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Transplant Tourism

**The consequences of organ trafficking for
vendors/victims, recipients and health systems**



Paolo Grossi



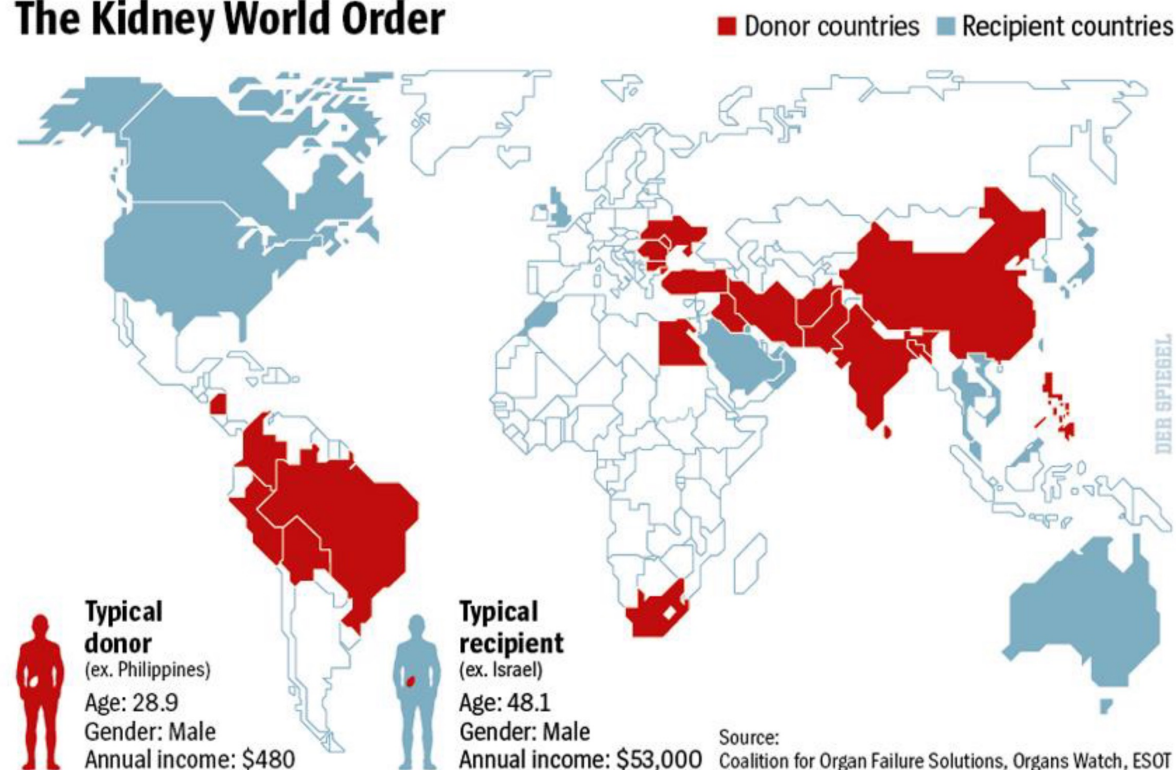
**6th International Congress Infections & Transplantation
Varese, 18-20 Maggio 2017**

Transplant Tourism & Infections: Outline

- Transplant Tourism
 - Definitions
 - Ethical Considerations
 - Scope of Problem
- Risk of Donor-Derived Diseases
 - Available Data
 - Theoretical Concerns
- Approach to the returned transplant recipient
 - Ethical Considerations
 - Review of Data & Routine Testing

Organ Trafficking is a Global Phenomenon

The Kidney World Order



On a global level, it is estimated that up to **5%-10%** of kidney transplants performed annually are the result of trafficking.

That's **3.400-6.800** kidneys per year (still possibly an underestimate).

Highly lucrative business: recipients usually pay between \$70.000-160.000 for an organ

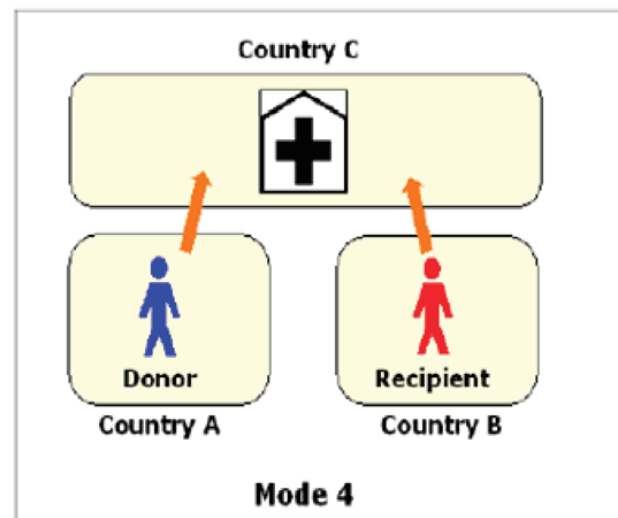
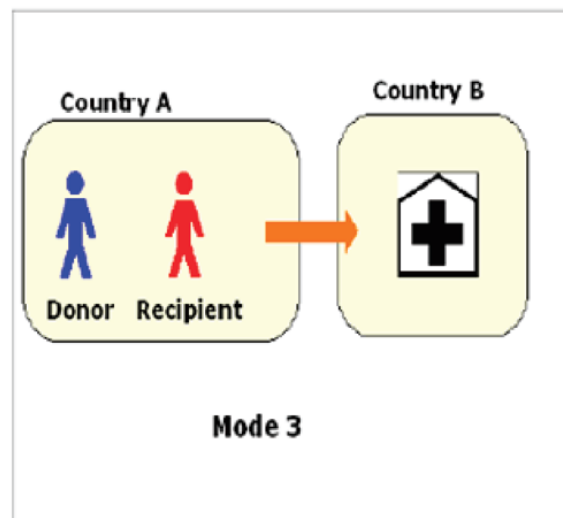
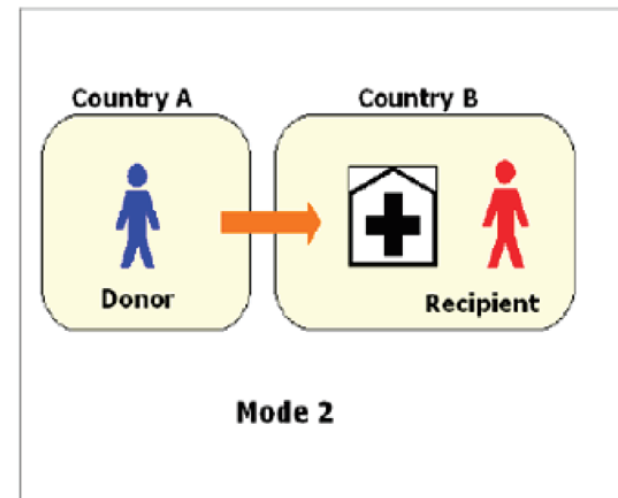
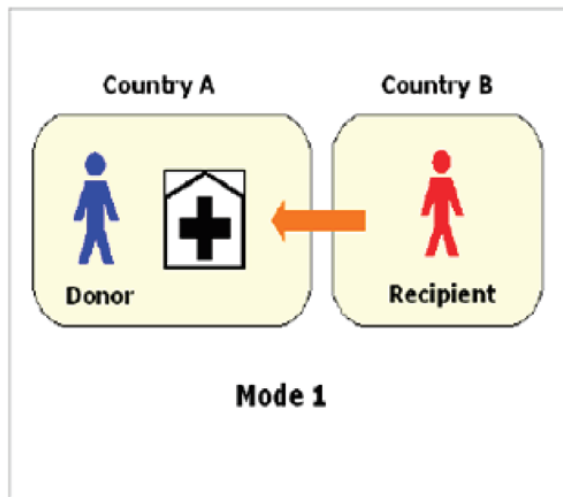
Transplant Tourism

- **Definition: donor or recipient travels to a foreign country specifically for a transplant**
- Poorly characterized
- Motivation: financial? Organ supply insufficiency?
- Screening tests performed: highly variable
- Clinical data may be lacking

Transplant Tourism: *Definitions*

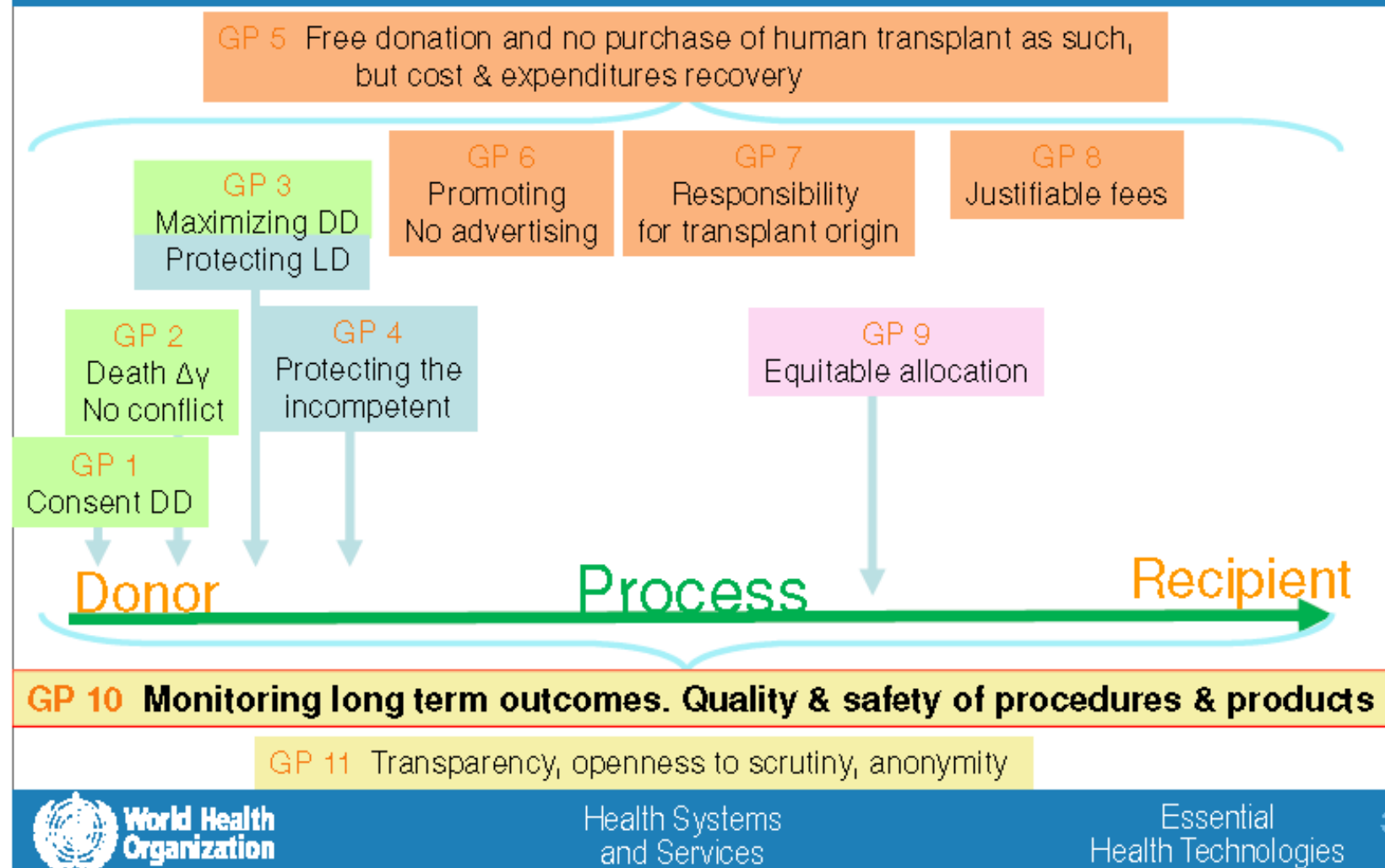
- **Organ trafficking**: the recruitment, transport, transfer, harboring or receipt of living or deceased persons or their organs by means of the threat or use of force or other forms of coercion, of abduction, of fraud, of deception, of the abuse of power or of a position of vulnerability, or of the giving to, or the receiving by, a third party of payments or benefits to achieve the transfer of control over the potential donor, for the purpose of exploitation by the removal of organs for transplantation.
- **Transplant Commercialism**: A policy or practice in which an organ is treated as a commodity, including by being bought or sold or used for material gain
- **Travel for Transplantation**: The movement of organs, donors, recipients, or transplant professionals across jurisdictional borders for transplantation purposes. Travel for transplantation becomes transplant tourism if it involves organ trafficking and/or transplant commercialism or if the resources (organs, professionals, and transplant centers) devoted to providing transplants to patients from outside a country undermine the country's ability to provide its own transplant services

Modes of international organ trade and organ trafficking



2010

WHO Guiding Principles on Human Cell, Tissue and Organ Transplantation



Transplant Tourism: The Istanbul Declaration

- A report published in 2007 estimated that 10% of the organs transplanted globally each year were obtained through trafficking, and that in some countries nearly all kidneys donated by the local population were for paying foreign recipients.
- This issue is not new, and was in fact recognized as a problem in the early 1990s.
- Subsequently, in 2004 the World Health Assembly (WHA; the decision-making body of the WHO and its 183 member states) urged member states “to take measures to protect the poorest and vulnerable groups from “transplant tourism” and the sale of tissues and organs, including attention to the wider problem of international trafficking in human tissues and organs

Transplant Tourism: *Ethical Issues*

■ The Declaration of Istanbul

6. Organ trafficking and transplant tourism violate the principles of equity, justice, and respect for human dignity and should be prohibited. Because transplant commercialism targets impoverished and otherwise vulnerable donors, it leads inexorably to inequity and injustice and should be prohibited. In Resolution 44.25, the World Health Assembly called on countries to prevent the purchase and sale of human organs for transplantation.
 - a. Prohibitions on these practices should include a ban on all types of advertising (including electronic and print media), soliciting, or brokering for the purpose of transplant commercialism, organ trafficking, or transplant tourism.
 - b. Such prohibitions should also include penalties for acts, such as medically screening donors or organs, or transplanting organs, that aid, encourage, or use the products of, organ trafficking or transplant tourism.
 - c. Practices that induce vulnerable individuals or groups (such as illiterate and impoverished persons, undocumented immigrants, prisoners, and political or economic refugees) to become living donors are incompatible with the aim of combating organ trafficking, transplant tourism, and transplant commercialism.



In Pakistan, Illegal Kidney Trade Flourishes As Victims Await Justice

November 3, 2016 - 5:05 AM ET

npr



PHILIP REEVES

November 2016



Some of the men imprisoned by a criminal gang in Pakistan's illicit kidney trade return to the apartment in Rawalpindi where

Economic and Health Consequences of Selling a Kidney in India

Table 1. Participant Characteristics
(N = 305)

	Mean (Median, Range)
Age, y	35 (35, 20-55)
Female, %	71
Education, y	2.7 (0, 0-12)
Annual family income, \$	420 (381, 0-1730)
Income below poverty line, %	71
Time since nephrectomy	6.0 y (6.4 y, 2 wk-19 y)
No. of people in household	4.2 (4.0, 1-8)

Table 2. Reasons for Selling a Kidney*

Reason	No. (%)
Pay off debts	292 (96)
Food/household expenses	160 (55)
Rent	71 (24)
Marriage expenses	65 (22)
Medical expenses	54 (18)
Funeral expenses	23 (8)
Business expenses	23 (8)
Other debts	49 (17)
Future marriage expenses for daughters	10 (3)
Extra cash	4 (1)
Start business	2 (1)
Other reason	3 (1)

*Percentages do not add up to 100% because some participants had more than 1 reason for selling or more than 1 source of debt.

Economic and Health Consequences of Selling a Kidney in India

- The amount promised for selling a kidney averaged \$1410 (range, \$450-\$6280), while the amount actually received averaged \$1070 (range, \$450-\$2660). Both middlemen and clinics promised on average about one third more than they actually paid.
- **Most of the money received was spent on debts (60%), food and clothing (22%), or marriage (5%).** Only 11% was retained as cash equivalents (cash, jewelry, bank deposit, or other investment).
- **Many of the participants reported a worsening of their economic status.**
- Among all participants, the average annual family income declined from \$660 at the time of nephrectomy to \$420 at the time of the survey, a decrease of one third ($P < .001$).

Economic and Health Consequences of Selling a Kidney in India

- **Change in Health Status**
- Participants rated their health status before and after nephrectomy by using a 5-point Likert scale ranging from excellent to poor. Forty participants (13%) reported no decline in their

Selling a kidney did not lead to a long-term economic benefit for the seller and was associated with a decline in health status.

- **Advice for Others**
- Participants were asked what advice they would give someone else with the same reasons they had for selling. Of 264 participants who answered this question, **79% would not recommend selling a kidney, while 21% would.**

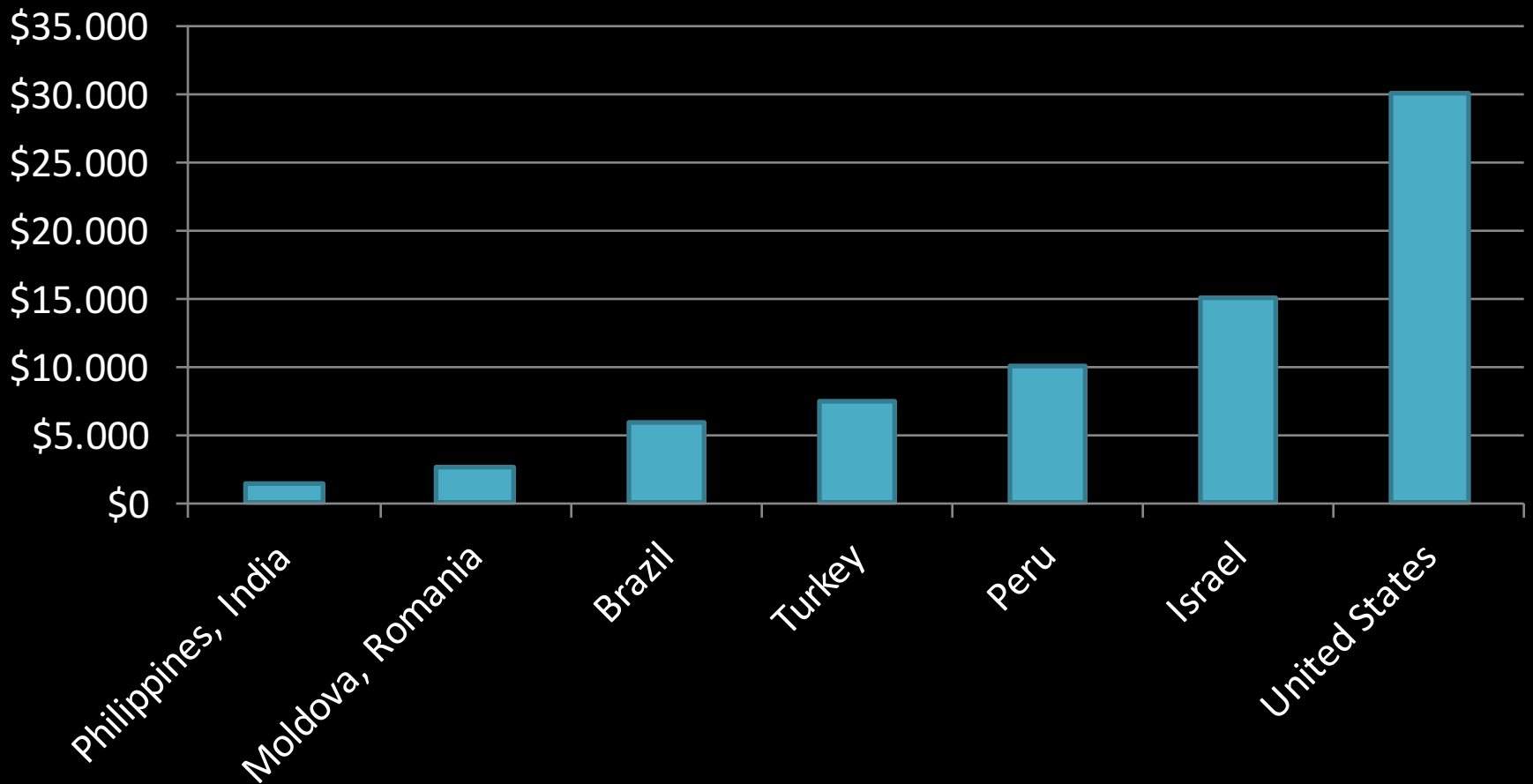
Economic and Health Consequences of Selling a Kidney in India

Table 3. Health Status Before and After Nephrectomy

Health Before Nephrectomy	Health After Nephrectomy, No.				
	Excellent	Very Good	Good	Fair	Poor
Excellent	11	16	15	58	50
Very good	0	14	16	53	39
Good	0	0	9	10	6
Fair	0	0	1	6	1
Poor	0	0	0	0	0

Average Amount Received by Kidney Sellers (US \$)

Price



USA → Foreign Transplants Cases by World Region, 1990-2006

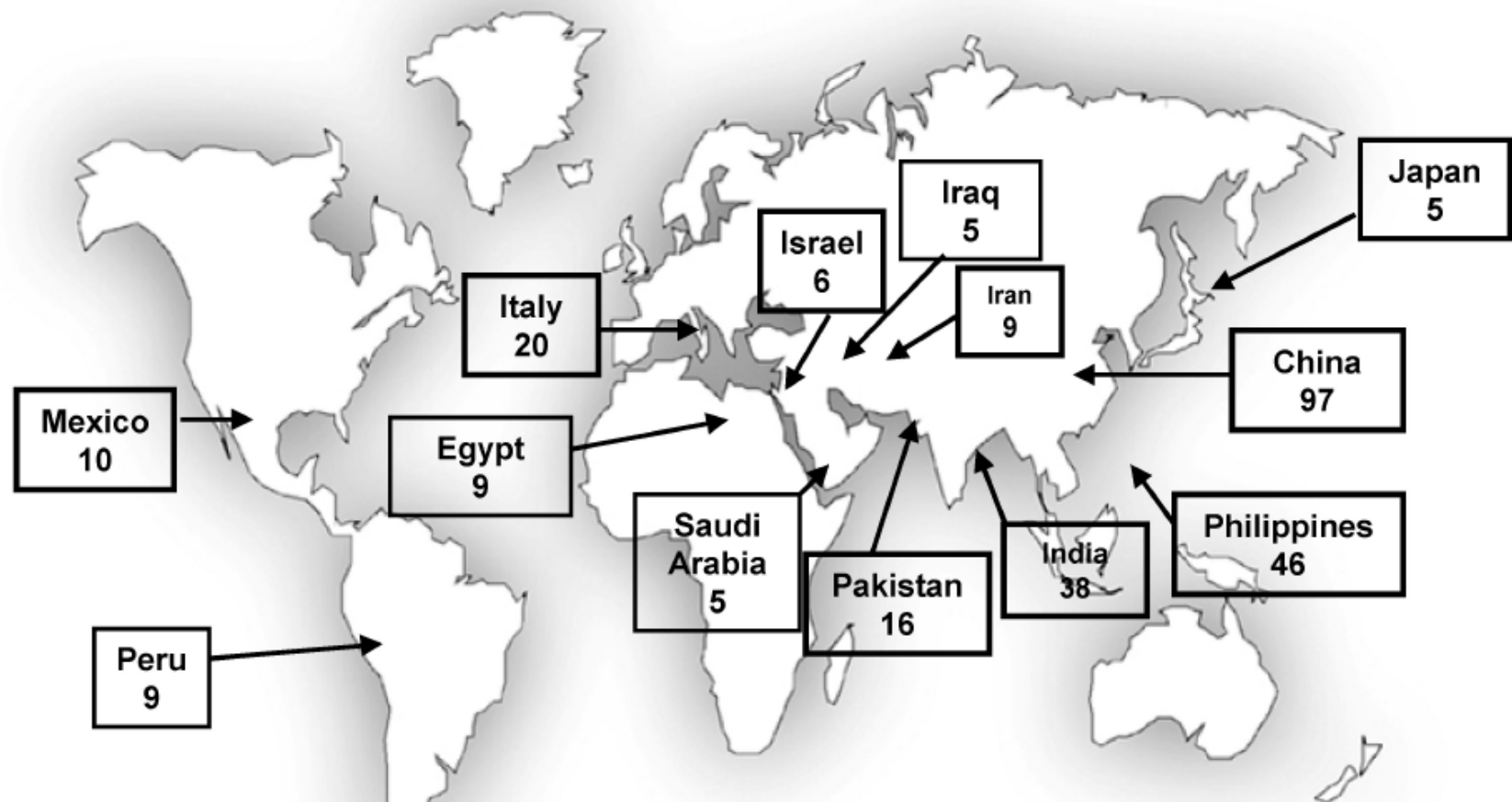
Merion *et al* examined waiting list removal data from 1987-2006 from the Scientific Registry of Transplant Recipients (SRTR) database, based on data from the Organ Procurement and Transplantation Network (OPTN)→

Table 2: Foreign transplants cases by world region, 1990–2006 (directly reported cases and validation data)

Year	East Asia & Pacific	Europe	Middle East & North Africa	South Asia	Western Hemisphere	Oceania	Unspecified foreign country	Total
1990–1999	4	9	4	3	7	0	10	37
2000	4	4	3	4	2	0	5	22
2001	8	1	5	9	1	0	5	29
2002	13	7	9	5	12	0	7	53
2003	17	4	2	8	8	0	2	41
2004	20	2	3	8	4	0	4	41
2005	41	3	5	7	3	0	12	71
2006	49	1	5	10	3	1	10	79
Region total	156	31	36	54	40	1	55	373
Region percentage	41.8%	8.3%	9.7%	14.5%	10.7%	0.3%	14.7%	100%

Source: SRTR Analysis, August 2007.

Countries With At Least 5 Patients Transplanted from US Waiting List



*Candidates removed from U.S. waiting lists, with either 1) foreign transplant directly noted in waiting list removal records or 2) indication of transplant at other than the listing center with confirmation of foreign transplant by listing center

Source: SRTR Analysis, August 2007



Transplant Tourism: *Scope - US*

Characteristic	Foreign Transplants	All UNOS Data
Total Populations	373 (0.08%)	494,250
Gender: Female	109 (29.2%)	197,012 (39.9%)
Race: Caucasian	106 (28.4%)	306,130 (61.9%)
Race: Asian	179 (48.0%)	20,325 (4.1%)
≥ College Education	120 (32.2%)	75,171 (15.2%)
Medicare	69 (18.5%)	165,989 (33.6%)
Self-Pay	33 (8.85%)	3,862 (0.78%)
Resident Alien	50 (13.4%)	13,240 (2.7%)
Nonresident Alien	61 (16.4%)	4,645 (0.9%)

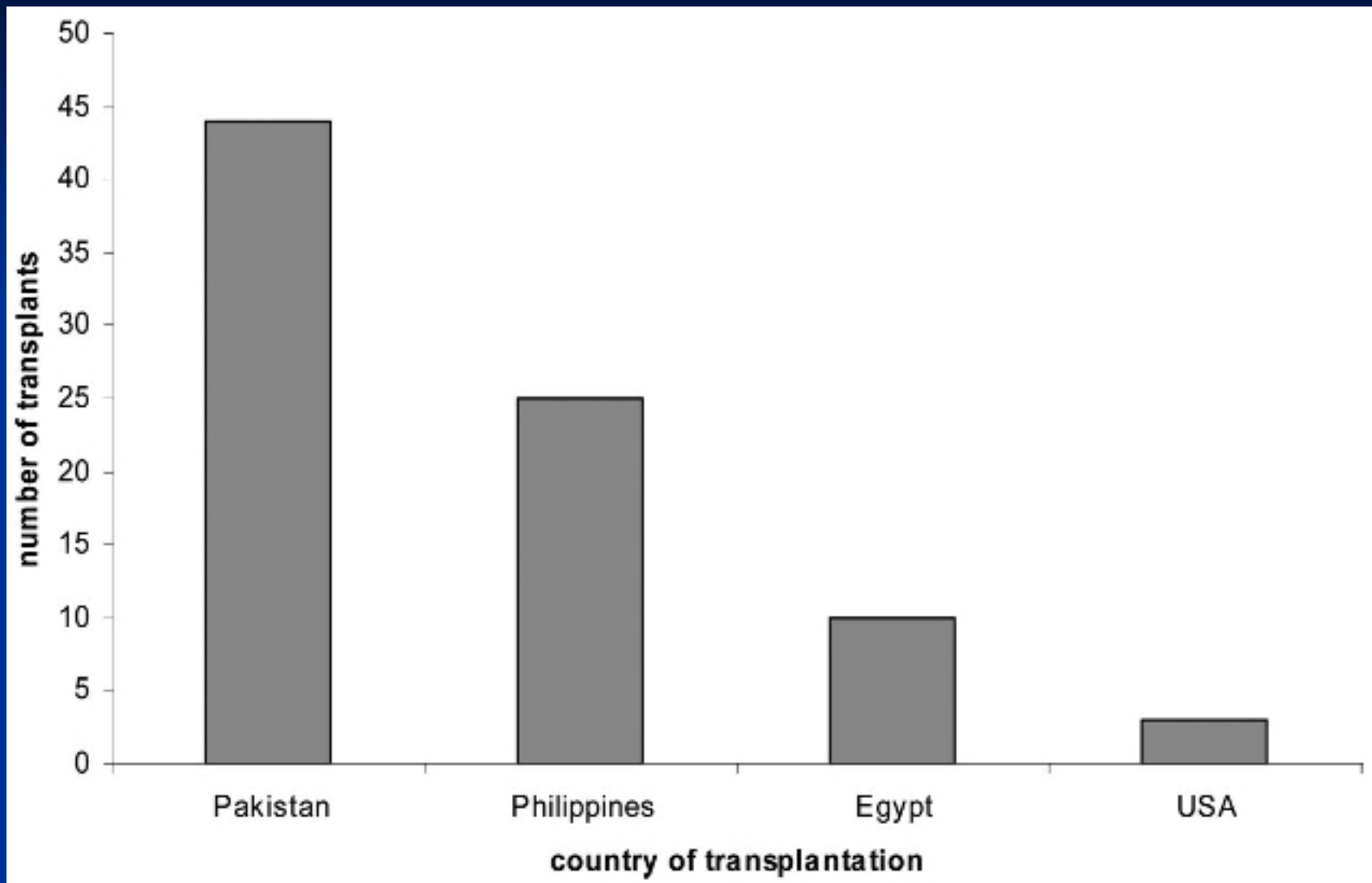
Transplant Tourism: *Scope – US*

Factors independently associated with foreign transplant among 494 463 candidates wait-listed between 1986 and 2006

Variable	Relative risk	95% confidence interval	p value
Male (vs. female)	1.41	1.13,1.75	0.002
Asian (vs. non-Asian)	11.24	8.92,14.17	<0.0001
College education (vs. noncollege education)	2.57	1.99,3.31	<0.0001
Working (vs. not working)	1.09	0.86,1.39	0.482
Self-payment (vs. not self-payment)	1.46	0.90,2.36	0.126
New York residence (vs. all but New York/California)	1.36	0.97,1.90	0.073
California residence (vs. all but New York/California)	0.95	0.74,1.21	0.657
Resident alien (vs. US citizen)	2.78	2.02,3.84	<0.0001
Nonresident alien (vs. US citizen)	11.85	8.16,17.22	<0.0001
Wait-list year (per year)	1.18	1.13,1.22	<0.0001

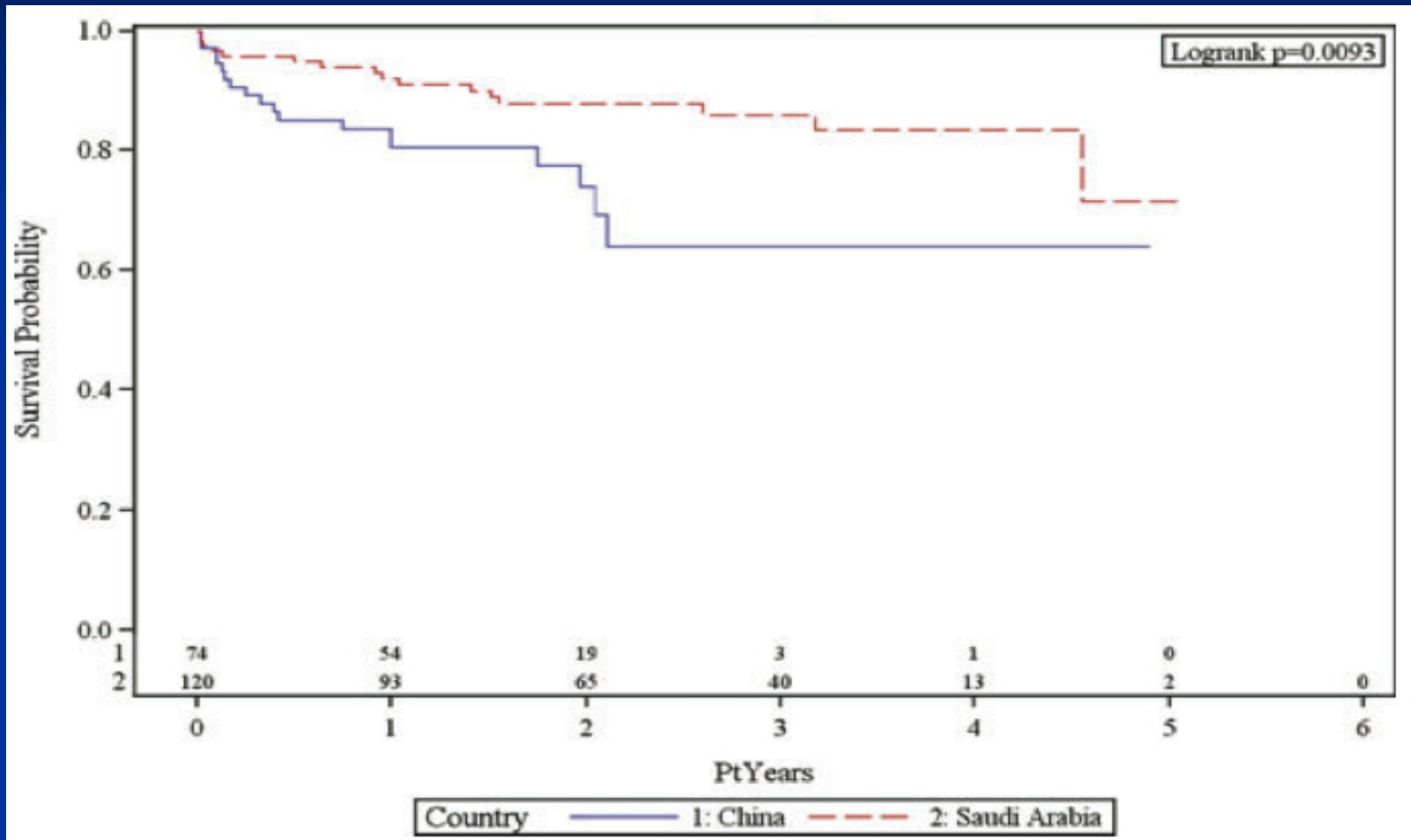
Merion *et al. Am J Transplant.* 2008; 8: 988-996.

Transplant Tourism: *Scope – Saudi Arabia*



Transplant Tourism: *Outcomes*

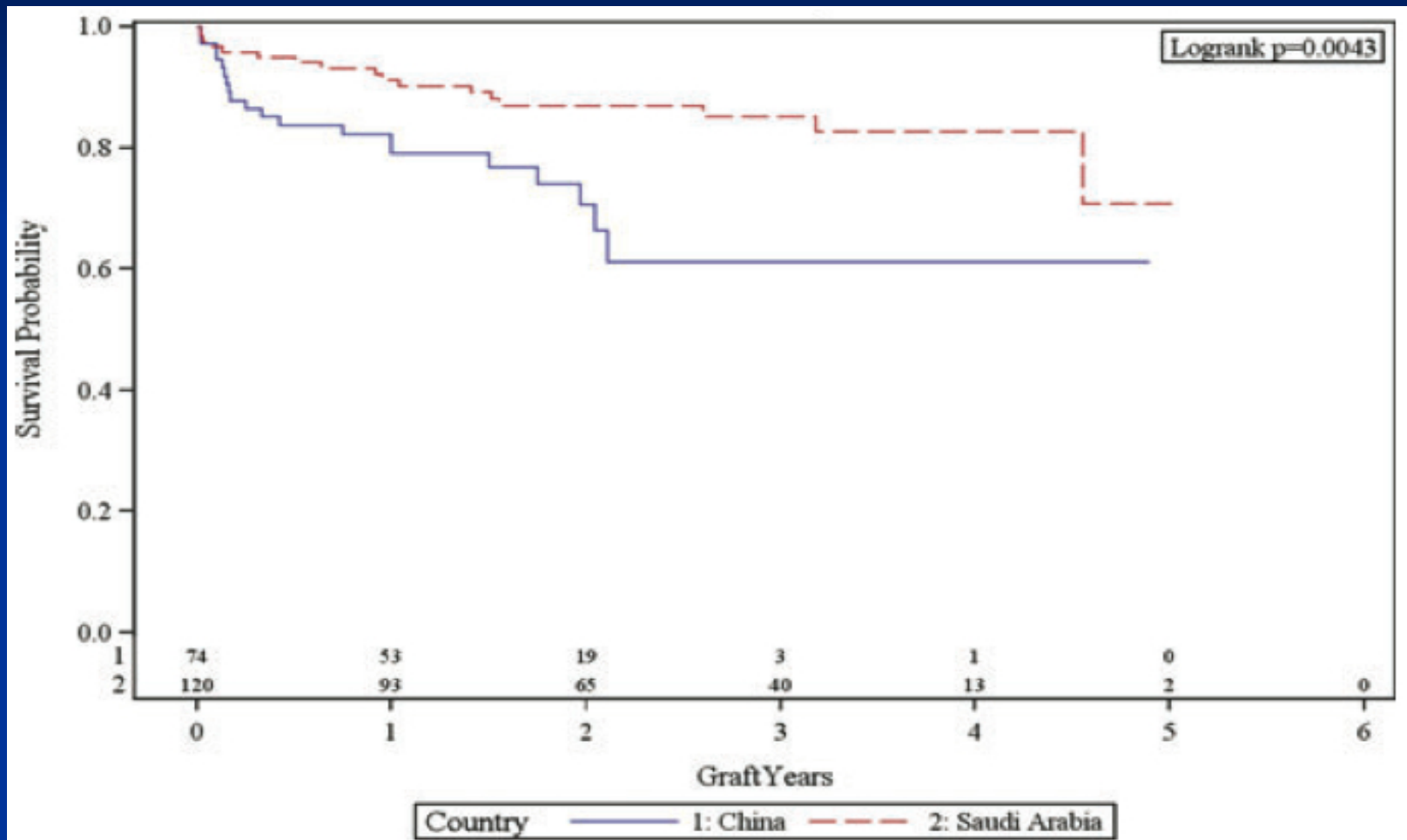
Patient Survival: Liver Transplant



Allam N, et al. *Am J Transplant.* 2010; 10: 1834-1841.

Transplant Tourism: *Outcomes*

Graft Survival: Liver Transplant



Transplant Tourism: *Outcomes*

Graft Survival: Pediatric Kidney Transplant

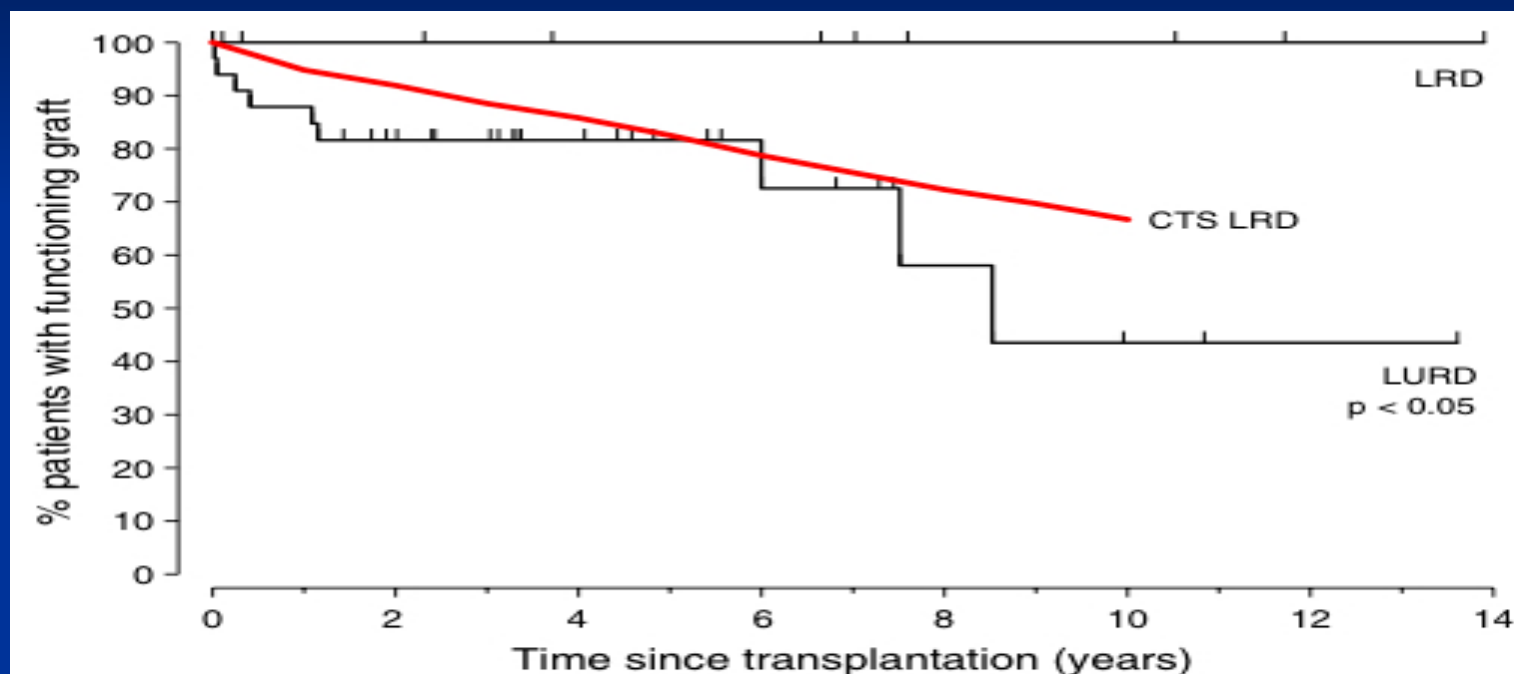


Fig. 1 Graft survival in 33 children with living unrelated donor grafts and ten children with living related donor grafts from Dubai, who underwent transplantation abroad. For comparison, graft survival of 3,150 children with their first LRD graft followed in the CTS study is shown

Transplant Tourism: *Outcomes*

- Reasons for reduced patient and graft survival
 - Increased risk of early rejection
 - Increased risk of surgical complications
 - Increased risk of infections
 - Donor-derived infections
 - HBV, HCV, HIV
 - Filamentous Fungi
 - Increased risk of bacterial infections (MDR)
 - Increased risk of viral infections
 - Chronic complications associated with infections (i.e. ischemic cholangiopathy)



Transplant tourism: a threat to public health

- Infections complicated 50-70% of transplant tourism cases reported in the literature, with a reported mortality of 20%-60%.
- ~60% to 70% of the deaths following renal transplants abroad took place within the first three months with the major cause being infectious complications.
- Patients transplanted abroad may introduce novel infectious diseases and MDROs to countries:
 - E.g. rabies, HIV, Chikungunya
- Cost of transplant tourism far exceeds that of domestic transplants.

Infectious complications of transplant tourism

Pathogen	Risk ^a	Comments	Reference
Bacterial Infections			
Wound infections	Unknown, likely high	Can be severe and require surgical intervention; can be due to MDR organisms.	[4], [6], [9], [11], [20], [21], [23]
Urinary tract infection	Unknown	Can be due to MDR organisms.	[13], [16]
Tuberculosis	2–15 %	Fatal cases have been described.	[6], [13], [16]
Viral Infections			
HIV	4–6 %	High rate of blood-borne pathogens likely due to inadequate donor screening and high background rate of infection in the community.	[4], [21], [25]
Hepatitis B virus	2–18 %	As for HIV. Fatal cases have been described.	[4], [11], [21], [25]
Hepatitis C virus	Unknown, likely high	As for HIV.	[31]
Cytomegalovirus	Up to 33 %	Likely due to lack of prophylaxis.	[4], [6], [11], [16]
Fungal Infections			
Molds	4 %	Often disseminated, involve the CNS, or directly involve the renal graft. High rates of graft loss and death. <i>Aspergillus</i> accounts for 2/3 of cases, and <i>Zygomycetes</i> 1/4 of cases.	[17], [33–38]
<i>Pneumocystis jiroveci</i>	8 %	Likely due to variable prophylaxis.	[19]
Parasitic Infections			
Malaria	6–11 %	Most common in transplants done in India; acquired via the organ, blood transfusion, or mosquito bite.	[20], [23], [39–41]

^a The percentage of patients who return from transplantation abroad with the specific infectious complication.

MDR multi-drug resistant

ID Outcomes: *Turkey* *paid kidney transplant in Egypt*

Table 1. Demographic, pre-transplant and post-transplant details of patients who went to Egypt for kidney transplantation

	Age	Gender	Underlying renal disease	Pre-existing comorbid conditions	Induction therapy	Initial immunosuppression	Complications
Patient 1	52	Male	Kidney stone disease	HTN	ATG + Steroid	TRL + MMF + Steroid	Neuropathy
Patient 2	64	Female	Unknown	HTN	Daclizumab + Steroid	TRL + EC-MPS + Steroid	Wound infection, evisceration, post-transplant DM
Patient 3	51	Male	Unknown	HTN	Daclizumab + Steroid	TRL + EC-MPS + Steroid	Wound infection, evisceration
Patient 4	62	Male	Polycystic kidney disease	HTN	Daclizumab + Steroid	TRL + EC-MPS + Steroid	Transplant pyelonephritis, faulty placement of kidney allograft because of indirect inguinal hernia
Patient 5	29	Male	IgA nephropathy	HTN, history of TB, hepatitis B, hepatitis c, history of previous transplantation	Daclizumab + Steroid	CsA + MMF + Steroid	Wound infection, hematoma, deep vein thrombosis, unexplained incision on the opposite side of the allograft, <i>in situ</i> left surgical compress, fluid collection

HTN, hypertension; Tb, tuberculosis; MMF, mycophenolate mofetil; EC-MPS, enteric-coated mycophenolate sodium (EC-MPS); CsA, cyclosporine; DM, diabetes mellitus.

ID Outcomes: *Macedonia*

Table 1. Medical and surgical complications in patients returning from Pakistan between January 2006 and March 2008 (%)

Wound infection	16 (44.4%)
Perirenal hematomas	4 (11.1%)
Perirenal abscesses	6 (16.6%)
Lymphoceles	4 (11.1%)
Urinary leakage	4 (11.1%)
Renal artery thrombosis	2 (5.5%)
Renal artery mycotic aneurysm	1 (2.7%)
Nephrectomies	3 (8.3%)
Postoperative hernias	14 (38.8%)
Deaths	7 (19.4%)
Sepsis (bacterial and fungal)	4 ((11.1%)
CMV disease	2 (5.5%)
Hepatitis C	9 (25%)
DM (steroid)	3 (8.3%)
Myocardial infarction	3 (8.3%)
Cerebrovascular stroke	2 (5.5%)
Rejection episode	9 (28%)
CAN	5 (13.8%)
UTI	33 (90%)

CMV, cytomegalovirus; CAN, chronic allograft nephropathy; UTI, urinary tract infection (*Pseudomonas*, *Escherichia*).

ID Outcomes: Children *UAE*

Complication	LURD	LRD
Infections	26/33	5/10
Viral		
CMV	9 (27%)	1 (10%)
Varicella	4 (12%)	1 (10%)
Herpes zoster	3 (9%)	0 (0%)
Bacterial		
Recurrent UTI	7 (21%)	2 (20%)
Septicemia	3 (9%)	1 (10%)
Post-transplantation lymphoproliferative disease	1 (3%)	0 (0%)
Hypertension	12 (36%)	2 (20%)
Diabetes mellitus	3 (9%)	0 (0%)
Hyperlipidemia	2 (6%)	0 (0%)

Major viral infections [Epstein–Barr virus (EBV), cytomegalovirus (CMV), varicella zoster (VZV)] were four-times more common in patients that had received LURD grafts than in those that had received LRD grafts.

ID Outcomes: *Saudi Arabia*

TABLE 3. Posttransplant complications of tourists and local transplant

	Local n (%)	Tourist	<i>P</i>
CMV	4 (5.6)	14 (15.1)	0.05
Hep B	0 (0)	1 (1.08)	0.38
Hep C	0 (0)	7 (7.5)	0.02
UTI	30 (41.7)	40 (43.0)	0.86
Pneumonia	1 (1.4)	4 (4.3)	0.28
TB	2 (2.8)	5 (5.4)	0.41
Wound	4 (5.6)	5 (5.4)	0.96
PTDM	4 (5.56)	9 (9.68)	0.39
Kaposi	2 (2.78)	2 (2.15)	0.80

CMV, cytomegalovirus; Hep B, hepatitis B; Hep C, hepatitis C; UTI, urinary tract infection; TB, tuberculosis; PTDM, posttransplant diabetes mellitus.

ID Outcomes: *Saudi Arabia*

Table 3: Comparison between posttransplant complications for patients transplanted in China and KFSH&RC

Complication	China (n = 74)	KFSH&RC (n = 120)	p-Value
Biliary complications	24 (32.4)	14 (11.7)	<0.01
Diffuse biliary stricture	14	5	
Anastomotic stricture	6	2	
Bile leakage	4	7	
Vascular complications	4 (5.4)	7 (5.8)	>0.05
Portal vein thrombosis	2	2	
Portal vein stenosis	1	1	
Hepatic artery thrombosis	1	3	
Recurrent HCC	3 (4)	3 (2.5)	>0.05
Sepsis	7 (9.5)	1 (0.83)	<0.01
Acquired HBV infection	4 (5.4)	0 (0)	<0.05
Opportunistic infections (CMV/EBV)	2/0 (2.7)	1/1 (1.7)	>0.05

ID Outcomes: *US Data*

UCLA Data

Table 6. Infectious complications after transplantation^a

Complication	Tourist (n [%]; n = 33)	Matched Cohort (n [%]; n = 66)
Total	17 (52.0) ^b	32 (48.5) ^b
Viral	12 (36.0)	9 (13.6)
CMV	10 (30.0)	8 (12.1)
HBV	1 (3.0)	0
HSV	1 (3.0)	0
EBV	0	0
VZV	0	1 (1.5)
Bacterial	7 (21.0)	21 (31.2)
pneumonia	1 (3.0)	5 (7.6)
UTI	4 (12.0)	14 (21.2)
wound	2 (6.0) ^c	2 (3.0)

^aEBV, Epstein-Barr virus; HBV, hepatitis B virus; HSV, herpes simplex virus; VZV, varicella zoster virus.

^bTotal number of patients with at least one infection (includes patients with multiple infections).

^cPerinephric abscess and peripancreatic abscess.

TABLE 2. Transplant and posttransplant details of patients who went abroad for kidney transplantation

Characteristic	Data
Type of transplant (n)	
Living donor	9
Deceased donor	1
Location of transplant (n)	
Pakistan	8 (all Somali)
China	1 (Chinese)
Iran	1 (Iranian)
Induction therapy (n)	
Daclizumab and methylprednisolone	1
Methylprednisolone	2
Unknown	7
Initial immunosuppression (n)	
Cyclosporine, mycophenolate mofetil, prednisone	3
Cyclosporine, azathioprine, prednisone	2
Unknown	5
Time until sought care in US after transplant, days (range)	25.5 (15–78)
Follow up time, years (range)	2.0 (0.4–3.7)
Acute rejection (n)	2
Graft survival at last follow up (n)	9
Patient survival at last follow up (n)	9
Mean serum creatinine at last follow up (mg/dL)	1.13 ± 0.34
Complications	
Severe wound infection	1
Sepsis	3
Cytomegalovirus	1
CNS aspergillus	1
Posttransplant diabetes mellitus ^a	2
Posttransplant erythrocytosis	1
Seizures posttransplant, related to cyclosporine	1

^a Non-insulin requiring; one patient on oral therapy and one patient diet controlled.

Institutional Cohorts

Author	Year	n=	Resident	Country of Tx	Infections
Geddes	2008	18	Scotland	Pakistan	malaria=1, no HBV/HCV/HIV
Higgins	2003	9	UK	India/ Pakistan	1@ HCV, CMV, wound infection; hepatitis B n=2
Prasad	2006	22	Canada	Varied	52% (n=11) has serious OIs (5=CMV, 8=pyelonephritis, 3=TB, 4= <i>Aspergillus</i>)
Canales	2006	10	USA	Pakistan =8	1@ CNS <i>Aspergillus</i> , CMV, wound infection; sepsis n=3
Kennedy	2005	16	Australia	varied	HBV=2, CMV=3, <i>Aspergillus</i> =tx nephrectomy

ID Outcomes: *Fungal Infections (70% Mortality)*

Invasive fungal infections post commercial kidney transplant: 19 cases occurring in 17 patients

Patient no.	Infecting organism	Residence	Region of transplant	Site of infection	Allograft infection	Graft loss	Outcome	Reference
1	<i>Aspergillus flavus</i>	USA	Pakistan	Knee, renal artery	Yes	Yes	Alive ¹	Present report
2	<i>Aspergillus fumigatus</i>	Saudi Arabia	Philippines	Spine	No	Not reported	Died	(7)
3	<i>Aspergillus</i> species	Turkey	Asia or Middle East	Disseminated	No	Not reported	Died	(8)
4	<i>Aspergillus</i> species	USA	Asia	Brain	No	No	Died	(9)
5	<i>Aspergillus</i> species	Canada	Asia or Middle East	Disseminated	Not reported	Not reported	Died	(10)
6	<i>Aspergillus</i> species	Canada	Asia or Middle East	Disseminated	Not reported	Not reported	Died	(10)
7	<i>Aspergillus</i> species	Canada	Asia or Middle East	Disseminated	Not reported	Not reported	Not reported	(10)
8	<i>Aspergillus</i> species	Canada	Asia or Middle East	Disseminated	Not reported	Not reported	Alive	(10)
9	<i>Aspergillus</i> species	Australia	Lebanon	Kidney	Yes	Yes	Alive	(11)
10	<i>Aspergillus</i> species	Turkey	Asia or Middle East	Brain	No	Not reported	Died	(8)
11	<i>Aspergillus</i> species	Turkey	Asia or Middle East	Urinary tract	Yes	Not reported	Alive	(8)
12	<i>Aspergillus terreus</i>	Slovenia	India	Wound	No	Yes	Died	(12)
7	<i>Pseudallescheria boydii</i>	Canada	Asia or Middle East	Brain abscess	No	Not reported	Not reported	(10)
13	<i>Ramichloridium mackenziei</i>	Saudi Arabia	Iran	Brain abscess	No	No	Alive ¹	(7)
14	<i>Zygomycetes</i>	Belgium	India	Kidney	Yes	Yes	Alive	(13)
12	<i>Zygomycetes</i>	Slovenia	India	Kidney	Yes	Yes	Died	(12)
15	<i>Zygomycetes</i>	Turkey	Asia or Middle East	Rhino-cerebral	No	Not reported	Died	(8)
16	<i>Zygomycetes</i>	Turkey	Asia or Middle East	Kidney	Yes	Yes	Died	(8)
17	<i>Zygomycetes</i>	Saudi Arabia	Pakistan	Liver	No	Yes	Died	(7)

¹Sustained severe neurological injury.

ID Outcomes: *Personal Experience*

- We have not carefully reviewed our experience at Northwestern
- Recognized cases seen by me:
 - All referred to me because of fever
 - UTI confused as malaria from the Philippines
 - 2 cases of highly resistant CRAB UTI from Pakistan (1 required graft removal)
 - 1 case of highly resistant KPC in liver abscess from Pakistan
 - 1 case of “fulminant” BK from the Philippines

Transplant Tourism in the Real World

- 57 y/o male with ESRD due to DM2 & HTN
- Pakistani immigrant returns to Pakistan pre-dialysis for living unrelated donor transplant
 - Resident & Non resident alien status (Asians 10x more likely)
 - 90% ethnic minorities returning to country of origin for transplant, often transplanted early (29% preemptive)
 - Employed, College education (rate 150% higher)
- Informed that donors are extensively screened for ALL potential infectious diseases
- Transplant complicated by fever & mental status changes 10-14 days post-op
- Transferred to major medical center in Karachi

Courtesy of Michele Morris, University of Miami

Diagnosis: Encephalitis due to *Plasmodium falciparum* & CMV

- Treated successfully for malaria – 1 month hospitalization in Pakistan
- Returns to US → denied therapy in UM post-transplant clinic due to illegal transplant
- Referred by private nephrologist for persistent CMV viremia
- Requires 2 years of antivirals and multiple doses of IVIG to clear CMV

Courtesy of Michele Morris, University of Miami

Institutional Cohorts

1 Summary of commercial transplantation case reports

First author	Country of origin of patients	Country of transplant	Years	No.	Patient survival at 1 year	New HIV infection	New HBV infection
Salahudeen ⁹	UAE and Oman	India	1984–1988	131	81.5%	3.8%	2.3%
Living Non-Related Renal Transplant Study Group ¹⁰	Saudi Arabia	India	1978–1993	540	96%	4.6%	8.1%
Sever ¹¹	Turkey	India, Iraq, Iran	1992–1999	115	90% (2 years)	nr	6%
Morad ¹²	Malaysia	nr	1990–1996	515	92%	nr	12%
Onwubalili ¹³	Saudi Arabia	India	1985–1991	16	nr	6.25%	6.25%
Ivanovski ¹⁴	Macedonia	India	1993–1997	14	78%	nr	nr

from Kennedy *et al*, Outcome of overseas commercial kidney transplantation: an Australian perspective, MJA, March 2005

Approach to the Returned TT

- Are you going to treat the patient?
 - Was the patient counseled not to seek a transplant through transplant tourism?
 - Who will you refer the patient to if you do not care for the patient?
- Review patient's pre-transplant evaluation
- Review available records from transplant center
 - Translate if necessary
 - Request additional information if incomplete
 - Consider if testing was adequate (is it equivalent to FDA-approved/cleared/licensed assays)
- Obtain a new baseline for the patient
 - Repeat serology & PCR for blood-borne pathogens
 - Consider testing for endemic infections

Transplant Tourism: Returning Home

- Consider screening for blood-borne pathogens:
 - HIV, HBV, and HCV
 - Bacteremias
 - Other endemic pathogens depending on clinical course (malaria, tuberculosis, Chagas disease, Strongyloides, MDRO, etc.)
 - Urinary tract infections
- Optimize prophylaxis
- Obtain information about surgical procedure(s) and immunosuppression.



Recommended initial screening for infectious diseases in transplant travelers

Exam Finding	Laboratory Test	Culture	Imaging
General H & P	CBC, CMP	Screening for MDROs – rectal swab, culture all open wounds	
	HIV, HBV, HCV PCR		
	HIV Ab or Ag/Ab		
	HBsAb, HBcAb, HBsAg		
	HCV Ab		
	RPR		
	Strongyloides Ab		
Wound infection or Non-healing Wound – Deep culture and biopsy	Pathology with Special Stains for bacteria, fungi, AFB, parasites	Bacterial, Fungal, AFB smears & cultures	
Collection adjacent to allograft	Pathology with Special Stains for bacteria, fungi, AFB, parasites	Bacterial, Fungal, AFB smears & cultures	
Skin Nodules – Biopsy	Pathology with Special Stains for bacteria, fungi, AFB, parasites	Bacterial, Fungal, AFB smears & cultures	
Fever with no obvious source	Repeat HIV, HBV, HCV PCR CMV PCR UA Thick & thin smears of blood for parasites	Blood cultures x 2 or more sets; Urine culture routine & AFB if UA abnormal; If able to produce sputum send bacterial gram stain & culture, AFB smear & culture; Consider BAL if thoracic CT abnormal	CXR, Consider CT sinuses, thorax, abdomen, and pelvis

Geographic Information

- CDC Yellow Book
www.cdc.gov/travel/contentYellowBook.aspx
- WHO International Travel and Health
<http://www.who.int/ith/en/>
- Global Schistosomiasis Maps
<http://www.who.int/wormcontrol/documents/maps/en/>
- Travel Medicine www.mdtravelhealth.com

ID Risks of Transplant Tourism

- Incidence of infection(s) unknown.
- Pre-transplant evaluation: extent and quality (both donor and recipient) likely quite variable.
- Quality of serology testing may be substandard.
- “Transplant tourists”, may return to their country of origin, and are at risk:
 - reactivation of latent infections
 - acquisition of new indigenous infections
- Documentation and communication with the transplant center may be limited.
- Prophylaxis against infection may be imperfect.

Transplant Tourism: *Moving Forward*

- What We Know
 - A rare, but clinically significant problem
 - Infectious complications are common and may affect patient and graft survival
 - Very limited data collected and analyzed to date
- Do we need to establish a registry?
- How is this handled in the context of your vigilance & surveillance system?
- How do the identified infections in the recipient impact/feedback to the donor?

2- URGES Member States:

...

to collaborate in **collecting data including adverse events and reactions** on the practices, safety, quality, efficacy, epidemiology and ethics of donation and transplantation;

to encourage the implementation of globally consistent coding systems for human cells, tissues and organs as such in order to facilitate national and international traceability of materials of human origin for transplantation;

...

REQUESTS the Director-General:

...

to **facilitate Member States' access to appropriate information** on the donation, processing and transplantation of human cells, tissues and organs, including **data on severe adverse events and reactions**;

...

The Declaration of Istanbul early impact and future potential

- The Declaration of Istanbul on Organ Trafficking and Transplant Tourism was adopted at an international meeting held in 2008.
- The Declaration has been published globally and consists of a set of principles and a series of proposals to improve the ethics and expand the benefits of the international organ transplantation endeavor.
- To promote and monitor the implementation of the Declaration, a Declaration of Istanbul Custodian Group (DICG) has been created.
- The DICG has provided support for official efforts to ban the sale of organs, restrict transplant tourism and prosecute those who persist in violating the law.
- Substantial progress has been made thus far in countries that have been the source of transplant tourists and in countries that have been the source of donor organs for trafficking.
- In China, however, the use of organs from executed prisoners for transplantation purposes continues despite widespread condemnation of this practice.

Conclusions

- Transplant tourism is unfortunately increasing despite international policies to prohibit commercial transplantation.
- Transplant tourism carries the risk of surgical complications, poor graft outcomes, increased mortality, and a significant increase in infectious complications.
- Bacterial, viral, parasitic, and fungal infections have all been described, and of particular concern are the high rates of blood-borne viral infections and invasive, often fatal, fungal infections.
- Transplant and infectious diseases physicians should have a high degree of suspicion for infectious complications, including unusual infections, in patients returning from transplantation abroad.