25.3% and 19.2%).

Screening for these infectious diseases is repeated every three months regardless of previous results, in line with national infection control protocols. Focal points at dialysis centers are required to report any positive cases immediately to the Ministry of Health. In addition, dedicated haemodialysis machines are available for the isolation of infected patients, ensuring safety of others within dialysis unit

- **Incidence and Prevalence**
    - Incidence of ESRD

In 2024, a total of 914 new End-Stage Renal Disease (ESRD) cases were reported across Jordan. Of these, 564 were males (62%) and 350 were females (38%). The overall incidence rate was 7.8 per 100,000 populations, with males exhibiting a higher rate (9.08 per 100,000) compared to females (6.34 per 100,000), based on a total population of approximately 11.73 million (6.21 million males and 5.52 million females). Geographically, the highest number of new cases was reported in Amman (358 cases), followed by Irbid (204) and Zarqa (134). Male predominance was evident across most governorates. While the highest incidence was in Madaba (15.1) followed by Irbid (9.4).

Table 5 : Distribution of New ESRD Cases by Governorate and Sex.

Governorate	Male	Female	Total	Incidence Rate per 100,000
Amman	226	132	358	7.28
Irbid	123	81	204	9.39
Zarqa	84	50	134	8.00
Balqa	29	22	51	8.45
Madaba	13	22	35	15.07
Mafraq	28	12	40	5.92
Jarash	13	10	23	7.90
Ajloun	11	5	16	7.40
Karak	16	11	27	6.95
Tafiela	4	5	9	7.61
Ma’an	4	2	6	3.08
Aqaba	13	8	21	8.56
Total	**564**	**350**	**914**	**7.79**

Table 6 : Distribution of New ESRD Cases and Incidence Rates by Sex.

Sex	New Cases	Population	Incidence Rate (per 100,000)
Male	564	6,212,500	9.08
Female	350	5,521,500	6.34
Total	**914**	**11,734,000**	**7.79**

- Period Prevalence of ESRD [2].

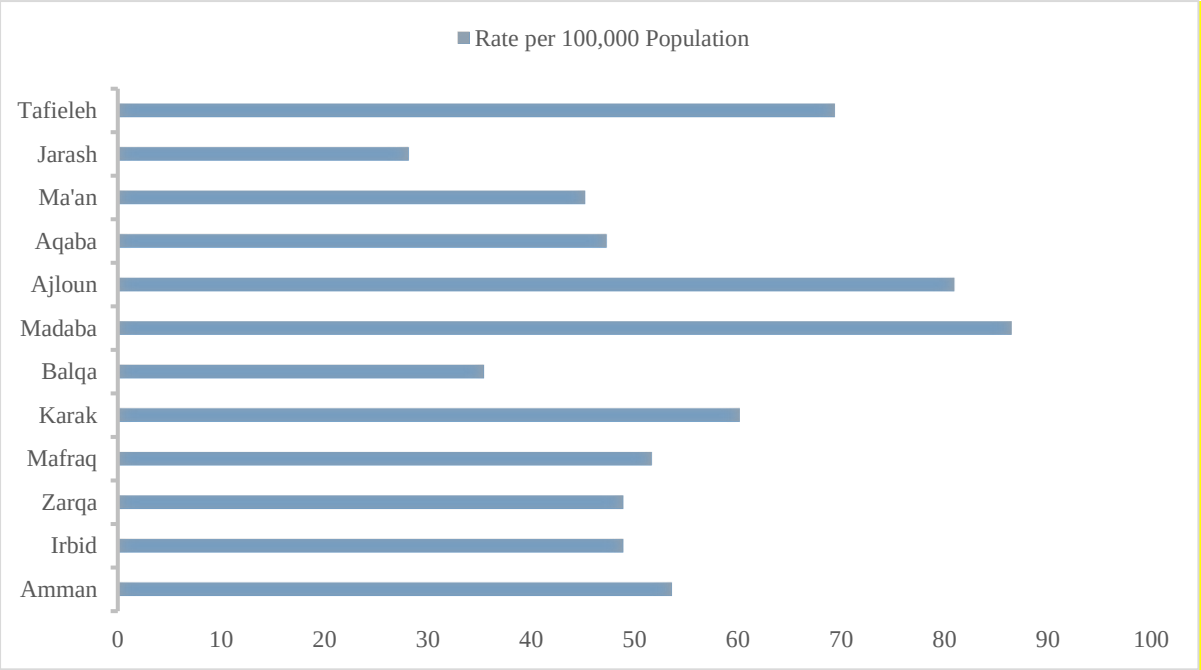
In 2024, the total number of patients diagnosed with End-Stage Renal Disease (ESRD) was reported as 6,063 cases. To better understand the burden of this disease across the country, the period prevalence rate was calculated using the total population of the main governorates, which collectively account for approximately 11.7 million people. The population data by governorate shows that Amman is the most populous with about 4.92 million residents, followed by Irbid with 2.17 million, and Zarqa with 1.68 million.

Using the total number of ESRD patients and the aggregate population, the overall prevalence rate was estimated at approximately 51.7 cases per 100,000 populations. This figure reflects the nationwide burden without distinction by sex or nationality.

Table 7 : Distribution of Period Prevalence of ESRD Patients by Governorate.

Governorate	Total Patients	Population (2024)	Prevalence rate per 100,000 Population
Amman	2639	4,920,100	53.62
Irbid	1063	2,173,200	48.91
Zarqa	820	1,675,700	48.93
Mafraq	349	675,200	51.67
Karak	234	388,700	60.19
Balqa	214	603,700	35.44
Madaba	201	232,300	86.53
Ajloun	175	216,200	80.94
Aqaba	116	245,200	47.31
Ma'an	88	194,500	45.22
Jarash	82	291,000	28.18
Tafieleh	82	118,200	69.39

Figure 2: ESRD Prevalence Rate Distribution by Governorate.



- **Dialysis Facility Distribution**

Dialysis services in Jordan are provided through 86 units distributed across various sectors: public, private, military, and academic hospitals.

The capital, Amman, had the highest number of units with 36 (42.0%), predominantly in private facilities (28 units), followed by public (3), military (4), and university (1) hospitals.

Other governorates with notable numbers of units included Irbid with 12 units (14%), Zarqa with 8 units (9.3 and Mafraq with 5 units (5.8%).

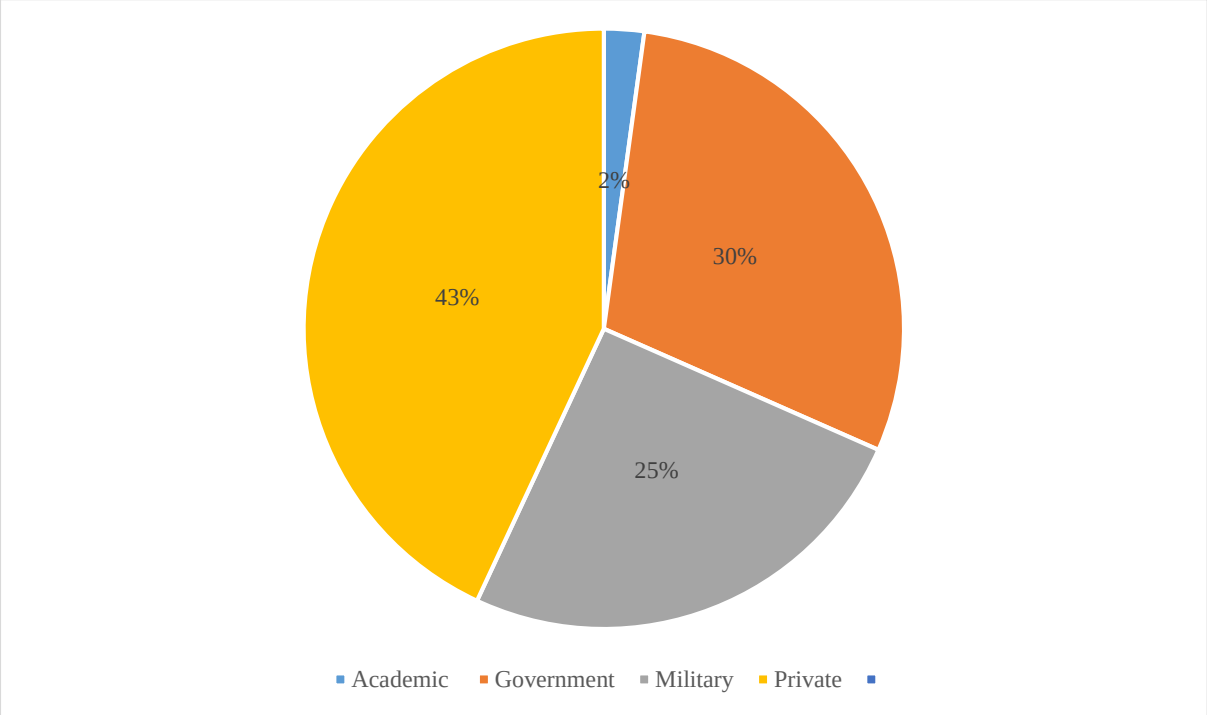
Several governorates, such as Ajloun, Jarash, Petra, and Ramtha, had only 1 or 2 units, representing a small fraction of the total capacity.

The distribution across facility types included 41 private units, 27 public units, 16 military units, and 2 university units, reflecting a diversified service provision landscape.

Table 8 : Distribution of Haemodialysis Units.

Directorate	Governorate	Private	Military	University	Total	% of Total
Ajloun	1	0	1	0	2	2.33
Amman	3	28	4	1	36	41.86
Balqa	4	0	0	0	4	4.65
Irbid	5	6	1	0	12	13.95
Jarash	1	0	0	0	1	1.16
Karak	2	1	1	0	4	4.65
Ma'an	1	0	1	0	2	2.33
Madaba	2	1	1	0	4	4.65
Mafraq	3	1	1	0	5	5.81
Petra	1	0	0	0	1	1.16
Ramtha	1	0	0	1	2	2.33
Tafeileh	1	0	2	0	3	3.49
Zarqa	2	4	2	0	8	9.30
Aqaba	0	0	2	0	2	2.33
Total	**27**	**41**	**17**	**2**	**86**	**100**

Figure 3: Distribution of ESRD Hemodialysis Patients by Health Center Type.



- **Dialysis Modality**
    - Haemodialysis

Dialysis treatment for End-Stage Renal Disease (ESRD) patients in Jordan was primarily delivered through two modalities: hemodialysis and peritoneal dialysis. Out of a total of 6,063 dialysis patients, 5,960 (approximately 98 %) were receiving hemodialysis.

Among hemodialysis patients, 60% were male (3,558 patients) and 40 % were female (2,402 patients). Jordanian nationals constituted the vast majority (96%), followed by Palestinian (2.3%) and Syrian (1.7%) patients.

Regarding the frequency of hemodialysis sessions per week, the majority of patients (69%) received three sessions, which is the standard recommended regimen. An additional 19% received two sessions per week, while smaller groups had one session (0.4%) or four sessions (0.4%) per week. However, for 11.8% of patients, data on the number of weekly sessions were missing, indicating a potential area for data quality improvement.

    - Peritoneal Dialysis

A total of 103 patients (1.7% of all dialysis patients) were receiving peritoneal dialysis in Jordan. Of these, 52% were male (54 patients), and 48% were female (49 patients). The vast majority (97%) were Jordanian nationals (100 patients), while the remaining 3% (3 patients) were Palestinians. No Syrian or other nationalities were reported under this modality.

Peritoneal dialysis services were exclusively available in selected public and military hospitals. Based on the data obtained, approximately 66 patients were treated in public hospitals, and 37 in military facilities. No private facilities provided peritoneal dialysis services. Private companies primarily manage home-based follow-up care for peritoneal dialysis patients, while overall clinical monitoring remains under the supervision of the Ministry of Health through designated centers.

Note: The figures presented for peritoneal dialysis patients are approximate, as data collection for this modality is limited and may not fully capture all patients across sectors.

Table 9 : ESRD Patient Distribution by Centre Type.

Centre Type	Haemodialysis Patients	Peritoneal Dialysis Patients
Academic	129	0
Government	1755	66
Military	1510	37
Private	2566	0
Grand Total	**5960**	**103**

Table 10 : Distribution of Dialysis Patients by Modality, Sex, and Nationality in Jordan.

Modality	Sex	Jordanian	Palestinian	Syrian	Others	Total
Haemodialysis	Male	3,415	79	51	13	3,558
	Female	2,282	59	56	5	2,402
	Total	**5,697**	**138**	**107**	**18**	**5,960**
Peritoneal Dialysis	Male	52	2	0	0	54
	Female	48	1	0	0	49
	Total	**100**	**3**	**0**	**0**	**103**
Grand Total		**5,797**	**141**	**107**	**18**	**6,063**

Table 11 : Distribution of Haemodialysis Sessions per Week among Registered ESRD Patients.

Number of Sessions per Week	Number of Patients	Percentage (%)
1 session	21	0.40
2 sessions	1,134	19.00
3 sessions	4,080	68.50
4 sessions	23	0.40
Missing / Not reported	702	11.80
Total	**5,960**	**100**

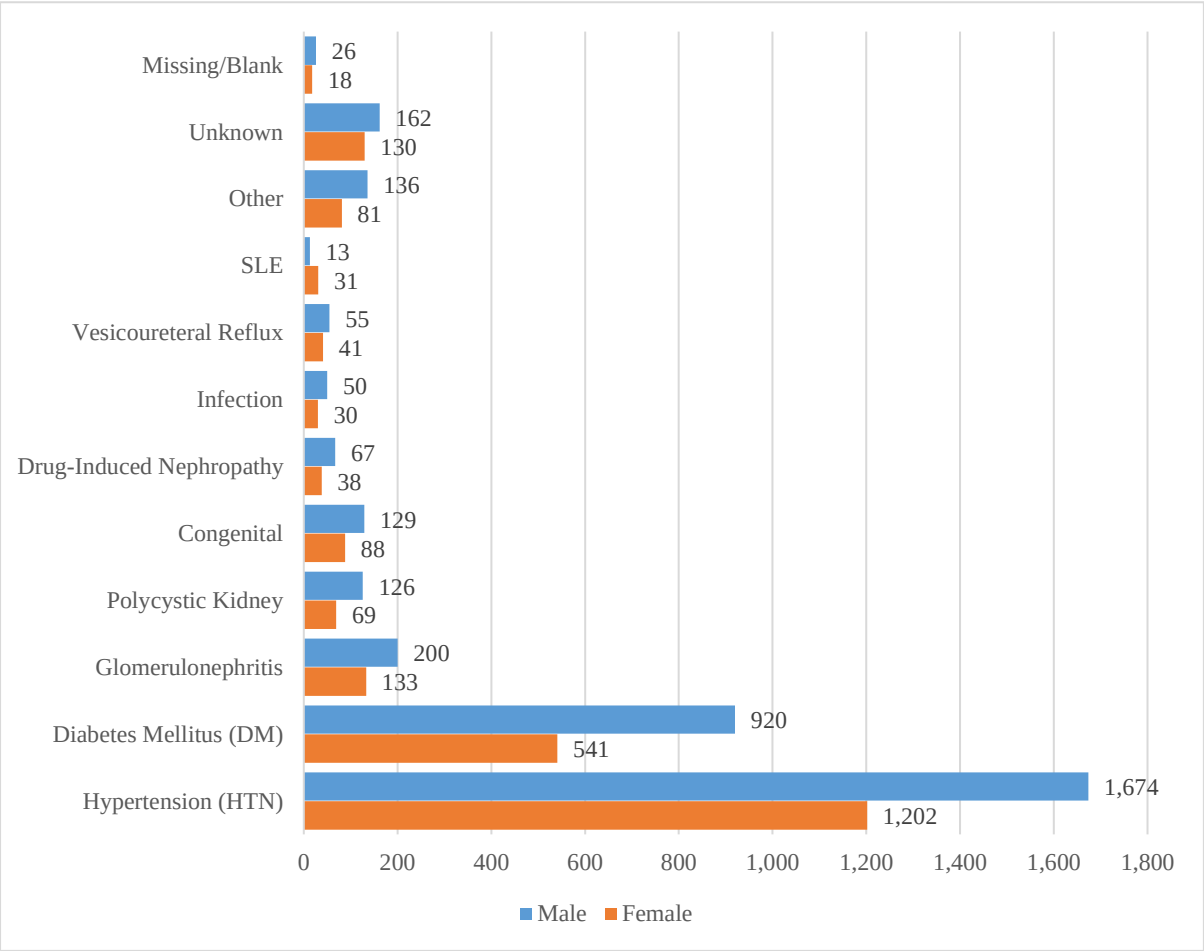
- **Etiological Distribution of End-Stage Renal Disease (ESRD)**

Hypertension was identified as the most common cause, accounting for 2,876 cases (48%) of all hemodialysis patients, with a higher number among males (1,674 cases) compared to females (1,202 cases). Diabetes mellitus was the second most frequently reported cause, responsible for 1,461 cases (25%), including 920 males and 541 females.

Additional causes included glomerulonephritis, polycystic kidney disease, congenital anomalies, and drug-induced nephropathy. Additionally, 292 patients (5%)—130 females and 162 males—were classified as having an unknown etiology, which may reflect diagnostic limitations in some healthcare settings.

Note: The data presented in this section are limited to patients undergoing hemodialysis. Etiology data for patients receiving peritoneal dialysis were not available and therefore excluded from the analysis.

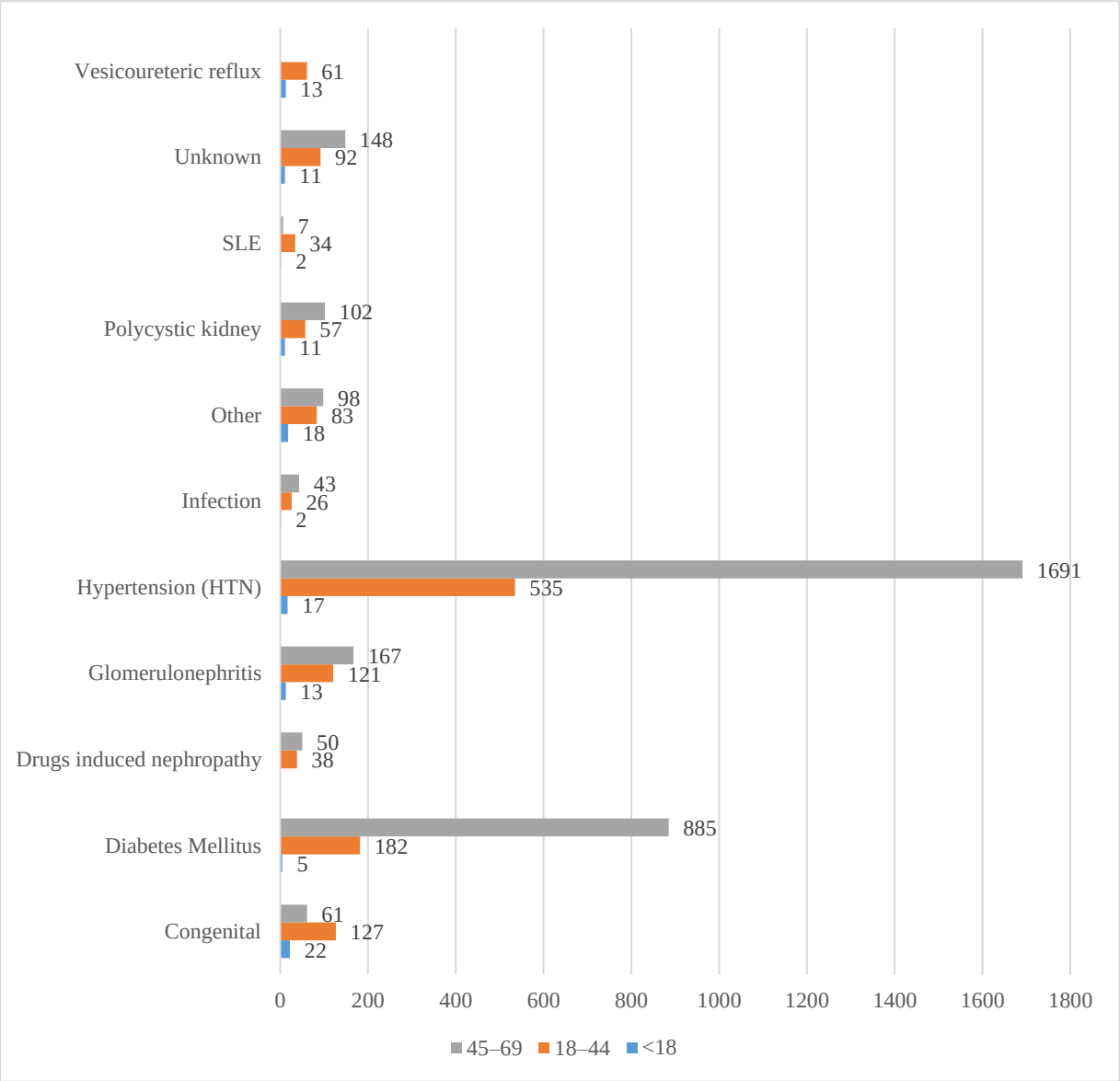
Figure 4: Distribution of End-Stage Renal Disease Etiology by Sex.



- Age-Related Patterns of ESRD Etiology

The analysis of End-Stage Renal Disease (ESRD) Etiology across age groups reveals clear age-related patterns. Hypertension and diabetes mellitus are the predominant causes among older adults, with prevalence increasing significantly with age. Congenital causes are primarily observed in younger populations, while Systemic Lupus Erythematosus (SLE) cases are mostly concentrated in young adults aged 18–44 years. These findings underscore the importance of age-specific prevention and management strategies to address the diverse causes of ESRD effectively.

Figure 5: Distribution of ESRD Etiology by Age Group.



- **Kidney Transplantation among Registered Dialysis Patients**

A total of 62 registered dialysis patients underwent kidney transplantation in Jordan, according to the End-Stage Renal Disease (ESRD) registry. This number reflects only patients formally documented within the registry.

Out of the 62 transplant recipients, Jordanian nationals comprised the vast majority (61 patients, or 98.4%), while only one patient (1.6%) was of Palestinian nationality. This reflects the overall dominance of Jordanians within the dialysis population and may also indicate greater access to transplantation services among citizens.

In terms of sex distribution, male patients accounted for 44 transplants (71%), while female patients received 18 transplants (29%). The predominance of males is consistent with their higher representation among ESRD patients.

Geographically, the highest number of transplant cases was recorded in Amman (23 cases), followed by Irbid (9 cases) and Mafraq (9 cases). Other governorates had fewer transplant cases, ranging between 1 and 6.

Table 12 : Distribution of Kidney Transplants by Governorate, Sex, and Nationality.

Governorate	Total Transplants	Jordanian	Palestinian	Male	Female
Ajloun	2	2	0	1	1
Amman	23	22	1	16	7
Aqaba	1	1	0	1	0
Balqa	2	2	0	2	0
Irbid	9	9	0	8	1
Jarash	1	1	0	0	1
Karak	3	3	0	2	1
Ma'an	1	1	0	1	0
Madaba	2	2	0	2	0
Mafraq	9	9	0	6	3
Tafiela	3	3	0	0	3
Zarqa	6	6	0	5	1
Total	**62**	**61**	**1**	**44**	**18**

- **Mortality in ESRD Patients**

In 2024, a total of 656 deaths were recorded among patients with End-Stage Renal Disease (ESRD) in Jordan. The highest number of deaths occurred in Amman (273), followed by Irbid (129), Zarqa (94), and Karak (32). These governorates also have the largest dialysis patient populations and better-established healthcare centers, which may reflect both a higher disease burden and more comprehensive mortality reporting .Based on the total number of ESRD patients (6,063), the mortality incidence rate was approximately 10,822 deaths per 100,000 ESRD patients, indicating a substantial burden of disease among this high-risk population. When calculated relative to the total population of Jordan (11,734,000), the mortality rate was approximately 5.6 deaths per 100,000 populations, reflecting the broader public health impact of ESRD-related mortality.

Sex-specific analysis showed that males accounted for 366 deaths (56%), while females accounted for 290 deaths (44%). This distribution aligns with the overall demographics of the dialysis population in Jordan, where males constitute a larger proportion.

Table 13 : Mortality Distribution among ESRD Patients in Jordan, by Governorate and Sex.

Governorate	Male	Female	Total Deaths	Incidence rate Per100000
Ajloun	5	8	13	6
Amman	175	98	273	5.6
Aqaba	10	8	18	7
Balqa	15	10	25	4
Irbid	71	58	129	6
Jarash	2	2	4	1.4
Karak	19	13	32	8
Ma'an	4	5	9	4.6
Madaba	9	10	19	8
Mafraq	21	12	33	5
Tafiela	4	3	7	6
Zarqa	54	40	94	5.6
Total	**366**	**290**	**656**	**5.6**

DISCUSSION

The 2024 report on End-Stage Renal Disease (ESRD) in Jordan provides valuable insights into the current status and trends of renal replacement therapy nationwide. Several key observations have emerged from the data, warranting attention for policy development and clinical improvement.

- **Epidemiological Patterns**

In 2024, the demographic profile of ESRD patients remains similar to previous years, with most patients being middle-aged or elderly Jordanians. Males constitute a larger proportion of both haemodialysis patients and newly diagnosed ESRD cases. This difference may be related to variations in exposure to risk factors, health-seeking behaviour, or disease progression.

Information regarding the primary causes of end-stage renal disease (ESRD) may not always be accurate due to several challenges in data collection and documentation. A major limitation is the heavy reliance on patient-reported history to determine the cause of kidney disease, which can be problematic since patients often have limited knowledge or recall of their medical conditions. This issue is compounded by inconsistent medical records and the absence of a unified electronic health information system across dialysis centers. Furthermore, many patients present late in the disease course, reducing opportunities for early

diagnosis and precise identification of the underlying cause. As a result, the reported distribution of ESRD causes should be interpreted with caution, acknowledging the possibility of misclassification and underestimation.

- **Treatment Modalities and Gaps**

Haemodialysis remains the dominant dialysis modality, accounting for over 98% of all dialysis patients. In contrast, peritoneal dialysis continues to be underutilized, limited to a small number of patients and facilities—mainly within the public and military sectors. Geographic disparities in access to dialysis units persist, with urban areas—particularly Amman—hosting the majority of centers, while rural regions continue to suffer from limited services.

Given these challenges, it is essential to expand access to alternative treatment options such as peritoneal dialysis, especially in underserved rural areas. In addition, kidney transplantation remains the most effective and sustainable treatment for eligible patients with end-stage renal disease. Promoting transplantation awareness, enhancing donor programs, and strengthening transplant infrastructure can significantly reduce the burden on dialysis centers.

Furthermore, implementing comprehensive patient education, improving follow-up systems, and ensuring equitable distribution of dialysis units are critical steps toward better patient outcomes and reduced disparities in care.

Collectively, these findings underscore the urgent need to strengthen early detection and management of chronic kidney disease, improve access to high-quality dialysis care, and expand preventive services—particularly in governorates with limited healthcare resources.

- **Data Quality and System Limitations**

Integrating ESRD data into the Cardiovascular and Diabetes Registry has improved data management. However, challenges remain, including inconsistent reporting of key variables such as smoking status and blood type, especially for patients registered before recent system updates. Furthermore, diagnostic documentation is often incomplete or lacking, limiting the accuracy of identifying primary disease causes. Data on peritoneal dialysis patients also remain incomplete in several areas. Addressing these gaps is essential to enable more comprehensive and reliable surveillance.

RECOMMENDATIONS

To reduce the burden of ESRD and improve patient outcomes in Jordan, efforts should focus on early detection and prevention of hypertension and diabetes, combined with public awareness campaigns targeting high-risk groups. Enhancing diagnostic capacity and standardizing medical records will help clarify disease causes and improve care. Expanding access to dialysis—especially peritoneal dialysis in underserved areas—and ensuring quality through clinical audits and equitable resource distribution are essential. Strengthening kidney transplantation programs and addressing regional and sex disparities will further improve survival. Finally, improving the national registry and data integration across sectors will support better surveillance and targeted interventions to reduce premature mortality.

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