

ATTITUDES AND PRACTICES REGARDING
THE SEASONAL INFLUENZA VACCINE IN STUDENTS
FROM MEDICAL COLLEGE “YORDANKA FILARETOVA”,
SOFIA

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Abstract

The influenza vaccine provides effective protection against seasonal flu, helping to reduce the risk of infection, severe illness, and complications. This study analysed attitudes, awareness, and practices related to the seasonal influenza vaccine among students at the Medical College “Yordanka Filaretova” in Sofia. A voluntary and anonymous survey was conducted with 97 students from the Medical Laboratory Technician programme and 54 from the Public Health Inspector programme, resulting in 84 completed responses. More than half of the respondents (62.0%) believe that young, healthy individuals do not need the vaccine, while 63.1% expressed concerns about potential side effects. A total of 11.9% respondents consider the vaccine ineffective, and 34.5% could not form an opinion on its effectiveness; 26.2% indicated they would get vaccinated if it were free, and 28.6% reported a lack of information about the vaccine. Increased awareness of the importance of the influenza vaccine and its benefits is crucial for benefit/risk assessment.

Key words: influenza vaccine, respiratory diseases, survey, benefit/risk assessment

Introduction. Influenza is a contagious respiratory disease with a rapid onset of symptoms, including high fever, headaches, muscle and body aches, fatigue,

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dry cough, sore throat, and gastrointestinal symptoms, such as nausea, vomiting, or diarrhea, especially in children. The severe complications include secondary bacterial pneumonia, often caused by *Staphylococcus aureus*, *Streptococcus pneumoniae*, or *Haemophilus influenzae*, ear infections, sinus infections, myocarditis, encephalitis, sepsis, and multi-organ failure [1,2].

CDC estimates there were 51 million influenza (flu)-related illnesses, 710 000 hospitalizations, and 45 000 deaths during the 2024–2025 flu season [3].

Influenza is a highly transmissible virus that can spread through respiratory droplets and contact with contaminated surfaces, where the virus can survive for up to 48 hours. Transmission rates typically peak during the winter months. Infected individuals are considered contagious from one day before the onset of symptoms until one week thereafter, with the highest viral dissemination occurring within the initial three to four days of symptom presentation [4,5].

The CDC Advisory Committee on Immunization Practices has made a “universal” recommendation since the 2010–2011 influenza season [6].

A variety of flu vaccines are available, each designed using different technologies and tailored to meet the specific needs based on age and individual health status [7] (Table 1).

Each year, the vaccines are formulated based on predictions by the World Health Organization (WHO). The WHO Global Influenza Programme provides a platform for influenza and other respiratory viruses surveillance data reporting and analysis. The information is shared through FluNet and fluID by the Global Influenza Surveillance and Response System (GISRS) and national epidemiological institutions [8].

T a b l e 1
Types of influenza vaccines

Type of influenza vaccine	Route of administration	Recommendations based on age and health status
Inactivated vaccine	Intramuscular injection	For children older than 6 months of age, healthy adults (18–64 years), pregnant women
Recombinant vaccine	Intramuscular injection	For healthy adults (18–64 years) and older adults (65+)
Live attenuated vaccine	Intranasal application (spray)	For children older than 2 years of age and healthy adults (18–50 years)
Cell-based vaccine	Intramuscular injection	For healthy adults (18–64 years) and older adults (65+)
Specialized formulations of inactivated vaccines	High-dose vaccine	Designed for a stronger immune response in people (65+)
	Adjuvanted vaccine	Includes an adjuvant to boost the immune response in seniors

The effectiveness of the influenza vaccine can vary considerably from year to year, and this is primarily attributed to the structure and behaviour of the influenza virus. The virus is known for its ability to mutate and change its surface proteins, which can lead to different strains emerging [7, 9].

Influenza virus is classified into subtypes based on the presence of its surface proteins, hemagglutinin (H) and neuraminidase (N). Currently, 18 distinct subtypes of haemagglutinin and 11 subtypes of neuraminidase have been identified, highlighting the diversity and complexity of viral strains. Influenza A is the most common type with variants like H1N1 and H3N2, which are found in humans and animals (birds and pigs), and are responsible for pandemics. Influenza B viruses circulate almost exclusively in humans and do not cause pandemics. They are classified into two main lineages: B/Yamagata and B/Victoria. While often milder than A, they can still cause severe illness. Influenza C are generally mild, sporadic, and do not cause epidemics. Influenza D primarily affect cattle and pigs and are not known to cause illness in humans [5, 10].

Influenza viruses mutate rapidly through antigenic drift, which leads to small mutations and antigenic shift, which may cause major changes. These mutations, particularly in the H and N surface proteins, allow the virus to evade the immune system. This capability is a key factor in reducing the effectiveness of vaccines and is responsible for both seasonal outbreaks and the potential for pandemics [11].

Effective communication and education are essential for encouraging vaccine acceptance among medical students. Due to their high social activity, increased mobility, and regular interactions with patients, medical students may contribute to the spread of diseases.

The findings across medical students from different countries are remarkably consistent. They generally acknowledge the importance of influenza vaccination, but actual vaccination rates are often lower than expected, especially in countries where vaccine promotion is weak.

A cross-sectional study in the Faculty of Medicine, University of Barcelona, Spain, during the 2010–2011 academic year, revealed that out of the 421 students who answered the questionnaire, only about 27%, intended to receive the flu vaccine [12].

Another cross-sectional study based on an anonymous questionnaire for 266 medical students of two Medical Schools in the Republic of Cyprus demonstrated that the majority believed that influenza and SARS-CoV-2 vaccines are safe and effective, but only 20.1% had been vaccinated in 2020–2021 against influenza [13].

A survey of medical students of Warsaw Medical University, Poland ($n = 502$), the Faculty of Medicine of Strasbourg University, France ($n = 371$) and Teheran University of Medical Sciences, Iran ($n = 172$) disclosed that the vaccination of students during the year of the survey was generally infrequent: the highest was in Strasbourg 29.7%; it was lower in Warsaw 15.2%, and lowest in Teheran at 4.7% [14].

The aim of this study is to analyze students' attitudes, awareness, and practices regarding the seasonal influenza vaccine and to identify factors influencing the decision to vaccinate.

Materials and methods. The method used was a questionnaire survey. The questionnaire was voluntary and offered to students of the Medical College "Yordanka Filaretova".

Twelve questions were included, concerning the frequency of vaccination (every year/sometimes/never), the level of awareness and the attitudes towards effectiveness and safety. The results of all 12 questions were presented in charts.

Results. A voluntary and anonymous survey was submitted to a total of 97 students from the Medical Laboratory Technician programme and 54 from the Public Health Inspector programme. In the survey, 84 respondents completed the questionnaire. These were 67 students from the speciality Medical Laboratory Technician and 17 students from the speciality Public Health Inspector.

The respondents were of various ages, categorized as follows: between 19 and 21 years old ($n = 46$, 54.8%), between 29 and 42 years old ($n = 30$, 35.7%), and between 47 and 56 years old ($n = 8$, 9.5%). In terms of gender distribution, there were 76 female respondents (90.5%) and 8 male respondents (9.5%). The following graphics illustrate the results from the answers (Fig. 1–3).

Sixty point seven one percent stated that they do not receive the flu vaccine at all, and only 3.57% reported getting vaccinated each year (Fig. 1A). Only one person reported receiving the flu vaccine this year, while 8.33% ($n = 7$ respondents) received it in the previous year (Fig. 1B).

More than half of respondents (62.0%) believe that young and healthy people do not need a flu vaccine (Fig. 2A). The majority of respondents stated that a doctor's recommendation is the key motivator for vaccination. Nine point five two percent of the students answered that the negative experience with the flu is a key factor in their decision to vaccinate (Fig. 2B). Regarding the question of whether the respondents consider the vaccine effective, there was no significant difference between those who stated they could not form an opinion (34.5%) and those who

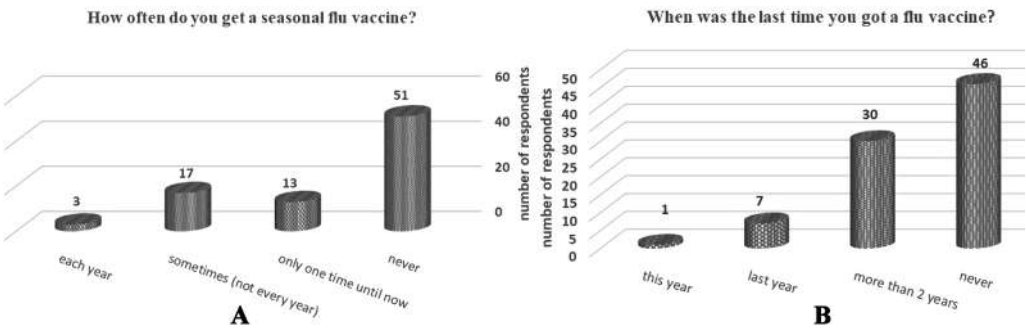


Fig. 1. Practices regarding the influenza vaccine

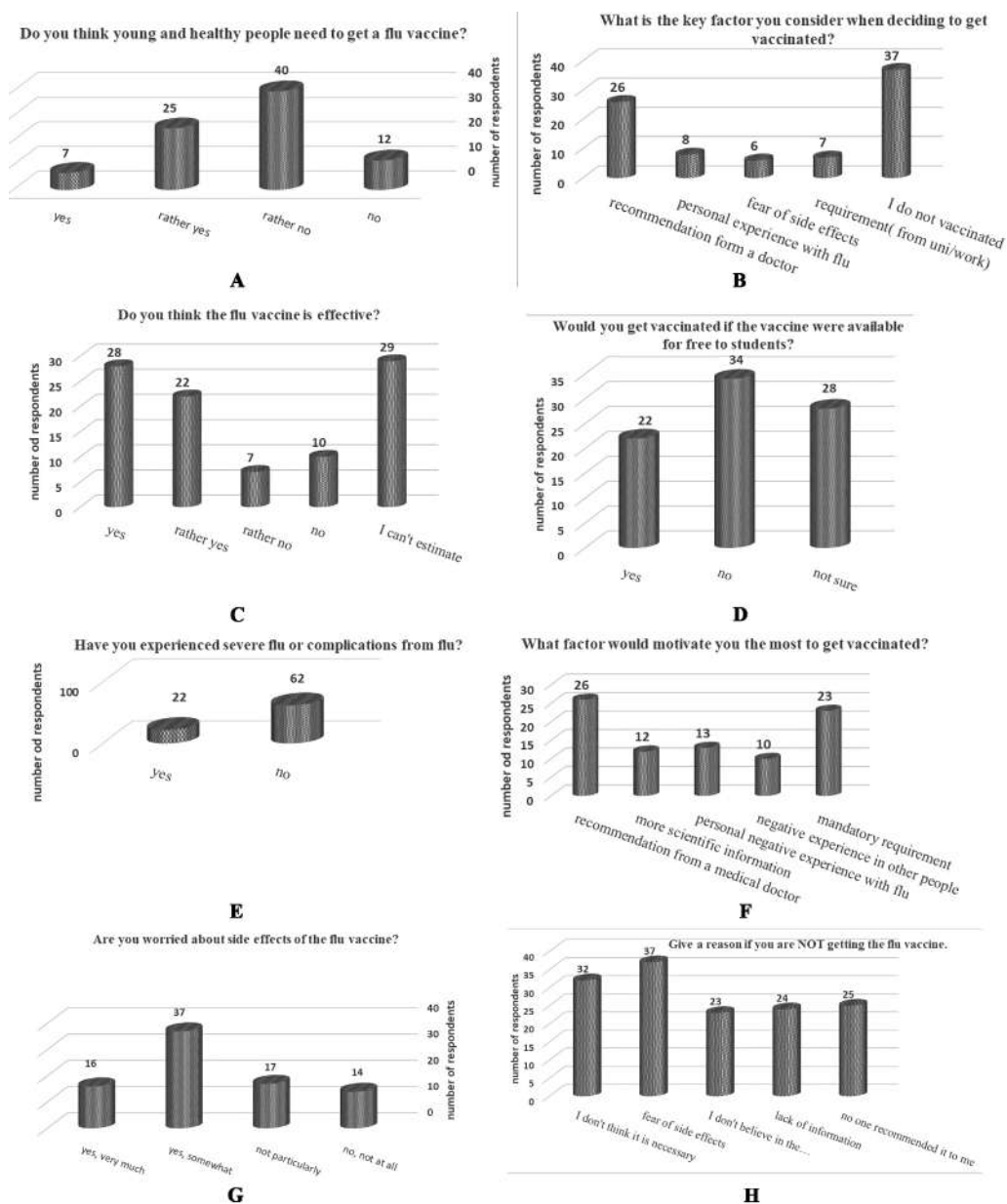


Fig. 2. Attitudes regarding the influenza vaccine and environmental impact

categorically stated that they consider it effective (33.3%). Eleven point nine percent of respondents indicated that they consider the vaccine to be ineffective (Fig. 2C), while 26.19% of respondents indicated that they would get the vaccine if it were free (Fig. 2D). Twenty-two of respondents reported experiencing severe flu or complications afterward (Fig. 2E). A significant portion of the participants,

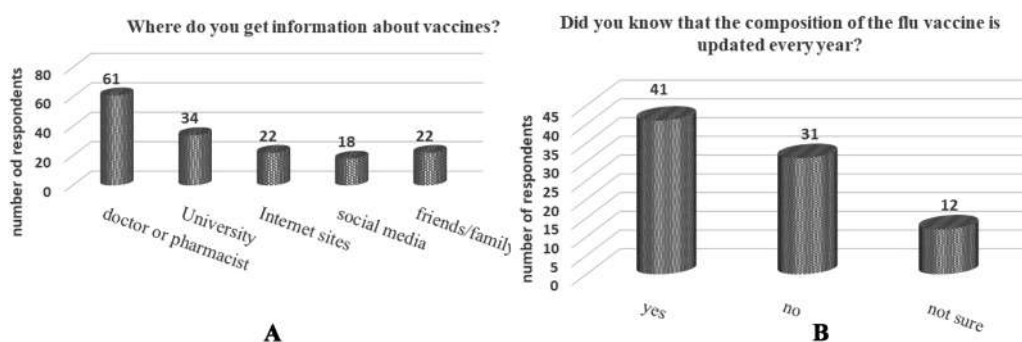


Fig. 3. Awareness regarding the influenza vaccine

specifically 63.10%, expressed concerns about the potential side effects associated with the vaccine. Among these individuals, 19.05% reported feeling very afraid about the possible adverse reactions they might experience (Fig. 2G). As other reasons for not getting vaccinated, after the main reason of fear of side effects from vaccination (44.05%), most people indicate that they do not consider it necessary (38.10%). Almost equal percentages believe that the flu vaccine is ineffective (27.38%) and that they lack information regarding the vaccine (28.57%) (Fig. 2H).

The majority of the respondents find that medical doctors (72.62%) and educational institutions (40.48%) are the most trusted sources for vaccine information (Fig. 3A). Nearly half of the respondents are informed that the composition of the flu vaccine changes every year (48.81%). Meanwhile, 36.90% of respondents indicated that they do not know, and 14.29% are unsure of their answer (Fig. 3B).

Discussion. About half of the respondents in our survey believe that the vaccine is not effective, citing fear of possible side effects as the predominant reason and declaring that they need more information about the vaccine.

Influenza vaccine effectiveness can vary, and this factor is one of the key considerations in the vaccination decision-making process. The protection provided by a flu vaccine varies from season to season and depends in part on the age and health status of the person getting the vaccine, what type of vaccine is used and the similarity between the viruses included in the vaccine and those circulating in the community. During years when the flu vaccine match is good, it is possible to measure substantial benefits from flu vaccination in terms of preventing flu illness and complications. For the 2026–2027 Northern Hemisphere influenza season, the WHO recommends quadrivalent vaccines containing a Missouri H1N1-like virus, a Darwin H3N2-like virus, and a Tokyo B/Victoria-lineage virus [7, 15].

The vaccine hesitancy is influenced by psychological, social, and informational factors. The fear of side effects is the primary reason. Most vaccines are very safe, but the risk perception is often amplified, leading people to overestimate rare risks. Additionally, some people have low trust in healthcare systems or pharmaceutical companies. Misinformation and claims such as vaccines causing autism

or infertility persist despite strong scientific evidence to the contrary, influencing decision-making [16].

It is very common among young and healthy people to have the attitude that they are unlikely to get seriously ill, reducing the motivation for preventive measures like vaccination. Some people are adherent to natural remedies, relying on their natural immunity and homeopathy treatments. Natural immunity is the first line of defense, but in some cases, it often comes with significant risks and complications, and the application of vaccines may be necessary [17].

Accessibility is another important factor. Even willing individuals may miss the vaccination if access is limited. The strongest recommendations may come from trusted professionals, and this may significantly increase the acceptance, as declared by a large group of respondents. If the vaccine is not actively recommended, patients may not prioritize it. Only a small number of countries worldwide reach the target of 75% vaccination rate [17,18].

According to recent data (WHO, OECD, Eurostat), countries with high influenza vaccination rates among people 65+ years of age are South Korea – about 85%, Mexico – about 83%, the United Kingdom – about 75–78%, Denmark – about 77–78%, and Ireland – also about 75% [19].

Among EU countries, Denmark reported the highest vaccination rate for people aged 65 or over at 77.5%, followed by Ireland (75.7%) and Portugal (71.8%). By contrast, Poland (9.6%), Slovakia (11.7%), and Bulgaria (15.2%) had the lowest rates. Bulgaria had the biggest increase in vaccination rates of people aged 65 or over (+46.2%) compared with 2022, ahead of Lithuania (+12.1%) and Poland (+11.6%) [20].

Conclusions. Increased awareness is essential regarding the necessity for the influenza vaccine, the negative consequences of influenza complications, and the composition of the vaccine to enable an accurate benefit/risk assessment. We recommended updating and expanding awareness of epidemiology and vaccinology so that future specialists are prepared to meet the challenges of highly contagious infections such as influenza.

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