

UAE & NEPHROLOGY LANDSCAPE

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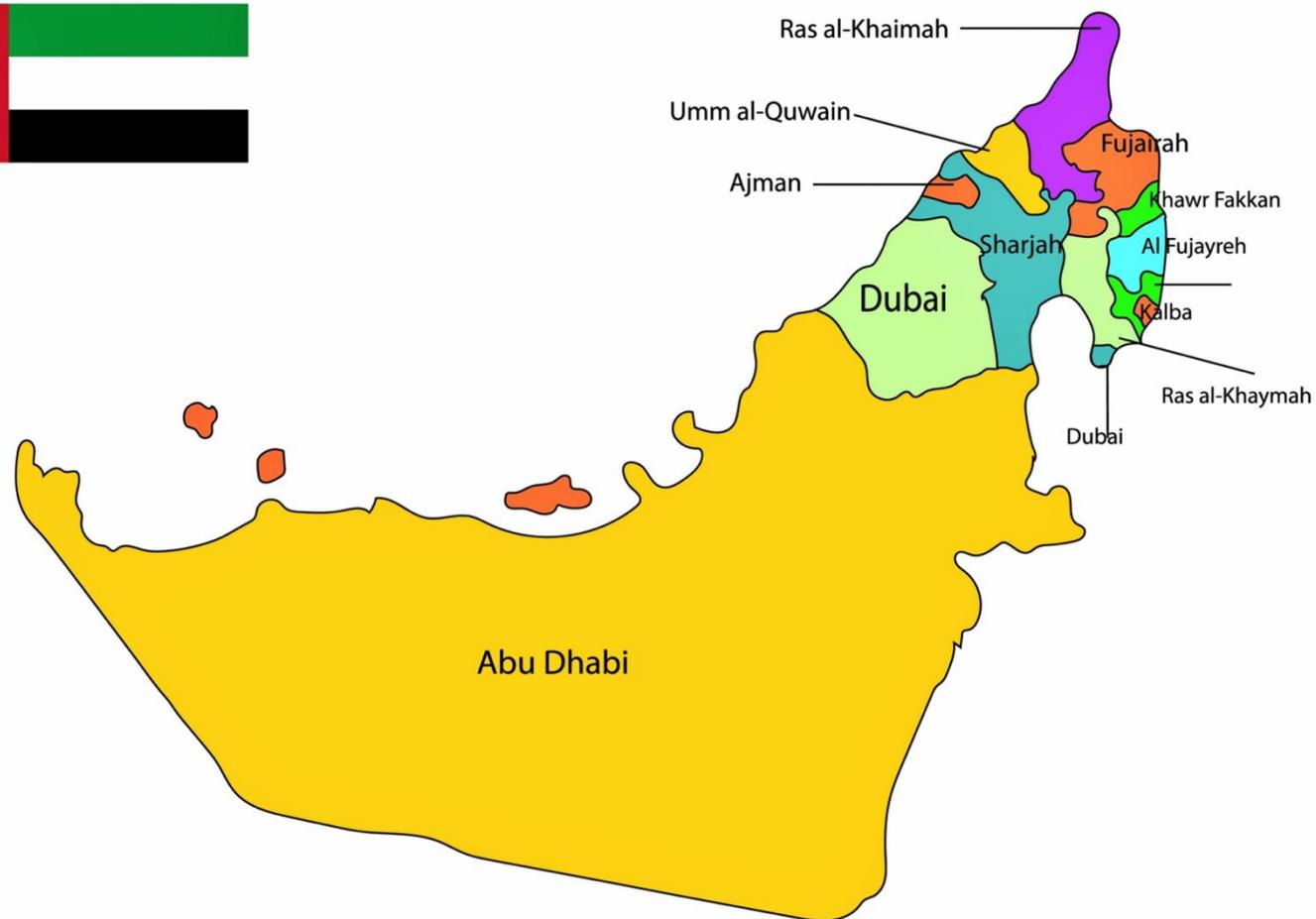
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United Arab Emirates





الإمارات
THE EMIRATES

POPULATION
9,682,088
MILLION



TOP 3 CITIES

» Dubai - 4,177,095

» **Abu Dhabi** - 2,784,490

» Sharjah - 2,374,132

UAE
Capital

732,861 USD

GDP
(2018)

UAE Dirham
is the
official currency



Arabic
is the
official language

Basic geographic and economic data for the GCC countries

Geographic and economic Parameters	Bahrain	Kuwait	Oman	Qatar	KSA	UAE
Total area - km ²⁽¹⁾	767	17,818	309,500	11,607	2,000,000	71,024
Total population millions – 2014 ⁽¹⁾ (% males) ⁽²⁾	1.452 (60)	4.123 (55)	4.2 (71)	2.2 (80)	30.9 (59)	9 (75)
% citizens ⁽¹⁾	46	31	56	10	67	11.3
GDP billion US\$ – 2014 ⁽³⁾	34	176	82	94	746	402
GDP per capita – 2014 ⁽⁴⁾	21,000	52,000	17,000	94,000	25,400	45,000
Total health expenditure per capita US\$ – 2013 ⁽⁴⁾	1900	2375	796	2882	1681	2233
Total health expenditure as percent (%) of GDP – 201 ⁽⁴⁾	4.9	2.9	2.6	2.2	3.2	3.2

GDP: Gross domestic product, KSA: Kingdom of Saudi Arabia, UAE: United Arab Emirates.

Demography and health status of the population in each of the GCC countries

Health status parameter	Bahrain	Kuwait	Oman	Qatar	KSA	UAE
Total population millions – 2014 ⁽¹⁾ (% males) ⁽²⁾	1.452 (60)	4.123 (55)	4.2 (71)	2.2 (80)	30.9 (59)	9 (75)
Median age (WHO – 2013) ⁽⁴⁾	30	29.5	26	32	28	30
Life expectancy at birth - male/female (WHO – 2013) ⁽⁴⁾	76/78	78/79	74/79	79/80	74/78	76/78
National prevalence of DM IDF World Diabetes Atlas ⁽⁵⁾	21.9	17.9	8.2	16.3	17.5	10.7
2008 hypertension estimated prevalence ⁽⁷⁾	37.1	29.1	34.5	33.8	33.1	27.5
Average body mass index ^(4,6)	27.4	29.5	24.9	26.8	27.3	28

KSA: Kingdom of Saudi Arabia, UAE: United Arab Emirates.

Brief History of Nephrology in UAE

- UAE independence was in 1971 with a population estimated then around 200,000 people.
- With the flow of the oil revenues, the country started to invest in healthcare and education
- One of the oldest hospitals, opened in 1968, was the Abu Dhabi Central hospital and soon many health services were offered including outpatient renal services.
- Dr Avinash Pingle, the nephrologist at the Central hospital, was instrumental in setting up the first dialysis unit in the UAE and also for introducing Nephrology as a specialty to the country.
- The Central Hospital in Abu Dhabi was the only center offering such services until 1980, receiving patients not only from the UAE, but also from neighboring countries such as Oman and Bahrain. The services then extended to be available in each emirate of the country.

- The UAE is the third largest and second most populous country in the GCC.
- IPD was initiated in 1976 ,CAPD begun in 1985.
- HD was established in 1977.
- There are 33 dialysis centers in the UAE: 22 are public and 11 in the private sector, altogether serving a dialysis population of > 3500 patients. Of the total dialysis population, only 40% are citizens.
- Nine centers are participating in DOPPS with 283 randomly selected patients.
- First transplant was started in 1985.

Kidney Disease in UAE

- In UAE similar to other countries, CKD has become an increasingly significant clinical and public health issue.
- This is because during recent decades, the UAE has undergone significant rapid economic growth and modern infrastructure development, following the discovery of oil.
- This economic progress has clearly brought many social benefits and opportunities for the country , including an increase in life expectancy.
- On the other hand, rapid modernization and urbanization have contributed to a substantial increase of risk factors for many chronic diseases like CKD, HTN, DM, obesity, dyslipidemia, and smoking.
- Cardiovascular disease is the principal cause of death in the UAE, constituting 28% of total deaths; other major causes are accidents and injuries, malignancies, and congenital anomalies.
- According to the World Health Organization data from 2014, 37.2% of adults in the UAE are clinically obese, with BMI scores of 30 or more.

- Information on the epidemiology of CKD and associated risk factors are in general limited in the UAE and GCC, when compared to western countries.
- However, with the recent implementation of electronic medical records, more awareness of chronic diseases and their economic burdens, as well as implementation of population-based screenings due to health insurance requirements, led to a significant amount of data available.
- Accordingly, there has been an increasing number of research publications that addressed kidney disease in the UAE and the GCC with details on prevalence and incidence of risk factors and their public health implications.

- the unique population-level screening (Weqaya) Programme for UAE Nationals living in Abu Dhabi, collected every three years from the age of 18, has recruited more than 94% of the adults into a screening programme for the rapid identification of those at risk and deployment of targeted interventions to control these risk factors.
- According to a study of CKD epidemiology and referral patterns conducted in Abu Dhabi, using the available screening population data combined with data from the unified Electronic Medical Records (EMR) system ,
 - the dialysis prevalence in Abu Dhabi was estimated at around 370 per million population (pmp) with an annual growth of 12-15%.
 - Among Emiratis, 4.6% of males and 2.8% of females had an eGFR between stage 3 and 5 CKD.
 - Among Expatriates, 4.2% of males and 3.2% of females had an eGFR between stage 3 and 5 CKD.

- The Dialysis Outcome and Practice Pattern Study (DOPPS) data, for which UAE and the rest of GCC joined phase 5, indicated that
 - diabetes is reported as the primary cause of End Stage Renal Disease (ESRD) for 41% of HD patients in the GCC compared to 43% in North America and 25% in Europe.
 - Among the GCC countries, DM as the cause accounts for 39% followed by HTN 34% in the UAE.
- In another study performed by a single government center in Dubai the data shows that DM as the cause of ESRD accounts for 57%.
- These studies and a few others demonstrate the need to improve the identification and referral of CKD patients and the need to increase public and physician awareness of CKD.

Hemodialysis

- The first chronic HD program was established in Abu Dhabi in 1977, followed by the emirate of Dubai in 1980 and then the rest of the emirates.
- By the end of 2021, the total number of patient on Center HD was estimated to be around 3500, being 2400 under Abu Dhabi health authority, 600 under MOH and the rest under Dubai health authority.
- As per data for the year 2018 ,dialysis prevalence is estimated to be around 260 pmp and the dialysis incidence is 130 pmp . The national percentage among the dialysis population account for 40% .
- Outsourcing of the dialysis services to private international companies has been established.

- All forms of convective therapies are available in UAE.
- The typical HD prescription has a dialysis flow of 500ml/min and blood flow rate that range between 250-350 depending on the patient weight and the vascular access.
- The conventional in-center ,four-hour , thrice-weekly session is the standard in UAE.
- 11% of the patients are on hemodiafiltration (HDF) prescription.
- Dialyzer reuse is not allowed in UAE.
- The main vascular access is arterioveous fistula in 55% of the patient, followed by central catheter 41% and 4% have graft.
- The annual mortality is estimated to be around 8.5%.
- All the nephrologist in UAE followed the international KDIGO/kdoqi guidelines in relation to dialysis adequacy or lab parameters.
- EMA has created and distributed a flow chart to all dialysis units in the country regarding the management of Chronic kidney disease bone mineral disorder (CKD-MBD)

- The dialysis services as well as all the ESRD drugs such as erythropoietin, phosphate binders and others are covered completely by the government for the nationals and through insurance, self-payment or charity for the UAE residents.
- Home HD (HHD) was introduced in 2017 through the private sector and is sponsored by the government for the nationals .It has provided relief to geriatric and disabled patients, for whom going to the center three times per week posed a problem; nearly 250 patients are getting this service as of the end of 2021.

- In addition, all forms of continuous renal replacement therapies as well as plasmapheresis and the use of dialysis or hemoperfusion in the treatment of poisoning, are available in the majority of Intensive Care Units (ICU) in the country.
- The dialysis units in the country, whether stand-alone or in-hospital, has to undergo a licensing process and fulfill all the requirements as per governments health authority roles and regulations, before establishment.
- The average dialysis facility in UAE will have nephrologists, dialysis nurses, a dietitian and a social worker . Dialysis technician are hardly appointed in the emirates. There is no fixed ratio of staff to patient but roughly it is around one doctor per 30-50 patient and one nurse per 4-6 patients on dialysis.

Peritoneal Dialysis

- The first PD program was established in 1976.
- Nowadays there are around 140 patients throughout the country on this modality, either in the form of Continuous Ambulatory Peritoneal Dialysis (CAPD) or Automated Peritoneal Dialysis (APD). Few centers offer this type of therapy to the patients.

	ALAIN	15
ABU DHABI	ABU DHABI SKMC	35
	ABU DHABI Central	25
DUBIA	DUBAI Hospital	25
SHARJAH	AL Qasmi Hospital	29
AJMAN	AJMAN SKMC	15

Renal Transplantation

- Organ Transplantation in many ME countries were influenced in the 1970s and 1980s by Islamic scholars opinion (Fatwas) about brain death and the shortage of technical transplant expert teams to perform the procedures before initiating kidney transplantation.
- A key fatwa in neighboring Saudi Arabia came about in 1982, which permitted deceased donor transplantation, paved the way to start a cadaveric renal program.
- Another progressive fatwa was issued, at the meeting of the Islamic Jurisprudence Conference in 1986 in Amman Jordan, declaring that the diagnosis of brain death was permissible and could be used to diagnose an irreversible process .
- soon after in 1988, another landmark fatwa was issued in Saudi Arabia allowing cessation of life sustaining therapy, including ventilation, permitted wider practice of deceased donation and transplantation in the middle east.

Some of the landmarks of transplantation in UAE were:

- the first living-related kidney transplant performed by Dr. Abdulla Daar at Mafraq hospital in Abu Dhabi in 1985, and the first two cadaveric transplant, from kidneys donated to UAE from European Union, in 1989.
- This first phase lasted until 2002 with a total of 62 living-related kidney transplants and two cadaveric kidney transplants performed with a 5-year graft survival of 82%. This initial success drew patients from neighboring countries such as Sudan and Yemen to do the procedure in the Emirates

- A presidential decree on transplantation was issued in 1993 and a Federal National Transplant committee was established soon after to work on needed bylaws and policies.
- In December 2007 a steering committee from the Transplantation Society and the International Society of Nephrology (ISN) met in Dubai under the umbrella of Emirate Nephrology Society to enhance the global efforts to address the growing problems of organ sales, transplant tourism and trafficking in organ donors in the context of the global shortage of organs. The preparatory work of the Steering Committee was a key achievement for the transplant community leading to the Declaration of Istanbul on Organ Trafficking and Transplant Tourism, which helped many countries to start their ethical national living and deceased organ donation programs.

- In 2008, Phase two for transplantation program in UAE was initiated when Shaikh Khalifa Medical City- SKMC, part of Abu Dhabi health Services company network, reestablished a kidney transplantation program in partnership with Cleveland Clinic Foundation. The program included living-related pediatric and adults kidney transplantation for all residents in UAE at the government expense.
- By the end of 2016, 160 cases of living-related kidney transplant and two cases of cadaveric transplant donated to UAE from Saudi Arabia had been performed.

- In 2017, phase three for transplantation started in UAE with the new transplantation law signed by the president of UAE, providing needed legal support for recognition of brain death as death, and permitting the start of deceased donation.
- At the same time, there has been significant investment in the transplant programs which led to start deceased organ donation including the start of UAE's heart, lung, liver and expansion of the transplant program with 14 deceased donations saving the lives of more than 40 transplant recipients by the end of 2018.
- To date there are six transplant programs, two in Abu Dhabi , three in Dubai and one in Sharjah. Five performing kidney transplantation, with Cleveland Clinic Abu Dhabi hospital performing multiorgan transplantations.

- There has been significant training programs for the ICU staff on organ donation protocols and there has been many capacity building programs in collaborations with international centers such as the Donation and Transplantation Institute in Spain and others.
- There are plans under way to establish UAE Organ Procurement Organization (OPO) to take organ donation to a more systematic approach in the coming period and the federal as well as local health authorities are addressing the required resources needed.

- Of note is that all the kidney transplantation procedures, plus medications, that have been done, were either health insurance sponsored or covered by governmental mandated funds free of charge.
- over 20 nationalities benefiting from the program with one year and three years graft survival for adult age group of 98% and 96% respectively and graft survival at one and 5 years for pediatric age group of 96.7% and 83.3% respectively, equivalent to data from many USA and international program.

- The incidence of pediatric kidney diseases has been several times higher in UAE compared to most of the western countries, most likely due to the high rate of consanguinity.
- Unfortunately, there are almost no accurate data regarding the epidemiology so far.
- Some of the top hereditary diseases are congenital nephrotic syndrome, autosomal recessive polycystic kidney disease and nephropathies.
- On the other hand, we are seeing more CKD caused by secondary causes due to the increasing advancement in treating complex diseases like cardiac, malignant, and rheumatic diseases.

- The first pediatric nephrology center in the UAE was established in Abu Dhabi (Central Hospital) in 1991, shortly followed by another center in the Emirates of Dubai (Dubai hospital) in 1993.
- Chronic dialysis services in the form of PD was introduced in both Abu Dhabi and Dubai in 1992 and 1996, respectively.
- HD was initially provided in the form of acute dialysis, but subsequently, chronic programs were established in 1995 and 1996 in Abu Dhabi and Dubai, respectively.
- Pediatric kidney transplantation was first established as living-related program at Sheikh Khaliah Medical City (SKMC), Abu Dhabi in 2010 followed by deceased donor program in both Abu Dhabi (SKMC) and Dubai (Al Jaleela Children hospital) in 2017 and 2018, respectively.
- Currently there are four centers within the UAE providing almost the whole spectrum of pediatric nephrology care including: all dialysis modalities, living and deceased kidney transplantation, plasma exchange and special treatments for complex glomerulonephritis and hemolytic uremic syndrome.

- AKI is common worldwide and associated with significant morbidity , mortality and resource utilization.
- In UAE ,unfortunately, there is no data registry for AKI.
- Available RRT for critical care nephrology include continuous therapies and conventional or prolonged intermittent HD, performed in wards or ICU.

Acute Kidney Injury and Critical Care Nephrology



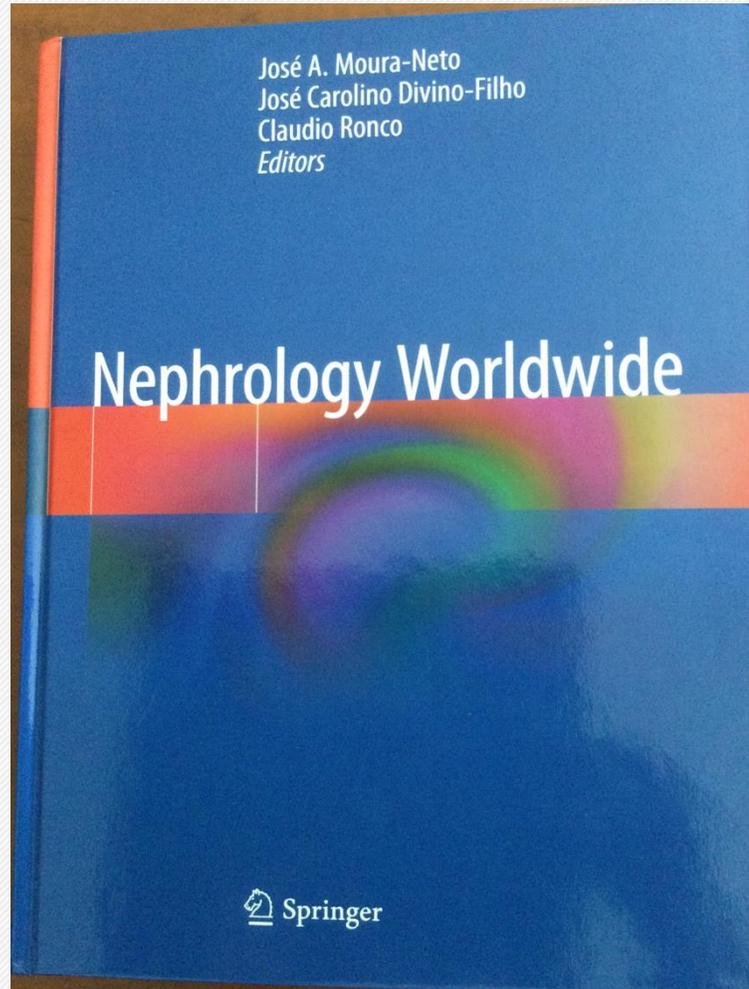
- In one publication on 2004 regarding the experience of one tertiary hospital with AKI , It was found that out of all 81 patients admitted with or developed AKI in hospital over 18months period ,
 - 10%were direct admission to nephrology service with AKI,
 - and 90% developed AKI in hospital.
 - Thirty percent were refered by oncology services and 15% by general medicine.
 - Sepsis was the cause in 44% of the patients, followed by drug nephrotoxicity in 14% and obstructive uropathy in 9%.
 - Sixty patients(74%) were managed conservatively ,and 21(26%) required RRT.
 - Patients survival for those managed on the ward was 71% compared to 33% for ICU patients.
 - Renal survival was 83% for ward patients, compared to 48% for those in the ICU.
- This single center data is consistant with the international data in regarding sepsis being the leading cause of AKI and patient that need treatment in ICU showed a worse prognosis for both patient and renal survival

Highlights of Nephrology in UAE

- The Emirates Nephrology Society (EMAN) was founded in 1996, under the umbrella of the Emirates Medical Association. Since its establishment, the society has been active in providing education to its membership and the greater region. It started as 15 members and now its membership exceeds the 120.
- EMAN has an excellent track record of hosting successful events, working closely with International and regional associations on these projects. The president of the society was a council member in ISN from 2011-2017 and an executive council member from 2015-2017.
- The society played a major role in collecting the data regarding the status of nephrology in the country, leading the activities during World Kidney Day and in conducting the first survey on organ donation public opinion.
- Kidney health and nephrology are of particular interest for the UAE. The founder and much loved first president of the country, HH Sheikh Zayed Al Nahyan, received a KT in 2000. As a result, the UAE initiated the largest charity run in support of renal patients, research, training and public awareness programs, the Zayed Charity Marathon, which is held annually in New York, Abu Dhabi and Cairo.

- The UAE has made significant progress in its health care system over the past 43 years. The health care sector continues to undergo major transformations to ensure that it is well integrated in order to meet international health care standards .
- Mandatory health insurance introduction and universal access to care since 2007 allowed further investment into the healthcare infrastructure with the private sector playing a greater role in both the delivery of the healthcare to the population and its financing. New sets of quality standards are being adopted, for both public and private healthcare delivery systems, with the aim to rank the providers relative to their outcomes and accordingly determine their reimbursements.
- Currently, major academic medical centers from North America, Australia and European Union, have partnered with both public and private institutions for healthcare provision. There are six medical schools and nursing & health sciences colleges spread across UAE attracting undergraduates students from UAE and Abroad. In addition, an expansion of post-graduate training programs at academic teaching hospitals is ongoing .

- The future challenges of nephrology in UAE, as in many other countries, are to decrease the prevalence of CKD. Early detection and management of chronic diseases, such as DM and HTN, which are the main underlying causes for ESRD, will help achieving this goal.
- While the country has made great strides, there is still much to be done in terms of disease registry, prevention and achieving self-sufficiency in organ donation.
- The country futuristic plan towards innovation, availability of G5 internet, use of big data and encouraging research could further help in disseminating knowledge and awareness.



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Original Article

Demographics and Key Clinical Characteristics of Hemodialysis Patients from the Gulf Cooperation Council Countries Enrolled in the Dialysis Outcomes and Practice Patterns Study Phase 5 (2012–2015)

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