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Vaccination status and attitudes of Ukrainians in Poland towards mandatory vaccinations

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Abstract

Introduction and Objective. The study examines the vaccination status and attitudes of Ukrainian refugees in Poland, focusing on factors influencing decisions regarding mandatory vaccinations. Given the ongoing migration and geopolitical instability, understanding these determinants is crucial for improving immunization coverage and mitigating public health risks.

Material and Method. Data were collected from 102 Ukrainian refugee participants in the Rzeszów area using a structured survey. The questionnaire included demographic questions and inquiries about vaccination practices, reasons for incomplete immunization, and attitudes toward vaccination. Statistical analysis was conducted to identify significant correlations.

Results. The study found that 55.88% of participants reported full vaccination of their children, while 42.16% had partial vaccination, and less than 2% were unvaccinated. The most common barriers to vaccination were limited access to vaccines (40%) and mistrust in vaccine formulations (37.78%). Additionally, statistical analysis revealed a significant correlation between the COVID-19 pandemic and vaccination uptake ($p < 0.05$).

Conclusions. The findings emphasize the need for targeted interventions to address vaccine hesitancy and logistical challenges among Ukrainian refugees. Strengthening cooperation between Ukraine and Poland is crucial for enhancing immunization coverage. Despite broader vaccine availability in Poland, hesitancy remains an issue, necessitating educational initiatives and policy adjustments.

Key words

Public health, refugees, COVID-19 vaccines, vaccination coverage, vaccination hesitancy, mandatory programmes

INTRODUCTION

The National Immunization Programme (NIP) for children in Ukraine includes 10 vaccinations against infectious diseases. These vaccinations are provided free of charge up to the age of 16. However, the vaccination coverage in Ukraine is highly variable, differing significantly by age group and region, and according to 2020 data, it ranged between 60–99%. For mandatory vaccinations in children, the coverage rates were: hepatitis B (80.9%), tuberculosis (92.7%), polio (84.2%), diphtheria, pertussis, and tetanus (81.3%), measles (81.9%), mumps and rubella (84.9%), and Haemophilus influenzae type B infections (85.2%) [1, 2].

Ukraine's immunization challenges have been exacerbated by widespread disruptions in healthcare services, including vaccination programmes. Illegal vaccination certificates are reportedly common, and the system struggles with inadequate infrastructure, particularly in rural areas and small towns [3]. These challenges have been further intensified by the socio-political instability since 2010, leading to significant declines in vaccination rates. For example, between 2014 – 2016, only 20% of children received the third dose of the diphtheria, tetanus, and pertussis (DTP) vaccine according to schedule [4].

Since the Russian invasion of Ukraine in February 2022, over four million refugees have arrived in Poland. Many families fleeing Ukraine include young children or individuals with chronic illnesses, and many are temporarily housed in overcrowded reception centres. This situation increases the risk of delayed or missed vaccine doses, particularly for mandatory vaccinations [5]. Diseases such as measles, polio, and tuberculosis, which are controlled in many European countries, remain significant public health threats due to low vaccination rates in Ukraine. For instance, between

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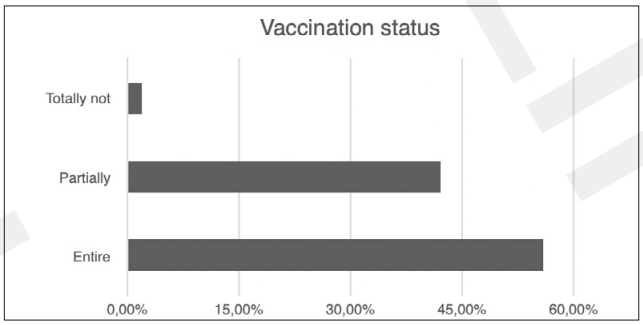
2017 – 2020, over 115,000 cases of measles and 40 related deaths were recorded in Ukraine [6].

In Poland, the vaccination landscape is starkly different. The National Immunization Programme includes 12 vaccinations against infectious diseases and ensures high vaccination coverage. In contrast to Ukraine, Poland's NIP includes vaccines against rotaviruses and pneumococcal infections. Additionally, Poland replaced the oral polio vaccine (OPV) with the injectable polio vaccine (IPV) in 2016, reflecting a commitment to optimizing immunization strategies [7].

The influx of Ukrainian refugees presents unique challenges to the Polish healthcare system. With over 70.000 reported deviations from mandatory vaccinations in Poland in 2022 alone, concerns about vaccine hesitancy, access issues, and misinformation persist. Moreover, Ukrainian refugees often face barriers to accessing healthcare services, such as language difficulties, unfamiliarity with the Polish healthcare system, and logistical issues [8].



The presented study explores vaccination status and factors influencing decision-making among Ukrainian refugees in Poland. Understanding these factors is crucial for developing targeted interventions to improve vaccination rates, and protect public health in both refugee and host populations.

MATERIALS AND METHODS

Ethical approval. All participants provided written informed consent, and the research protocols and procedures were conducted in accordance with the ethical standards outlined in the Helsinki Declaration of 2013. Ethical approval was granted by the Human Research Ethics Committee of the University of Rzeszów (Approval No. 2022/063 of 1 June 2022). Data collection spanned June – September 2022.

Study design and participants. The survey designed by the research team consisted of 9 carefully formulated questions, and was translated into Ukrainian to ensure clarity and comprehension for the participants. The initial 4 questions collected demographic data, including parents' age, number of children, education level, and region of origin.

The demographic breakdown of the participants is presented in Table 1, which classifies the respondents by age group.

Table 2 contains data on the educational level of the respondents, showing the number and percentage of participants within each education category.

The subsequent questions concerned key aspects of vaccination practices. Participants were asked about the vaccination status of their children, investigating whether their children had received all mandatory vaccinations, only some, or none at all. They were also prompted to specify reasons for abstaining from vaccinations, such as logistical challenges, lack of trust in vaccine formulations, or misinformation. Furthermore, the survey inquired about the primary sources of information influencing their vaccination decisions, including healthcare professionals, online resources, and other media. One of the survey questions addressed the impact of the COVID-19 pandemic on the implementation of children's vaccination schedules.

Table 1. Classification of surveyed individuals by age groups

Age group	Number	Percentage (%)
18–25	18	17.7
26–30	16	15.7
31–40	44	43.1
40	24	23.5

Table 2. Classification of surveyed individuals by education status. Student Scientific Club of Infectious Diseases

Education	Amount	Percentage (%)
Primary	3	2.9
Secondary	2	2.0
Vocational	20	19.6
High school	22	21.6
Bachelor's degree	55	53.9

Source: author's own work

Data collection was conducted at medical facilities in the Rzeszów area from June – September 2022, ensuring accessibility for participants. Written consent was obtained from the managers of these facilities to carry out the study, and the anonymity of participants was guaranteed. A total of 102 participants voluntarily completed the survey, providing a comprehensive dataset for analysis.

The collected responses were systematically entered into Microsoft Excel for organizational and preliminary review. The data were then analyzed using statistical software, allowing the researchers to uncover trends, relationships, and significant findings regarding vaccination practices and attitudes among the study population.

Statistical analysis. The statistical analysis of the collected data was carried out using Statistica 13.1 software (StatSoft), a reliable and widely recognized tool for data analysis in research. To examine the relationships and dependencies between variables, the Pearson chi-square test was employed, which is particularly effective for evaluating categorical data. This approach enabled the identification of statistically significant associations between the demographic characteristics of participants, and their responses to questions about vaccination status, reasons for abstaining from vaccination, and sources of information.

The results were systematically presented in the form of frequencies, expressed both numerically and as percentages, to provide a clear and interpretable overview of the findings. These were organized into cross-tabulation Tables, facilitating easy comparison of variables and revealing meaningful patterns in the data.

A significance level of $p<0.05$ was adopted to determine statistical significance, ensuring that the findings were robust and credible. This threshold is standard in scientific research, minimizing the likelihood of falsely identifying relationships between variables while maintaining the integrity of the analysis.

RESULTS

The majority of the examined individuals originated from the Dnipropetrovsk region (15.69%) and L'viv region (14.71%), reflecting a diverse geographical distribution among the participants. This distribution may provide insights into regional differences in vaccination practices and healthcare access within Ukraine. Data analysis further revealed that 55.88% of the participants had full vaccination status according to the Ukrainian National Immunization Programme, while 42.16% had been only partly vaccinated. Notably, less than 2% of the surveyed individuals were completely unvaccinated (Fig. 1). These findings highlight the varying degrees of immunization coverage among the study population, and underscore the potential challenges in achieving herd immunity within displaced populations.

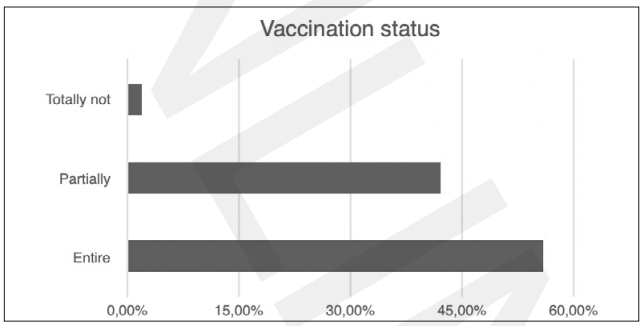


Figure 1. Vaccination status of children among Ukrainian refugees in Poland

Among the 10 mandatory vaccinations included in Ukraine's National Immunization Programme, the highest vaccination rates were observed for hepatitis B (87.25%), tuberculosis (85.29%), and a combined vaccine for tetanus and diphtheria (85.29%). These high rates suggest that these vaccinations might be prioritized due to their perceived importance or availability within the healthcare system. In contrast, the lowest vaccination coverage was noted for Haemophilus influenzae type B, with only 65.69% of children vaccinated (Tab. 3). This disparity may indicate logistical challenges, differences in public awareness, or vaccine availability for certain diseases. These findings underscore the uneven distribution of vaccination coverage, which could contribute to the varying levels of disease susceptibility among the population.

The primary reasons for opting out of vaccination for children among the respondents were lack of access to vaccines (40%) and a lack of trust in vaccine formulations (37.78%) (Tab. 4).

These barriers are further reflected in Figure 2, which illustrates the growing trend of deviations from mandatory vaccinations over time. The data emphasize a concerning pattern that is not only influenced by logistical challenges, but also by pervasive mistrust and misinformation surrounding vaccinations. Understanding these factors is crucial for designing effective interventions to address vaccine hesitancy and improve immunization rates.

Table 3. Survey results regarding decisions about vaccinating a child according to Ukraine's National Immunization Schedule

Vaccination against	Yes	No	Percentage of vaccinated
Hepatitis B	89	13	87.25 %
Tuberculosis	87	15	85.29 %
MMR	79	23	77.45 %
Tetanus, diphtheria	87	15	85.29 %
Pertussis	80	22	78.43 %
Polio	82	20	80.39 %
Haemophilus influenzae B	67	35	65.69 %

Source: Author's own work

Table 4. The main reasons for decision of non-vaccination children. Author's own work

Reasons for non-vaccination	
Lack of access to vaccines	40.00%
Lack of information about the possibility of vaccination	13.33%
Lack of trust in medical products	r
Toxic substances	11.11%
Fear of long-term effects	11.11%
Fear of adverse effects	15.56%
Vaccines cause autism	6.67%
Fear of anaphylactic shock	4.44%
Lack of evidence on vaccine testing	2.22%
Prefer for a child to develop immunity through natural infection	4.44%
Reluctance towards pharmaceutical companies	8.89%
I don't want my child to suffer	4.44%

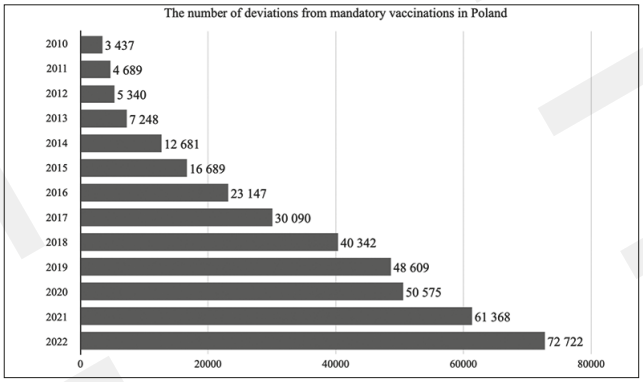


Figure 2. Trends in deviations from mandatory vaccinations in Poland (2010 – 2022)

The majority of respondents (64.71%) stated that the outbreak of the COVID-19 pandemic did not impact their adherence to vaccination. The leading sources of information about vaccines were healthcare professionals (70.59%) and the Internet (46.08%). Considering the influence of certain factors, such as parents' age, number of children, level of education, background, and the impact of the pandemic on the level of vaccination of children, it was found that only the COVID-19 pandemic remained significantly statistically correlated with the uptake of mandatory vaccinations ($p < 0.05$) (Tab. 5).

Table 5. The correlation of the impact of the COVID-19 pandemic on vaccination uptake

n=102	Chi^2	df	p
	6.556359	2	0.0377

*Chi-square values indicate the strength of association between variables; *degrees of freedom represent the number of independent observations; *p-values determine the statistical significance of the association

DISCUSSION

The National Immunization Programme (NIP) in Poland includes 12 vaccinations against infectious diseases. In contrast to Ukraine, Poland also incorporates vaccinations against rotaviruses, which are one of the most common etiological factors in the occurrence of acute diarrhea in the paediatric population. Additionally, the Polish NIP includes vaccinations against pneumococci which, in turn, are a leading cause of respiratory tract infections in children. The remaining vaccinations cover the same pathogens, although they sometimes differ in the administration schedule, vaccine type, and the number of required doses. In Ukraine, children receive both inactivated (dead) injectable polio vaccine (IPV) and live oral polio vaccine (OPV). However, in Poland in April 2016, the oral polio vaccine (OPV) was replaced with the injectable polio vaccine (IPV) [1, 9].

The unfavourable socio-political situation in Ukraine after 2010 led to a several years collapse of the vaccination system. The percentage of children vaccinated under the mandatory vaccination programme from 2008 – 2010 had been very high, reaching up to 90%, but in the subsequent years, a significant decline was observed [10]. Between 2014 – 2016, only 20% of all children were vaccinated against diphtheria, tetanus, and pertussis with the third dose of DTP, according to the vaccination schedule [11].

Simultaneously, since January 2016, the number of cases of measles in Europe has increased alarmingly, with several highly developed countries, including Italy, Romania and Austria, struggling with the problem [12]. There was also an outbreak of measles in Ukraine due to the low vaccination rates,which potentially could have been prevented through preventive measures. Specifically, from 2017 – 2020, over 115.000 cases of measles and 40 deaths were recorded. Another challenge for the healthcare system was the poliovirus, isolated in more than 20 children, of whom 2 suffered from acute flaccid paralysis. In February 2022, in response to this epidemic, a mass vaccination campaign began but was ultimately interrupted by the Russian invasion, exposing Ukrainian children to the risk of poliovirus infection [6]. Furthermore, tuberculosis (TB), remains a significant public health problem in Ukraine, with an especially high rate of multidrug-resistant tuberculosis (MDR-TB), which accounts for 24 – 29% of newly-diagnosed cases. Additionally, Ukraine ranks second among European countries in terms of HIV/TB co-infection. Just under one-fourth (22%) of Ukrainians living with HIV are concurrently infected with tuberculosis. When the Russian invasion of Ukraine began on 22 February 2022, seasonal flu was circulating, but only 167,000 Ukrainians (0.4% of the population) had been vaccinated [13]. The healthcare system for children in Ukraine is centrally coordinated and managed by the Ministry of Health, while at the local level, it falls under the jurisdiction of regional health authorities. Only about 5% of Ukrainians are covered by voluntary private health insurance. The Ministry of Health holds executive authority for implementing the country's health policy and oversees and manages the country's healthcare institutions. The financing of children's healthcare can be divided into 2 categories: central and local. Primary healthcare – foundational healthcare – established in March 2018, is managed by the National Health Service of Ukraine (NSHU); its creation was a key factor in the reform of the healthcare system of the country. NHSU primarily implements the national policy for the financial guarantee for citizens' medical services. At the local level, healthcare is mainly managed by the Ministry of Health, which coordinates hospitals and health centres. Both paediatricians and family doctors share the responsibility for the basic healthcare of children up to the age of 18 [14].

In Poland, a continuous, annual increase has been observed in the number of deviations from mandatory vaccinations; in 2010, 3,437 deviations were recorded, while in 2022, this number increased to 72,722 (Fig. 2) [15].

Comparing the obtained results in the current study to the Polish population, several differences can be noted. According to survey research conducted on Polish citizens, the main reasons for deviating from mandatory vaccinations in Poland include concerns about the adverse effects of the vaccine (50%), negative vaccination experiences within the family (37.5%), and a lack of information about the benefits of vaccinations (29%) [16]. Meanwhile, the primary sources of information about vaccinations among Polish respondents are medical personnel (69.66%) and the Internet (66.29%) [17].

The topic of vaccinations for foreigners in Poland has gained significance in the context of the escalation of the armed conflict in Ukraine. This event prompted the introduction of legal regulations aimed at preventing the spread of diseases. According to the Act on Aid to Ukrainian Citizens in Connection with the Armed Conflict in the Territory of that State, Ukrainian citizens with legal residence in Poland have been granted free access to healthcare services financed by the National Health Fund. However, spa treatments, rehabilitation, and access to certain medications are excluded from this scope [18]. According to the Act on Preventing and Combating Infections and Infectious Diseases in Humans, every person residing in the territory of Poland is obligated to undergo vaccinations. This obligation applies to foreigners staying for more than 3 months. Individuals staying for a shorter period are exempt from this requirement. The catalog of mandatory vaccinations is determined by the Minister of Health's Regulation and is annually updated in the Vaccination Programme [19, 20]. Currently, there are no specific regulations regarding the verification of vaccinations administered to foreigners. It is commonly believed that in the absence of documentation, the individual should be considered unvaccinated. In order to strengthen public health protection, in March 2022, the Minister of Health introduced a Regulation on campaign vaccinations for Ukrainian citizens, covering diseases such as diphtheria, pertussis (whooping cough), measles, poliomyelitis, and hepatitis A [21]. This regulation does not specify the duration a foreigner must spend in Poland to be eligible for such vaccination. It's worth noting that campaign vaccinations are free and entirely voluntary, but their acceptance depends on qualification into groups particularly at risk of infection or infectious diseases.

In summary, current regulations impose the necessity of vaccinations only in specific cases, with the assumption that protective vaccinations are aimed at safeguarding society as a whole against disease. Introducing campaign vaccinations for Ukrainian citizens could significantly improve the epidemiological situation [22]. The vaccination landscape for Ukrainian children and refugees in Poland reveals complex challenges and disparities. Ukraine's National Immunization Programme faces variability in coverage, highlighting the need for targeted interventions. The influx of refugees has exacerbated concerns, with low vaccination rates and such potential issues as illegal certificates [23].

The presented study on Ukrainian refugees in Poland sheds light on their vaccination status and attitudes. While a significant portion have full vaccination, a noteworthy percentage remain unvaccinated or only partially vaccinated. Access issues and vaccine hesitancy emerged as key factors in parental decisions. Comparatively, Poland's robust National Immunization Programme offers a broader spectrum, addressing prevalent infectious diseases. Replacement of the oral polio vaccine with injectable forms reflect a commitment to optimal immunization strategies [24].

The healthcare systems in both countries play pivotal roles: Ukraine grapples with central coordination challenges, exacerbated by the recent conflict, while Poland's comprehensive approach ensures centralized and local management, with a minimal reliance on private health insurance. The study underscores the critical role of healthcare professionals and the Internet in shaping vaccination perspectives, and navigating the complexities, addressing misinformation, enhancing access, and bolstering public awareness, all become crucial in promoting vaccination.

Limitations of the study. The study was conducted in a single region of Poland – around the Rzeszów area – which may have limited the generalizability of the results to the entire population of Ukrainian refugees in Poland. The sample consisted of 102 participants, which may have been insufficient to fully reflect the diverse attitudes and behaviours among all Ukrainian refugees. The data were collected using a survey, which carries the risk of subjective responses from participants. Some individuals may have provided answers aligned with social expectations, rather than their actual beliefs.

CONCLUSIONS

The study highlights the complexities of vaccination programmes and underscores the importance of collaborative efforts between Ukraine and Poland to improve immunization rates. The findings reveal that the COVID-19 pandemic was the only factor significantly correlated with vaccination uptake, emphasizing the need for further research into reasons for vaccine hesitancy. Additionally, in future studies, the impact of emigration on vaccination status warrants closer examination.

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