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## Chip technology as a preventive tool against child trafficking

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### Abstract

**Relevance** The research relevance is predefined by the extensive practice of using the institute of chipping to preserve the life and health of children, protecting them from committing crimes, by implanting a microchip at the will and permission of parents, and children are still vulnerable to external influences.

**Purpose.** The research aims to conduct a comprehensive and complex research of the institute of microchipping of children from legal, psychological, social and technological points of view, identify its advantages and disadvantages as a means of counteracting and preventing child trafficking, determine the feasibility of using microchipping as a tool of crime prevention concerning children.

**Methodology.** The following methods were used: analysis and synthesis, induction, deduction, comparison, statistical analysis, formal-legal method and interdisciplinary approach.

**Results.** Results: a comprehensive study of the feasibility and legality of using the institute of chipping concerning children in the Republic of Kazakhstan was conducted, and the practice of foreign countries on this issue was studied and presented. The question of efficiency, necessity and effectiveness of chipping minors to prevent crime was studied. The statistics of crimes such as trafficking in children, as well as the influence of technology on children, parenting and relationships between parents and children, were studied.

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**Conclusions.** Possible directions of development of the institute of chipping have been suggested, and permissible variants of the use of technology for children have been given. The study is of practical value as it introduces a new and complex view of the chipping institute and its application concerning minors in legal science.

**Keywords:** biotechnology; human rights; confidential information; crimes against the family; bioethics.

## Introduction

This is a topic that needs to be explored as the use of microchips in the world is increasing, but there is a lack of a full understanding of the safety, humanity and legal basis for the institution of chipping. There are several questions and uncertainties about this method of preventing human and child trafficking, about the impact on the child's body, the violation of children's rights on the one hand and the opportunities the chip provides for the safety of minors on the other. The problem is the lack of a comprehensive approach to understanding the use and spread of the institute of chipping in the Republic of Kazakhstan (RK). The fact that the topic touches on religious, ethical, legal and psychological aspects is also seen as problematic. The Constitution of the Republic of Kazakhstan [1] stipulates in Article 18 the human right to privacy and confidentiality of personal deposits and savings. The use of a microchip can violate these fundamental rights, which is also the dilemma of the use of chipping. However, there are advantages to chipping, including the possibility of reducing crime and preventing crime. Therefore, the topic needs to be explored, as there are several conflicting views in science and no comprehensive approach to drawing an objective conclusion regarding the institution of chipping, in particular, but not limited to, as a means of preventing trafficking in children.

E. Begaliev [2] has already studied this topic and reached these conclusions. It is noted that the chipping of the population should be done only based on the personal consent of the person, in written or electronic form with an appropriate signature. At the same time, the elaboration of legal acts on this topic is foreseen. The study emphasizes the possibility of chipping obligatory for certain categories of persons (criminals, discharged or served sentence for grave crimes), people with memory loss, military servicemen and certain types of state employees on doctor's recommendation. At the same time, the study introduces a conclusion to allow the chipping of children upon the consent of both parents. Apart from supporting the development of the institute of microchipping of the population, the following disadvantages are pointed out: the rejection of the microchip by the body, allergic reactions, improper protection and storage of the information.

The issue was researched by D. Murach and T. Ryabchenko [3]. The study concludes that there are positive and progressive experiences with the chipping technology, but it is noted that the current model of chipping institutions has its negative aspects. The risk of accumulation and further misuse of personal data exists; therefore, institutions can exist only if improved. The concept of a basic model for the use of chips implies the unfair use of personal information, which is against the law. Furthermore, another potential problem with modern chipping is that the technology is used first for one purpose and then for another, so it is not secure enough. The study

investigated the practice of chipping in the USA on employees of a single company.

M. Beylin [4] investigated the chipping technology in the development of artificial intelligence from an ethical-philosophical point of view. The study concludes that chipping human beings is likely to create a situation where the choice of how to become and develop human beings will not depend solely on the individual and thus will create moral and legal problems. Since human beings are surrounded by constant progress, electronics, and artificial intelligence to a greater or lesser extent. As long as legislation does not keep pace with the pace of society and artificial intelligence – it will not be possible to fully control and protect all sensitive customer information. To date, advanced artificial intelligence (AI) technologies have created more primitive types of the same AI, so it is difficult to predict how microchips will behave in the human body. There are unresolved questions about the control of the mind and nervous system by the chip, both ethically and legally. As the law now does not distinguish between the fault of an autopilot vehicle and the fault of the driver, in the same way in the future it will be difficult to distinguish between the fault of a person and the effect of a chip on a person. This is why the paper notes that the institution of chipping is not currently considered reliable.

Ethical and legal aspects of human digitalisation, including chipping, were studied by N.M. Buhayova [5]. The conclusions of the study were made that digital technologies of chipping and bionic prosthetics can change a person's personality. If chipping is used as medical technology, it is possible to improve the abilities. Chips that are built into the cerebral cortex will create a direct interface between the human brain and a computer, and thus a person will be able to control technology with the power of thought. Overall, the study positively identifies the possibility of chipping as a medical technology, but there are several technical and legal issues arising from the development of such a field. For example, technical issues include digital failures, viruses and inadequate software to store personal information. Legal issues include the issue of punishment and guilt and cybercrime.

Yu. Danylchenko [6] investigated the topic of chipping as a biotechnology for crime prevention. The study noted that the trend of chipping, where a microchip is implanted into a person's body, is gaining popularity. A microchip is a device based on an integrated circuit or based on RFID (Radio Frequency Identification) technology which can be programmed to identify a person, determine location and/or provide access to personal data and payment credentials. The author noted that chipping can be effective in preventing crime, but there is a serious risk of human rights violations, establishing control over the individual. In summary, the potential for the use of biotechnology, including chipping, in various areas of the economy and society, including to reduce the potential for crime, is significant and has not yet been sufficiently explored.

Most of the research focuses on the technology of microchipping the general population. The research aims to provide a systematic cross-sectional analysis of the institution of chipping, in particular children, to prevent crimes against them, to assess the advantages and disadvantages of such technology and to highlight the possible scope for the use of microchips for the safety of children. The research objectives are to study foreign experience on the topic of chipping in general and the use of technology for children in particular, study crime statistics for the last 3 years in the Republic of Kazakhstan and compare the positive characteristics of chipping and negative ones.

## **Materials and Methods**

General scientific (method of analysis and synthesis, induction and deduction, comparison) and special methods (statistical analysis, formal-legal method) were used. An inter-sectoral approach was also applied. The theoretical part was formed using general scientific methods, and the available normative documents on the topic were researched. The individual results and the approaches to the research – the variants of achieving the goal and offering solutions to the problem – were also achieved by using special scientific methods. Available information on the topic of research and the studies of scholars in this legal field have been processed by the analysis and synthesis method. The legislation of the Republic of Kazakhstan was analysed. First, the subject of the study was divided into parts, such as the practice of countries of the world on this topic, legal aspects, ethical features, and statistics, using the method of analysis. After that, all the nuances and peculiarities of the topic were synthesized to determine the feasibility of the chipping institute. The method of statistical analysis investigates the data on the number of crimes of different years on the topic of work and concludes the number and growth of crime. Using this method, the level of trafficking in minors in society and its progress or regression over time is determined.

Specific facts and experiences in the use of chipping on children were studied using the induction method, identifying its advantages and disadvantages. Empirical data has also been collected, including research by scientists on human chipping, analysing the data and highlighting general patterns and trends in chipping. The inductive conclusion about the positive and negative aspects of chipping children has been drawn. Using the deductive method, the existing legal provisions and general principles were analysed to assess the legality and ethics of chipping children. The method formulated general legal principles, norms and standards regarding children's rights and freedoms, privacy and personal data protection and analysed the arguments that are "for" and "against" chipping children. Both methods were used together to form a comprehensive and reasoned view of the topic in the research paper. A deductive approach was used to conclude the extent to which chipping of children complies with or violates general legal principles and norms.

A comparative study of the practices of European countries, China, Latin American countries and the USA was carried out and their experiences and public attitudes towards the technology of chipping the population and children were evaluated. The comparative method was

used to compare the opinions of selected scientists and to highlight the positive aspects, and the dominant opinions in the studies. The formal-legal method was used to assess the position of the legislation of the Republic of Kazakhstan concerning chipping technologies. The conclusion about the compliance of the legislation with modern realities was made, and the institution of chipping was investigated for its compliance with the Constitution, the Basic Law of the State.

An interdisciplinary approach was used to analyse the topic in the context of human rights, criminal law, psychology and ethics. These fields are closely intertwined in the topic of population chipping, and it is possible to identify new characteristics that have not been explored before. Studies in criminal law, criminology, criminal procedure, ethics, sociology and psychology were used in this study. The views of scholars that have been taken as a basis are those of Kazakhstani and foreign scholars in the previously mentioned fields. The normative basis for the study is the Constitution of the Republic of Kazakhstan [1], Criminal Code of the Republic of Kazakhstan No. 226-V [7], Law of the Republic of Kazakhstan No. 345-II "On the rights of the child in the Republic of Kazakhstan" [8].

## **Results and Discussion**

The chip itself is a device built on an integrated circuit or using RFID (Radio Frequency Identification) technology. Chip technology is not new as it is already being used in various areas of life, namely in document management, technology and animal husbandry. This technology reduces forgery, and loss and improves the identification of documents. A microchip is a spacious and relatively inexpensive way of storing and marking information. A similar technology of passport chipping exists in Ukraine. Having clarified the features of the biometric passport, it is concluded that it is a necessary step to prevent illegal migration in Ukraine and that its functionality allows for the renunciation of the use of "old" paper documents.

Today, chipping in animal husbandry is popular and sometimes even mandatory. Pets are also chipped. It is common practice in the European Union, and it is compulsory to chip pets at border crossings. The chip contains information about the animal (name, health, vaccination and sterilisation details) and the owner (name, telephone number and address). This chip helps locate the animal if lost, identify it and enter the data into the register of compulsory and preventive vaccinations. The use of this technology concerning humans is already being implemented and is becoming widespread. As an example, in Belgium, chipping technology is used optionally for banking data, such as information on deposits, accounts, payments and other similar transactions. A Belgian company specialising in digital marketing has decided to implant electronic chips under the skin of its employees. These chips allow employees to open office doors and use office equipment, especially computers [9-11].

In 2015, the Swedish company Epicenter introduced microchips for its employees, which replaced badges and were used for building access, office space and other purposes. More than 4,000 Swedes have recently received microchip implants. Sweden's largest railway company allows passengers to use chips instead of tickets. Such technology is also expected to be used by people to pay for

purchases in shops and restaurants [12-14]. The practice of chipping employees also exists in Estonia. The IT and telecommunications sectors in the country increasingly use microchips for their employees that are implanted into the body. This replaces their keys and badges and allows them to get into lifts. A study by A. Siibak and M. Otsus [15] found that employees also use microchips for their tasks such as sending emails, buying coffee, paying or scheduling things on a smart board.

The practice of chipping children also exists. There is a programme in Brazil to chip children, as the country actively abducts minors, taking them to neighbour states for exploitation in prostitution, organ trafficking and forced labour slavery. Most often, the initiators of the chipping of children are their parents [16]. In the southern Chinese city of Zhuhai, a primary school has launched an experiment with Guanyu Technology in which children's clothes have been fitted with embedded microchips to track their whereabouts. Thanks to these devices, parents can track their child's whereabouts in real-time on a website. If a pupil enters a 'danger zone', the system sends messages to teachers and parents. In addition, this system allows parents to communicate with their children as the chip automatically connects to the messaging system [17-19].

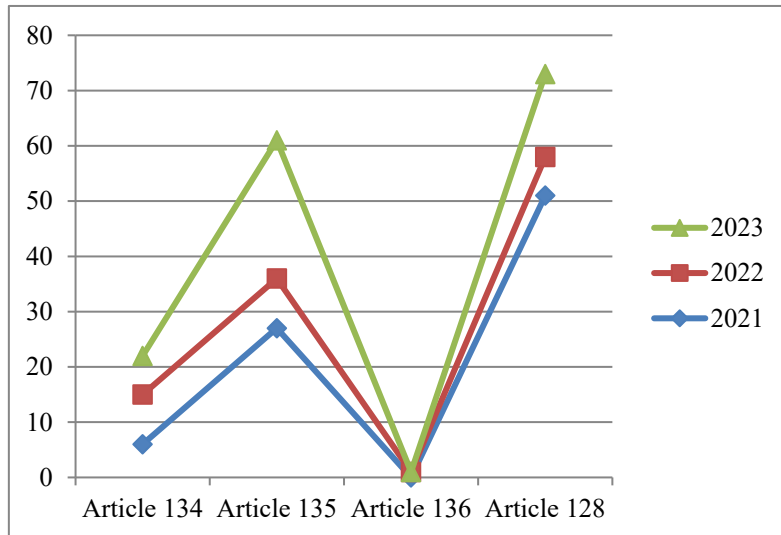
Because the practice of chipping the population, including children, exists – there is a need to determine the absence of violation of human rights and the rights of the child. The Constitution of the Republic of Kazakhstan [1] stipulates in Article 18 the right of everyone to privacy, personal and family secrets, and protection of their honour and dignity. And Article 18(2) provides for the right to secrecy of information on deposits, custody, personal information. With a chip that will contain all personal information about an individual, there is a need to accumulate and store information from all over the country, and digital information for which a multi-layered protection mechanism must be defined. However, even when such information has protection, there is a risk of unauthorised disclosure and leakage, leading to its use for criminal purposes. To date, the use of chipping has put at risk the basic human right to privacy and confidentiality.

Article 22 of the Constitution also stipulates the right to freedom of conscience. Religion plays a major role in human life and is a fundamental right for everyone. Depending on one faith or another, it is forbidden to implant foreign objects into one's body, assign serial

numbers. Therefore, chipping on the part of the state should only be done voluntarily and in such a way that there are no restrictions on rights between people with and without a chip. Non-discrimination is important to respect the constitutional right to freedom of conscience. Regarding children's rights specifically, chipping must be done with the consent of both parents. But even then, there is a risk of violation of the child's rights, discrimination and emotional and psychological control by the parents. Thus, chipping can be applied to a legally capable and able-bodied person with consent and with a conscious choice, but the question arises whether the consent of the child to such chipping is necessary. Otherwise, the chipping of children without their will could be equated to the chipping of an animal.

The first thing to note is that Law of the Republic of Kazakhstan No. 345-II "On the rights of the child in the Republic of Kazakhstan" [8] Article 11 provides for the right of the child to freedom of expression, conscience, information and participation in public life. Thus, every child has the right to freedom of speech and expression and freedom of conscience. If chipping is carried out with parental consent without consideration of the child's will – the right to freedom of expression will be violated and the right to freedom of conscience may also be violated if the child's religion does not consider it ethical to implant a microchip. Infringement of the rights of the child and forced chipping by the parents is not a necessary measure and is not part of the statutory parental responsibilities mentioned above in Article 24 [8].

Therefore, given all the risks of the chip and its advantages as an affordable and effective modern technology, there should be an area where the benefits of its use could outweigh the risks of chipping. Such an area could be crime prevention. Given the Brazilian experience mentioned previously, the use of this technology is understood to be possible not only for the convenience of public life as a substitute for identity documents but also as a method of human and child trafficking prevalent in these countries. It is believed that an implanted microchip can help track a child's movements and prevent crime. Using data from Bodies of legal statistics and special records [20] and articles 128, 134, 135 и 136 of the Criminal Code of the Republic of Kazakhstan No. 226-V [7] the number of human and child trafficking offences for the period 2021, 2022 and 2023 was investigated (Figure 1).



**Figure 1.** Number of offences for which criminal proceedings were pending during the reporting period (data as of July 2021, July 2022 and March 2023)

*Note: Article 134 – involving a minor in prostitution; Article 135 – juvenile trafficking; Article 136 – child substitution; Article 128 – human trafficking.*

*Source: [20].*

Statistics from 2021 to 2023 show an increase in the number of recorded offences of trafficking in human beings (Article 128) and trafficking in minors (Article 135). These crimes are rather latent, and it is therefore difficult to determine whether there are more cases of trafficking or whether such crimes have become more effective. As it is not known how much of this type of crime is left out of the statistics, conclusions are drawn from official data and an increase in crime in this category is noted.

Two options for the introduction of chipping as a human trafficking prevention method are identified in international practice: mandatory chipping by the state for certain categories of persons (children) with parental consent, and as a service option by the state (implementing chipping upon request and with parental consent) [21-23]. Under the first option, such a state programme can be applied to all children to keep them safe from crime. In this form, the state, represented by certain authorities, would be the holder of the information and the subject of access to the chip data. Such a system would have the disadvantage of preventing crime as control of the child would presumably not be 24/7 but on request when a crime has already been committed against the child. The police would then can trace the location and locate the child. However, prevention is difficult as to prevent abuse, monitoring must be permanent, which the state is not physically able to do. In this situation, prevention will only be possible after the spread of such technology, which means more exposure to a certain type of crime. When moving abroad, the chip may cease to fulfil its functions, as theoretically its operation as an electronic document under the legal regime of the Republic of Kazakhstan only extends to the territory of the Republic of Kazakhstan.

Regarding the option of chipping at the request of the parents to monitor the safety of the child outside the home – there is a risk of abuse of parental rights and responsibilities, respectively limiting the rights of the child. This almost nullifies the parenting, trust and proper relationship between parents and children. At the same

time, the child develops fears and complexes, which leads to negative psychological attitudes in adulthood. The child’s right to self-expression and freedom of conscience is violated, as the decision to chip in is made by the parents alone. Article 24 of the Law of the Republic of Kazakhstan No. 345-II “On the rights of the child in the Republic of Kazakhstan” [8] presumes the parents’ obligation to create the living conditions necessary for the child’s full development, to care for, to support financially, to take care of the child’s well-being and to provide housing for the child.

The implantation of a chip without the child’s will and without the health indicators available to do so is a forced intervention in the child’s body, to establish control over the child. Implanting a microchip is an intervention in the body – and is therefore a medical procedure that must be carried out by medical professionals [24-27]. Since such a procedure cannot be a treatment and is not a direct measure to preserve life and health – parents have no right to force such measures on their child. Chipping may be used for incapacitated or disabled children, children with mental illness, who cannot control their behaviour. In these cases, the chipping procedure may be ordered as a way to track the child’s whereabouts. Alternatively, chipping off the child’s phone, belongings and clothing without interfering with the body is suggested. In other cases, it has been proposed that chipping should be carried out not only with parental consent but also with the consent of the child when he or she reaches the age of 14, an age at which the child can understand the procedure, its consequences and reasons for use. In the case of young children and new-borns, however, the issue of chipping is different. The most vulnerable among minors are new-borns, whose trafficking is spreading across the country and around the world. The Criminal Code of the Republic of Kazakhstan No. 226-V [7] does not distinguish trafficking in new-borns as a separate crime and therefore falls under Article 135 – trafficking in minors, which makes it impossible to statistically track the number of crimes.

D. Utepov and B. Karimov [28] investigated a specific case of child trafficking. As such, in 2021, the Almaty Police Department initiated a preliminary investigation into the trafficking of minors. From the materials of the criminal case, it follows that a user of the social network “VKontakte” nicknamed “A” published a post with the following information: “Hello! I am 25 years old, pregnant and in the sixth month of pregnancy. The baby is a boy. Due to family circumstances, I can’t keep him. I want him to live with a caring family and be well off. Text me if you are from Almaty”. This action formally falls under the corpus delicti of Article 135 of the Criminal Code of the Republic of Kazakhstan No. 226-V [7]. The criminal case was terminated due to lack of corpus delicti. The ground for termination of the case was the fact of deactivation of user “A” and the deletion of the publication. Since more than 20 days had elapsed between the discovery of the publication and the conduct of specific investigative actions, the prosecuting authority was unable to identify the author of the advertisement.

Following B.T. Abulkairova and G.A. Bidildaeva [29], trafficking in children (both minors and new-borns) should be prevented on a societal level. The determinants of such crimes at the societal level are insufficient funding of preschool, medical and educational institutions and the low social and material status of the population. Given the prevalence of child trafficking, including new-borns from maternity and orphanages, there is a proposal, similar to Brazil, to implant a microchip to prevent child trafficking and to monitor the movement of the child from the maternity home. The microchip would be an electronic document in which all information and legal actions regarding the child (taxpayer identification number (TIN), birth certificate, parents’ details, place of registration, whether the child has been abandoned at birth, its onward journey to parents, adoptive parents, children’s homes) would be stored automatically and simultaneously in a database. There is also the issue of religion and ethics, as not all parents will consent to chipping, and mass compulsory chipping may prevent a certain number of crimes, but will cause a wave of outrage from society, religious organisations and human rights activists. In addition, there is a real risk of harm to the health of the newly born living organism. Allergies, intolerances and rejection by the body of a foreign body are normal reactions to a stimulus, so this technology may even be dangerous to the life and health of the baby.

If the mass use of microchips is allowed for all new-borns or older children (minors in general) at once, the effectiveness in preventing and exposing child trafficking offences is demonstrated predominantly at the beginning of its use. This occurs because, when used en masse and implanted in one place on the body (currently the part of the palm between the thumb and forefinger), criminals who would kidnap children to sell them can have the chip forcibly removed from the child’s body to avoid prosecution and punishment. When chipping becomes widespread, there will be new and novel methods of circumventing them. Regarding child trafficking straight from the maternity home – it is worth noting that this is a group crime involving facilitators, perpetrators or organisers maternity hospital staff and managers, police officers and workers who are the first people to implant the

microchip and enter the relevant information about the child. At this stage, there may be a scheme to replace the chip, enter inappropriate data, swap data to further sell the child. Therefore, the chipping of children should be seen as a promising technology, but one that has not been sufficiently researched and refined for widespread use.

M. Ferron et al. [30] investigated the technology of children’s independence outside the home and remote parental control, including the use of a microchip. Parents’ views on technologies to support children’s independence were investigated. It was concluded that chipping technology and other parental control technologies undermine trust. Therefore, it is important to support a parenting style based on trust, which is a very effective method of combating risks to children. An alternative thought was found regarding a sensor in a child’s smartphone or other devices only for location tracking and without intrusion into personal space. The study is similar in that it focuses on the parent-child relationship and how chipping controls can worsen it. The study is consistent in that it focuses on the introduction of chips in other things, phones because tampering with a child’s body is a traumatic procedure that can do more harm than good. It is therefore worth seeking alternatives to keep your child safe. The difference in the work is that this one also draws attention to the legal point of view of the violation of the rights of the child and the abuse of parental responsibilities.

W. Turner [31] explores the topic of chipping from the perspective of privacy violations in the workplace concerning the practice of companies developing microchips for their employees. The study relates to the fact that, as of 1 August 2017, a small technology firm, Three Square Market in Wisconsin, had been chipping employees. The programme was voluntary and more than fifty of the firm’s eighty employees took part. The chips replace key cards and passwords, allowing employees to enter the building and log on to their computers. More and more companies are using specific GPS (Global Positioning System) technology and data tracking to monitor the productivity of their employees. As a result, the work environment is evolving rapidly, and employers have more access to information about their employees than ever before. Now, thanks to implanted microchips, employers can access almost all the data they collect. They can make hiring decisions based on average heart rate or number of hours of sleep. To protect workers’ privacy rights, employees should strive for a team approach. What is common to the findings is that the microchip is still an information-gathering technology and there is a risk of data privacy, so there is now a clear question of protecting the information and the chip database. The study differs in that the author W. Turner has not investigated the specifics of chipping children.

A. Žnidaršič et al. [32] conducted a comprehensive study of the public’s readiness to be chipped. The results of the study indicate that ease of use, usefulness and trust are important factors that influence the intention to use a microchip. Public confidence should be linked to the privacy and security of the technology. Concerns about possible painful procedures and other health problems reduce the use of microchips in the opinion of the public. Further research on changes in the acceptance of microchip implants following a global pandemic is also suggested.

Unlike other technologies, microchip implantation is quite specific and therefore there are many arguments both for and against its adoption. The paper notes that the use of microchips is influenced by religion and the level of education. The research is consistent in aspects of public attitudes towards microchips, as well as public concerns and beliefs about their unsafety. The study differs in that no sociological surveys or experiments were conducted in this work. It also disagrees with the one above on the need for people to be chipped.

The study by W. Zeng [33] examines the morality of chipping technology. It is noted that, to date, the technology of implanting a chip into a person continues to develop. However, this technology also faces several ethical problems. The negative impact of this technology exceeds the positive. It is pointed out that if this technology is to be widely used in the future, serious attention should be paid to solving ethical problems associated with it. It is proposed: firstly, to investigate the use of wearable devices instead of implantable chips; and secondly, to strengthen access rights to the chips to protect the data stored on them. In the future, chip implantation technology represents a promising trend in development. However, the moral aspects associated with this technology should be considered. It is therefore important that people pay more attention to the use of this technology and determine how integral and necessary it is in our lives. These studies fully agree that, to date, this technology is not in line with ethics and religion, and that it would be much more ethical and safer to use portable devices with chips than to implant them into a child's body.

The study by S. Shafeie et al. [34] is devoted to the modelling of microchip adaptation, examining the expectations and fears of the population about this technology. This study aimed to examine current attitudes towards microchip implantation in the United States. The study concluded that American society accepts such technology as positive and modern. But the need to preserve the individual's right to choose remains very important. Technology should not discriminate or restrict human rights [35-37]. Furthermore, emphasis is made on the need for further research on the topic, as there is a need to develop chipping technology. The study points out that attitudes towards chipping depend on age and religion. People of retirement age are less willing to be chipped, while the number of young people who want to be chipped is increasing.

K. Lobban [38] investigated privacy issues in the use of microchips. The study notes that in the case of microchips, there is a great opportunity to sacrifice data privacy. As time passes and technology advances, the level of privacy and security of personal data decreases. The information in the chip is automatically collected and passed on, and the owner cannot prohibit the collection of such information. While the use of microchips can add convenience to everyday life and simplify simple tasks, the potential privacy implications far outweigh any benefits. The use of microchips entails problems of data collection and sharing, opening opportunities for unauthorised surveillance. Current privacy legislation in the United States is not sufficiently adapted to protect citizens from data breaches, unwanted monitoring and the sale of their personal information. Studies agree that the microchip carries a risk

of information leakage and violates a person's privacy. In addition, there is the problem of storing and accumulating personal information that could be lost or used in a crime.

O. Niinen et al. [39] investigate the trend of implanting a microchip with radio frequency and communication devices for health monitoring, payment convenience, and identification. It is concluded during the study that by implanting a microchip, privacy and material biocompatibility problems can occur, which can lead to fibrosis, inflammation and rejection of the implant. It is noted that the RFID technology used for identification is still in its infancy. However, the technology is considered positive for use in elderly care, and healthcare. RFID implants may also be needed in the area of immigration or work permits. In addition, a study carried out in the US in 2007 found that parents were far more likely to chip their children than to do so for themselves. The RFID microchip was suggested to be implanted in children in the first place, as it is a quick medical response and protection against abduction. Studies disagreed on the priority of implanting a microchip in children, as there are numerous legal, social and ethical issues to be resolved.

In a similar vein, A.Y. Ümütlü [40] notes that there are ethical and information security issues associated with human chipping. It is noted that when it comes to protection and security, the most obvious and basic difficulties are related to the impact on society and individuality. The implantation procedure needs detailed legal regulation. For example, citizens should receive substantial safeguards and punishment should be provided for violation of these safeguards. Apart from practical concerns, ethical and legal considerations, there is the problem of the subject of the procedure. Whether it will be a competitive market of services or a state monopoly. It is concluded that the use of technology to improve mental retardation or memory or neurological care is encouraging but requires greater caution concerning psychological effects. Attention was drawn to the concept of human identity and the boundaries between the individual and society. Concerning children, it was pointed out that there are unlimited risks to the physical and psychological health of children, as it is not yet clear whether the chips will be useful for education and safe for the child's health.

Thus, the studies have been devoted to various aspects and problems of chipping people in general and children in particular. This study includes consideration of the already studied aspects and the study of new proposals for the development and expediency of the institute of chipping in the Republic of Kazakhstan.

## **Conclusions**

The following conclusions were made based on the results of the study. Firstly, examining the practice of chipping in other countries, it is noted that today microchips are used by people voluntarily, to replace documents, IDs, travel documents, and passes. For children, chips are used to track their progress at school and their location outside the home. It has been determined that, to date, the chipping of the population of Kazakhstan is inconsistent with the Constitution and violates human rights, as well as being inconsistent with and restricting the rights of children. At the same time, it is concluded that the use of the microchip threatens the leakage of personal and confidential

information, as the state has not yet had time to adopt appropriate modern acts and procedures by which the data of chipped children and the general population would be sufficiently protected against loss and unauthorised interference.

Furthermore, the study describes the negative aspects of microchip use on children, as it not only violates rights but also threatens the health and normal parent-child relationships, as well as the chip can affect the immature nervous system of the child. The statistics of child trafficking for the last 3 years in the Republic of Kazakhstan, dynamics of growth and possibilities of prevention are studied. The pros in the prevention of child trafficking through microchips are identified. The harm from such technology today exceeds the benefit, as there are risks to the health and life of the child already at the implantation stage. For new-borns, chipping can be even more dangerous. Chipping children can be effective in combating trafficking in minors if appropriate laws, protection systems and procedures are put in place if the current legislation of Kazakhstan is amended. If not, there are many risks and there are no guarantees of the safety of the information. At this stage, it is recommended that microchips are implanted in children with disabilities, psychological problems and restrictions for their safety in society. And for children over the age of 14, it is suggested that microchips be implanted only after the consent of both parents and the child.

The study is of practical significance, as it provides recommendations for the use of the institution of chipping. The following practical recommendations for chipping children have been drawn up as a result of the research. The use of a microchip is possible and effective enough that the technology should be developed as soon as possible. It is recommended that the use of microchips should be introduced at document and passport level. Another recommendation is the implementation of microchips for children when they are implanted in children's clothes or gadgets. As of today, implanting a chip into a child's body is hazardous to health and cannot be done with the child's wishes. For safety, it is suggested that a chip be used on things. It is also recommended to create a database with a high level of protection against unauthorised access to create a foundation for storing information from the chips in the future. Thus, the objective stated at the beginning of the study has been achieved. The impact of microchips on the body still needs to be investigated in more detail, and a legal basis for legislation on the use of microchips needs to be formulated.

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#### Conflict of Interest

None.

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### **Анотація**

**Актуальність** дослідження зумовлена широкою практикою використання інституту чіпування для збереження життя та здоров'я дітей, захисту їх від вчинення злочинів, шляхом імплантації мікрочіпа з волі та дозволу батьків, при цьому діти залишаються вразливими до зовнішніх впливів.

**Мета.** Метою дослідження є всебічне та комплексне дослідження інституту мікрочіпування дітей з правової, психологічної, соціальної та технологічної точок зору, виявлення його переваг та недоліків як засобу протидії та запобігання торгівлі дітьми, визначення доцільності використання мікрочіпування як інструменту запобігання злочинам щодо дітей.

**Методологія.** Використано такі методи: аналіз і синтез, індукція, дедукція, порівняння, статистичний аналіз, формально-юридичний метод та міждисциплінарний підхід.

**Результати.** Проведено комплексне дослідження доцільності та правомірності застосування інституту чіпування щодо дітей в Республіці Казахстан, вивчено та представлено практику зарубіжних країн з цього питання. Вивчено питання ефективності, необхідності та результативності чіпування неповнолітніх з метою запобігання злочинності. Вивчено статистику таких злочинів, як торгівля дітьми, а також вплив технологій на дітей, батьківство і відносини між батьками і дітьми.

**Висновки.** Запропоновано можливі напрямки розвитку інституту чіпування, наведено допустимі варіанти використання технологій для дітей. Дослідження має практичне значення, оскільки вводить в юридичну науку новий комплексний погляд на інститут чіпування та його застосування щодо неповнолітніх.

**Ключові слова:** біотехнології; права людини; конфіденційна інформація; злочини проти сім'ї; біоетика.