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## Review

### Transplant tourism: a literature review on development, ethical and law issues

Le Chi Cong<sup>a⊕</sup>, Linh Tran<sup>bc⊕</sup>, Le Thi Phong Lan<sup>d⊕</sup>, Giang Jan Nguyen<sup>e</sup>, Mohamed Essam Elrggal<sup>f</sup>,  
 Nguyen Hai Nam<sup>g</sup>, Nguyen Tien Huy<sup>h\*</sup>, Nguyen Duc Truong<sup>i\*</sup>

<sup>a</sup>Nephrology-Hemodialysis Department, Universisty Medical Center, Ho Chi Minh City, Vietnam;

<sup>b</sup>Institute of Fundamental and Applied Sciences, Duy Tan University, Ho Chi Minh City, Vietnam;

<sup>c</sup>Faculty of Natural Sciences, Duy Tan University, Da Nang City, Vietnam;

<sup>d</sup>Department of Radiology, Phuong Chau International Hospital, Can Tho, Vietnam;

<sup>e</sup>American University of Antigua College of Medicine, St. John's, Antigua and Barbuda, US;

<sup>f</sup>Nephrology Department, Kidney and Urology Center, Alexandria, Egypt;

<sup>g</sup>Division of Hepato-Biliary-Pancreatic Surgery and Transplantation, Department of Surgery, Graduate School of Medicine, Kyoto University, Kyoto, Japan;

<sup>h</sup>Department of Clinical Product Development, Institute of Tropical Medicine (NEKKEN), School of Tropical Medicine and Global Health, Nagasaki University, Nagasaki, Japan;

<sup>i</sup>Department of Obstetrics and Gynecology, FV Hospital, Ho Chi Minh City, Vietnam.

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**Abstract: Objectives:** This study aims to narratively review the progression of ethical and legal issues related to transplant tourism. **Methods:** PubMed search and Google search with keywords were used in March 2022 to identify relevant studies and law documentation. **Results:** The progression of transplant tourism was classified into three main periods. Before 2000, the most popular destination country was India (1,308 cases), this period was characterized by the absence of laws and regulations worldwide. The period from 2000 to 2010 was the peak explosion of transplant tourism, China became the most popular destination of tourists (7,591 cases). This triggered alarms by World Health Organization (WHO) resolution in 2004 and Istanbul declaration in 2008 calling for regulations to prohibit transplant tourism. From 2010 till today, additional scientific publications reported several complications in overseas transplanted patients. Laws and regulations restricting transplant tourism were promulgated by many countries such as Israel, Taiwan, Spain and others. **Conclusions:** Transplant tourism is considered as illegal worldwide. WHO and many developed countries announced laws and measures to prevent this activity. The incidence of transplant tourism is currently decreasing, continued efforts should persist to end this criminal act.

**Keywords:** ethics; legislation; organ harvesting; transplant tourism; progression.

⊕Authors equally contributed to the work

\*Address correspondence to Nguyen Duc Truong at the Department of Obstetrics and Gynecology, FV Hospital, Ho Chi Minh City, Vietnam; E-mail: [nguyenductruongdr@gmail.com](mailto:nguyenductruongdr@gmail.com)

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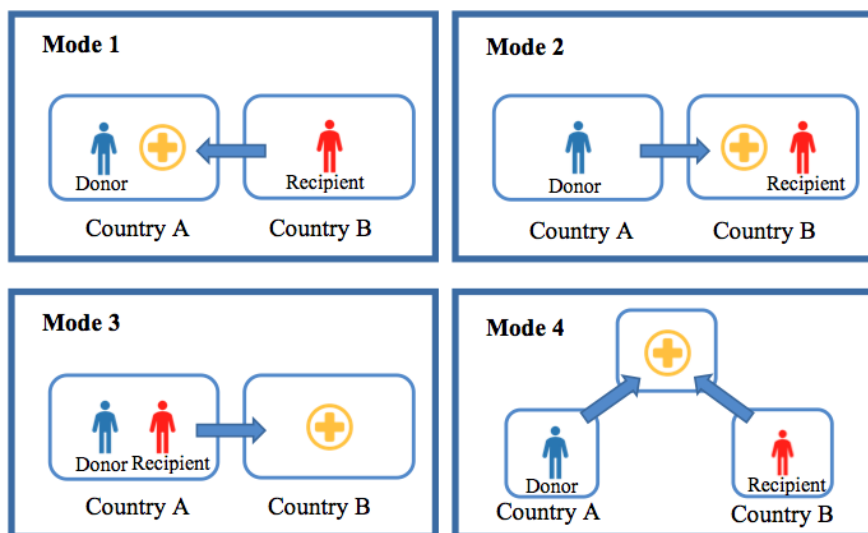
## 1. INTRODUCTION

Organ transplantation is an option in the treatment for organ failure. It has saved the lives of millions of patients with end-stage organ failure. However, donated organs are not sufficient to cope with the rising number of demanding patients. The data from the Global Observatory on Donation and Transplantation (GDOT) program demonstrated a substantial increase in the total number of transplanted cases over the years in 111 involved countries; however, donated organs only met 10% of the organ transplant demand [1]. This disparity between organ demand and organ supply has led to the emergence of organ trading and transplant tourism (TT), which accounted for 5-10% of total transplanted cases at that time, according to World Health Organization (WHO) [2]. This term, TT, emerged to describe the surge of wealthy foreigners arriving in India and other countries in search of organs for a price in the late 1980s. India was the most popular destination for commercial transplants at that time [3].

TT was first globally described in the WHA57.18 resolution of WHO in 2004, which called for measures to protect poor people who are the most vulnerable group from this activity. The resolution included drawing attention to the wider problem of international trafficking of human tissues and organs [4].

In 2008, TT and other related terms were defined in the Istanbul declaration [5], then it was revised in 2018 as follows: travel for transplantation is the movement of persons across jurisdictional borders for transplantation purposes. Travel for transplantation becomes TT, and thus unethical, if it involves trafficking in persons for the purpose of organ removal or trafficking in human organs, or if the resources (organs, professionals and transplant centers) devoted to providing transplants to non-resident patients undermine the country's ability to provide transplant services for its own population [6].

To better classify TT, Yosuke Shimazono has described four different modes of TT and explained the various activities of recipients, commercial living donors, and involved transplant centers at Second Global Consultation on Human Transplantation, WHO headquarters meeting in Geneva in 2007 [7]. Among those modes, mode 1 describes a recipient traveling from country B to country A where both the donor and transplant center were located. Mode 2 describes a donor from country A traveling to country B where the recipient and transplant center were both located. Mode 3 demonstrates both a donor and recipient from country A traveling to country B where the transplant center was located, and mode 4 represents a donor from country A and a recipient from country B both traveling to another country where the transplant center was located [5] (Figure 1).



**Figure 1.** Four different modes of international organ trade and organ trafficking. Adapted from (Shimazono March 28–30, 2007)

Two full reports about TT were published by researchers of European Union [8] and Council of Europe [9]. These reports described in detail the illegality of TT and declared it condemned by the Council of Europe, WHO, World Medical Association (WMA) and the Transplantation Society. The practice is unethical because of two points: harms on donors and the unethical practice or organ harvesting. In this review, we aim to characterize the progression of TT, describe the ethical issues and legislative implementation.

## 2. MATERIALS AND METHOD

This review was conducted by searching on PubMed database using the term “transplant tourism” for original

research or reviews. Ancestry searches were also conducted by reviewing the references section of all worthwhile articles to identify additional studies on the topic until March 2022. Related legislation and policies were searched by using Google search with keywords including “legislation,” “law,” “organ trafficking,” “organ harvesting,” and “organ abuse” in March 2022.

## 3. RESULTS AND DISCUSSION

A total of 103 original studies (Table 1) and three websites related laws and policies [10-12] were identified. Among these publications, 16 studies were excluded for under-reporting of the number of transplanted patients and the year of transplantation; while 87 studies were included (Figure 2).

Most of the included studies were also included in another two systematic reviews [13, 14]. The number of patients engaged in TT and their destination was reported in Table 2. In terms of the country of origin and number of recipients, the highest was Taiwan with 3,567 cases, followed by Korea and Malaysia with 2,849 and 1,886 cases, respectively. It must be

noted that TT occurred mainly in the black market; therefore, the definitive number remains unknown. Therefore, we identified three major periods of the progression of TT with the corresponding laws or policies of international organizations and nations during three intervals of time: before 2000, from 2000 to 2010, and from 2010 until now.

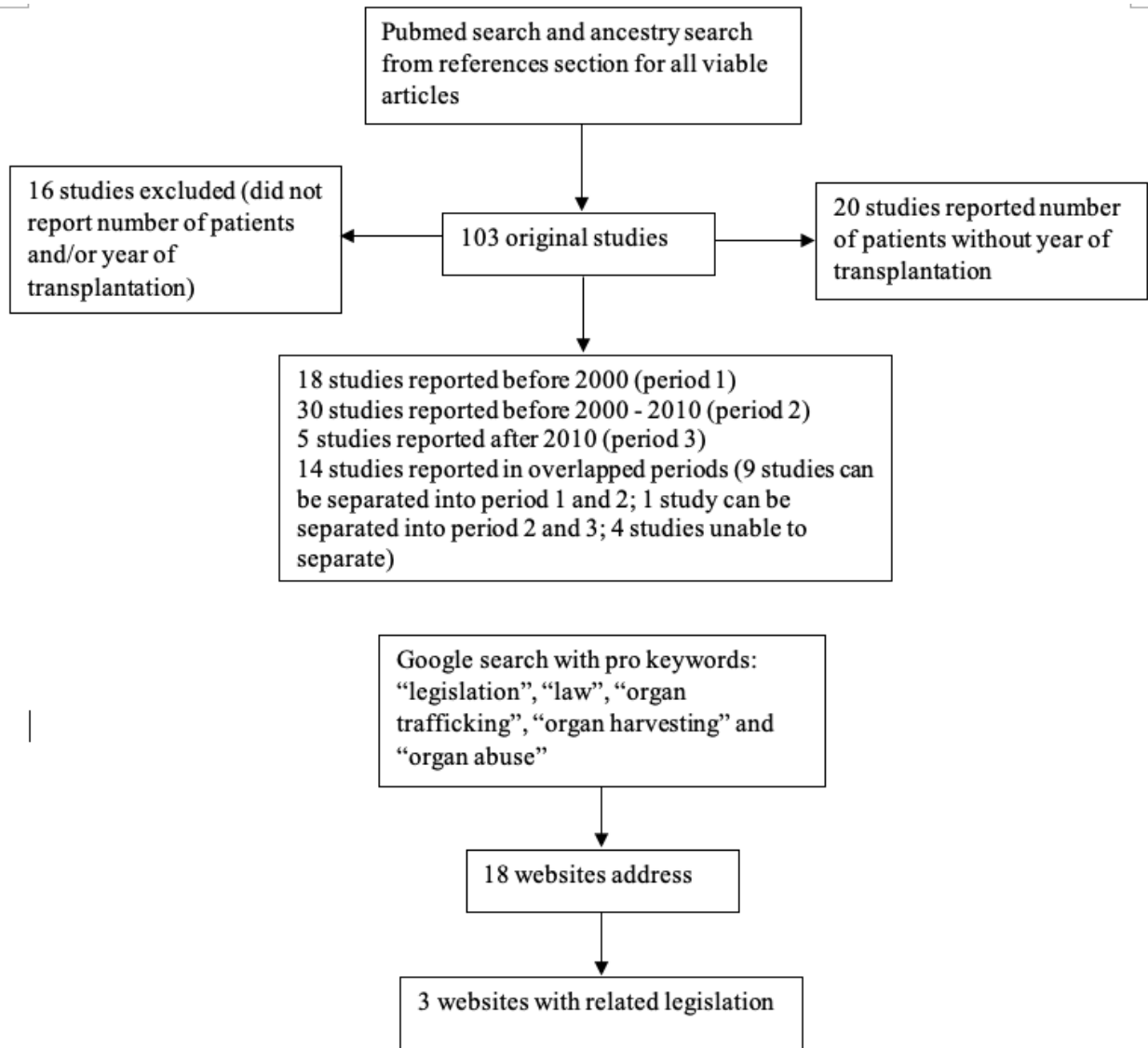


Figure 2. Diagram of the study and law database search

**Table 1.** Destination of transplant tourist

Destination of transplant tourist before 2000.					
Author	Year of publication	Year of transplantation	Number of Patients	Resident	Country of transplant
Akpolat and Ozturk [13]	1998	1991–1994	12	Turkey	India (12)
Al Asfari [13]	1995	1988–1993	38	Syria	India (38)
Al-Wakeel [13]	2000	1990-1996	57	Saudi Arabia	India (37), Egypt (14), USA (5), Pakistan (1)
Al-Wakeel [13]	2000	1998–2001	51	Saudi Arabia	India (51)
Ben Hamida [13]	2001	1995–1999	20	Tunisia	Iraq (14), Egypt (3), Pakistan (3)
Chien [14]	2000	1991–1998	100	Taiwan	China (100)
Colakoglu [13]	1998	1991–1995	127	Turkey	India (127)
Friedlaender [13]	1993	1988–1992	36	Israel	India (36)
Fukushima [14]	2013	1992	1	Japan	USA
Hussein [13]	1996	1984–1994	56	Saudi Arabia	India (56)
Johny [13]	1990	1985–NW	53	Kuwait	India (49), Egypt (2), Philippines (1), Iraq (1)
Kennedy [13]	2010	1990–2004	13	Australia	India (3), China (6), Iraq (1), Philippines (1), Lebanon (1), Eastern Europe (1)
Lei [13]	1992	1986–1991	101	Malaysia	India (101)
Morad [13]	2000	1990–1996	515	Malaysia	India and China
Prabhakar [13]	2000	1986–1991	115	Singapore	India (115)
Salahudeen [13]	1990	1984–1988	130	United Arab Emirates, Oman	India (130)
Sanal [35]	2004	1995, 1992	2	Turkey	Russia, India
Sever [13]	1994	1992–1993	34	Turkey	India (34)
Sever [13]	2001	1992–1999	115	Turkey	India (106), Iraq (7), Iran (2)

Table 1. (continue)

Destination of transplant tourist 2000-2010					
Author	Year of publication	Year of transplantation	Number of Patients	Resident	Country of transplant
Adamu [14]	2012	2006–2009	45	NW	Pakistan (28), Egypt (10), Philippines (6), China (1)
Ahn [36]	2018	2000-2010	1576	Korea	China (1528)
Alghamdi [13]	2010	2003–2008	93	Saudi Arabia	Pakistan (46), Philippines (26 Egypt (11), USA (3), China (2), Iran (2), Syria (1), Lebanon (1), Jordan (1) USA (10), UK (6)
Allam N [14]	2010	2001-2007	74	Saudi and Egyptian	China (74)
Berglund [14]	2012	2005-2006	3	Sweden	Pakistan (2), Iran (1)
Canales [13]	2006	2002-2006	39	USA	Pakistan (8), China (1), Iran (1)
Canales [13]	2006	2002–2006	10	United States	Pakistan (8), China (1), Iran (1)
Cha [14]	2011	200-2009	87	South Korea	China
Chung [14]	2010	2002-2008	69	South Korea	Philippines (3), China (66)
Chung MC [14]	2014	1999-2009	2309	Taiwan	China (2309)
Cronin [14]	2011	2000-2009	245	UK	Pakistan (121), India (48), China (12), Philippines (8), Iran (8), Egypt (7), USA (4), NW (37)
Dulal [14]	2008	2003-2008	452	Nepal	India (449), Germany (2), USA (1)
Geddes [14]	2008	2000–2007	18	Scotland	Pakistan (18)
Gill [14]	2011	2000-2007	93	Canada	China (39), India (14), Iran (5), Philippines (16), Pakistan (11)
Gill J [14]	2008	1995-2007	33	Canada	China (14), Philippines (4), India (3), Pakistan (1), Iran (6), Peru (1), Egypt (1), Turkey (1), Mexico (1), Thailan (1)
Goh BI [37]	2012	2000-2012	1117	Malaysia	China (1005), India (67), Other (45)
Hsu CC [14]	2011	2001-2003	398	Taiwan	China (398)
Ivanovski N [14]	2011	2006-2007	36	Bailkan	Pakistan (36)
Kapoor [14]	2011	2001–2007	10	Canada	China (4), Pakistan (3), India (1), Philippines (1), Mexico (1)
Kwon CH [14]	2011	2000-2005	966	Korea	China (966)
Leung [14]	2007	2001-2007	12	Hong Kong	China (12)
Malakoutian [14]	2007	2005–2006	NW	Iran	Iran
Merion RM [14]	2008	2001-2006	373	USA	China (26) Philippines (12), India (10), Pakistan (4)
Polcari [14]	2011	2001-2007	9	USA	China (3), Pakistan (3), Philippines (1), India (2)
Quach K [38]	2016	2000-2011	45	Canada	China (36)
Scheper-Hughes [14]	2006	2003	1	USA	South Africa
Shimizu [14]	2007	2006	1	Japan	NW
Shoham [14]	2010	2006	19	USA	Asia or Middle East (11), India (3), Pakistan (2), Philippines (1), Lebanon (1), Iran (1)
Solak [39]	2012	2003–2010	14	Turkey	Egypt (5), Iraq (4), Pakistan (2), Russia (2), India (1)
Tsai [14]	2014	2003-2009	307	Taiwan	China (307)
van Balen [14]	2016	2000-2009	22	Kosovo, the Netherlands, and Sweden	Pakistan (14) India (4) China (1) Russia (1) Columbia (1) Iran (1)
Vathsala [14]	2009	2001–2006	209	Singapore	NW
Zargooshi [14]	2008	2006–2007	100	Iran	Iran

**Table 1.** (continue)

Destination of transplant tourist 2010 to date					
Author	Year of publication	Year of transplantation	Number of Patients	Resident	Country of transplant
Ahn HJ [36]	2018	2011-2016	151	Korea	China (146)
Al Salmi I [40]	2018	2013- 2015	158	Qatar	Pakistan (142), China (12), Egypt (2), Iraq (2)
AlBugami MM [41]	2017	2013-2016	86	Audi Arabi	Egypt (46), Iran (16), China (13)
Okafor [42]	2017	2008-2015	126	Nigeria	India (113), UK (4); Pakistan (2), USA (1)
Wong HS [43]	2017	2013-2015	61	Malaysia	China (39), India (3), Other (19)
Destination of transplant tourist in mixed period					
Author	Year of publication	Year of transplantation	Number of Patients	Resident	Country of transplant
Ackoundou-N'Guessan [14]	2010	1995–2009	16	Ivory Coast	India (5), Tunisia (5), NW (6)
Alkhunaizi [14]	2005	1998-2003	80	Saudi Arabia	Pakistan (1), Iran (1), Philippines (1), NW (77)
Ambagtsheer [14]	2013	1994–2005	45	The Netherlands	Indian, China, India, Iran, Iraq, Pakistan, USA, Colombia
Sugo [14]	2002	1985–2001	14	Japan	NW
Jung [14]	2015	2009–2013	33	Mongolia	South Korea
Khalaf [14]	2004	1993–2004	67	Egypt	Europe (49), USA (12), Japan (6)
Krishnan [14]	2010	1996–2006	40	UK	Pakistan
Kucuk [14]	2005	1978–2001	220	Turkey	India, Iraq, Iran
Majid [14]	2010	1993–2009	45	Dubai	Philippines (15), Pakistan (7), India (7), Iran (2), Syria (1), Jordan (1), Egypt (1), Germany (2), UK (2), France (1), Singapore (1), USA (1), Israel (1), NW (4)
Ng [14]	2009	1989–2007	4	Singapore	China
Rizvi [14]	2009	1993–2007	126	Pakistan	Pakistan
Tsai [14]	2011	1987–2006	215	Taiwan	China
Wahab [14]	2014	2004–2012	12	Egypt	China
Go [14]	2004	1993-2003	53	Malaysia	NW
Studies report number of patients without reporting year of transplantation					
Author	Year of publication	Year of transplantation	Number of Patients	Resident	Country of transplant
Abdeldayem [14]	2008	NW	15	Egypt	China (15)
Cader [44]	2013	NW	39	Malaysia	China
Chen [14]	2010	NW	19	Taiwan	China
Coker [13]	1994	NW	21	Turkey	India (11), Russia (3), Germany (2) United States (2), England (1), Belgium (1), Greece (1)
Dodo[14]	2000	NW	8	Japan	USA (7), Germany (1)
Erikoglu [14]	2004	NW	6	Turkey	Iraq (5) and India (1)
Greenberg [14]	2013	NW	10	Israel	Egypt
Guy [14]	2013	NW	1	USA	Guyana
Huang [14]	2011	NW	15	Taiwan	China
Inston [14]	2005	NW	6	UK	India
Ivanovski [14]	2005	NW	16	Macedonia (81.3%), Kosovo (18.8%)	India (16)
Lu [14]	2014	NW	19	Taiwan	NW
Muraleedharan [14]	2006	NW	20	India	India
Scheper-Hughes [14]	2011	NW	1	Israel	South Africa
Solak [14]	2010	NW	1	Turkey	Egypt
Spasovski [14]	2008	NW	1	Macedonia	Pakistan
Sugiyama [14]	2009	NW	1	Japan	NW
Tsai [14]	2014	NW	185	Taiwan	China
Wright [14]	2013	NW	3	Canada	Asia
Yakupoglu [14]	2010	NW	5	Turkey	Egypt

NW: Not Written

**Table 2.** Country of origin and number of recipients

Country of origin	Number of recipients
Taiwan	3,567
Korea	2,849
Malaysia	1,886
Turkey	557
Nepal	452
United States	452
Saudi Arabia	337
Singapore	328
UK	291
Canada	244
Qatar	158
United Arab Emirates, Oman	130
Nigeria	126
Egypt	94
Audi Arabi	86
Saudi and Egyptian	74
Kuwait	53
Israel	47
Dubai	45
The Netherlands	45
Syria	38
Bailkan	36
Mongolia	33
Japan	25
Kosovo, the Netherlands, and Sweden	22
Tunisia	20
Scotland	18
Macedonia	17
Ivory Coast	16
Australia	13
Hongkong	12
Sweden	3

### 3.1. Progress of TT and related legislation/policies

The progress of TT is virtually parallel to the progress of organ transplantation. With the advancement in transplant techniques and the development of new effective anti-rejection medications approved by Food and Drug Administration (FDA) in 1983, the number of organ transplants has dramatically increased [15]. However, due to the economic, moral, and religious issues, the need for better immunological matching, the lack of organ donors, and other legal restrictions, organ transplantation has been restricted. These factors triggered commercial transplantation and organ trafficking in unregulated countries.

Before 2000, there were a total of 1,977 overseas transplant cases reported (Figure 3A). India was the most popular destination of TT with 1,308 cases, followed by China with 528 cases, Egypt with 14 cases, Pakistan with 5 cases, and others. The only legal document against TT at that time was the resolution of WHA44.25, which was proposed by the WHO in 1991 to call for protection of the minors and other

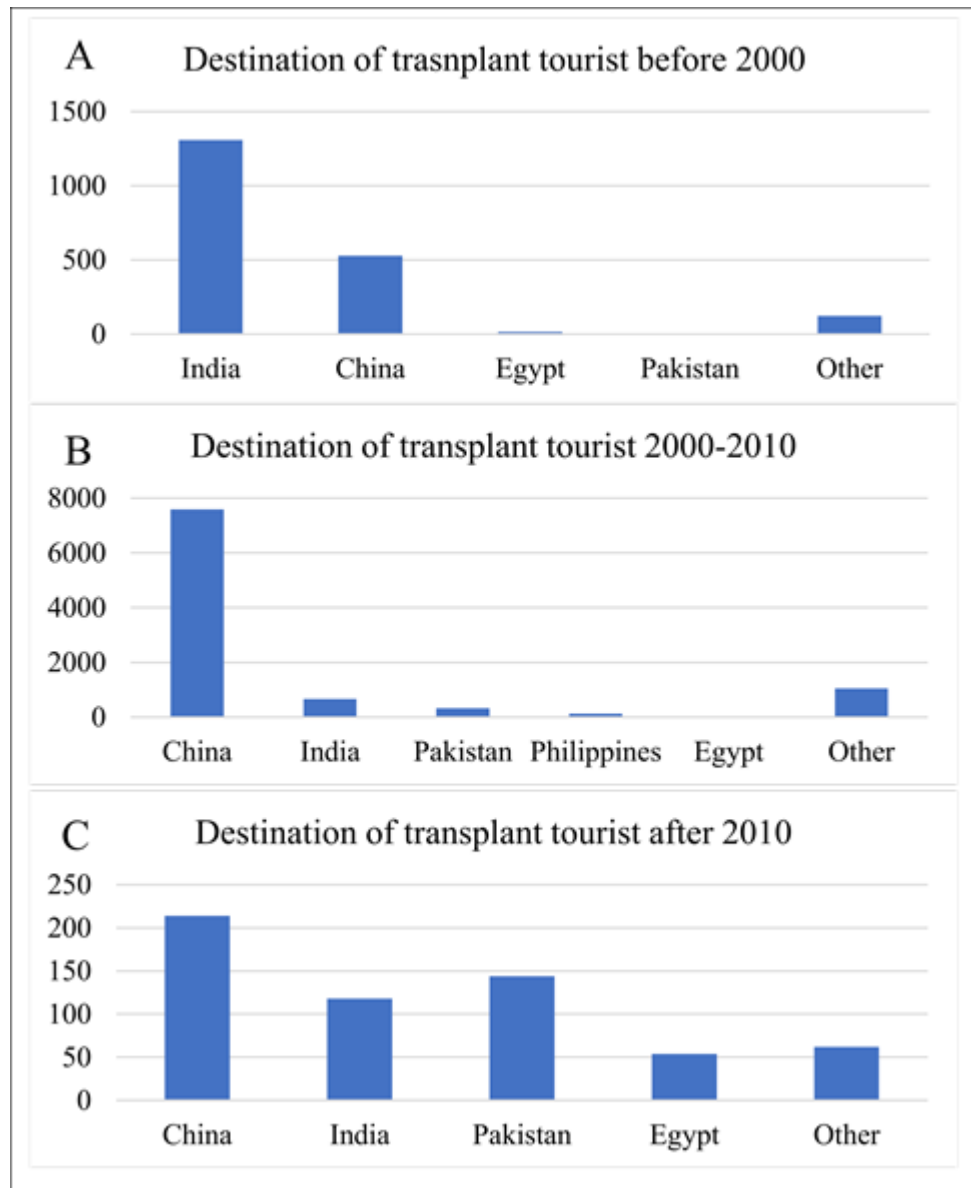
vulnerable persons from the coercion and improper exploitation to donate organs.

From the year 2000 to 2010, the total number of transplant tourists was nearly five times higher than the previous period with 9,795 cases worldwide. The numbers of transplant tourists visiting China was 7,591 cases; it increased exponentially at 14 times higher in comparison to the previous period (Figure 3B). China became the most popular destination country for TT during this timeframe; India, Pakistan, and Egypt were still among the top popular sites with 667,327 and 123 cases, respectively. Philippines joined with 133 cases reported. In this decade, more legislation was announced and resolutions established by WHO, Council of European, WMA, in addition to the Istanbul declaration against TT.

From the year 2010 to 2016, the number of published papers about TT complications decreased significantly, which may denote the success in the international fight against TT. The total number of reported TT cases was 592 with China still being the most popular destination (Figure 3C). During this interval, a surge of legislation against TT, especially

organ harvesting leading to death in China, emerged from the United States, the Council of Europe, and Medical Association.

Subsequently, many countries implemented laws or health policies against TT from 2006 thereafter. People participating in TT were fined or even imprisoned. Enforced consequences demonstrated more awareness in the prevention of the activity globally.



**Figure 3.** Destination of TT before 2000 (A), during 2000-2010 (B), and after 2010 (C)

### 3.2. Exploitation of susceptible populations

Since its establishment, a first scientific report about the harmful consequences of TT for both donors and organ recipients was published in 1990 [16]. The recipients received organ transplants through organ-brokers, and then consequently suffered from severe postoperative complications, including serious infections, leading to a high rate of mortality (18.5% at one year) [16].

Despite the expensive prices for the organs offered for sale on the internet, as described by Shimazono in 2007 such as: 75,000 USD for a kidney; 120,000 USD for a liver; 110,000

USD for a pancreas; and 150,000 USD for a lung transplant [2], the studies in India and Pakistan showed that the vendors were merely only paid a small portion. In fact, the vendors were defined as commercial living donors whose motivation is monetary gain the destitute with a high rate of illiteracy [17]. They sold their organs to pay off debts and for other essential needs of life such as food and clothing [18]. However, there was no improvement in their economic status; their average income even declined a third after selling their organs. Moreover, their health deteriorated for the remainder of their lives [18, 19]. The similar condition has been reported in Iran, Egypt, and the Philippines. Furthermore, accompanied by physical and economical downgrade, the vendors or



commercial living donors also suffered from psychological burden such as being ashamed and isolated from the society [20]. The four trafficking networks in India, South Africa, Kosovo, and the USA were discovered by authorities proved that what we know about the TT based on scientific data may be just a tip of the iceberg [8].

### 3.3. The story of organs source in China

As China is one of the main countries practicing OT/TT since the year 2000, we are discussing separately the story of organ source in China. According to data from the Ministry of Health of China, before 2000, the annual number of kidney transplants were only about 4,000 in total, and limited report about liver transplant cases was found [21]. However, during the period from 2000 to 2007, the figure for kidney transplants exceeded 6,000 cases per year, and it even peaked to 12,000 cases annually in 2005. Concurrently, there was an exponential growth in the number of liver transplants, which increased from under 100 cases in 2000, to 2,300 cases in 2004, and finally reached its peak at 3,500 cases per year in 2005 [22]. Jiefu Huang, the former Vice Minister of Health of the People's Republic of China stated that about 90% of organ sources were from deceased donors and most of them came from executed prisoners, and another small portion came from traffic accident victims [23]. However, there has been no transparent data of executed prisoners published by the Chinese government. According to tabulations constructed by Amnesty International report from the publicly-available data, the number of annual executed prisoners were considerably less than the number of annual organ transplant in China, specifically the estimated sentenced death in 2005 was only about 3900 people while the total number of kidney transplant reached to 12,000 cases as described above [24]. A report revealed that the Chinese government performed forced removal of organs leading to death not only from executed prisoners but also from prisoner of conscience who were mainly Falun Gong (a Chinese spiritual practice) practitioners [25-27]. The actual number of cases is difficult to get due to lack of accessible data and could be greatly underestimated. It is difficult to know the actual fact due to lacking of transparent data from China and the action of prohibiting independent investigator of Chinese government.

This unethical practice was stated by Council of Europe [9]. Concerns about ethical standards implemented in research publications using materials from executed prisoners, a recent review investigating on Chinese organ transplantation concluded that around 92.5% (412/445 included studies) failed to clarify whether or not, the organs were sourced from executed prisoners and 99% (439/445 included studies) failed to report that organ sources gave consent for transplantation [28]. Scholars in genocide study presented that forced organ harvesting from Falun Gong practitioner in China is one part of Chinese Government's effort to eradicate of this group [29].

### 3.4. Legislation effectiveness against TT act

International efforts to fight against TT has been continuously evolving. The effectiveness of legislation imposed by some countries of origin including Europe, Malaysia, Israel, Turkey, United States, Australia, Spain, Taiwan was reported in details in Table 3. Before 2000, there

were extremely limited organizations or nations that paid attention to TT; Turkey played a pioneer in ordering legislation with the law on organ transplantation in 1979 [30]. This law was used as a model by many other countries in the following time. In 1991, WHO proposed resolution calling for protecting the vulnerable from TT. After the 2000, TT expanded very rapidly resulting in some severe unethical issues; criminal organ trafficking network and forced organ-harvesting leading to death in China. Many international organizations and nations have raised their voices against TT. The most significant evolution in the fight against TT was the declaration of Istanbul in 2008, which officially condemned organ commercialism and TT. Moving forward, with the efforts of human rights activists and medical specialist association, law against TT has been implemented in numerous countries of origin (Table 3), and law regulating organ transplantation has also been implemented in countries of destination.

Law implementation and related policies against TT has been effective in many countries of origin to reduce the number of transplant tourists travelling abroad to countries where laws prohibiting organ sales are poorly enforced or overrode by loopholes. Council of Europe was the leading league of countries that actively fought against TT. From the Convention on Human Rights and Biomedicine in 1997, an additional protocol concerning Transplantation of Organ and Tissues of Human Origin, to the passing law prohibited organ trafficking in 2016 and 2017. The number of patients going abroad for transplant within this region has dropped down significantly [9]. The same trend occurred in Israel and Malaysia. After implementing law in 2008, the number of patients going abroad for kidney transplant decreased from 155 in 2006 to 35 in 2011 [31]. Amongst the top three countries of tourist's origin, Taiwan implemented a law against TT in 2015, yet there is no report on its effectiveness till now [32]. Malaysia implemented a policy that refuses to dispense immunosuppressive therapy for free to TT patient without the approval of the Ministry of Health from January 2012, resulting in at least one third reduction of the number of patients engaging in TT annually [33].

On the other hand, some top countries of destination where transplantation takes place, according to a subsequent report from the Council of Europe, transplant legislation was adopted. In October 2014, Hangzhou Resolution was promulgated which terminate the usage of organ from executed prisoners [34]. However, recent reports have provided that thousands of patients from South Korea, Gulf Region and Western Chinese community still going to China for organ transplant [35]. Regular visit transplant center of members of the Declaration of Istanbul Custodian travel to China suspected that TT is still active and on-going [9]. The same story has been reported in India, although this country building law in 2008, but TT is still ongoing with poor regulation [9]. After implementing the laws, Philippines had a success in controlling the foreigner transplant tourist but was unable to deal with local one [36]. There was no report on other countries of destination in medical literature.

There are several limitations in our narrative review. Since there was no universal obligation to report cases of TT, the reported numbers might underestimate the magnitude of the problem. Moreover, even after China announced that starting

2015, hospital-based donors would be the sole source of organs in response to international criticism, the reported numbers following this announcement appeared to be falsified

according to a recent study [37]. In addition, being a narrative review with unstructured search terms, some studies might have been missed from our search.

**Table 3.** Development Progression of legislation/policies against TT before 2000, during 2000-2010, and after 2010

Year	Organization/Nation	Document	Impact on OT/TT
<b>Legislation against TT before 2000</b>			
1979	Turkey	Law no 2238 on the Harvesting, Storage, Grafting, and Transplantation of Organs and Tissues [28]	Forbidding buying and selling and all advertisement in connection with the harvesting and donation of organs and tissues and require penalty.
1991	WHO	WHA44.25 Resolution [45]	Protection to minors and other vulnerable persons from coercion and improper exploitation to donate organs
<b>Legislation against TT during 2000-2010</b>			
2004	WHO	WHA57.18 Resolution [46]	Measures to protect the poorest and most vulnerable groups from “TT”
2005	Council of Europe	CETS No. 197 [47]	Action against trafficking of human organs
2006	World Medical Association	Resolution [48]	Demand China to stop using prisoners as organ donors
2008 2018	Transplantation Society and the International Society of Nephrology	Istanbul declaration [49]	Define TT Call to bring TT to an end
<b>Legislation of leading nations/organizations against TT and organ harvesting in China during 2010 - 2016</b>			
February 2014	United States	Resolution HR0730 of the State of Illinois [50]	Condemning Forced Organ Harvesting, urge the government to bring an end to the revolting practice of harvesting organs from living Falun Gong practitioners for transplants
October 2014		Resolution No.1052 of Pennsylvania State [51]	Calling upon the People’s Republic of China to immediately end the practice of forced organ harvesting
2015	Council of Europe	Treaty series – No.216 [49]	Action against trafficking of human organs
2016	European Parliament	Rule 136 of Parliament’s Rules of Procedure [49]	End organ harvesting from prisoners of conscience in China
2016	World Medical Association	Repeated Resolution [48]	Demand China to stop using prisoners as organ donors
2016	United States	Resolution 343 of US House of Representatives[52]	Expressing concern regarding organ harvesting in the People’s Republic of China
<b>Legislation/policies against TT/organ harvesting in China by other nations from 2006 - now</b>			
2006	Australia	Australian Health Ministry [53]	Abolition of training programs for Chinese doctors in organ transplant technique Banning joint research programs with China on organ transplant.
2008	Israel	Israel Organ Transplant Act [11]	Prohibit reimbursement. Three years’ imprisonment and a large fine for the purchase, sale, or brokerage of an organ
2009		The New Criminal Code [11]	Consider the illegal trafficking of human organs as a felony
2010	Spain	The New Criminal Code, Article 156 bis [11]	Impose penalties for participants of organ trafficking with imprisonment from six to twelve years
2012	Malaysia	Ministry of Health [31]	Prohibit reimbursement to TT patients Fine and imprisonment of 1 to 5 years for involvement in brokering organs or organ tourism
2015	Taiwan	The Human Organ Transplantation Act [11]	Doctors who engage in organ brokerage will have their licenses revoked 3 to 12 years’ imprisonment and a fine between 50,000 and 300,000 euros
2015	Italy	Senate Bill [11]	Doctors who promote or facilitate illegal organ tourism would face lifetime disqualification
2016		Law No. 2937 [11]	Ban organ trafficking in November 2016
2017	Norway	The Norwegian law of June 16th 2017 nr. 54[10]	Prevent and combat trade with human organs Increased penalties for breach of the provisions in legislation
2019	Belgium	Amendment to the Belgian Penal Code [46]	Imprison up to 10 years and a fine of up to 75,000 EUR for anyone who forcedly takes an organ from a person

WHO = World Health Organization, TT = transplant tourism, OT = Oversea Transplantation, WMA: World Medical Association

## CONCLUSIONS

Our review has characterized an overview on the progression of TT under the effectiveness of related policies and legal issues as well as clearly describe the unethical consequences that violate the ethical principles of medicine: “first do no harm”. It is clear that TT leading two unethical consequences: taking advantage from the destitute causing them to become physically, and mentally deficit and socioeconomic downgrade in some developing countries and forced organ removing leading to death in China.

During the early progression of TT, India was the most popular destination for commercial transplants before 2000, meanwhile China was the most popular destination country, followed by Pakistan and India, after 2000 until now. Legislative ethics on TT has been recently garnered more attention and has recently taken into considerations. It is proved that law implementation in countries of origin have positive effects on reducing TT; however, in countries of destination, law has played a limited role on abroad TT. Organ donation is an altruistic value; however, organ shortages led to TT, which has culminated in organ trading, organ harvesting, and taking advantage of the defenseless. We suggest an international cooperation in bringing TT to a termination.

## LIST OF ABBREVIATIONS

TT: Transplant tourism; FDA: Food and Drug Administration; GDOT: Global Observatory on Donation and Transplantation; WMA: World Medical Association; OT: Oversea Transplantation.

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## CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

## AUTHORS' CONTRIBUTION

LCC, NDT: concept/design, data analysis/interpretation. LT: drafting article, critical revision of article. LTPL: approval of article. GJM, MEE, NHN: data collection. NTH: approval of article, funding. All authors read and approved the final manuscript.

## ORCID ID

Linh Tran  <https://orcid.org/0000-0001-8667-082X>  
 Giang Jan Nguyen  <https://orcid.org/0000-0002-0527-7055>  
 Mohamed Essam Elrggal  <https://orcid.org/0000-0002-7049-4777>  
 Nguyen Hai Nam  <https://orcid.org/0000-0001-5184-6936>  
 Nguyen Tien Huy  <https://orcid.org/0000-0002-9543-9440>  
 Nguyen Duc Truong  <https://orcid.org/0000-0002-9315-1611>

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