

## Reasons for influenza vaccination in older adults in 2019 and 2020

Motivos para vacinação contra influenza em idosos em 2019 e 2020

Motivos para la vacunación contra la influenza en adultos mayores en 2019 y 2020

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**Abstract**

**Objective:** To assess influenza vaccination coverage and reasons for vaccination or not in older adults, in the campaigns of 2019 and 2020.

**Methods:** This is a quantitative and longitudinal study, carried out in Três Lagoas (MS). Older adults registered in health care or social services participated. In the first quarter of 2020, 172 older adults were assessed in person, of whom 86 were re-interviewed between August and October 2020 through telephone contact. In the first interview, questions were asked about the flu vaccination in 2019 and the reasons for vaccination or not. In the second, the questions were about vaccination in 2020 and why. Vaccination coverage for 2019 and 2020 was compared using the McNemar test.

**Results:** There was a predominance of women, with an average age of 69.1 years. Vaccination coverage in 2019 was 90.7%. Most of them took the vaccine because they believed it was important. As reasons for non-vaccination, the previous reactions and the fact that they did not have the flu were highlighted. In 2020, coverage was 86.0%. Most older adults were vaccinated because the vaccine was available in the Unified Health System (*Sistema Único de Saúde*). The reasons for non-vaccination were fear of leaving home due to the pandemic and lack of professional guidance. There was no significant difference in vaccination coverage in 2019 and 2020 ( $p=0.388$ ).

**Conclusion:** Vaccination coverage decreased in the year of the pandemic, with no significant difference. Reliable information from healthcare professionals and the media is essential for maintaining high vaccination coverage.

**Resumo**

**Objetivo:** Avaliar a cobertura vacinal para influenza e os motivos para vacinação ou não em idosos, nas campanhas dos anos de 2019 e 2020.

**Métodos:** Estudo quantitativo e longitudinal, realizado em Três Lagoas (MS). Participaram idosos cadastrados em serviços de saúde ou de convivência. No primeiro trimestre de 2020, foram avaliados presencialmente 172 idosos, dos quais 86 foram reentrevistados entre agosto e outubro de 2020 por meio de contato telefônico. Na primeira entrevista, questionou-se sobre a vacinação contra a gripe em 2019 e os motivos para vacinação ou não. Na segunda, as questões foram sobre a vacinação em 2020 e os motivos. As coberturas vacinais de 2019 e 2020 foram comparadas pelo teste de McNemar.

**Resultados:** Houve predomínio de mulheres, com média de 69,1 anos de idade. A cobertura vacinal em 2019 foi de 90,7%. A maioria tomou a vacina por acreditar que era importante se vacinar. Como motivos para a não vacinação, destacaram-se as reações anteriores e o fato de não ficar gripado. Em 2020, a cobertura foi

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de 86,0%. A maioria dos idosos se vacinou pelo fato de a vacina estar disponível no Sistema Único de Saúde. Os motivos para não vacinação foram medo de sair de casa devido à pandemia e falta de orientação profissional. Não houve diferença significativa na cobertura vacinal em 2019 e 2020 ( $p=0,388$ ).

**Conclusão:** A cobertura vacinal diminuiu no ano da pandemia, sem diferença significativa. Informações confiáveis de profissionais de saúde e da mídia são essenciais para a manutenção de altas coberturas vacinais.

## Resumen

**Objetivo:** Evaluar la cobertura vacinal de la influenza y los motivos para la vacunación o no de adultos mayores en las campañas de los años de 2019 y de 2020.

**Métodos:** Estudio cuantitativo y longitudinal, realizado en Três Lagoas (Mato Grosso do Sul). Participaron adultos mayores registrados en servicios de salud o de convivencia. En el primer trimestre de 2020, 172 adultos mayores fueron evaluados presencialmente de los que 86 fueron entrevistados nuevamente entre agosto y octubre de 2020 por medio de contacto telefónico. En la primera entrevista, se preguntó sobre la vacunación contra la gripe en el 2019 y los motivos para vacunarse o no vacunarse. En la segunda, las preguntas fueron sobre la vacunación en el 2020 y los motivos. Las coberturas vacunales de 2019 y de 2020 fueron comparadas por la prueba de McNemar.

**Resultados:** Hubo un predominio de mujeres, con un promedio de 69,1 años de edad. La cobertura vacinal en el 2019 fue del 90,7 %. La mayoría tomó la vacuna por considerar que era importante vacunarse. Como motivos para la no vacunación, se destacaron las reacciones anteriores y el hecho de no quedarse engripado. En el 2020, la cobertura fue del 86,0 %. La mayoría de los adultos mayores se vacunó por el hecho de que la vacuna está disponible en el Sistema Único de Salud. Los motivos para la no vacunación fueron el miedo de salir de casa en función de la pandemia y la falta de orientación profesional. No hubo diferencia significativa en la cobertura vacinal en el 2019 y el 2020 ( $p=0,388$ ).

**Conclusión:** La cobertura vacinal disminuyó el año de la pandemia, sin significativa diferencia. Informaciones confiables de profesionales de salud y de los medios son esenciales para el mantenimiento de altas coberturas vacunales.

## Introduction

The influenza vaccine was first made available by the Brazilian National Immunization Program (PNI - Programa Nacional de Imunização) in 1999, for older adults from 65 years. In 2000, the age group was extended to 60 years, and the current goal of vaccination coverage in older adults is 90%.<sup>(1)</sup> The main purpose of the vaccine is to reduce, among the most susceptible, the chance of complications, such as pneumonia, hospitalization and death, especially in risk groups.<sup>(2)</sup>

Vaccination of older adults against influenza depends on several factors. One study identified that vaccination coverage increases with advancing age, the number of chronic conditions, the fact that he is a former smoker, a worse health assessment, a greater number of visits to the health service in the previous weeks and blood pressure measurement in the last 12 months.<sup>(3)</sup> In other investigations, the reasons for not vaccinating were not wanting to be vaccinated or not liking it, forgetting, not having the flu, being afraid, having a previous adverse reaction or a cold after taking it in previous years, being sick, being allergic and medically contraindicated.<sup>(4,5)</sup>

In December 2019, the disease caused by coronavirus 2019 (COVID-19) appeared in China. In January 2020, it was declared an Emergency in Public Health of International Concern, and on

March 11, 2020, it was characterized as a pandemic.<sup>(6,7)</sup> On March 11, 2021, after 1 year of pandemic, there were 11,277,717 cases and 271,889 deaths confirmed by COVID-19 in Brazil.<sup>(8)</sup> The pandemic highlighted the need to reorganize practices and services to the population, generating numerous challenges for the health system.<sup>(6)</sup>

Annual vaccination is the first line of defense against influenza. Prevention against influenza during the COVID-19 pandemic can reduce the burden of the health system and the demand for care, as well as help in the differential diagnosis, releasing services to meet demands arising from the new coronavirus, and in co-infection management, while the COVID-19 vaccine is not yet available to the entire population.<sup>(9-11)</sup>

During the COVID-19 pandemic in 2020, several strategies were adopted in the annual influenza vaccination campaign to meet the expected vaccination coverage. They included the use of digital technologies to publicise the campaign; vaccination in stages; the vaccine application in external areas of health units and in schools, day care centers and community centers (different places of care were chosen for suspected cases of COVID-19); drive-thru vaccination; professional training and distancing in queues, in addition to the use of masks and constant hand washing.<sup>(9,11,12)</sup>

Prevention measures, such as social distancing, mask use and hand washing, associated with influenza vaccination, resulted in a reduction in the number of influenza cases globally.<sup>(13,14)</sup> However, the pandemic may have affected vaccination coverage in Brazil and worldwide, which may result in the resurgence of several diseases, in addition to co-infection of influenza and COVID-19, causing higher mortality.<sup>(11,13,15)</sup>

The maintenance of high vaccination coverage for influenza was a premise in Brazil in 2020, aiming to reduce the impact on the health system, overloaded with patients with COVID-19,<sup>(16)</sup> however, it is not known the impact that the pandemic may have had on vaccination of older adults against influenza. The present study aimed to assess the vaccination coverage for influenza vaccine and the reasons for vaccination or not in older adults in the 2019 and 2020 campaigns.

## Methods

This is a quantitative and longitudinal study, developed in the municipality of Três Lagoas, which is located on the east coast of the state of Mato Grosso do Sul and borders the state of São Paulo. In 2010, the city had 101,791 inhabitants, and 9.9% were  $\geq 60$  years. The estimated population for 2020 was 123,281 inhabitants.

People aged 60 years or over, registered in a health or community service in the city and able to respond to the interview, as perceived by the interviewer, were included. Not living in the municipality was an exclusion criterion.

For the first interview, the sample was calculated by the formula for estimating proportion in a finite population study, considering the significance level of 10% ( $\alpha=0.10$ ), a sampling error of 5% ( $e=0.05$ ), an estimated proportion of 80% ( $p=0.80$ ) and a finite population of 10,067 (number of older adults living in the municipality), resulting in the minimum sample of 171 older adults.

From January to March 2020, 183 older adults were invited to participate in the study, and 11 refused. A total of 172 older adults (response rate of

93.9%) were randomly interviewed during care in Basic Health Units ( $n=53$ ), Center for Medical Specialties ( $n=40$ ), Older adults Clinic ( $n=50$ ) and associations of retirees that offered social activities ( $n=29$ ).

In the interviews, the phone number of older adults was collected, who were contacted between August and December 2020. Two older adults had no phone. Of the remaining 170, 53 did not answer, and 21 phones did not exist. Still, in three cases, the person who answered the phone did not know the older adult, two numbers were commercial, and five older adults died, resulting in 86 older adults (50% of older adults initially interviewed). Contact was attempted three times, in alternate periods. The final sample consisted of 86 older adults who answered both the one-to-one interview and the telephone interview.

The groups (losses and re-interviewees) were compared and were similar in terms of sex ( $p=0.426$ ), marital status ( $p=0.445$ ), self-perceived health ( $p=0.449$ ), age ( $p=0.699$ ), education (0.634) and family income ( $p=0.720$ ), according to the chi-square test, categorical variables, and Mann-Whitney U test, for continuous variables.

The one-to-one interviews took place in a reserved place, while the older adults waited for care or participated in the service activities. The telephone interviews were conducted individually, maintaining information confidentiality. The evaluators were trained for such approaches.

The questionnaire was developed by the researchers, according to Ministry of Health vaccination manuals, the Brazilian Immunization Society (SBIIm - *Sociedade Brasileira de Imunização*) and with influenza vaccination data listed in the literature. With the reading of these materials, added to the practical experience of the researchers in working in immunization services, an instrument was constructed, listing several possible reasons for vaccination and non-vaccination. The instrument was submitted to face validation, a subtype of content validation, in which colleagues or research subjects assess the content to verify if it really reflects what the researcher wants to assess.<sup>(17)</sup> Validation was done by three nurse professionals, two with experi-

ence in gerontology and one in vaccination. The instrument was adapted according to the suggestions. Then it was applied in five older adults, to verify the understanding and the ease of application, not being necessary change and resulting in the following questions below.

In the first interview, which was in person, interviewee sociodemographic and health characterization was made, recording sex, age, education (years), marital status (with or without a partner), monthly family income (R\$), number of people living in the house (including adults older) and self-rated health (very good/good; regular/ bad/ very bad).

The question about influenza vaccination was as follows: “Did you take the vaccine in 2019?” The reasons for vaccination and non-vaccination were also questioned in the previous campaign (Chart 1). “Which professional do you think should clarify doubts about the influenza vaccine, or in case of adverse reactions?”, was also asked, and the answer options for this question were: doctor, nurse, nursing technician, community health worker (CHW) or do not know; “Do you often receive reminders when the older adult vaccination campaign is near?” and “Who gives the reminders?”, with doctor, nurse, nursing technician, CHW and media as response options. The second interview was by phone, and the question was “Did you take the flu vaccine in 2020?”, in addition to the reasons for taking it or not.

Data were analyzed through the Statistical Package for the Social Sciences (SPSS), version 25.0, through frequency, percentage and mean ± standard deviation. Vaccination coverage for 2019 and 2020 was defined as a percentage and by 95% confidence interval (95% CI) for proportion. The older adults groups that took and did not take the vaccine in 2019 and 2020 were compared for sociodemographic and health variables, using the chi-square test for categorical variables and the Mann-Whitney U test for continuous variables, due to the absence of normality in data distribution. The 2019 and 2020 ratios were compared using McNemar’s exact test. The significance level adopted was  $p \leq 0.05$ .

**Chart 1.** Reasons asked for vaccination and non-vaccination of older adults in 2019 and 2020

Reason	Vaccination in 2019	Vaccination in 2020
Conviction (the vaccine really works and it is important to be vaccinated)	X	X
Absence of flu episode after starting to take annually	X	X
Receive/rely on the guidance of a healthcare professional	X	X
Receive guidance from family/friend		
Vaccine availability in the Unified Health System	X	X
Advertising on television/radio/media	X	X
Protection and composition are different every year	X	X
Often flu	X	X
Loss of effect after 1 year	X	X
Increase in cases of the disease	X	X
Increase in deaths from the disease	X	X
Receiving the vaccine at home		
Pandemic COVID-19 (reduction of impact on the health system)		X
Influenza vaccine protects against COVID-19		X
	Non-vaccination in 2019	Non-vaccination in 2020
Not to have the flu	X	X
Previous reaction	X	X
Fear/ dislikes needle	X	X
Relative/friend said it is bad	X	X
Know someone who has had a reaction	X	X
Lack of professional guidance	X	X
Difficulty in accessing the vaccine	X	X
Vaccines are useless	X	X
One dose in life is enough	X	X
Did not know/does not know when the campaign will be	X	X
Lack of vaccine	X	X
Fear of leaving home due to pandemic		X

The project was approved by the Institutional Review Board of the *Universidade Federal do Mato Grosso do Sul* (CAAE (*Certificado de Apresentação para Apreciação Ética* - Certificate of Presentation for Ethical Consideration) 22845719.6.0000.0021). All older adults who agreed to participate read and signed the Informed Consent Form.

## Results

Of the 86 older adults interviewed, the majority were female (67.4%) and rated health as very good/good (52.3%). Half of them had a partner. The mean age was  $69.1 \pm 5.7$  years (median of 69.0), and the mean schooling was  $6.2 \pm 5.0$  years (median of 5.0). The average monthly family income was R\$3,072.80 (about US\$558.69) ± 2,090.00 (about US\$380) (median of R\$2,090.0), and older adults lived in homes with  $2.4 \pm 2.0$  people (median of 2.0).

The most cited professional to clarify the vaccine was physician (40.7%), followed by nurse (20.9%), CHW (19.8%) and nursing technician (14.0%). They could not say 18 older adults (20.9%). About vaccination reminders, 98.8% reported receiving them, and the most cited as responsible for reminding them were the media (72.1%) and the CHW (51.2%).

Vaccination coverage in 2019 was 90.7% (95%CI 82.7-95.2) and, in the 2020 campaign, 86.0% (95%CI 77.2-91.8). When the coverage was compared, it was observed that there was no difference in the proportions of responses ( $p=0.388$ ).

Table 1 shows the comparison between the older adults groups who took and did not take the vaccine in 2019 and 2020 for characterization data. No significant differences were identified between the variables in the two periods studied.

**Table 1.** Comparison of older adults ( $n=86$ ) who were vaccinated and did not vaccinate against influenza in 2019 and 2020 regarding sociodemographic and health variables

Took the vaccine	2019		p-value*	2020		p-value*
	Yes (median or %)	No (median or %)		Yes (median or %)	No (median or %)	
Sex			0.754			0.547
Female	91.4%	8.6%		84.5%	15.5%	
Male	89.3%	10.7%		89.3%	10.7%	
Age, years	69.0	68.0	0.587	69.0	69.0	0.940
Education, years	4.5	6.5	0.533	5.0	5.0	0.782
Family income, R\$	2.090.0	2.400.0	0.970	2.090.0	1.930.0	0.821
Marital status			0.458			1.000
With a partner	93.0%	7.0%		86.0%	14.0%	
Without a partner	88.4%	11.6%		86.0%	14.0%	
People in the house	2.0	2.0	0.790	2.0	2.0	0.839
Self-perceived health			0.539			0.438
Very good/good	93.3%	6.7%		82.2%	17.8%	
Regular	85.7%	14.3%		92.9%	7.1%	
Very bad/bad	92.3%	7.7%		84.6%	15.4%	

\* Chi-square test for categorical variables and Mann-Whitney U test for continuous variables

The reasons for vaccination and non-vaccination in 2019 and 2020 are presented in Table 2.

In 2019, the majority of older adults took the vaccine by conviction, because they believed it really worked and it was important to be vaccinated (78.2%), followed by those who did not have the flu after starting to be vaccinated annually (34.6%) and those who took for vaccine availability and advertisements on television/radio/media (26.9% each). Among the older adults who did not be vaccinated, 37.5% did not take it by previous reaction and 25.0% did not have the flu.

**Table 2.** Reasons for vaccination and non-vaccination of older adults ( $n=86$ ) against influenza in the years 2019 and 2020

Vaccination reasons*	2019 ( $n=78$ )	2020 ( $n=74$ )
	n(%)	n(%)
Conviction (the vaccine really works and it is important to be vaccinated)	61(78.2)	34(45.9)
Absence of flu episode after starting to take annually	27(34.6)	44(59.5)
Vaccine availability in the Unified Health System	21(26.9)	56(75.7)
Advertising on television/radio/media	21(26.9)	45(60.8)
Receive/rely on the guidance of a healthcare professional	20(25.6)	43(58.1)
Protection and composition are different every year	20(25.6)	42(56.8)
Often flu	17(21.8)	4(5.4)
Loss of effect after 1 year	16(20.5)	48(64.9)
Increase in cases of the disease	8(10.3)	5(6.8)
Increase in deaths from the disease	3(3.8)	2(2.7)
COVID-19 pandemic (reduced impact on the health system)	-(-)	43(50.0)
Influenza vaccine protects against COVID-19	-(-)	11(12.8)
Reasons for non-vaccination*	2019 ( $n=8$ )	2020 ( $n=12$ )
	n(%)	n(%)
Previous reaction	3(37.5)	2(16.7)
Not having the flu	2(25.0)	2(16.7)
Fear/ dislikes needle	1(12.5)	1(8.3)
Did not receive/do not trust the guidance of a health professional	1(12.5)	3(25.0)
Vaccines are useless	1(12.5)	-(-)
Have not heard about the campaign.	-(-)	2(16.7)
Difficulty in accessing the vaccine	-(-)	2(16.7)
Relative/friend said it is bad	-(-)	-(-)
Know someone who has had a reaction	-(-)	-(-)
One dose in life is enough	-(-)	-(-)
Lack of vaccine	-(-)	-(-)
Fear of leaving home due to pandemic	-(-)	3(25.0)

\*Non-mutually exclusive categories

Among the older adults who took the vaccine in 2020, the most cited reasons were vaccine availability in the Unified Health System (SUS – *Sistema Único de Saúde*), with 75.7%, loss of effect after 1 year (64.9%) and advertising on television/radio/media (60.8%). Taking the vaccine to reduce the impact on the health service due to COVID-19 was reported by 50.0% of older adults. For older adults who did not take the vaccine in 2020, the main reasons were fear of leaving home due to the COVID-19 pandemic (25.0%) and the fact that they did not receive/did not rely on the guidance of a health professional (25.0%).

## Discussion

Vaccination coverage for influenza in the older adults assessed was 90.7% in 2019 and 86.0% in 2020, with no significant difference. In 2019, most

took the vaccine because they believed it was important to be vaccinated. Among the older adults who did not receive the vaccine, the reasons were previous reactions and the fact that they did not have the flu. In 2020, the majority of older adults were vaccinated because the vaccine was available in SUS, and 50% mentioned the pandemic as a reason for vaccination, as a way to reduce the impact on the health system. The reasons for non-vaccination were fear of leaving home due to the pandemic and lack of professional guidance.

The identified values of influenza vaccination coverage in older adults, both in 2019 and in 2020, were higher than those reported in previous studies conducted in Brazil, as 79.7% in the city of São Paulo, in 2015,<sup>(18)</sup> and 73.0% in a study with data from 70 Brazilian municipalities, conducted in 2015/2016.<sup>(19)</sup> Despite this and no significant difference was identified between the 2019 and 2020 coverage in the sample, the 2020 figure was lower than the national target, which was 90%.<sup>(1)</sup> Data from the municipality of Três Lagoas available in the Brazilian National Immunization Program Information System (SI-PNI - *Sistema de Informação do Programa Nacional de Imunizações*) show vaccination coverage for influenza in older adults of 118.4% in 2019 and 129.7% in 2020.<sup>(20)</sup> It is worth noting that coverage above 100% may indicate a lag in the number of older adults used to calculate it, not demonstrating the situation's reality.<sup>(21)</sup>

Considering more current data, during the pandemic, preliminary data from the EPICOV-19 study, conducted in 2020 with 8,265 older adults, found that vaccination coverage for influenza was 82.3%.<sup>(22)</sup> Italian data indicate that vaccination coverage for influenza in patients who were hospitalized for COVID-19, especially in older adults, was only 44.2%,<sup>(23)</sup> which shows another factor that may be related to lower vaccination in 2020. Future studies should investigate whether older adults who did not join the campaign were hospitalized by COVID-19. Thus, vaccination coverage in the pandemic year needs to be further explored, as they may indicate regional disparities, data lag or even influence of hospitalizations and deaths due to the pandemic.

In 2019, believing that the vaccine really worked, not having more flu after vaccination, vaccine availability and media advertisements were the most cited reasons for vaccination. These data corroborated previous studies that highlighted the importance of knowledge for vaccination.<sup>(5,24,25)</sup>

On the other hand, non-vaccination was justified by previous adverse reactions and reports of not having the flu. Adverse events may occur after vaccination, resulting from errors in vaccine conservation, handling and application. Most of them are benign and transient, and severe reactions are rare.<sup>(26)</sup> To control them, the knowledge of professionals working at the vaccination site is required. Furthermore, needle fear has already been reported as a factor that can interfere with vaccination, and professionals working in the vaccination room play a fundamental role in reassuring the patient and promoting effective health education.<sup>(19,27)</sup>

As reasons for vaccination in 2020, the availability of the vaccine, the loss of effect after 1 year and the advertising in the media were mentioned. A systematic review and meta-analysis analyzed 106 studies, which indicated that cost reduction for patients (vaccine availability), clinical reminders, different personal and direct contact strategies and media campaigns were associated with increased vaccination.<sup>(25)</sup> Another investigation identified that favorable factors for vaccination included ease of access to the service, encouragement of health providers, and use of media and social networks.<sup>(28)</sup>

The media can contribute to increasing vaccination coverage through guidance on the vaccine's purpose, dissemination of dates and incentive to vaccinate the population, both by the Ministry of Health campaigns and by experts' newspaper reports and interviews, to answer possible population's doubts.<sup>(29,30)</sup>

The pandemic affects a large number of people and impose new rules and habits for the population. Pandemic information is constant in the media.<sup>(27)</sup> The media may also have contributed to 50% of older adults reporting that they had taken the vaccine because it could reduce the impact on the health system due to the COVID-19 pandemic, as this information was disseminated during the cam-

paign.<sup>(9,11,12,16)</sup> The media's credit for the pandemic scenario is perceived, as well as its importance to remind society of prevention, including the vaccination schedule. The media is a universal means of dissemination, since many people may not understand the scientific terms of articles from academia.

Among the older adults who did not take the vaccine in 2020 were those who were afraid to leave home and those who did not receive/did not trust the guidance of a health professional, which can be attributed to the pandemic. During the COVID-19 pandemic, Primary Care teams are essential in community orientation, early diagnosis and initial fight of the disease.<sup>(7)</sup> However, in this context, adaptations were necessary in the care of health professionals, who turned to the population at risk, identification and testing of suspected cases, treatment and monitoring of mild cases and referral of severe cases.<sup>(6,7)</sup> Thus, the population has avoided being present in health units for fear of contracting the virus.<sup>(6)</sup> This was aggravated by the fact that, due to social distancing, home visits were restricted,<sup>(31)</sup> which may have led to the decrease of reminders about the influenza vaccination campaign.

Fake news (popularly known as fake news) is also a way to spread news in the pandemic, whether about the anti-vaccine movement and the COVID-19 flu vaccine or false adverse effects. In ideal conditions of public communication, authorities must commit to the transparency of information that is easy to understand, generating credibility, trust and partnership with the media. Aspects related to fake news and the use of communicative reason by public authorities are discussed, establishing parallels with the phenomenon of anti-vaccination and its consequences.<sup>(32)</sup>

A study that aimed to assess the knowledge, attitudes and practices of Italians regarding influenza vaccination in 2020 identified that, for 33.5% of respondents, the COVID-19 pandemic did not influence the intention of influenza vaccination in the 2020/21 campaign. However, 20.4% were totally influenced, saying that if the pandemic did not exist, they would not intend to be vaccinated. Among the reasons for non-intention of vaccination, we

mentioned: vaccines are made to generate profits for the pharmaceutical industry (20.3%), the influenza vaccine does not work (17.7%), I took it before and it didn't work (9.1%), fear of needles (8.9%) and medical recommendation (8.2%).<sup>(33)</sup> Some of these reasons were reported in the present study.

To ensure greater vaccination coverage, it is necessary to overcome the misinformation and out-of-date of the population. In the Italian study, 77.8% of respondents said they would like to receive more information about vaccines overall.<sup>(33)</sup> Non-vaccination is related to lack of information. Influenza vaccination should be recommended by health professionals, who should propose strategies to minimize the risks of vaccination in the pandemic period, such as avoiding agglomerations and reaching minorities and individuals with less access to the service.<sup>(34,35)</sup> It is also important to update and education professionals on a permanent basis, to assist them in decision-making and care in the vaccination process. In this context, nursing professionals play a very important role in health education actions, which, together with home visits, can increase vaccination coverage.<sup>(36)</sup>

The main limitation of this study was the possible memory bias, because it was based on self-report. The data cannot be generalized, because it is a convenience sample of older adults who attended health and coexistence services, who are more prone to self-care. The non-response or lack of telephone contact are also limitations, because they reduced the initial sample, which, by the study, was initially planned before the pandemic, did not consider possible losses of longitudinal follow-up. Nevertheless, it is emphasized that the loss and re-interviewed groups were similar in terms of sociodemographic and health characteristics. Further studies, with larger samples and in other contexts, are recommended.

## Conclusion

The present study is a pioneer in the identification of the reasons for vaccination and non-vaccination

against influenza in older adults in the scenario before and current to the COVID-19 pandemic, which contributes to the advancement of scientific knowledge, supporting planning strategies to increase vaccine coverage. There was higher influenza vaccination in the year prior to the pandemic than in the campaign that occurred during the course of the pandemic, but this difference was not significant. It was realized the importance of the media to remember the vaccine population and inform about COVID-19, especially for older adults, who can be confused amidst of so much information, which can even be false. Education, both of professionals and of the population, about the importance and benefits of vaccination should be intensified. Nurses play an essential role, since they are responsible for supervising the work in the vaccination room and educating the team. Influenza vaccination helps promote healthy aging and should be performed annually. The performance of health professionals and the media is extremely important for the success of vaccination campaigns, especially during the pandemic.

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## Collaborations

Azambuja HCS collaborated with development and design, data analysis and interpretation and article writing. Carrijo MF and Velone NCI contributed to data analysis and interpretation and article writing. Santos Junior AG, Martins TCR and Luchesi BM contributed to development and design, data analysis and interpretation and critical review of intellectual content. All authors approved the final version to be published.

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