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Pregled | Review



Vaccine Diplomacy: Health Rights versus Freedom of Choice

Diplomacija cijepljenja: Pravo na zdravlje ili sloboda izbora

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Keywords

VACCINE HESITANCY; ETHICAL CONCERNS; PATIENT ADHERENCE; MISINFORMATION; DISTRUST IN HEALTHCARE SYSTEMS; EVIDENCE-BASED INFORMATION

Ključne riječi

OKLIJEVANJE PREMA CIJEPLJENJU; ETIČKE BRIGE; ADHERENCIJA PACIJENTA; DEZINFORMACIJE; NEPOVJERENJE U ZDRAVSTVENE SUSTAVE; INFORMACIJE TEMELJENE NA DOKAZIMA SUMMARY. The escalating childhood vaccination debate raises profound ethical and legal concerns for pediatricians, as vaccine hesitancy proves to be a complex phenomenon shaped by socio-cultural, psychological, and economic factors. Despite attempts to encourage vaccination adherence, appeals from Pediatrician Societies often fall short, with hesitancy theories focusing on factors like misinformation and distrust. In order to combat hesitancy, enhanced public education and awareness campaigns are proposed, aiming to address concerns with evidence-based information. However, when communication fails, penalties are considered, with limited research on their impact, while global misinformation fuels anti-vaccination sentiments, leading to a large number of unvaccinated children in Croatia due to unclear quidelines on non-compliance. The legal landscape varies across EU countries, from relatively modest fines imposed in Croatia to stricter measures enforced in Poland and France. The European Court of Human Rights acknowledges the delicate balance between individual rights and public health, underscoring the societal importance of vaccination. Pediatricians grapple with ethical dilemmas, especially in situations where fines prove to be ineffective. Denying access to public community groups or institutions to a child becomes a last resort, done for the purpose of prioritizing community well-being over individual choices. Strategies for pediatrician protection include informed consent, clear communication, and meticulous documentation, though conflicts may arise in situations where non-vaccinated children face exclusion from nursery schools. In conclusion, a nuanced approach is crucial to address the complexities and legal ramifications of vaccine hesitancy. The clash between health rights and freedom of choice necessitates legal reforms beyond punitive measures, emphasizing the importance of education. Future research should explore the impact of penalties on vaccination rates and the post-penalty status of the unvaccinated, thus contributing to a more comprehensive understanding of this multifaceted issue.

SAŽETAK. Eskalirajuća rasprava o cijepljenju djece izaziva duboke etičke i pravne brige za pedijatre, jer se opor prema cijepljenju pokazuje kao kompleksan fenomen oblikovan socio-kulturnim, psihološkim i ekonomskim faktorima. Unatoč pokušajima poticanja pridržavanja cijepljenja, apeli Pedijatrijskih društava često ne uspijevaju, s teorijama oklijevanja usmjerenima na faktore poput dezinformacija i nepovjerenja. Kako bi se borili protiv oklijevanja, predlažu se pojačane kampanje javnog obrazovanja i svjesnosti, s ciljem adresiranja zabrinutosti informacijama utemeljenim na dokazima. Međutim, kada komunikacija ne uspije, razmatraju se kazne, s ograničenim istraživanjem njihovog učinka, dok globalne dezinformacije potiču antivakcinacijske pokrete, dovodeći do 8% necijepljene djece u Hrvatskoj zbog nejasnih smjernica. Pravni okvir varira među zemljama EU, od relativno skromnih kazni nametnutih u Hrvatskoj do strožih mjera provedenih u Poljskoj i Francuskoj. Europski sud za ljudska prava priznaje delikatnu ravnotežu između individualnih prava i javnog zdravlja, naglašavajući društvenu važnost cijepljenja. Pedijatri se suočavaju s etičkim dilemama, posebno u situacijama gdje se kazne pokažu neefikasnima. Odbijanje pristupa djeteta javnim zajedničkim grupama ili institucijama postaje posljednje sredstvo, učinjeno u svrhu prioritiziranja dobrobiti zajednice nad individualnim izborima. Strategije za zaštitu pedijatara uključuju informirani pristanak, jasnu komunikaciju i pažljivu dokumentaciju, iako mogu nastati sukobi u situacijama kada djeca koja nisu cijepljena budu isključena iz vrtića. Zaključno, nužan je nijansiran pristup za adresiranje složenosti i pravnih posljedica oklijevanja prema cijepljenju. Sukob između prava na zdravlje i slobode izbora zahtijeva pravne reforme izvan kaznenih mjera, naglašavajući važnost edukacije. Buduća istraživanja trebala bi istražiti utjecaj kazni na stope cijepljenja i post-kazneni status necijepljenih, čime bi se doprinijelo sveobuhvatnijem razumijevanju ovog višedimenzionalnog pitanja.

The debate surrounding childhood vaccination has intensified, thus raising ethical and legal questions for pediatricians. Recent theoretical developments have revealed that vaccine hesitancy is a complex phenomenon influenced by a myriad of factors, including so-

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cio-cultural, psychological, and economic variables (1). There are growing appeals and efforts from the Pediatrician Society for parents to follow the immunization schedule, but unfortunately the majority of them have an unsuccessful result (2). Most of the theories of vaccine hesitancy are, however, focused on explaining the underlying reasons for individuals' reluctance to accept vaccinations, examining factors such as misinformation, distrust in healthcare systems, and perceptions of vaccine risks versus benefits (3). One way to overcome these problems is to enhance the public education and awareness campaigns, addressing these concerns with evidence-based information and fostering trust in the healthcare system (4). A new approach is therefore needed for understanding and addressing the complexities of vaccine hesitancy. A common technique to use when communication fails is a penalty, widely considered to be a good way to protect children. As far as we know, no previous research has investigated the impact of a strong penalty on vaccination. In a global context, the World Health Organization (WHO) reports that vaccination saves millions of lives annually, by creating herd immunity that protects even those with compromised immune systems (5). However, misinformation that has spread through social media has fueled the anti-vaccination movement, leading to a decline in vaccination rates (6). In Croatia, 8% of children remain unvaccinated against diseases like diphtheria, tetanus, and whooping cough which represents a huge problem. There is a further problem with the shifting of responsibility between the Ministry of Health and the State Inspectorate which reflects the ambiguity in addressing the issue of non-compliance. The legal system lacks clear guidelines on further actions if a parent, having paid the fine, still refuses to vaccinate their child (7).

The objective of this paper is to demonstrate the feasibility of follow-up measures, thus ensuring a systematic and effective approach to monitoring and assessing progress in a vaccination context. Furthermore, this paper points out the advantages and practicability of striking a delicate balance between promoting public health through widespread vaccination efforts and respecting the individuals' freedom of choice in healthcare decisions within this complex and nuanced topic. This article also explores the ethical and legal dilemmas faced by pediatricians in situations where parents resist vaccination and highlights the repercussions of such decisions. For the current work, it is sufficient to point out that the primary focus is on examining the impact of recent policy changes on healthcare outcomes. However, it is important to recognize the broader context of the evolving landscape in childhood vaccination and the associated legal and ethical challenges which provide a foundation for a comprehensive understanding of the implications of these

policy changes. Our main emphasis is on analyzing the factors that influence the trust erosion and its implications in terms of making vaccination-related decisions. This is enough to get a sufficiently accurate solution, however, acknowledging the broader context and considering the multifaceted nature of trust-related challenges would contribute to a more comprehensive understanding of the dynamics at play.

Legal Framework

In the Croatian legal system, children are individuals under special state protection, and there is a general duty for everyone to safeguard children as the most vulnerable group (Article 62 and Article 64, paragraph 1 of the Constitution of the Republic of Croatia). Children have various rights that are inherent to them, aiming to protect them during their transition into adulthood. These rights include the right to life and health, which is extremely significant and guaranteed by the Convention on the Rights of the Child (Article 6 and Article 24) and the Family Act (Article 84) (8). The sources of law imply that the state is obligated to ensure the protection of children's rights and interests, not only within family relations but also in public services like health and education. However, the primary responsibility for realizing the rights of a child, including the right to life and health, lies with the parents, as emphasized by the Convention on the Rights of the Child (Article 5) (8,9). When it comes to vaccination obligations, the legal framework in Croatia is governed by the Law on the Protection of the Population against Infectious Diseases, Regulation on the Implementation of Immunization, Prophylaxis, and Chemoprophylaxis against Infectious Diseases, and the Mandatory Vaccination Program. The law outlines infectious diseases subject to mandatory vaccination, including tuberculosis, diphtheria, tetanus, whooping cough, polio, measles, rubella, mumps, hepatitis B, and diseases caused by Haemophilus influenzae type B. Non-compliance with vaccination obligations may result in fines (10). Parents have the right and duty to ensure a child's health, including routine and acceptable medical procedures like vaccination. In a specific case, where a parent refused vaccination due to concerns about a perceived link between vaccines and autism, the Constitutional Court rejected the claim, emphasizing the state's positive obligation to protect public health. The recent fines raise questions about the effectiveness of punitive measures in ensuring compliance and the ethical considerations surrounding such penalties (8,9) The recent imposition of a 266 euro fine on 37 parents in Croatia for refusing to vaccinate their children against whooping cough brings to light the complex interplay between health rights and freedom of choice (7).

Comparisons with other EU countries highlight the variation in approaches. While Croatia's fines are relatively modest, countries like Poland and France enforce more stringent measures, including higher fines and potential imprisonment for non-compliance with the legal obligations (11). In the context of mandatory childhood vaccination, a recent legal case examined the general principles surrounding this practice. This legal obligation is present in many jurisdictions, with the Czech Republic serving as a specific example. The duty requires parents to vaccinate their children against nine recognized diseases, and this mandate is grounded in medical science. Non-compliance can result in fines, and non-vaccinated children may be denied admission to educational institutions, except in cases of health-related contraindications (12).

The European Court of Human Rights deliberated on a case where a parent was fined for failing to adhere to the vaccination duty, and other applicants faced denial of admission to educational facilities. The Court acknowledged that compulsory vaccination, being an involuntary medical intervention, implicates the right to respect for private life under Article 8 of the Convention (13). Recognizing the legitimate aims pursued by such policies, the Court underscored the importance of vaccination not only for the individuals receiving it but also for those relying on herd immunity due to medical constraints. It emphasized the significance of considering the best interests of children in immunization-related decisions. The Court noted the support for vaccination duties from relevant medical authorities, framing them as responses to societal needs to protect public health. The judgment highlighted the paramount importance of maintaining a balance between individual rights and public health objectives. Addressing concerns about proportionality, the Court examined the scope of vaccination duties, existing exceptions, and procedural safeguards. It concluded that challenges to the efficacy and safety of vaccines had not been established. Additionally, it assessed specific circumstances, determining that imposed fines were not excessive, and measures like nonadmission to educational institutions were preventive rather than punitive (13,14). Importantly, the Court clarified that the key issue was not whether alternative, less prescriptive policies could have been adopted, but whether the authorities have exceeded their margin of appreciation. Concluding that the measures were "necessary in a democratic society", the Court affirmed the justifiability of such measures within the legal frameworks of jurisdictions with mandatory vaccination policies. In 2021, the Court's first judgment on compulsory childhood vaccination was reached: (Grand Chamber judgments are final (Article 44 of the Convention). All final judgments are transmitted to the Committee of Ministers of the Council of Europe for

supervision of their execution. www.coe.int/t/dghl/ monitoring/execution.)

Challenges Faced by Pediatricians

Pediatricians find themselves at the center of ethical dilemmas when parents resist vaccination. This suggests that, in the eyes of parents, constitutional rights and freedoms come into conflict with the obligation to prevent the spread of infectious diseases (15). The imposition of fines, while serving as a deterrent, may not address the root causes of vaccine hesitancy. In situations where parents have persistently refused vaccination for their child despite penalties, which caused the child to remain unprotected from vaccine-preventable diseases, healthcare providers may find themselves facing a challenging ethical dilemma. While penalties may serve as a deterrent, the issue of an unprotected child persists, posing a risk not only to an individual child but also to the broader community (16). In such cases, the denial of access to public community groups or institutions to a child may be considered as a last resort to safeguard the health of other vulnerable individuals, especially those who are unable to receive certain vaccines due to medical reasons. This approach aligns with the principle of prioritizing the well-being of the community over individual choices in situations where public health is at stake (17). Before resorting to this extreme measure, healthcare providers should exhaust all possible avenues for education and communication with the parents. Collaborating with public health agencies, legal experts, and ethicists becomes crucial in navigating the complexities of implementing such restrictive measures. It is essential to communicate clearly and transparently with parents about the potential consequences of continued refusal of vaccination, emphasizing the community-wide impact and the need to protect those who are unable to be vaccinated. Offering alternative solutions, such as educational programs or counseling, is an option that can also be explored to address underlying concerns contributing to vaccination refusal (18). The decision to deny access to public community groups or institutions to a child should be made in consultation with relevant authorities and in adherence to legal and ethical standards. Establishing clear criteria for such measures and ensuring due process is crucial to avoid potential legal challenges and maintain fairness in the decision-making process. While the denial of access is a drastic step, it underscores the importance of prioritizing public health and protecting vulnerable populations. It is essential to approach this measure with sensitivity, empathy, and a commitment to finding solutions that address the root causes of vaccination refusal, ultimately fostering a safer and healthier community (19).

Pediatrician's Role in Vaccination	Strategies for Pediatricians:
1.Professional Duty	1.Informed Consent:
2.Rigorous Testing proofs	1. Obtain signed informed consent.
3.Legal and Ethical Support	2. Provide comprehensive information on vaccination
4.Effective Communication	benefits, risks, and alternatives.
5.Legal Protection Strategie	2.Clear Communication:
	1. Establish open and clear communication with parents
Pediatricians should:	2. Address parental concerns and provide answers to
1. Approach discussions with confidence.	reduce conflicts.
2. Ground decisions in evidence-based medicine	3.Documentation:
and ethical standards.	1. Maintain meticulous medical records.
3. Prioritize the paramount goal of ensuring the health and well-being of children	 Include details of discussions with parents and signed consent for legal preparedness.

Figure 1. Key Strategies for Pediatricians in Addressing Legal Threat Slika 1. Kliučne strategije za pedijatre u suočavanju s pravnim prijetnjama

How can pediatricians protect themselves?

From the challenges that pediatricians are faced with, key findings emerge that pediatricians should not fear or be deterred by parents threatening legal action regarding vaccinations for several important reasons. Firstly, pediatricians are bound by a professional duty to prioritize the health and well-being of their patients, which includes recommending and administering vaccinations based on scientific evidence and medical guidelines. Secondly, vaccines undergo rigorous testing and scrutiny before approval, thus ensuring their safety and efficacy (20). Pediatricians act as advocates for evidence-based medicine, and their recommendations align with the consensus of the medical community and public health organizations. Furthermore, legal and ethical standards support pediatricians who adhere to established medical practices. Courts typically recognize and value the expertise of healthcare professionals in matters of vaccination, understanding that their recommendations are grounded in the best interests of the child. Pediatricians must communicate effectively with parents, addressing their concerns and providing them with accurate information about the benefits and risks of vaccinations (21). Building trust through open dialogue and shared decision-making can contribute to a more collaborative relationship, reducing the likelihood of legal disputes. Ultimately, pediatricians should approach vaccination discussions with confidence, grounded in their commitment to evidence-based medicine, ethical standards, and the paramount goal of ensuring the health and well-being of their young patients. Pediatricians

can protect themselves from potential legal challenges related to vaccination by adhering to specific strategies and practices. One of them is Informed Consent - ensuring that parents or guardians sign informed consent before vaccination can be crucial (22). This involves providing comprehensive information about the benefits, risks, and alternatives to vaccination. Another one of these strategies is Clear Communication - pediatricians should establish open and clear communication with parents. Understanding parental concerns and providing answers to questions can reduce potential conflicts. The third strategy mentioned here is Documentation - careful maintenance of medical documentation, including information about discussions with parents regarding vaccination and signed consent, can be crucial in case of legal challenges (Figure 1).

Guidelines for pediatricians in primary care and hospital settings in situations where parents refuse vaccination are described in Tables 1 and 2. By following these guidelines, pediatricians can navigate discussions with parents who refuse vaccination, prioritize patient safety, promote informed decision-making, contribute to overall public health efforts, and maintain a collaborative approach with healthcare teams and parents.

These guidelines include the following: Parental Education – actively educating parents about the importance of vaccination, its benefits, and scientific facts can improve their understanding and reduce fears and uncertainties; Legal Consultation – if faced with a threat of a lawsuit, pediatricians should consult with legal professionals specializing in medical law to obtain legal

Table 1. Guidelines for pediatricians in primary care in situations where parents refuse vaccination Tablica 1. Smjernice za pedijatre u primarnoj zdravstvenoj zaštiti u situacijama kada roditelji odbijaju cijepljenje

Guidelines for pediatricians in primary care in situations where parents refuse vaccination:

1. Open Communication:

- Engage in open and respectful dialogue with parents who express reluctance or refusal to vaccinate their child.
- Actively listen to their concerns and address them with empathy, providing evidence-based information on the safety and efficacy
 of vaccines.
- 2. Education:
 - Offer clear and comprehensive educational materials on vaccines, including their benefits and potential risks, to enhance parental understanding.
 - Emphasize the importance of vaccines in preventing serious illnesses and maintaining community immunity.
- 3. Document Discussions:
 - Thoroughly document all discussions related to vaccine refusal in the patient's medical records.
- Include details about the information provided, parental concerns addressed, and any alternative vaccination schedules discussed. 4. Provide Resources:
 - Supply credible resources, such as reputable websites or pamphlets, that further explain the science behind vaccinations.
 - Encourage parents to seek information from reliable sources and address any misconceptions.
- 5. Multiple Visits:
 - Consider scheduling additional appointments to allow for further discussion and information exchange.
 - Use these visits as opportunities to address evolving concerns and potentially reconsider vaccination decisions.
- 6. Respect Autonomy:
 - Acknowledge parental autonomy in decision-making regarding their child's healthcare.
 - Clearly explain the potential consequences of vaccine refusal, not only for their child but also for the broader community.
- 7. Alternative Schedules:
 - If appropriate and supported by medical evidence, discuss the possibility of alternative vaccination schedules that may align better with parental preferences.
 - Highlight the importance of completing the recommended vaccine series to ensure optimal protection.
- 8. Provide Informed Refusal Form:
 - Offer an informed refusal form for parents to sign, indicating that they have been informed about the risks associated with vaccine refusal.
 - Clearly outline the potential consequences of their decision.
- 9. Collaborate with Specialists:
 - If necessary, collaborate with pediatric infectious disease specialists or other relevant healthcare professionals to address complex cases and provide additional perspectives.
- **10.** Community Education:
 - · Actively participate in community education initiatives to foster overall awareness of the importance of vaccination.
 - Engage in public health campaigns to promote vaccination and dispel common myths.

guidance and support; Involvement in Professional Associations – membership in professional medical associations can provide support and resources for pediatricians, keeping them informed about the latest guidelines and legal aspects of their practice and respecting professional standards, proper documentation, transparent communication, and collaboration with legal professionals can help pediatricians mitigate the risk of legal challenges and protect their practice (23).

Discussion

The escalating debate on childhood vaccination has brought forth intricate ethical and legal dilemmas for pediatricians. The multifaceted nature of vaccine hesitancy, influenced by socio-cultural, psychological, and economic factors, remains a formidable challenge despite concerted efforts to encourage adherence to vaccination schedules (24). The clash between health rights and freedom of choice underscores the necessity for legal reforms (25). A punitive approach, while a common response to non-compliance, prompts a call for a more comprehensive strategy. Education, awareness campaigns, and ensuring fulfillment of vaccination obligations emerge as crucial components to protect public health. The impact of strong penalties on vaccination rates is an area requiring future research while questions about the effectiveness of penalties and the post-penalty status of the unvaccinated population demand exploration (26). This suggests a need for in-depth studies to assess the long-term implications of penalties on vaccination behavior. Globally, vaccination, endorsed by the World Health Organization, faces challenges from misinformation, resulting in declining rates. In Croatia, the shifting of responsibility between the Ministry of Health and the State Inspectorate reveals ambiguity in addressing the issue of non-compliance, especially when a parent, having paid the fine, still refuses to vaccinate their child.

Croatia's legal system prioritizes children's rights and health, but the recent fines raise concerns about the effectiveness and ethical considerations of punitive measures. Comparisons with other EU countries show variations in approaches, from modest fines imposed in Croatia to more stringent measures, including imprisonment, enforced in Poland and France.

Legal obligations, as seen in the Czech Republic, mandate vaccination, raising questions about propor-

TABLE 2. GUIDELINES FOR PEDIATRICIANS IN HOSPITALS IN SITUATIONS WHERE PARENTS REFUSE VACCINATION Tablica 2. Smjernice za pedijatre u bolnicama u situacijama kada roditelji odbijaju cijepljenje

Guidelines for pediatricians in hospitals in situations where parents refuse vaccination:

1. Assess Patient's Medical History:

- Review the child's medical history to identify any contraindications or potential risks associated with vaccination.
 - Consider the child's overall health status before engaging in discussions with parents.

2. Team Collaboration:

- · Collaborate with a multidisciplinary team, including infectious disease specialists and hospital ethicists, to ensure a comprehensive approach when dealing with vaccine refusal.
 - Seek input from colleagues to gather diverse perspectives on the situation.

3. Informed Consent Process:

 Prioritize the informed consent process, ensuring that parents fully understand the potential consequences of refusing vaccinations. • Clearly document all discussions and decisions in the patient's medical record.

- 4. Provide Clear Information:
 - Offer clear and scientifically accurate information about the benefits and risks of vaccinations.
 - Use visual aids or educational materials to enhance understanding, especially in a hospital setting where the focus is on immediate healthcare needs.

5. Risk Communication:

- · Communicate the potential risks to the unvaccinated child, as well as the broader hospital community, given the increased vulnerability of hospitalized individuals.
- Emphasize the importance of preventing vaccine-preventable diseases within a hospital environment.

6. Emergency Preparedness:

- Emphasize the potential severity of vaccine-preventable diseases and the increased risk within a hospital setting.
- Highlight the hospital's commitment to patient safety and the implementation of infection control measures.

7. Ethical Considerations:

- Engage in discussions with hospital ethicists to navigate ethical considerations related to vaccine refusal.
- Strive to balance parental autonomy with the ethical responsibility to protect the health and well-being of the child and others in the hospital.

8. Documentation of Parental Refusal:

- · Clearly document parental refusal in the child's medical record, detailing the reasons provided by parents and the information provided by healthcare professionals.
- Include any recommendations or alternative measures discussed with parents.

9. Legal Consultation:

• If necessary, consult with legal professionals to understand the legal implications of vaccine refusal within a hospital setting.

• Ensure that all actions align with legal standards and regulations.

10. Post-Discharge Planning:

- Develop a post-discharge plan that includes discussions on catching up on missed vaccinations once the child is no longer in a hospitalized setting.
- · Provide resources for parents to access follow-up care and vaccination services.

tionality and individual rights. European Court of Human Rights judgments emphasize the delicate balance between individual rights and public health objectives, recognizing the importance of vaccination for societal well-being (27).

Pediatricians find themselves in a complex ethical dilemma when parents resist vaccination. While fines serve as deterrents, they may not address root causes. The denial of access to public community groups or institutions to a child emerges as a last resort, prioritizing community well-being over individual choices, especially for those unable to receive vaccines. Pediatricians are urged not to fear legal threats, supported by their professional duty and adherence to rigorous testing protocols for vaccine safety. Advocating evidencebased medicine and effective communication with parents is a crucial step. Strategies like informed consent, clear communication, and meticulous documentation safeguard pediatricians against potential legal challenges (28).

When non-vaccinated children are not accepted in nursery schools (an exception is made for those who cannot be vaccinated for health reasons), this may raise concerns about potential conflicts, ethical considerations, and societal repercussions, which can be addressed by engaging in open dialogues, implementing transparent policies, and fostering a collaborative approach involving various stakeholders. However, we acknowledge that there are considerable discussions among researchers as to the multifaceted nature of vaccine hesitancy, including its underlying causes, effective intervention strategies, and long-term impacts on public health (29).

Experts from the Croatian Association for the Promotion of Patient Rights, and the International Council of the Patient Ombudsman emphasize the need for legal reforms. The focus should shift from mere financial penalties to ensuring the fulfillment of the vaccination obligation, with guidelines on post-fine procedures (23).

Conclusion

On this basis, we conclude that a nuanced and multifaceted approach is imperative to address the complexities of vaccine hesitancy and its legal ramifications. Navigating the landscape of vaccine diplomacy represents a novel scientific frontier. The clash between health rights and freedom of choice continues to pose challenges for pediatricians and policymakers. As the debate unfolds, there is a growing consensus on the need for legal reforms that go beyond punitive measures, focusing on education, awareness, and ensuring the fulfillment of vaccination obligations to safeguard public health. It remains a question for future research to investigate how penalties impact the increase in the number of vaccinations. Further studies should explore what happens with the unvaccinated after the penalty is paid.

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