

THE INFLUENZA VACCINATION UPTAKE IN ROMANIA DURING THE 2022 - 2023 SEASON

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Abstract

The influenza vaccines remain insufficiently used in most countries around the world, despite the proven benefits of annual vaccination in preventing seasonal influenza and its related complications. The aim of this paper is to present the results of the influenza vaccination campaign in Romania during the 2022 - 2023 season, using the data available in the reports generated from the National Electronic Registry of Vaccinations regarding influenza vaccinations carried out from September 1, 2022, to April 30, 2023. During the influenza season, 1,492,950 doses of influenza vaccines were administered, 99% of the national stockpile (1,479,803). The vaccination uptake among the overall population (8%) was similar to that recorded among healthcare workers and lower compared with the vaccination uptake among people aged 65 years and over (24%). In Romania, the influenza vaccination uptake remains low. Measures to increase the uptake of influenza vaccinations are needed to ensure better coverage.

Rezumat

Vaccinurile gripale rămân insuficient utilizate în majoritatea țărilor lumii, chiar dacă și-au dovedit de-a lungul timpului utilitatea în prevenirea gripei sezoniere și a complicațiilor asociate acestora. Scopul acestei lucrări este de a prezenta rezultatele campaniei de vaccinare antigripală din România din sezonul 2022 - 2023, folosind datele disponibile în rapoartele generate din Registrul Electronic Național de Vaccinări privind vaccinările antigripale efectuate în perioada 01 septembrie 2022 - 30 aprilie 2023. În sezonul 2022 - 2023 au fost administrate 1.492.950 doze de vaccin gripal, 99% din stocul național (1.479.803). Acoperirea vaccinală în rândul întregii populații (8%), este similară cu cea înregistrată în rândul personalului medico-sanitar și mai scăzută în comparație cu acoperirea vaccinală în rândul persoanelor cu vârsta de 65 de ani și peste (24%). Acoperirea vaccinală antigripală în România rămâne scăzută. Având în vedere importanța acestei vaccinări, este absolut necesară implementarea imediată a unui set de măsuri care să aibă în vedere creșterea acoperirilor vaccinale antigripale anuale.

Keywords: tetravalent vaccine, influenza, COVID, vaccination

Introduction

Influenza continues to represent an important public health challenge, being one of the main causes of morbidity and mortality worldwide. Seasonal influenza epidemics are associated with a high number of medical visits, hospitalisations and deaths, in addition to school and work absenteeism. The World Health Organisation (WHO) has estimated that influenza is responsible for 290,000 - 650,000 deaths annually [25]. The evolution of each influenza season (severity, duration) is dependent on the susceptibility of the

population, vaccination uptake, the virulence of the circulating strain and the match between the vaccine strains and the circulating one.

Even if the quality and availability of influenza vaccines has improved considerably over time and their benefits in reducing the medical and economic impact of the disease are recognized worldwide, influenza vaccines are insufficiently used in most countries of the world, influenza remaining an insufficiently controlled disease [16].

In Romania, the influenza vaccination is offered free of charge for high-risk groups, which include persons aged between 6 months and 64 years with chronic diseases, children aged between 6 months and 59 months, pregnant women, healthcare workers, adults and children, those hosted in social protection institutions, persons who provide medical and social assistance, as well as those providing homecare to persons considered at high risk for severe complications of influenza and people aged 65 years and over [13]. Until the 2022 - 2023 influenza season inclusive, the Ministry of Health had acquired annually, by auction, the number of doses required by family doctors and by other entities (such as hospitals, social protection institutions and defence system facilities) for vaccinating the eligible groups. The product acquired may differ from year to year, with the choice being influenced by product availability, price and available funds. In Romania, influenza vaccination is carried out in family doctors' offices, in hospitals (for healthcare workers), in some vaccination centres, but also in community pharmacies. In October 2022, a pilot programme for the vaccination of the population against seasonal influenza in pharmacies was launched, according

to a new regulation. To obtain the authorization to vaccinate against influenza, the community pharmacy should be adequately equipped, and the vaccinating pharmacists should be certified for this activity. The certification is obtained after a 5-day course involving both theory and practical demonstrations, followed by an exam [15].

During the 2022 - 2023 influenza season, four tetra-valent influenza vaccines were available, produced on embryonated chicken eggs and having the antigenic composition recommended by the World Health Organization (WHO) for the Northern Hemisphere: A/Victoria/2570/2019 (H1N1) pdm09-like virus; A/Darwin/9/2021(H3N2)-like virus; B/Austria/1359417/2021 (B/Victoria lineage)-like virus; B/Phuket/3073/2013 (B/Yamagata lineage)-like virus [26].

The vaccine with high-dose antigen was available in Romania for the first time during the 2022 - 2023 season (receiving the authorization for use in Romania in May 2020), but only for self-purchase.

The main characteristics of the vaccines available in Romania during the 2022 - 2023 season can be found in Table I.

Table I

The main characteristics of influenza vaccines available in Romania during the 2022 - 2023 season [3, 5, 8, 23]

Vaccine brand	Vaxigrip Tetra™	Influvac Tetra™	Fluenz Tetra™	Efluelda®
Type of vaccine	Tetavalent influenza vaccine (fragmented, inactivated virion)	Tetavalent influenza vaccine (surface antigen, inactivated)	Influenza vaccine (live-attenuated, nasal administration)	Tetavalent influenza vaccine (fragmented, inactivated virion, high-dose antigen)
Administration route	Intramuscular or subcutaneous	Intramuscular or profound subcutaneous	Intranasal	Intramuscular or subcutaneous
Indications	≥ 6 months of age	≥ 6 months of age	24 months - 18 years old	≥ 60 years old
Antibiotics	Neomycin	Gentamicin	Gentamicin	-
Other substances	Traces of eggs	Traces of eggs	Traces of eggs	Traces of eggs

According to the current legal framework, all vaccinations carried out in Romania should be reported in the National Electronic Registry of Vaccinations [7, 14]. The aim of this paper is to present the results of the influenza vaccination campaign in Romania during the 2022 - 2023 season.

Materials and Methods

A descriptive study regarding the 2022 - 2023 influenza vaccination campaign in Romania was performed using the reports generated from the National Electronic Registry of Vaccinations on November 4, 2023. The selected study period was from September 1, 2022, to April 30, 2023.

A descriptive analysis was performed for the vaccines distributed through the National Vaccination Programme and another one for the influenza vaccines self-purchased. We also looked for the total number of adverse events following influenza immunisation (AEFI) reported in the National Electronic Registry of Vaccinations. The full study methodology, as well

as the advantages of the National Electronic Registry of Vaccinations, were previously described for the COVID-19 vaccination [4].

Results and Discussion

The Ministry of Health has distributed 1,500,000 doses of Influvac Tetra™ for the vaccination of high-risk groups through the National Vaccination Programme, from September 20, 2022, to September 27, 2022. The number of doses distributed is based on the estimated number of doses sent in the summer of 2022 by family doctors and other entities (such as hospitals, social care institutions and representatives of the defence system) for vaccinating eligible groups. From these, 1,479,803 (99%) doses of influenza vaccines were administered, most of them in the family doctors' offices (1,395,196; 94%), followed by the doses administered in the vaccination centres organised mainly within a healthcare facility (84,592; 6%). The highest number of doses was administered in Bucharest (88,092; 6%), the country capital,

probably due to the larger population. Following Bucharest were Constanța County (83,035; 5.6%) and Dolj County (79,854; 5.4%).

The highest number of doses administered was recorded in October 2022 (923,619; 62%) (Figure 1).

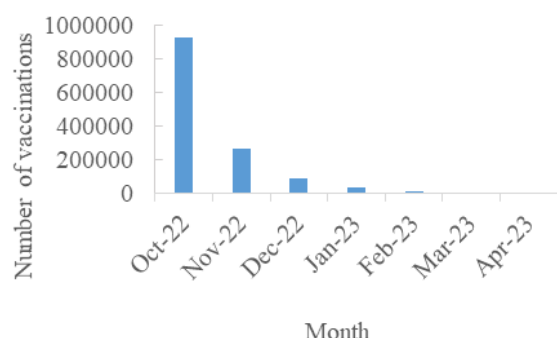


Figure 1.

The distribution of doses administered through the National Vaccination Programme in Romania, September 1, 2022 - April 30, 2023

Most doses were used for vaccinating people aged 65 years and over (873,405; 59%), but the vaccination

coverage among this group is only 24%. In Figure 2, it is noticeable the higher vaccination uptake in elderly people.

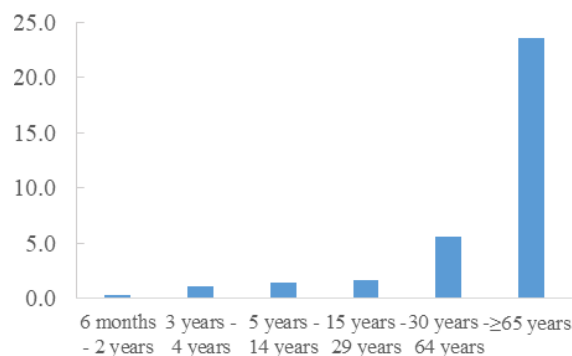


Figure 2.

The influenza vaccine uptake in Romania (by age group), 1 September 2022 - 30 April 2023

Regarding the distribution of doses administered, we can notice in Table II the distribution of doses administered by risk groups, others than extreme age groups.

Table II

The distribution of doses administered through the National Vaccinations Programme by risk group in Romania, September 1, 2022 - April 30, 2023

Risk group	Number of doses administered	Percentage of total doses administered
People aged 6 months - 64 years with chronic conditions	239,858	16.2
Healthcare workers	29,925	2.0
Social care protection beneficiaries	6,480	0.4
Pregnant women	494	0.0

The vaccination uptake among healthcare workers was 8%.

From the total number of doses distributed by the Ministry of Health, 793 were lost (0.05%), most of them as a consequence of cold chain interruption (711; 90%).

In addition to the doses administered through the National Vaccination Programme, 12,337 doses of influenza vaccines were self-purchased by people who did not benefit from the free vaccine.

In these cases, Vaxigrip Tetra™ (9,407; 76%) and Influvac Tetra™ (1,498; 12%) were the two most frequently used products. Efluelda® was less used (15; 0.1%). Most doses were used for the vaccination of people aged 30 to 64 years (4,906; 40%). About 25% (3,016) were used for children's vaccinations (aged 6 months to 14 years old).

The vaccination was mainly carried out in the family doctor's office (11,836; 96%), followed by the vaccination centres (388; 3%).

One hundred twelve (1%) doses were administered in community pharmacies authorised to vaccinate against influenza within the 2022 - 2023 pilot programme for the vaccination of the population against

seasonal influenza in pharmacies. The vaccination in pharmacies started on December 22, 2022, and was carried out in 8 counties, including Bucharest.

Overall, the influenza vaccine uptake (AV) during the 2022 - 2023 season was 8%, with variations from county to county (from 3% to 14%) (Figure 3).

During the study period, 253 adverse events following influenza vaccination (AEFI) were reported (representing 0.02% of the total number of doses administered, both from public and personal funds), one after the administration of the Fluenz Tetra™ vaccine and the others after the vaccination with Influvac Tetra™. Local reactions (108; 43%), asthenia (93; 37%) and joint pain (10; 4%) were the most frequently reported adverse events of these. One anaphylactic reaction was reported after the administration of Fluenz Tetra™. The median age of people who experienced AEFI was 64 years (IQR 47.5 - 73). No deaths were recorded.

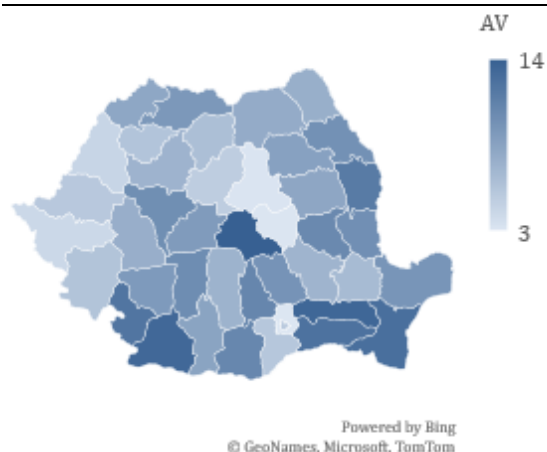


Figure 3.

The influenza vaccine uptake in Romania (by county), September 1, 2022–April 30, 2023

In this research, we set out to present the results of the influenza vaccination campaign in Romania during the 2022 - 2023 season, using data provided by the National Electronic Registry of Vaccinations.

In Romania, the 2022 - 2023 influenza vaccination campaign started at the end of September, with most doses being administered in October 2022, immediately after the receipt of the vaccine distributed by the Ministry of Health. Even if the vaccine was available on time and the utilisation rate was almost 100% for the national stockpile, the vaccination coverage is low, both in the overall population (8%), but also in the risk groups (24% in elderly people, 8% in healthcare workers). The influenza vaccine uptake has decreased over the past decade. For example, in 2007 - 2008, the vaccination uptake in the overall population was 16.6% and 49.4% in the elderly [17, 18]. In 2009 - 2010 and 2010 - 2011, the vaccination uptake in the overall population was 6% [17, 18]. In 2012 - 2013, the vaccination uptake in the overall population was 4.2% and 14.9% in the elderly [17, 18]. Other European nations have also reported declines in influenza vaccination coverage over time. In Poland, the influenza vaccination coverage rate has remained at a 3% threshold nationally in the past 10 years [11]. In 2020 - 2021, a higher influenza vaccination uptake was recorded in Romania (13% in the overall population, 35% in the elderly and 46% among healthcare workers), probably in the context of the COVID-19 pandemic. Starting with the 2021 - 2022 influenza season, a decrease in influenza vaccine uptake was reported, returning to values similar to pre-pandemic seasons (5.2% in the overall population and 16.3% in the elderly in 2017 - 2018, 6.8% in the overall population and 20.9% in the elderly in 2018 - 2019, respectively 7.9% in the overall population and 23.5% in the elderly in 2019 - 2020) [10]. It has been hypothesised that once the acute phase of the emergency was over, the attitude towards influenza

vaccination worsened [18], possibly because of the lack of a robust preventive culture, the fatigue of the population and the decrease in the level of trust in authorities. This dynamic of influenza vaccination uptake during the COVID-19 pandemic was also reported in other studies [6, 18, 20, 21].

However, the vaccination uptake among healthcare workers is worrisome, being lower compared with the previous seasons (21.5% in 2021-2022 [10], 45.9% in 2020 - 2021 [10]), but it is in accordance with the low uptake of bivalent vaccine against COVID-19 in this group, suggesting the fact that healthcare workers may be tired of respecting preventive measures and are not aware about the impact of influenza and about the benefits of influenza vaccination for protecting them, the patients and the community [19]. Further studies are needed to explore the nature of barriers among healthcare providers regarding influenza vaccination in Romania.

Even if most doses were used for vaccinating elderly people, the vaccination coverage of people aged 65 years and older is less than the target recommended by the World Health Organisation and the European Centre for Disease Control and Prevention.

In children and pregnant women who are at risk of contracting influenza, developing severe forms of influenza, or transmitting the virus to family members who are at risk of severe outcomes, influenza vaccination coverage is also very low. This suggests the need to design better educational campaigns targeting parents and carers.

In order to ensure an adequate immune response in the extreme age groups, the most appropriate influenza vaccine should be offered free of charge. During previous seasons, only standard-dose vaccines were offered free of charge, but high-dose antigen vaccines for older people and live-attenuated vaccines for healthy children should also be considered for total reimbursement. The data presented above showed that not all children aged less than 6 years of age benefited from the influenza vaccine from the national stockpile. For some of them, the vaccine was purchased, and live-attenuated vaccines were used in most of the cases, suggesting that parents are aware of the advantages of this vaccine.

In addition, the high utilisation rate of the national stockpile highlights better management of the vaccines, but also the need to increase the availability of influenza vaccines for more people. During the previous two seasons, a higher number of doses were available, but the utilisation rate was lower (84% in 2020 - 2021 and 76% in 2021 - 2022) [10]. In order to increase the availability of influenza vaccines and reduce the number of doses sacrificed, the legal framework that regulates the reimbursement of influenza vaccines for at-risk groups represents an important step in this direction. Moreover, the programme for vaccination of the population against seasonal influenza

in community pharmacies will contribute to increasing influenza vaccination uptake by facilitating access to influenza vaccines. Even if Romania does not have such a long experience in proving influenza vaccinations in pharmacies compared with other countries [1], and during the 2022 - 2023 season only 112 vaccinations were carried out in pharmacies, data from countries with more experience showed that providing vaccinations in pharmacies by authorised pharmacists improved vaccination coverage rates and group immunity, reducing healthcare costs and the inappropriate use of antibiotics [2].

Our study also showed a very low uptake of the influenza vaccine in the overall population. Therefore, it is necessary to mention that the benefits of influenza vaccination should be promoted both in at-risk groups and in the general population, because it has been suggested that the low circulation of influenza viruses seen with social distancing measures during the 2020 - 2021 and 2021 - 2022 cold seasons has probably also reduced population-level immunity; this implies that more people may be susceptible to severe influenza outcomes and potentially complications compared with pre-pandemic years [12].

The data presented above suggests the urgent need for improving influenza vaccination uptake in Romania. The 2022 - 2023 influenza season is only an example of an influenza season characterised by high morbidity and mortality after two seasons with reduced circulation of influenza viruses. During this season, influenza has put an additional burden on healthcare services; co-infections with other respiratory viruses were frequent and severe, and deaths were recorded [12]. By achieving a higher vaccination coverage rate, this burden could be reduced in the future.

The efforts should be focused on combating vaccine hesitancy through educational campaigns and communicating transparently all information on the safety and efficacy of influenza vaccines. Also, it is important to raise awareness about the importance of influenza vaccination among healthcare workers and to continue to involve healthcare providers and pharmacists in promoting and vaccinating against influenza (through training and clear responsibilities). The educational campaigns should also address the proper storage and transport conditions for influenza vaccines in order to be safe and effective.

Moreover, it is important to ensure a good development of the influenza vaccination campaign by ensuring adequate stocks of vaccines on time, ensuring funds for addressing the main causes that lead to low vaccination uptake, and timely payment of vaccination services.

Because data regarding adverse events following influenza immunisation used to be collected in different ways by June 2023, the limitations of this study are related to the insufficient data available in the National Electronic Registry of Vaccinations to

describe these [4]. Starting in June 2023, all AEFI must be reported in the National Electronic Registry of Vaccinations. In the near future, an accurate image of the safety of influenza vaccines will be offered by the National Registry of Vaccinations, and the data could be used to increase the level of trust of the population in this vaccine.

Conclusions

In Romania, influenza vaccination uptake remains low. Measures to increase the uptake of influenza vaccinations are needed to ensure better coverage. Our findings highlighted a suboptimal uptake of vaccines across all population groups (8% in the overall population), including those at high risk (8% among healthcare workers; 24% among people aged 65 years and older). Evidence-based interventions need to be included in future campaigns to improve availability and ensure that adequate knowledge and awareness are provided, with reference to the importance of the influenza vaccine.

Conflict of interest

The authors declare no conflict of interest.

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