

The state of the international organ trade: a provisional picture based on integration of available information

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Abstract Organ transplantation is widely practised worldwide. The expansion of organ transplantation has led to a critical shortage of organs and the development of the organ trade. Many patients travel to areas where organs are obtainable through commercial transactions. Although the international organ trade is regarded as an important health policy issue, its current state remains obscure because of scarce data and the lack of efforts to synthesize available data. This paper is an attempt to integrate information about the current international organ trade and create a tentative global picture based on a systematic review of 309 media reports, journal articles and other documents. The international organ trade is described in terms of its forms, the organ-exporting countries, the organ-importing countries and its outcomes and consequences.

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الترجمة العربية لهذه الخلاصة في نهاية النص الكامل لهذه المقالة. *Al final del artículo se facilita una traducción al español.* Une traduction en français de ce résumé figure à la fin de l'article.

Introduction

Organ transplantation is an effective therapy for end-stage organ failure and is widely practised around the world. According to WHO, kidney transplants are carried out in 91 countries. Around 66 000 kidney transplants, 21 000 liver transplants and 6000 heart transplants were performed globally in 2005. The access of patients to organ transplantation, however, varies according to their national situations, and is partly determined by the cost of health care, the level of technical capacity and, most importantly, the availability of organs.

The shortage of organs is virtually a universal problem. In some countries, the development of a deceased organ donation programme is hampered by sociocultural, legal and other factors. Even in developed countries, where rates of deceased organ donation tend to be higher than in other countries, organs from this source fail to meet the increasing demand. The use of live donors for kidney and liver transplantation is also practised, but the purchase and sale of transplant organs from live donors are prohibited in many countries.¹

The shortage of an indigenous “supply” of organs has led to the de-

velopment of the international organ trade, where potential recipients travel abroad to obtain organs through commercial transactions. The international organ trade has been recognized as a significant health policy issue in the international community. A World Health Assembly resolution adopted in 2004 (WHA57.18) urges Member States to “take measures to protect the poorest and vulnerable groups from ‘transplant tourism’ and the sale of tissues and organs”.² Despite growing awareness of the issue, the reality of the international organ trade is not well understood due to a paucity of data and also a lack of effort to integrate the available information.

This paper is a preliminary attempt to bring together the available information on the international organ trade. It aims to present a tentative global picture of the context and forms of the organ trade; the major organ-exporting and -importing countries; and the outcomes and consequences of commercial organ transplants.

Methods

This paper originated from a literature review commissioned by the Clinical

Procedure Unit of WHO’s Department of Essential Health Technologies and was undertaken during July and August 2006. Its purpose was to gather information on the international organ trade and transplant tourism, and to synthesize this into a tentative global picture using multiple research strategies.

Medical articles on the outcome of commercially arranged overseas transplants were collected through Medline/PubMed. Using Reference Manager, the first search was conducted using two parameters: “kidney transplantation” AND “nonrelated” OR “unrelated”; the second search was made with “kidney transplantation” AND “commerce” OR “commercial”. The abstracts were checked and, if judged relevant, the entire items were retrieved; their references were also consulted. Academic articles containing information on the scope and trends of the international organ trade were obtained using the same search procedure.

Because the paucity of scientific research was anticipated, media reports were identified as significant complementary resources. Articles published in the past five years that were accessible in both English and Japanese were examined. The initial search was

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Table 1. Transplant tourism web sites available 21 March 2007

Name of organization, web site	Location of transplantation	Transplant package
BEK-transplant (http://www.bek-transplant.com/joomla/index.php)	China	Kidney (US\$ 70 000) Liver (US\$ 120 000) Pancreas (US\$ 110 000) Kidney and pancreas (US\$ 160 000)
China International Transplantation Network Assistance Center (http://en.zoukiishoku.com/)	China	Kidney (US\$ 65 000) Liver (US\$ 130 000) Lung (US\$ 150 000) Heart (US\$ 130 000)
Yeson Healthcare Service Network (http://yeson.com/index.htm)	China	Kidney, liver, heart and lung
Aadil Hospital (http://www.aadilhospital.com/index.html)	Pakistan	Kidney
Masood Hospital (http://www.masoodhospital.com/services/surgery/ktp/kidney_transplant.htm)	Pakistan	Kidney (US\$ 14 000)
Renal Transplant Associates (http://www.renaltransplantsurgery.com/index.html)	Pakistan	Kidney [Euro 16 000 (US\$ 20 500)]
Kidney Transplant Associates (http://www.kidney.com.pk)	Pakistan	–
Liver4You (http://www.liver4you.org/)	Philippines	Kidney (US\$ 85 000)

made using online database services [LexisNexis Global Business and News Service, accessed through Oxford University Library Services (OXLIP; available at: <http://www.bodley.ox.ac.uk/oxlip/index.html>)]. Articles indexed as “organ trafficking” were examined and items containing factual information on the organ trade were retrieved. After the identification of the major “organ importing and exporting” countries, reiterative searches were made to gather further information from the aforementioned database and Google searches. Relevant items in the author’s personal library were also included. For the purpose of this paper, an additional survey of media reports published up to 10 May 2007 was carried out. A summary of the survey was presented at the Second Global Consultation on Human Transplantation at WHO’s Geneva headquarters (28–30 May 2007), and benefited from the participants’ comments and information.

The material obtained using these methods was organized into a searchable database and systematically reviewed.

Results

In total, 309 documents – 243 media materials, 51 journal articles and 15 other documents – were judged to be the most relevant. As anticipated,

quantitative data was scarce. However, several documents, including academic articles, conference papers and reports by health ministries and national transplant registries, were obtained for several countries. Media reports were found to be useful in gaining information on the prevalence and forms of the international organ trade and as a source of data not accessible in academic journals. The major findings from these will be summarized below.

Forms of the international organ trade Transplant tourism

The most common way to trade organs across national borders is via potential recipients who travel abroad to undergo organ transplantation, commonly referred to as “transplant tourism”. Although this term may be contentious as it disregards the patients’ desperate motives and fails to reflect ethical issues. However, it is used in resolution WHA 57.18 and in international health policy discussion to refer to overseas transplantation when a patient obtains an organ through the organ trade or other means that contravene the regulatory frameworks of their countries of origin.

“Transplant tourism” involves not only the purchase and sales of organs,

but also other elements relating to the commercialization of organ transplantation. The international movement of potential recipients is often arranged or facilitated by intermediaries and health-care providers who arrange the travel and recruit donors. The Internet has often been used to attract foreign patients. Several web sites offer all-inclusive “transplant packages” – the price of a renal transplant package ranges from US\$ 70 000 to 160 000 (Table 1).

There are also facilitators in the recipients’ countries of origin. In Taiwan, China 118 patients who underwent organ transplants in China were questioned by their Department of Health, and 69 reported that their transplants were facilitated by doctors. Subsequently, the local authorities in Taiwan, China, have prohibited such activities.³ There have also been allegations that embassy officials of certain Middle Eastern countries have facilitated overseas commercial kidney transplants in Pakistan and the Philippines.^{4,5}

Under the General Agreement of Trade in Service (GATS), governments may choose to trade health services to achieve their national health objectives. Health service exports, through the treatment of foreign patients entering their territory (classified as “mode 2” or “consumption abroad”), are used

by some countries as an instrument of economic development.⁶ The trade in transplant-related health services across borders, however, may result in the inequitable allocation of deceased donor organs and has also raised ethical concerns, especially when this occurs in a country where the regulatory frameworks to protect live organ donors from coercion, exploitation and physical harm are not well developed or implemented.

Other forms of international organ trade

There are other forms of international organ trade that demand attention. In some cases, live donors have reportedly been brought from the Republic of Moldova to the United States of America, or from Nepal to India.^{7,8} In other cases both recipients and donors from different countries move to a third country. More than 100 illegal kidney transplants were performed at St. Augustine Hospital in South Africa in 2001 and 2002; most of the recipients came from Israel, while the donors were from eastern Europe and Brazil. The police investigation in Brazil and South Africa revealed the existence of an international organ trafficking syndicate.⁹ These cases may involve human trafficking for the purpose of organ transplantation. Unlike cell tissues, no confirmed report on transplant organs being trafficked after their removal was found in this survey.

The organ-exporting countries

India was a commonly known organ-exporting country, where organs from local donors are regularly transplanted to foreigners through sale and purchase. Although the number of foreign recipients seems to have decreased after the enactment of a law banning the organ trade (the Human Organ Transplantation Act of 1994),¹⁰ the underground organ market is still existent and re-surfacing in India. The Voluntary Health Association of India estimates that about 2000 Indians sell a kidney every year.¹¹ The drop in foreign recipients in India was accompanied by an increase in the number of foreign recipients in other countries, such as Pakistan and the Philippines.

In Pakistan, according to the Sindh Institute of Urology, approximately 2000 renal transplants were performed in 2005, of which up to two-thirds were estimated to have been performed on

Table 2. The annual number of patients going overseas for transplants

Country (year)	Numbers of transplants
Malaysia (2004)	<ul style="list-style-type: none"> • 132 renal transplants outside the country (China, India) • 42 renal transplants in Malaysia²³
Oman (2003)	<ul style="list-style-type: none"> • 83 living nonrelated renal transplants outside the country (Iran, Pakistan) • 8 renal transplants inside the country²⁴
The Republic of Korea (2004)	<ul style="list-style-type: none"> • 73 overseas transplants in China in 2003; 124 as of the end of August in 2004²²
Saudi Arabia (2006)	<ul style="list-style-type: none"> • 646 renal transplants outside the country • 351 renal transplants inside the country²⁵
Taiwan, China (2005)	<ul style="list-style-type: none"> • 450 transplants in other Chinese areas; 300 for renal transplants, the rest for liver, heart, lung transplants³

foreigners.¹² In the Philippines, data obtained from the Renal Disease Control Program of the Department of Health, National Kidney Transplant Institute, show that of the 468 kidney transplants in 2003, 110 were for patients from abroad. There is no comparable data for Egypt but a considerable number of patients from neighbouring countries are believed to undergo organ transplantation there.¹³

In China, around 12 000 kidney and liver transplants were performed in 2005. Most of the transplant organs were alleged to have been procured from executed prisoners, a practice which itself is criticized by the international community.^{14,15} In the absence of paid organ donors, a question may be raised regarding whether the deceased organ transplants in China constitute an organ trade. Yet the lack of established rules about the allocation of organs, coupled with the prioritizing of foreigners due to their ability to pay and the existence of brokers, have been widely reported. These factors have led to the view that deceased organ transplants for foreigners in China do constitute part of the international organ trade. The number of foreign recipients in China is difficult to estimate, but a media report offers circumstantial evidence that over half of the 900 kidney and liver transplants performed in one major transplant centre in 2004 were for non-Chinese citizens from 19 countries.¹⁶

The lack or insufficiency of a legal framework or enforcing mechanism in these countries has been highlighted by the public media and local experts. However, the Chinese and Pakistani governments recently have been taking steps to curtail the international organ

trade (as of May 2007), which may change their respective situations.^{17,18}

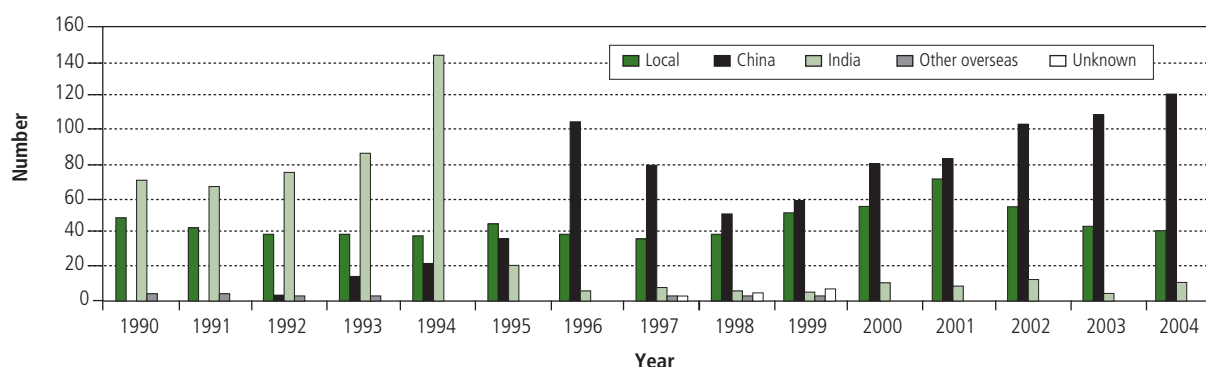
Other countries where kidneys are reportedly sold include Bolivia, Brazil, Iraq, Israel, the Republic of Moldova, Peru and Turkey.¹⁹ In Colombia, where 69 of 873 organ transplants were performed on foreigners, there is an allegation that organs of deceased donors were used in the organ transplants that were commercially arranged for foreigners.²⁰ The case of the Islamic Republic of Iran merits a special mention: paid kidney donation is practised legally but there is a strict regulation of the allocation of organs to non-local citizens, thereby restricting the international organ trade.²¹ In contrast, the Philippine government is moving towards institutionalization of paid kidney donation and acceptance of foreign patients.⁴

The organ-importing countries

The term "organ-importing countries" is used here to refer to the countries of origin of the patients going overseas to purchase organs for transplantation. A report by Organs Watch, an organization based at the University of California, USA, identified Australia, Canada, Israel, Japan, Oman, Saudi Arabia and the USA as major organ-importing countries.¹⁹

Yet transplant tourism has become prevalent in many other countries of all continents and regions. Data are available through surveys conducted by health authorities and professional societies in these regions (Table 2). It should be noted that in some countries the number of patients going overseas for kidney transplantation outweighs the number of patients undergoing kidney transplantation locally. More

Fig. 1. Locations of kidney transplants for Malaysian patients



Source: National Transplant Registry, Malaysia.²³

detailed data available from Malaysia and Oman show the shifting destinations of overseas organ transplantation (Fig. 1, Fig. 2 and Table 3).

Although it is premature to undertake a substantial analysis of this issue because comparable data from other regions are not available, these data suggest a heavier reliance on overseas transplantation and transplant tourism in Asia and the Middle East than in other regions. For example, in Canada and the United Kingdom (where, respectively, 1027 and 1914 domestic renal transplants were performed in 2005)^{26,27} it is estimated by local experts that around 30 to 50 patients undergo overseas commercial kidney transplants.^{28,29}

Consequences and effects

In several instances, newspaper articles have reported the deaths of patients who went abroad for overseas commercial transplants; the abuse, fraud and coercion of paid kidney donors are also frequently reported. These reports have

raised serious concerns about the consequences of the international organ trade, both for recipients and donors.

The studies on the outcomes of kidney transplants performed for non-local residents in organ-importing countries are summarized in Table 3.³⁰⁻⁴² In some studies, mostly those based on small data sets, patient survival and graft survival rates are considerably lower than the internationally accepted standard; in other studies, they are shown to be comparable with local results. Confounding factors – e.g. survivor biases, locations, periods and number of data sets – make generalizations difficult.

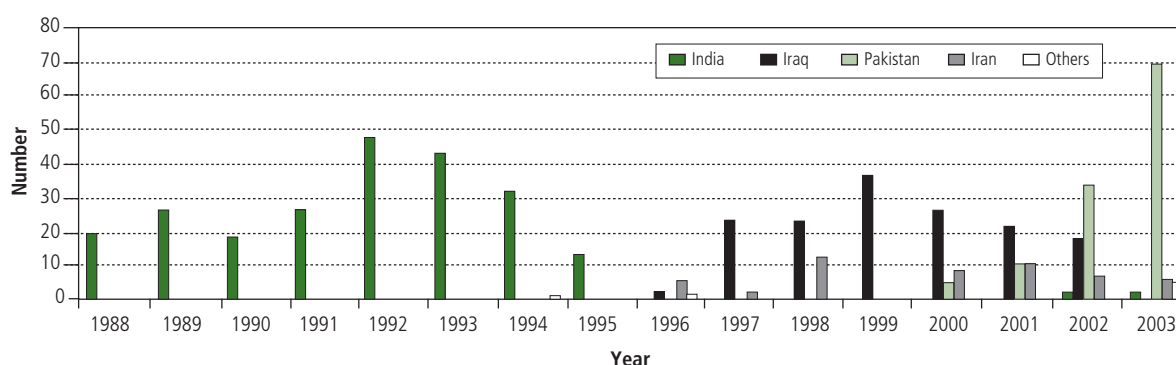
Many of these studies, nonetheless, report a heightened frequency of medical complications, including the transmission of HIV and the hepatitis B and C viruses.³⁰⁻⁴¹ Moreover, one study from the United Kingdom reports that patients who had been suspended from the local transplant list for medical reasons were operated on abroad.³³ These factors seem to indicate the existence of

substandard medical practices. Given the desperate desire of the patients to undergo organ transplantation, their risk of being exploited should not be underestimated.

Even less empirical research has investigated the health and other impacts of paid organ donation on the donors. No medical data about the health status of paid kidney donors were found in this survey.

Several social scientific studies described the perceived health and economic status effects of kidney donation on paid donors in certain countries. Three quantitative data sets are summarized in Table 4. This research shows that the underlying motivation of most paid kidney donors is poverty, and that lasting economic benefit after donation is limited or even negative because of the limited employability of such patients and the perceived deterioration of their health. Results from other more qualitative research are consistent with these quantitative surveys in other countries. Paid kidney donation is also associated

Fig. 2. Locations of overseas kidney transplantations for Omani patients



Source: Mohsin N.²⁴

Table 3. Patient and graft survival rates indicated in studies reporting the outcome of overseas kidney transplantation, 1997–2006

First author	Period	Origin	Number of patients	Country of transplant (number)	Patient survival (1 year)	Graft survival (1 year)
Akpolat ³⁰	1991–1994	Turkey	12	India	NR	91.7%
Al-Wakeel ³¹	1991–1996	Saudi Arabia	57	Egypt (14) India (37) Pakistan (1) USA (5)	93.7%	93%
Ben Hamida ³⁹	1995–1999	Tunisia	20	Egypt (3) Iraq (14) Pakistan (3)	93.1%	85.4%
Colakugol ⁴⁰	1991–1995	Turkey	127	India	93%	83%
Frishberg ³²	1998 (3 years)	Israel	18 (paediatric)	Iraq	94.4%	83.3%
Inston ³³	–	UK	23	India (73%) and other Asian countries	^a	
			6	Indian subcontinent	^b	
Ivanovski ³⁴	10 years through 2005	Kosovo ³ and the former Yugoslavian Republic of Macedonia ¹³	16	India (15) Nepal (1)	78.6%	78.6%
Kennedy ³⁵	1990–2004	Australia	16	China (7) Eastern Europe (1) India (4) Iraq (1) Lebanon (2) Philippines (1)	85%	66%
Kucuk ⁴¹	1978–2001	Turkey	154	India, Iran or Iraq	95%	90%
			304	Local live donor transplantation	95%	93%
Living Non-related Transplant Study Group ³⁶	1978–1993	Saudi Arabia	540	India	97%	90%
			75	Local donors	95%	90%
Morad ³⁷	1990–1996	Malaysia	389	India	93%	90%
			126	China	92%	90%
			258	Local related live donor	96%	91%
Sever ³⁸	1992–1999	Turkey	115	India (106) Iran (2) Iraq (7)	90% (2 years)	84% (2 years)
Sun ⁴²	1984–2004	Taiwan, China	31	China	100%	100%
			34	Local cadaveric transplants	100%	100%

^a Eight patients died shortly after their return and five others lost their kidneys. The overall successful transplant rate was 44% in the short term.

^b Four patients died shortly after their return, due to sepsis and multi-organ failure.

with depression, regret and discrimination. Paid kidney donors do not receive follow-up care, due to financial and other reasons.^{43–48}

Discussion

The results of this survey suggest that the international organ trade no longer represents sporadic instances in transplant medicine. In view of the circumstantial evidence cited, the total

number of recipients who underwent commercial organ transplants overseas may be conservatively estimated at around 5% of all recipients in 2005. Moreover, undergoing transplantation through the international organ trade has become the most common way of undergoing organ transplantation in certain countries.

The international organ trade links the incapacity of national health care systems to meet the needs of patients

with the lack of appropriate regulatory frameworks or implementation elsewhere. It exploits these discrepancies and is based on global inequities. Accordingly, the growth and regularization of the international organ trade should be regarded as a global public health issue.

Health authorities have been urged to update their legal frameworks – in both organ-exporting and -importing countries. Yet they must also address the underlying problem of organ shortage

Table 4. Consequences of paid kidney donation in Egypt, India and the Islamic Republic of Iran

First author	Budiani ⁴⁹	Goyal ⁴⁴	Zargooshi ⁴⁷
Location	Egypt (N = 142)	India (N = 305)	Iran (N = 300)
Sex	95% male 5% female	29% male 71% female	71% male 29% female
Economic status	Not applicable	<ul style="list-style-type: none"> 60% of female and 95% of male worked as labourers or street vendors 71% were below the poverty line 	<ul style="list-style-type: none"> 27% unemployed 42% part-time employed 13% full-time employed
Effects on health	<ul style="list-style-type: none"> 78% reported deterioration in their health status 	<ul style="list-style-type: none"> 86% reported deterioration in their health status 	<ul style="list-style-type: none"> 58% reported negative effects on their health status. 60% reported negative effects on their physical activities
Effects on economic / financial status	<ul style="list-style-type: none"> 78% spent the money within 5 months of their donation 73% reported a weakened ability to perform labour-intensive jobs 	<ul style="list-style-type: none"> Decline in average family income 96% of donors sold their kidneys to pay off debts and 75% were still in debt at the time of the survey 	<ul style="list-style-type: none"> Somewhat (20%) to very (66%) negative effects 65% reported negative effects on their employment status

by using organs from ethically acceptable sources. International cooperation may be considered to establish rules pertaining to overseas transplantation to curtail the international organ trade. While considerable disagreement exists over whether the legally regulated market and the use of financial rewards and incentives are ethically acceptable, the *international* organ trade could be an issue on which international consensus and policy harmonization could be effectively pursued.

This survey of the international organ trade is limited in several ways,

reflecting the scarcity of previous efforts to gather and synthesize the relevant information. The picture of the international organ trade presented in this paper should be regarded as provisional and tentative. One conclusion is that there is an urgent need for further medical and social scientific research. The paucity of previous efforts to monitor the international organ trade arguably indicates an inadequate current mechanism to deal effectively with this global issue. Establishing a platform on which researchers, policy-makers, professional societies and international governing

bodies cooperate in gathering and sharing information may be considered an essential step towards a more substantial international health policy. ■

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Résumé

Situation du commerce international d'organes : un tableau prévisionnel reposant sur l'intégration des données disponibles

La transplantation d'organes est maintenant largement pratiquée de part le monde. La diffusion de cette pratique a conduit à une pénurie critique des organes et au développement d'un commerce international. De nombreux patients se rendent dans des zones où l'on peut obtenir des organes par des transactions commerciales. Bien que le commerce international d'organes soit considéré comme une question importante de politique sanitaire, la situation actuelle de ce commerce demeure obscure en raison de la rareté des données et du manque d'efforts pour

faire la synthèse de celles disponibles. Le présent article s'efforce d'intégrer les données sur l'état actuel du commerce international d'organes et fournit un tableau préliminaire de cet état à partir d'une revue systématique de 309 rapports par les médias, articles de revue et autres documents. Le commerce international d'organes est décrit sous l'angle des formes qu'il adopte, des pays qui le pratiquent en exportant ou en important des organes et des résultats et conséquences qu'il entraîne.

Resumen

Situación del comercio internacional de órganos: panorama provisional basado en la integración de la información disponible

El trasplante de órganos es una intervención ampliamente practicada en todo el mundo. La expansión de ese tratamiento ha provocado una grave escasez de órganos y la aparición del fenómeno del comercio de órganos. Muchos pacientes viajan a zonas donde es posible comprar y vender órganos. Aunque el comercio internacional de órganos se considera una importante cuestión de política sanitaria, sigue habiendo grandes incertidumbres sobre la situación actual de esa práctica, debido a la falta de datos y de iniciativas para sintetizar los datos

disponibles. En el presente artículo se ha procurado integrar la información disponible sobre el comercio internacional de órganos en la actualidad para ofrecer un panorama mundial provisional, basado finalmente en una revisión sistemática de 309 noticias aparecidas en los medios de comunicación, artículos de revistas y otros documentos. Se describe el comercio internacional de órganos en relación con sus distintas modalidades, los países que exportan órganos, los países que los importan, y los resultados y consecuencias de esa práctica.

ملخص

وضع التجارة الدولية في الأعضاء البشرية:

صورة مبدئية مرتكزة على تجميع المعلومات المتوافرة

الجهود في مجال تجميع البيانات المتوافرة. وتأتي هذه الورقة كحداثة لتجميع المعلومات حول الأوضاع الحالية للتجارة الدولية في الأعضاء البشرية، ورسم صورة مبدئية لها، تركز على مراجعة منهجية لعدد 309 تقارير إعلامية، ومقالات صحفية وغيرها من الوثائق، والتي تقدم وصفاً للتجارة العالمية في الأعضاء، من حيث أشكال هذه التجارة، والبلدان المصدر للأعضاء والبلدان المستوردة لها، وحاصل هذه التجارة وعواقبها.

تمارس عمليات زرع الأعضاء البشرية على نطاق واسع في جميع أنحاء العالم، وقد أدى هذا التوسع في زرع الأعضاء إلى حدوث نقص خطير في هذه الأعضاء ونشوء تجارة فيها، حيث يسافر العديد من المرضى إلى المناطق التي يمكن الحصول على الأعضاء فيها من خلال المعاملات التجارية المختلفة. ورغم أنه يُنظر إلى التجارة الدولية في الأعضاء على أنها قضية هامة من قضايا السياسات الصحية، إلا أن وضعها الحالي لا يزال غامضاً بسبب ندرة المعلومات، ونقص

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