

## **Illegal Trade in Human Organs: Ways to Overcome and the Importance of Artificial Intelligence in Solving this Problem**

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### **Abstract**

The relevance of this subject determines the confusing and hidden nature of the global problem of illegal commercial trade in anatomical materials, which remains out of the attention of the public and law enforcement agencies. Therefore, the purpose of this study is to analyse the social and legal factors of the existence and spread of this problem and ways to overcome it. The investigation of this problem was conducted using the following techniques: the method of theoretical analysis allowed considering the legal, ethical, and informational aspects of illegal trade in human organs as a kind of modern form of slavery, and the empirical method of regulatory documentation helped to analyse international legislation on countering human exploitation and illegal transplantation. The study covers the root causes of the existence and current state of illegal trade and the legal problems of prosecution of subjects of this crime.

**Keywords:** Exploitation; Information Technology Tools; Black Market; Organ Transplantation; International Human Trafficking; Anatomical Materials.

### **Introduction**

For many years, false assumptions have been spread that human trafficking is a local phenomenon and occurs only in impoverished countries, where the freedom and Civil/Political Law Index annually shows the most terrible indicators. In fact, today, there is almost no country that, even indirectly, is not involved in human trafficking. Not only including the places where the abduction or kidnapping of victims is conducted but also the destinations. Human trafficking is a modern interpretation of slavery and is one of the most problematic phenomena in Europe and worldwide (Vermech, 2022; Mostova & Hutorov, 2023). Illegal trade is perhaps the most dangerous manifestation of human exploitation since anyone can become a victim of fraud, regardless of age, gender, or region, and the crime itself, in addition to abduction and displacement, includes recruitment, fraud, and threats (Kwok & Lee, 2022).

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Human trafficking, being a variational crime, is closely intertwined with the illegal trade in anatomical materials since patients who need the necessary transplants are at risk of becoming victims of human trafficking. However, organ trafficking is not reported as often compared to forced labour and sex trafficking due to the lack of discussion and propaganda (Wong, 2021; Raposo, 2023). Indeed, although illegal organ trafficking causes a wide range of legal, ethical, or financial factors, this act can be classified as one of the most hidden crimes. Despite the extensive international regulatory framework, the availability of legal transplantation methods, and fairly evident commercial aspects of the crime, the current combat against illegal traffic of anatomical materials does not give the desired results, and the so-called black market is only expanding, especially in African countries. Black markets are particularly common among poor regions, mainly due to the willingness of living donors to seek surgical removal of their organs in exchange for a substantial amount of quick cash (Wilkins, 2018; Shebanin & Allakhverdiyeva, 2022). Notably, the Covid-19 pandemic affected the development of the "industry": the loss of jobs, the focus of governments on combating the pandemic, the economic crisis, etc. "The people who were already uneducated, uninsured, and unemployed are now even more eager to accept offers that they should not," stated Aimee Comrie, project coordinator, GLO. ACT in the United Nations Office on Drugs and Crime (Jack, 2020). Since the black market operates internationally and locally, illegal transplantation has now reached its maximum development, leading to a relentless search for its elimination.

Being one of the most economically mercenary, this crime is characterised by a minimal risk of criminal liability for its subjects. The discovery of new ways to conduct illegal activities made exposing suspects in the illegal seizure of human organs more problematic (Marmura, 2022; Seredyuk, 2022; Karpushyna & Veresha, 2023). All the above forces law enforcement agencies and various international organisations to use the latest information and engineering tools that can be useful in countering the trade in human anatomical materials. Artificial intelligence technology (AIT), which can change the prevention of illegal activities such as smuggling and human trafficking, is at the forefront (Artificial intelligence to tackle trafficking across EU borders, 2019). Primarily, this refers to monitoring transactions or creating new connections and models of such data. However, the introduction of this technology can be a key factor, if not in the complete elimination of illegal trade in human organs, then at least in the exposure of international criminal organisations and the gradual reduction in the number of new cases of human exploitation.

In general, this issue is examined in the papers of many researchers who covered various aspects of the illegal practice of human exploitation. For example,

E. Cockbain and K. Bowers (2019) considered the main types of human trafficking and compared them, while F. Ambagtsheer (2021) focused on solving problems related to prosecuting subjects of illegal organ trafficking. The impact of the Covid-19 pandemic on the trade in anatomical materials and human trafficking is the subject of study by J. Todres and A. Diaz (2020), and/including V. Jack (2020). In addition, K. Kackenmeister (2019) explained the potential of AIT in counteracting illegal human trafficking. Despite the rather extensive scientific base, this problem requires further development and analysis from legal, economic, and medical standpoints due to its versatility.

### **Materials and methods**

The methodological basis of this study consists of the following scientific techniques: theoretical methods of analysis and generalisation and empirical methods for examining regulatory documentation. The theoretical generalisation method enabled analysing the main features and properties of illegal trade in anatomical materials as a criminalised act and fixing its place among other forms of human exploitation. Through theoretical analysis, modern factors of expanding the sphere of illegal trade in human organs, including legal problems of prosecution of subjects of this crime, were comprehensively considered. The method of regulatory documentation allowed interpreting international regulations on transplant tourism and identifying existing gaps in legislation. The purpose of this study is to identify modern, alternative ways to combat all forms of international human trafficking practices. The study was conducted on a theoretical foundation prepared in advance.

The latter was presented in the studies of American, European, Latin American, and Ukrainian researchers who directly covered the problem of illegal trade in human anatomical materials and focused on finding new forms of combating the global crisis of human trafficking. International regulations also provided the theoretical material. This study was conducted in three main stages.

The first stage included the definition of the goal, problems, and sequence of actions. The normative regulations and similar scientific sources were analysed to form a theoretical foundation. Therewith, the diversity of forms of human exploitation, the impact of the COVID-19 pandemic on the expansion of traffic, and a wide variety of factors in the origin and functioning of illegal seizure and subsequent trade in human organs were investigated. The composition of the criminal offence of human trafficking and its constituent elements are also covered.

The second stage was characterised by identifying legal and practical problems of solving this crime and legal issues related to the prosecution of its subjects. Organisations designed to counteract the expansion of human trafficking and illegal exploitation were named, and statistics on the disclosure of this offence

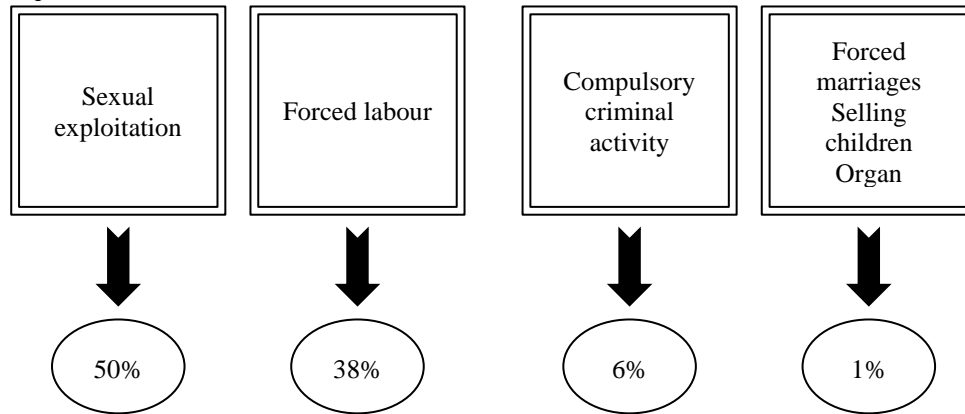
were given. Existing ways to overcome the problem of illegal trade were identified, and modern ways of combating it were analysed. Attention was focused on covering the importance of the latest global technologies, namely artificial intelligence, in helping law enforcement agencies and non-governmental organisations combat the illegal trade in anatomical materials. In the second stage, the conclusions obtained during the experiment were clarified and verified, and the author's analytical material was presented, including statistical material identified using information sources.

In the third stage, conclusions were formulated on the subject under study and ways to overcome this problem were proposed. Legal, ethical, and economic factors of the illegal trade in human organs spread were presented, including arguments in favour of using the latest information technologies. In the future, the results of this study can serve as a necessary foundation for further research and analysis of human organ trafficking and the global problem of human exploitation.

## **Results**

Illegal transplantation of anatomical materials is a global international crime that has remained out of the global community's attention almost all the time of its existence. Shadow business, the black market, millions of dollars a year – despite the commercial aspects of this crime, illegal organ trafficking is the least discussed subject compared to other forms of human trafficking or exploitation in general. The most frequently mentioned form of human trafficking is undoubtedly sexual exploitation (79%), followed by forced labour (18%). These results were published by the United Nations Office on Drugs and Crime (UNODC) in 2009 (Global report on trafficking in persons, 2009), and although the percentage has changed slightly over the past few years, such changes are a consequence of the prosperity of other forms of human exploitation, but not the awareness of the world community about the large-scale problem of illegal human trafficking. Figure 1 displays how superficial today's open data is about the functioning of the illegal market for seized human organs.

**Figure 1** The proportion of identified victims of human trafficking by forms of exploitation, 2018



Source: national data development of the United Nations Office on Drugs and Crime (Global report on trafficking in persons, 2010).

When identifying victims of illegal organ trafficking (or the traffickers themselves, intermediaries, or direct buyers), the statistics are naturally less impressive compared to sexual exploitation or forced marriage. This refers to both subjective and objective components of this crime. When considering such forms of human exploitation as forced labour or sexual slavery, in most cases, law enforcement agencies are confronted with the disappearance of a person or either their own or their family's testimony. However, the illegal trade in anatomical materials is much more hidden. As a rule, this refers to the voluntary sale of one's organs conditioned upon a difficult financial situation, which is a common practice in third world countries, or the extraction of anatomical materials after the death of a person. Although there is the abduction of the victim for the forced removal of organs, poverty and official or unofficial consent to the sale individualise the illegal sale of organs in relation to human trafficking as a separate offence since "all cases of human trafficking involve a certain combination of isolation of the victim, emotional or physical violence and threats to drag the victim into the trap of tacit agreement with the demands of the merchant" (Efrat, 2015). In addition, unlike any other form of exploitation, organ trafficking involves the presence of a special entity – a medical worker, which greatly complicates the process of identifying donors and recipients (Arzuaga Mendoza, 2023). On the one hand, it is considered quite reasonable to provide information about illegal transplantation, but in many jurisdictions, reporting a patient involved in human trafficking – or even the existence of a human trafficking network – would require changes in legislation

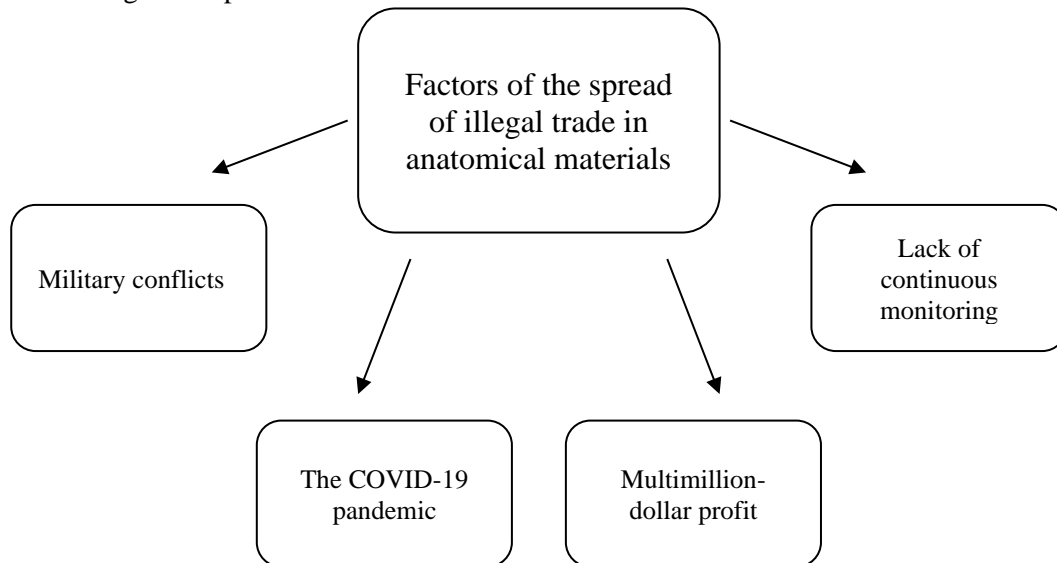
(i.e., new legislation, amendments to the current law, or actual judicial practice) (Caulfield et al., 2016; Chovnyuk et al., 2022; Karpenko, 2022).

Notably, silencing the problem does not contribute to its solution – the percentage of cases of illegal seizure and trade in human anatomical materials is only growing yearly. Worldwide, the number of illegal transplants is estimated to be about 10.000 per year (Columb, 2020). Such indicators force international organisations to look for new legal and economic leverage systems, introducing tougher sanctions or updating a stable set of regulatory documents. Thus, in the summer of 2018, a new version of the Istanbul Declaration on organ trade and transplant tourism, adopted in 2008, was published. In addition to including leading terms and concepts, the Declaration contains a wide range of jurisdictional principles that should help "solve the growing number of pressing problems caused by such vicious processes" as illegal transplantation and trafficking in human organs (The declaration of Istanbul on organ trafficking and transplant tourism, 2018). In particular, according to the author, the primary principle is Principle No. 10, which focuses on overcoming transplant tourism through national government counteraction strategies. Countries that impose strict bans on organ trafficking within their borders but do not hold their residents accountable for taking part in such activities in another country not only undermine their own laws but also unfairly impose a burden on other states, to the detriment of their residents and law enforcement systems (Martin et al., 2019; Editha, 2021).

Illegal trade in anatomical materials is a cross-border phenomenon and therefore requires national and international regulation. Differences in regulatory requirements for transplant procedures create a favourable environment for illegal traffickers, which undermines the quality and safety of donation and increases the risk of the spread of human trafficking. Most countries lack a legal framework, as they have not yet adopted specific or comprehensive legislation covering the donation and transplantation of human organs and tissues (Loua et al., 2020; Melnyk & Avramenko, 2023). The above refers to the lack of regulatory documents, the limits of regulation, and the sanctions programme. The practice of illegal trafficking in organs affects not only the interests of specific subjects of this crime but also an endless list of related criminal acts, for example, corruption in law enforcement agencies and Border Services or fraud on a large scale (Martynenko & Martynenko, 2022; Merkulova et al., 2023). The largest number of crimes against a person's health or sexual integrity falls precisely in countries with an ambiguous judicial system, where international or regional criminal organisations have more freedom (Zamira Sinaj et al., 2012; Prychepii, 2022).

However, the lack of an extensive legislative framework is not the only source of globalisation of the problem of illegal trade in anatomical materials.

Figure 2 displays the legal and economic factors that radically affect the functioning of the illegal transplant market.



**Figure 2** Factors of the spread of the illegal trafficking in human organs

The risk of increased human trafficking during armed conflicts arises for several reasons. Firstly, the need to escape from war creates a huge number of refugees who repeatedly become victims of illegal trafficking in people or human organs. Although the war attracts increased attention from the international community, it also attracts the interest of terrorist and criminal groups. Secondly, the presence of a living organism is not a mandatory factor when extracting organs or tissues from a donor. Quite often, "suppliers" of anatomical materials look for donors in areas where wars and armed conflicts occur since human lives are not recorded in such "flashpoints" (Lisitsyna & Vasylenko, 2021).

Having affected every cell of public life, the COVID-19 pandemic completely captured the attention of the world community (Yaroshenko & Tomashevski, 2021). By creating a public health emergency, the coronavirus infection has also distorted both statistics on detecting cases of illegal organ trafficking and data on abducted persons (Pētersone et al., 2021; Yaroshenko et al., 2021; Karnitis et al., 2022). Moreover, by focusing all its resources on combating the pandemic, the world prepared a great space for the illegal transplant market to flourish. In addition, COVID-19 makes it difficult to identify victims of human trafficking (Todres & Diaz, 2020; Reznikova et al., 2022). Overall, the coronavirus disease created serious obstacles in helping victims of human trafficking and prompted merchants to seek reliable underground ways of living.

Undoubtedly, one of the root causes of the illegal market for human organs is the growing demand for transplant operations every year and the constant shortage of anatomical materials. It is estimated that the total number of transplants performed worldwide is less than 10% of the global need (Ambagtsheer, 2021). Thus, a fairly logical pattern arises: the greater the demand – the greater the hype, the growing hype – a considerable profit. Illegal human tissue or organ transplants cost hundreds of thousands of dollars, and donors, when voluntarily withdrawn, usually receive only a tenth of the full amount, while the rest of the funds belong directly to the merchant and their intermediary. Notably, the difficult financial situation is the main incentive for victims to sell their internal organs, yet many people sell their kidneys or lungs because they desire to improve the already sufficient quality of life.

The lack of a monitoring system for transplant operations leaves the possibility of the functioning of controlled donation. The lack of information, the inability to establish national or international monitoring of organ extraction/removal, and the identification of the final beneficiary open up prospects for transplant tourism (Horislavska & Patratii, 2022; Kliuchnyk et al., 2023). In addition, the procedure of illegal transplantation can take place in private and public medical institutions, which only expands the scale of the investigation (Tastulekov et al., 2019). That is why "in practice, it is very difficult to track the medical history of recipients and the data of institutions performing operations" (Ainley, 2011).

In addition to the existing jurisdictional problems, difficulties in tracking transplant procedures and the lack of structured accounting of cases of illegal trade in anatomical materials burden the work of law enforcement agencies in prosecuting subjects of this crime. The situation is also complicated by the access of organisers of illegal transplant tourism to considerable funds using the most modern technologies to stay out of the public's field of view. In current conditions, representatives of criminal organisations use modern technological achievements to conduct their criminal activities (Lisitsyna, 2021). Thus, government officials must learn to adapt to the global changes associated with the emergence of various types of information technology tools to recognise cases of crimes committed against a person's life, health and sexual integrity. Now the most promising is the use of artificial intelligence technology in the combat against the international business of trade in anatomical materials.

The range of capabilities of artificial intelligence technology is extremely wide, for example, creating graphs and links between thousands of transactions to identify criminal groups or creating new algorithms for fast analysis of digital data. "Criminals are trying to hide their money laundering activities in several institutions. Only a fraction of any story is visible until the dots are connected with



external information, one may not even realise that a crime is happening", states Stuart Davis, executive vice president of financial crime risk management and chief anti-money laundering specialist, Scotiabank (Leveraging AI key to advancing the fight against human trafficking post-pandemic, 2022).

The introduction of artificial intelligence (AI) will help to get ahead of criminals and establish international cooperation between law enforcement agencies and non-governmental/governmental public organisations. Advanced countries have already started using the latest technologies to detect smuggling or cases of illegal trade. For example, one of the first international programmes is the project Roborder, which monitors the border using mobile robots created based on artificial intelligence. International cooperation plays a key role in combating illegal human trafficking and organ trafficking, as several countries immediately cover the crime territory when crossing the border.

In general, analysing the existing legal and social sources of spreading the global problem of illegal trade in anatomical materials, the following ways to overcome this crisis are identified:

1. First, to eliminate conflicting regulations and discrepancies in the global regulation of illegal trade in human organs, it is appropriate to create an International Code of transnational crimes, which should cover the problem of human trafficking and illegal exploitation. For example, a list of offence subjects and corresponding sanctions against recipients and donors, medical workers, "brokers" and their intermediaries, or border guards. In addition, the scope of this tool should cover both direct organ trafficking and human trafficking for organ extraction (Kelly, 2013). Regional legislation must be developed to form a state structure for beneficiaries and donors.
2. Secondly, law enforcement agencies urgently need to use the latest scientific technologies to track the manifestations of illegal trade and find optimal ways to overcome the global problem.
3. Thirdly, in addition to combating illegal trade in anatomical materials, it is necessary to look for ways to establish a legal transplant process and solve the supply and demand problem. Strategic government programmes stimulating and financially supporting donors would be crucial in regulating the sales market and post-mortem donation.

### **Discussion**

When investigating the problems of illegal practice of the trade in anatomical materials, researchers are repeatedly faced with the need to distinguish between two categories: human trafficking for organ extraction and direct trade in human organs. It is impossible to claim a complete discrepancy between the two crimes, but their

partial identification substantially affects the development of a system of counteraction, including regulatory regulation, consolidation of the range of subjects and methods of prosecution. Analysing the international legal framework for illegal organ seizure, S. Gawronska (2019) noted that since the definitions of human trafficking can vary substantially between countries, it can be difficult to establish clear boundaries between organ trafficking and human trafficking and allow for a convergence of criminal law that sufficiently considers the often-unstable situation of the donor. The essence of the definition of human trafficking implies the presence of factors such as abduction, concealment and transfer of a person, and although the author agrees with Sylvia's reasonable opinion that illegal seizure is the centre of both crimes simultaneously, still organ trafficking and subsequent transplant activities have a more specific criminalised system and components of prosecution.

Therewith, the issue of legalising the transplant market is increasingly raised due to the global shortage of organs and a disproportionately large percentage of recipients in need. Admittedly, opponents and supporters of legalisation do not have a common opinion when dealing with legal, economic, and moral aspects. On the one hand, opening up a free market by lifting the ban on organ sales will reduce the incentive for criminals and create opportunities for a legal organ market (Edgar & Block, 2021). Moreover, it is quite popular to consider the sale of an internal organ by a person to be disrespectful to one's personality, and think that in any case, such markets should cause ethical concern, especially regarding their impact on the poor (Kerstein, 2016). As already mentioned, the human organ market is expanding its influence primarily in poor areas, resulting in unwanted loss of life. The illegal market cannot be regulated at the state level, but its main idea can be destroyed by legalising the sale of organs. In fact, when analysing the benefits of government compensation for kidney donors, P. Held et al. (2016) proved in their study that if the government compensated kidney donors, it would substantially increase the availability of kidneys for transplantation, which substantially improves the situation of all transplant candidates, especially the poor.

Admittedly, being one of the main factors of the prosperity of the illegal market, the financial component can eventually become the main factor of counteraction. Many researchers have analysed the open centre for anatomical materials from the standpoint of legal profit since the "regulated organ market" is a direct financial incentive for dead and living donation (Levy, 2018; Patynska-Popeta & Zinchuk, 2022; Riabchuk et al., 2022). The practice of illegal trafficking in human organs is primarily aimed at satisfying the financial interests of brokers and their intermediaries and does not affect the monetary profits of affected victims, as noted earlier. As a result, donors do not receive even a third of the amount they

could get through the legal market for human materials and stimulating state instruments. This aspect is thoroughly analysed in the study by M. Parada-Contzen and F. Vázquez-Lavín (2019), in which researchers suggested that compensation for living donors should be at least the expected expense of a patient with chronic kidney disease.

In addition, the network of illegal merchants owes its existence not only to the lack of a unified position on commercial donation – regulatory omissions in the field of transplant law both at the regional and international levels and a lack of regulatory tools serve as a factor in supporting shadow businesses. The signing of international regulations or the conclusion of memoranda of cooperation have their effect on highlighting the problem of human trafficking and illegal transplant activities. For example, analysing the impact of the Istanbul Declaration of 2008, the researchers concluded that compared to the countries taking part, the growth trend in reporting on "kidney sales", "kidney trade", and "transplant tourism" was more pronounced in non-taking part countries (Islam et al., 2020). However, by signing the documents, governments make as little effort as possible to actually combat these crimes. Therefore, it is right to constantly apply the comparative method, which researchers are increasingly turning to, to highlight innovative decisions taken by the Iranian government against the background of the aggravation of the transplant crisis. In particular, B. Bastani (Bastani, 2015) concluded that the "Iranian model" effectively eliminated the black market for kidneys that exists in some other countries and disposed of the intermediary who earns tens of thousands of dollars by organising questionable kidney donations from a medical and ethical standpoint. Furthermore, when investigating strategies for expanding organ transplantation in Iran, researchers emphasise that the organisation and coordination of organ transplantation activities are possible only through a comprehensive well-coordinated system with an effective organisational structure (Kiani et al., 2018). Therefore, the creation of effective legal tools and the introduction of paid donations will not only solve the problem of illegal markets for anatomical materials or illegal enrichment of merchants but also protect victims of organ trafficking and ultimately become a powerful weapon that will destroy the core of crime.

However, it is impossible to radically overcome the problem without updating the ways to deal with it. Having emphasised the expediency of introducing artificial intelligence technology into operational search activities, the importance of using the information potential to destroy the illegal trade in anatomical materials and exploitation is noted in the study (Sousa Machado & Malta Fernandes, 2023). Despite a small number of attempts, researchers try to comprehensively examine the diverse abilities of the technological machine to use the latest technology in the

activities of investigative units, non-governmental organisations, and state or local authorities. When discovering the potential of artificial intelligence in the combat against manifestations of human trafficking, K. Kackenmeister (2019) highlighted the prospects for cooperation between law enforcement agencies and non-governmental institutions by providing access to the analysed data systems and improving the identification of victims. However, AIT, programmed to detect patterns, can be useful in identifying organised criminal groups through digital prosecution of transactional transfers. "Big data and AI influence human trafficking today, which was impossible 8 or 10 years ago. Machine learning can help to understand patterns in seconds that can take a person several lifetimes to understand," Dr Gary M. Schiffman, founder of Giant Oak (Wu, 2020). Thus, by investigating the various possibilities of forecasting, planning and monitoring, researchers consolidate the importance of science and modern technologies in developing strategies to counteract traffic and trade in anatomical materials. The author again confirms that artificial intelligence technology justifies its presence in solving any criminal act.

The illegal trade in human organs is a current international crisis, the combat against which requires a set of effective legal, political, and technological tools. The global prevalence of illegal trafficking in human anatomical materials and the disproportionately small percentage of victims identified require raising awareness among health professionals, law enforcement officials, and international transplant organisations. Although the issue of legalising the organ market will be the subject of ethical and legal discussions for many years to come, countering illegal activities that encroach on fundamental intangible goods should be of constitutional importance in the struggle for a free and independent society.

### **Conclusions**

After analysing the root causes of the aggravation of the global crisis of illegal trade in human organs, it can be argued that illegal transplant tourism owes its prosperity to the international shortage of organs and flexible legal regulation. Firstly, the growing need for human material transplants creates an endless living queue that tends to pay large amounts of money to shadow brokers, leading to illegal donations in the planet's poorest regions. For their part, earning millions of dollars each year, organised criminal associations encourage medical professionals, security officials, or bankers to cooperate to expand the influence and boundaries of their activities. Secondly, gaps in the field of transplant law make it impossible for safe commercial donations to exist, which would bring the international community closer to the destruction of the black market network. By signing regulatory documents, countries do not actually introduce strategies to counteract

the illegal trade in anatomical materials, although, admittedly, they are gradually beginning to understand the scale of this problem.

Opening a legitimate organ market is a concern for the public, as there is a high risk of oppression towards the poor. Therefore, the legally regulated organ market initially requires further development of such components as: international cooperation in the field of countering illegal trade in human materials, combating corruption among employees of state bodies and medical institutions, spreading awareness of the subject of legal donation among the population, introducing the latest information technologies to combat human trafficking, etc.

The problem of illegal trade in anatomical materials affects dozens of political and legal factors and therefore requires further research both from a medical and legal standpoint. Allowing altruistic or post-mortem donation will ensure that the process is monitored for the donor and recipient status since the combat against illegal trade should focus not only on regulations but also on increasing the number of available organs. The illegal trade in anatomical materials largely depends on secrecy, so the world's most important task is to make it more visible and open to resolution.

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