

Organ Transplantation

By the end of year 2008, a total of 3800 living donor and 1960 deceased donor renal transplantation have been performed inside the kingdom of Saudi Arabia. It is worth mentioning that the deceased organ transplantation program in the Kingdom received a big boost with the inception of the National Kidney Foundation in 1984 and further in 1993 when this organization was upgraded and renamed as Saudi Center for Organ Transplantation (SCOT).

A total of 394 kidneys have been transplanted during year 2008, of which 228 were from living related donors and 166 from deceased donors. Among the 166 deceased kidneys, 18 were used for pediatric recipients and 8 were given for urgent condition recipients.

Liver transplantation program in the Kingdom was started in the year 1990. Up to end of 2008, a total of 719 liver transplants have been performed. This includes 260 liver transplants from living donors including pediatric recipients performed at the Riyadh Armed Forces Hospital and adult recipients performed in King Faisal Specialist Hospital, Riyadh and King Fahd National Guard Hospital, and 459 deceased liver transplants performed in in King Faisal Specialist Hospital, Riyadh and King Fahd National Guard Hospital.

In the year 2008, there were 38 liver transplants from living related and 59 from deceased donors.

Between 1986 and 2008, there were 153 whole hearts and 468 hearts as source of valves transplantations inside the Kingdom. During this year alone, 19 whole hearts and 29 hearts as sources for valves have been transplanted.

Although more than 16,000 corneal transplants have been performed in the Kingdom from 1983 to 2008, the number of locally harvested corneas is dismally low (585 corneas).

A total of 12 pancreases were transplanted since 1990 including one pancreas operation transplant this year (combined pancreas-kidneys).

Lung transplantation activity (started in 1990), has a total of 28 lungs transplanted to 20 recipients as single or bilateral.

As for organ sharing program with Kuwait, Spain, Qatar and Kingdom of Bahrain, SCOT benefited from 43 kidneys, 66 livers, 7 whole hearts, 39 hearts for valves and 4 lungs since the program took place with these countries.

Renal Transplantation – 2008

During this year, 2008 kidneys were being transplanted inside the Kingdom of Saudi Arabia. 228 from living related donors and 166 from deceased donors. The following table shows the performance of the national transplant centers during year 2008.

Deceased and Living Related Renal Transplantation in Saudi Arabia -2008

S. No.	Hospital Name	Living Related Donors	Deceased Donors	Total
1	King Faisal Specialist Hospital, Riyadh	96	54	150
2	Armed Forces Hospital, Riyadh	37	27	64
3	King Fahd National Guard Hospital, Riyadh	15	26	41
4	King Faisal Specialist Hospital, Jeddah	13	8	21
5	King Fahd Hospital, Jeddah	9	10	19
6	Khamis Mushyat Military Hospital	9	9	18
7	Al-Hada Military Hospital, Taif	10	5	15
8	King Abdul Aziz Hospital, Jeddah	6	7	13
9	Saad Specialist Hospital, Al Khober*	12	0	12
10	King Fahd Specialist Hospital, Dammam	5	6	11
11	King Fahd Military Complex, Dhahran	7	3	10
12	King Fahd Armed Forces Hospital, Jeddah	6	3	9
13	North West Armed Forces Hospital, Tabuk	0	8	8
14	New National Jeddah Hospital*	2	0	2
15	Dr. Sulaiman Faqeeh Hospital, Jeddah*	1	0	1
	TOTAL	228	166	394

** Private sector hospitals performing living related renal transplantation*

Performance of deceased Renal Transplantation in 2008

Number of Harvested Kidneys	Number of Transplanted Kidneys	Number of Transplanted Patients
179	166	166

1 kidney combined with liver transplanted by KFSH- Riyadh

2 kidneys transplanted from non heart beating case by KFSH-Riyadh

1 kidney combined with pancreas transplanted by KFSH- Dammam

- 13 kidneys were harvested but not transplanted this year due to
 - 3 kidneys with glomerulosclerosis
 - 2 kidneys were HBsAg+ve
 - 2 kidney due to small artery and veins
 - 1 kidney due to technical problem
 - 1 kidney due to full of stone
 - 1 kidney- cross match positive
 - 1 atrophic kidney
 - 1 kidney due to myxoid degeneration with muscle atrophy
 - 1 kidney- recipient is unstable during operation

- Cold Ischemic Time (CIT) for locally harvested deceased kidneys was (15.8 ± 4.7 hours) ranging between 3.5 and 46.5 hours. On the other hand, matching sex (male to male or female to female) renal transplantation from deceased donors was done in 60% of the cases.
- Age Distribution for recipients and donors of the deceased kidneys are indicated in the following table

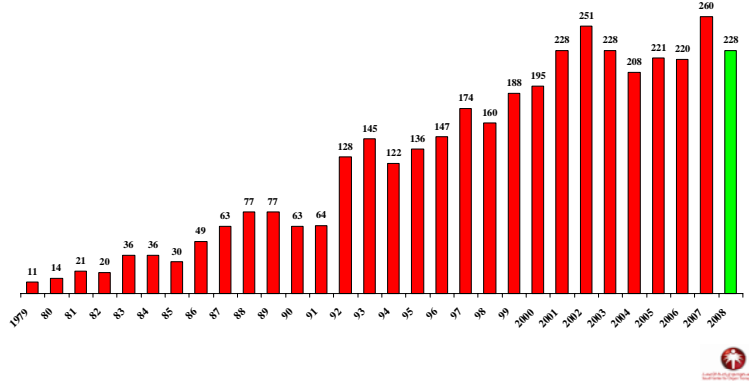
Age Distribution for Recipients and Donors of the Deceased Kidneys

Recipient Age (Years)	Donor Age (Years)						TOTAL
	< 5	5-15	16-29	30-50	51-65	>65	
< 5	-	1	-	1	-	-	2
5-15	2	2	7	7	-	-	18
16-29	-	1	11	28	2	-	42
30-50	-	-	14	48	7	2	71
51-65	-	-	2	22	6	-	30
>65	-	-	-	2	1	-	3
TOTAL	2	4	34	108	16	2	166

According to the data of renal failure patients in the Kingdom of Saudi Arabia, 382 patients underwent living renal transplant operations outside the kingdom during the year 2008

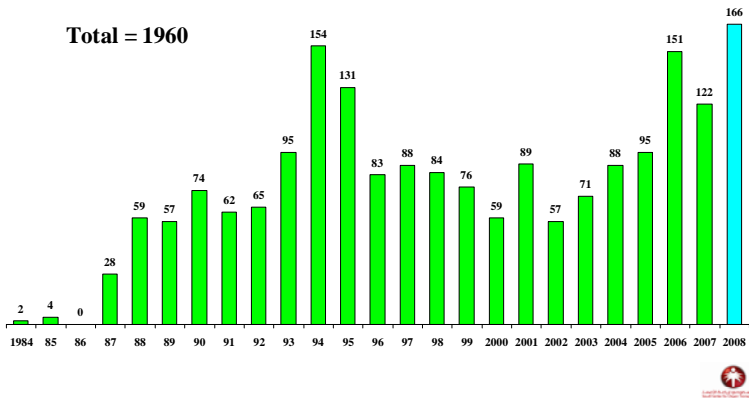
Living Related Donor Renal Transplantation 1979 - 2008

Total = 3800

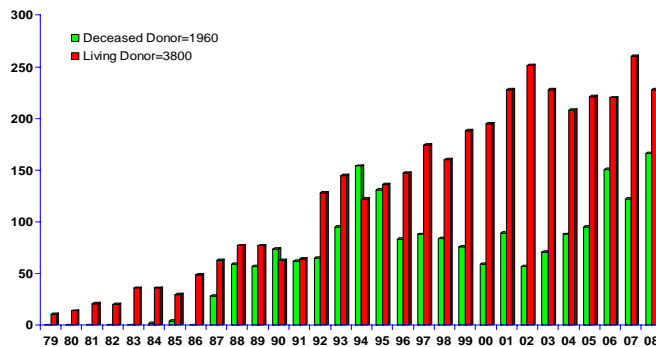


Deceased Donor (Retrieved Locally) Renal Transplantation 1984 - 2008

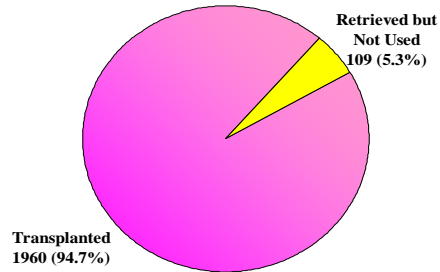
Total = 1960



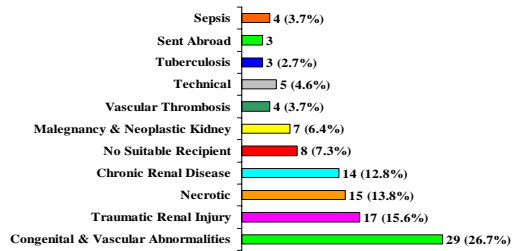
Deceased and Living Donor Kidney Transplantation in KSA



Kidneys from Deceased Donors 1986 - 2008



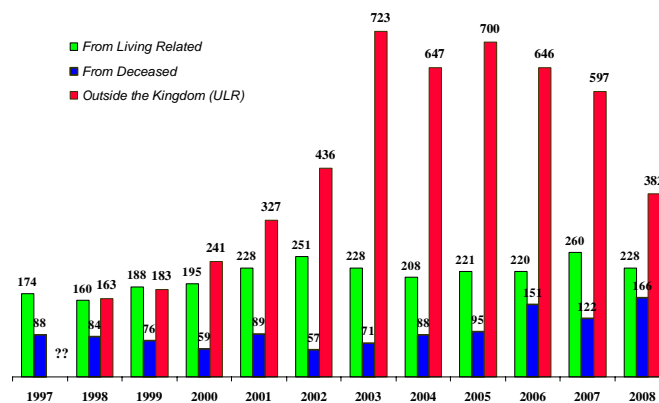
Reasons for Not Using Retrieved Deceased Donor Kidneys 1986 - 2008



Total = 109



Renal Transplantation Inside and Outside the Kingdom (1997 - 2008)



Kidney Transplantation Centers in the Kingdom of Saudi Arabia



Liver Transplant - 2008

The number of brain death cases consented for liver donation this year was 114. Harvesting was taken place in 71 cases, however only 59 livers were transplanted; 26 at King Fahd National Guard Hospital and 33 at King Faisal Specialist Hospital- Riyadh. Liver were not used in 55 cases for following reasons:

1. Liver were consented but not harvested in (43) cases:
 - Sudden cardiac arrest of the donor (7) cases.
 - Technical problem in Medivac (weather conditions) (1) case.
 - Liver lesion (3) cases.
 - Homodynamic instability of donor (2) cases.
 - Elevated liver enzymes (19) cases.
 - Old age donor (2) cases.
 - No recipient (5) cases.

2. Liver was rejected by transplant centers during harvesting, on macroscopic evaluation, in (2) cases because of sepsis.

3. Liver was rejected by transplant centers after harvesting in (12) cases:
 - Fatty livers (5) cases.
 - Liver fibrosis (3) cases.
 - Liver necrosis (1) case.
 - Liver infection (1) case.
 - Liver deteriorated after harvesting (1) case.
 - Recipient deteriorated (1) case.

Living Related Liver Transplantation - 2008

38 cases of living related liver transplantation were done during this year, 18 at Riyadh Armed Forces Hospital, 7 at King Faisal Specialist Hospital-Riyadh and 13 at King Fahd National Guard Hospital-Riyadh. Details of this were shown in the tables below:

King Faisal Specialist Hospital - Riyadh

Case No.	Age of Recipient	Reason for Liver Failure	Relation	Age of Donor
1	54yrs.	HBV	Son	27yrs.
2	52yrs.	HBV	Son	23yrs.
3	40yrs.	HCV	Brother	31yrs.
4	60yrs.	HCV	Son	27yrs.
5	57yrs.	Bilharzias	Son	23yrs.
6	44yrs.	HCV	Brother	25yrs.
7	61yrs.	Cryptogenic	Son	19yrs.

Total Number of Post Liver Transplantation Follow-Up Patients from KFSH-Riyadh - 172

King Fahd National Guard Hospital - Riyadh

Case No.	Age of Recipient	Reason for Liver Failure	Relation	Age of Donor
1	63yrs.	HCV	Son	32yrs.
2	51yrs.	HBV	Son	24yrs.
3	1.5yrs.	PFIC	Mother	27yrs.
4	65 yrs.	HCV	Son	24yrs.
5	65yrs.	Cryptogenic	Son	30yrs.
6	16yrs.	Cholestasis	Brother	27yrs.
7	66yrs.	HBV	Son	35yrs.
8	53yrs.	HCV	Son	27yrs.
9	57yrs.	Cholestasis	Daughter	33yrs.
10	61yrs.	HBV	Son	30yrs.
11	65yrs.	HBV	Son	31yrs.
12	56yrs.	Cryptogenic	Son	19yrs.
13	43yrs.	HCV, HCC	Sister	32yrs.

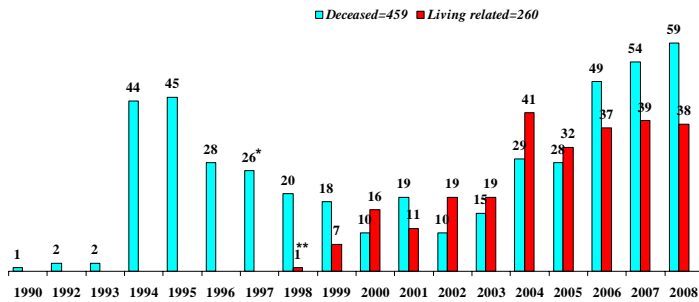
Total Number of Post Liver Transplantation Follow-Up Patients from KFNGH-Riyadh - 151

Riyadh Military Hospital

Case No.	Age of Recipient	Reason for Liver Failure	Relation	Age of Donor
1	7 months	Biliary Atreasia	Cousin	21yrs.
2	4 years	? PFIC	Uncle	32yrs.
3	10 months	Biliary Atreasia, post kasai	Father	28yrs.
4	1 year	Allagille Syndrome	Mother	34yrs.
5	7 years	PFIC	Father	47yrs.
6	6 months	Biliary Atreasia	Father	28yrs.
7	2 years	PFIC Type 1	Mother	21yrs.
8	4 months	Biliary Atreasia	Relative	24yrs.
9	9 years	Liver Cirrhosis	Relative	21yrs.
10	8 months	? Biliary Atreasia	Aunt	34yrs.
11	13 years	GSD Type 1	Relative	32yrs.
12	11 months	Ductal Plate Malformation	Relative	29yrs.
13	10 years	Chronic Liver Disease	Relative	27yrs.
14	1 year	PFIC	Relative	33yrs.
15	1 year	Biliary Atreasia	Mother	28yrs.
16	1 year	PFIC	Mother	30yrs.
17.	1 year	PFIC	Mother	33yrs.
18.	6 years	PFIC Type 1	Mother	28yrs.

Total Number of Post Liver Transplantation Follow-Up Patients from RKH - 123

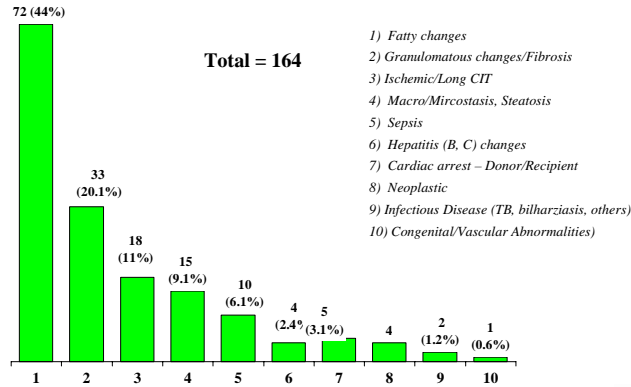
Liver Transplantation 1990 - 2008



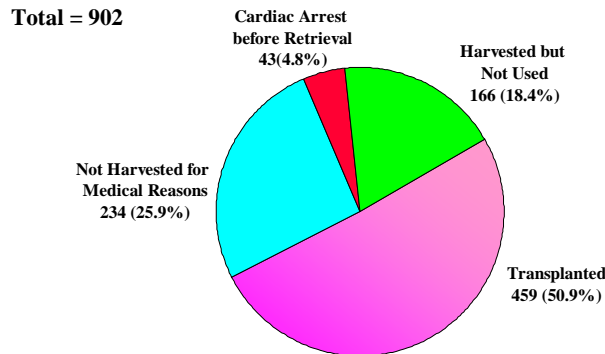
* All operations performed in KFNGH from 1997 to 2000
 ** First living related liver transplantation performed in RKH



Causes of Unused Harvested Livers 1994 - 2008



Livers from Deceased Donors 1994 - 2008



Heart Transplantation - 2008

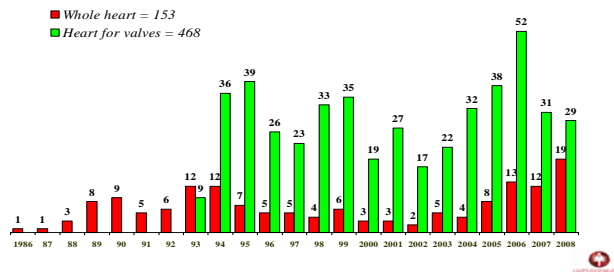
Ninety Three (93) consented obtained for heart donation (78.8% of total consented cases). (19) Whole hearts were harvested and transplanted at King Faisal Specialist Hospital, Riyadh, in addition to twenty nine (29) hearts harvested to be used as sources for valves; all were given to King Faisal Specialist Hospital, Riyadh.

Forty Five (45) hearts were consented for donation but not harvested for the following reasons: Unfit donor for medical reasons (sepsis, donor history) (16) cases, sudden cardiac arrest of donor before harvesting (8) cases and hepatitis serology positive (8) cases, no suitable recipients (8) cases and old age donor (5) cases.

Donor Heart Valve Procurement and Utilization in the Year 2008

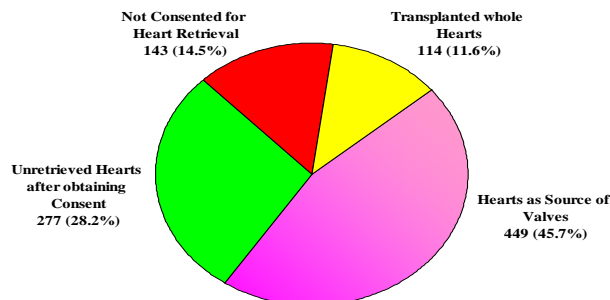
	Aortic Valve	Pulmonary Valve
Collected	29	29
Used	15	16
Still to be used	12	10
Discarded	2	3

**Heart Transplantation
1986 - 2008**



**Hearts from Deceased Donors
1993 - 2008**

Total = 983



Lungs Transplantation - 2008

One (1) lung transplant operation was done this year. The following table shows the lung transplantation activity for the last years.

Lung Transplantation in Kingdom of Saudi Arabia

Hospital Name	No. of Transplant Operation
King Fahd Hospital, Jeddah	4 (1991-1994)
King Faisal Specialist Hospital, Riyadh	12 (Since 1996)
King Faisal Specialist Hospital, Jeddah	4 (Since 2001)

Total lungs transplanted = 28

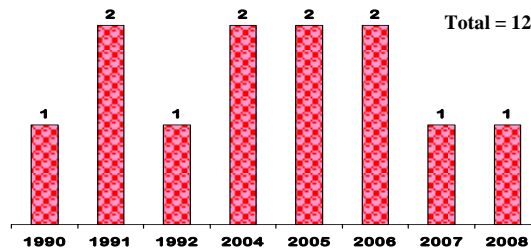
Total lungs transplant patient = 20

Pancreas Transplantation - 2008

One (1) pancreas transplant operations was done this year at King Fahd Specialist Hospital, Dammam. It was combined transplant operation (kidney-pancreas).

It is also worth mentioning that the first pancreas operation in the Kingdom was done in 1990, followed by two combined pancreas-kidney operations in 1991. In addition to another combined operation in 1992 at Al-Shati Hospital done in collaboration with King Abdulaziz Hospital - Jeddah

Pancreas Transplantation in Saudi Arabia 1990-2008



Cornea Transplantation - 2008

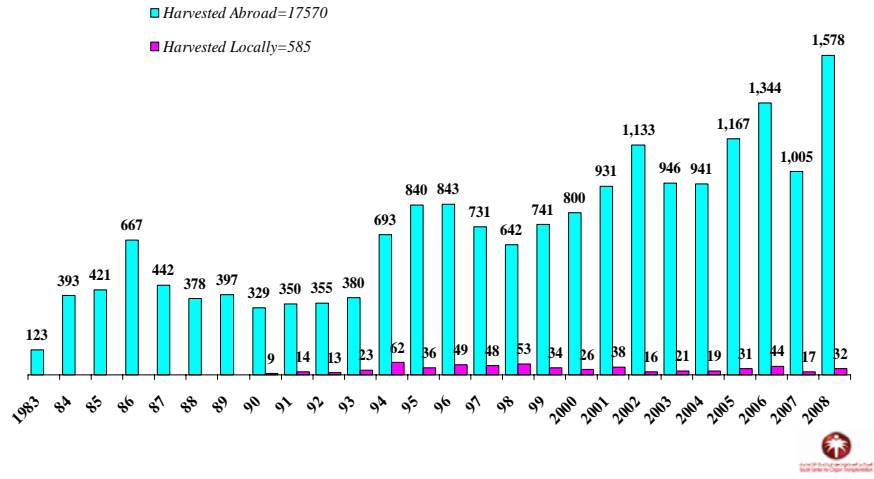
Corneal donation program (as a tissue) is currently harvested along with multi- organ retrieval from brain death donors.

In the year 2008, consent for corneal donation was obtained in 41 brain death cases (34.7%) of total consented cases. (16) Cases were harvested while the remaining (25) were not harvested for the following reasons: hepatitis serology (HCV, HBsAg, HBcAb) (14) cases, medical history of donor (3) cases and technical reasons (8) cases.

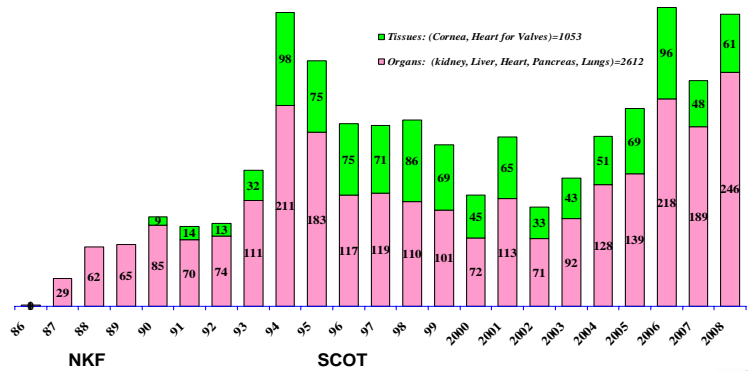
Corneal Distribution in - 2008

No.	Hospital Name	Waiting List	Harvested Locally	Harvested Abroad
1	King Khalid Eye Specialist Hospital, Riyadh	395	30	1194
2	Maghrabi Eye Hospital	13	0	276
3	Eye Hospital, Jeddah	250	2	4
4	King Fahd National Guard Hospital, Riyadh	85	0	11
5	King Abdulaziz University Hospital, Riyadh	40	0	28
6	King Khalid National Guard Hospital, Jeddah	55	0	3
7	Royal Commision-Jubail And Yanbu	18	0	0
8	Eye Specialist Hospital –Dhahran	50	0	55
9	Assir Central Hospital	0	0	0
10	Al Manea Hospital, Al Khobar	0	0	7
TOTAL		906	32	1,578

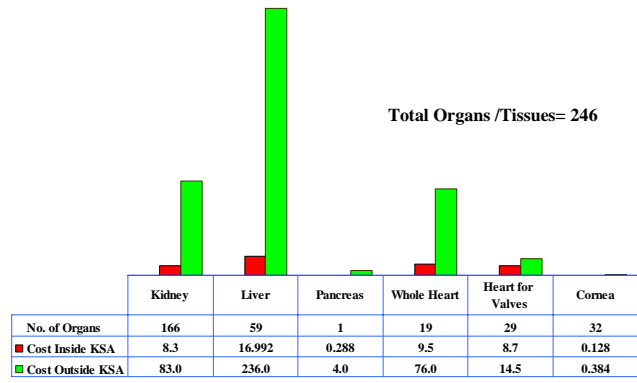
Corneal Transplantation 1983 - 2008



Total Deceased Organs and Tissues Transplanted in KSA (1986 - 2008)

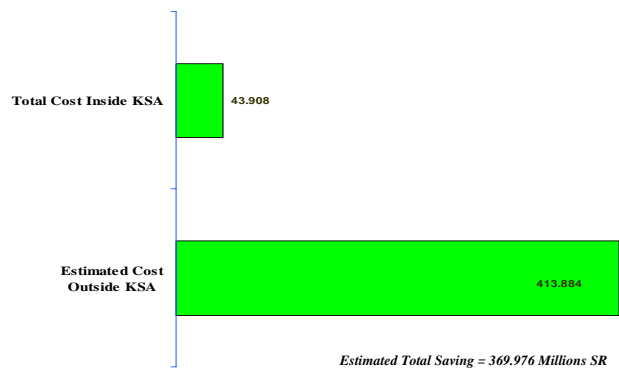


Cost of Organs and Tissues Transplantation Inside and Outside the Kingdom for Year 2008 (in million SR)



The figure shows the cost of transplant for different organs (kidney, liver, heart... etc), and the amount of saving when comparing inside and outside organ transplantation

Comparison of Estimated Total Cost of Organs and Tissues Transplanted Inside and Outside the Kingdom for Year 2008 (in million SR)



**Harvesting/Transplantation Activities from Organ Sharing Program
Between the Kingdom and Other Countries* (1996-2008)**

Year	Harvested/Transplanted Organs					Total Harvested/ Transplanted Organs
	Kidney	Liver	Whole Heart	Heart for Valves	Lungs	
1996-2000	6/6	19/14	4	11	2	42/37
2001	13/12	3	-	1	-	17/16
2002	2	2	-	2	-	6
2004	6	6/5	1	4	-	17/16
2005	7	13/10	1	12	4/2	37/32
2006	6/3	12/8	-	7	-	25/18
2007	2	14/13	1	2	-	19/18
2008	6/5	12/11	-	-	-	18/16
Total	48/43	81/66	7	39	6/4	181/159

* Kuwait , Qatar, Bahrain and Spain



**Transplant Activities from Organ Sharing Program Between the Kingdom and
Other Countries (1996-2008)**

Year	Country	Transplanted Organs					Total Organs
		Kidney	Liver	Whole Heart	Heart for Valves	Lungs	
1996-1999	Kuwait	1	14	4	11	2	32
2000	Spain	5	-	-	-	-	5
2001	Spain	12	-	-	-	-	16
	Kuwait	-	3	-	1	-	
2002	Kuwait	2	2	-	2	-	6
2004	Kuwait	2	3	-	2	-	16
	Qatar	4	2	1	2	-	
2005	Kuwait	1	9	1	9	2	32
	Qatar	6	1	-	3	-	
2006	Kuwait	2	6	-	6	-	18
	Qatar	1	2	-	1	-	
2007	Kuwait	-	9	1	1	-	18
	Qatar	2	3	-	1	-	
	Bahrain	-	1	-	-	-	
2008	Kuwait	3	9	-	-	-	16
	Qatar	2	2	-	-	-	
Total		43	66	7	39	4	159



**Deceased Organ Donation Program
Total Number of Deceased Organs Transplanted
1986 - 2008**

