

equally important. Increasing violence and abuse toward HCWs should be taken seriously, and the offenders must be punished to prevent repeated offenses.

A well-planned and specific approach to address healthcare issues is needed, and implementation and follow-up are essential. The COVID-19 pandemic has reminded us all of the importance of HCWs and their role in providing a strong foundation for a country's health and well-being. As the Director-General of WHO, Dr. Tedros Adhanom Ghebreyesus, said, "No country, hospital or clinic can keep its patients safe unless it keeps its health workers safe."<sup>6</sup>

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# Influenza vaccination among healthcare personnel during the coronavirus disease 2019 (COVID-19) pandemic

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*To the Editor*—Influenza in healthcare personnel (HCP) may lead to absenteeism and nosocomial outbreaks.<sup>1,2</sup> The Centers for Disease Control and Prevention, the Advisory Committee on Immunization Practices, and the Healthcare Infection Control Practices Advisory Committee recommend annual immunization of HCP.<sup>3</sup> During the coronavirus disease 2019 (COVID-19) pandemic, influenza immunization was emphasized vigorously in hope of reducing the burden of respiratory illnesses, medical visits, and hospitalizations that would further strain the healthcare system. We compared influenza vaccine uptake and patterns of declination waivers among HCP before and during the COVID-19 pandemic, and we identified demographics or occupational roles that may be associated with influenza vaccine declination.

At University of Texas Southwestern Medical Center, all HCP are required to complete the annual Seasonal Flu Survey in ReadySet (Axion Health, Broomfield, CO), our employee health software database. On the annual seasonal flu survey, HCP can agree to receive the vaccination at mobile vaccination kiosks or occupational health clinics, upload documentation if vaccinated elsewhere, or decline vaccination by selecting yes or no to 1 or more commonly cited reason for declination. During the 2020–2021

influenza season, additional resources such as video series, campus briefings, and town halls were utilized to highlight the importance of influenza vaccination to all HCP. In September, biweekly video series hosted by executive leadership were dedicated to the dual threats of COVID-19 and influenza. The president's biweekly campus briefings highlighted the importance of influenza vaccine, and the emergency operations center sent weekly e-mails to remind HCP of the ongoing influenza campaign.

HCP demographics, occupational role, influenza vaccine uptake, and reasons for declination were obtained for influenza seasons between 2019 and 2021. Data were analyzed using SPSS Statistics version 25 software (SPSS, Armonk, NY). Differences between means were compared using the Student *t* test, and proportions were compared using  $\chi^2$  tests. Variables that were statistically significant were analyzed by multivariate logistic regression. All tests were 2-sided, and  $P < .05$  was considered statistically significant. This study was exempt from institutional review board review under category 4.

Vaccination uptake rate declined significantly during the COVID-19 pandemic, with 13,853 (55.7%) HCP vaccinated, 1,027 (4.1%) declined, and 10,010 (40.2%) with incomplete surveys during the 2020–2021 influenza season compared with 15,757 (63.5%) vaccinated, 664 (2.7%) declined, and 8,393 (33.8%) with incomplete surveys during the 2019–2020 influenza season ( $P < .01$ ). Safety and/or side effects were the most common reason

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**Table 1.** Seasonal Influenza Vaccination Compliance Rates, 2019–2021

Variable	2019–2020				2020–2021			
	Vaccinated No. (%)	Declined No. (%)	Odds Ratio (95% CI)	<i>P</i> Value	Vaccinated No. (%)	Declined No. (%)	Odds Ratio (95% CI)	<i>P</i> Value
Total	15,757	664			13,853	1,027		
Sex, female	10,872 (69.0)	498 (75)	1.20 (1.00–1.44)	.06	9,637	820	1.36 (1.15–1.60)	<.01
Age, mean $y \pm$ SD	41.2 $\pm$ 12.4	41.4 $\pm$ 11.8	1.00 (1.00–1.01)	.43	41.8 $\pm$ 12.4	40.0 $\pm$ 11.4	0.99 (0.98–0.99)	<.01
<b>Occupation</b>				<.01				<.01
Nurses	2,724 (17.3)	92 (13.9)	Reference		2,468 (17.8)	192 (18.7)	Reference	
Physician, APP	2,829 (18.0)	16 (2.4)	0.18 (0.10–0.30)		2,645 (19.1)	36 (3.5)	0.20 (0.14–0.29)	
Other clinical personnel	3,280 (20.8)	142 (21.4)	1.31 (1.00–1.71)		2,499 (18.0)	238 (23.2)	1.28 (1.05–1.56)	
Nutritional services	212 (1.3)	25 (3.8)	3.58 (2.25–5.70)		186 (1.3)	55 (5.4)	3.95 (2.82–5.53)	
Environmental services	352 (2.2)	16 (2.4)	1.41 (0.82–2.44)		360 (2.6)	17 (1.7)	0.71 (0.42–1.18)	
Administrative personnel	3,147 (20.0)	216 (32.5)	2.04 (1.59–2.62)		3,020 (21.8)	352 (34.3)	1.55 (1.29–1.86)	
Other nonclinical personnel	1,798 (11.4)	124 (18.7)	2.15 (1.62–2.85)		1,399 (10.1)	118 (11.5)	1.17 (0.92–1.49)	
Research	1,415 (9.0)	33 (5.0)	0.73 (0.48–1.09)		1,276 (9.2)	19 (1.9)	0.20 (0.12–0.32)	
<b>Declination reason</b>								
Medical reasons		68 (10.2)				103 (10.0)		
Safety/side effects		498 (75.0)				702 (68.4)		
Vaccine gives flu		256 (38.6)				330 (32.1)		
Vaccine doesn't prevent flu		361 (54.4)				437 (42.6)		
Religious reasons		172 (25.9)				267 (26.0)		
Fear of injections		121 (18.2)				165 (16.1)		
Not convenient		97 (14.6)				134 (13.0)		
Not important		139 (20.9)				164 (16.0)		
Other reasons		208 (31.3)				276 (26.9)		

Note. SD, standard deviation; APP, advanced practice practitioners.

for declining, followed by “vaccine does not prevent flu,” and “vaccine gives flu” (Table 1). In our multivariable analysis, occupational role was associated with influenza declination for both the 2019–2020 ( $P < .01$ ) and the 2020–2021 influenza season ( $P < .01$ ). Physicians and advanced practice providers had low influenza declination rates (OR, 0.20; 95% CI, 0.14–0.29), whereas personnel in nutrition services (OR, 3.95; 95% CI, 2.82–5.53) and administrative personnel (OR, 1.55; 95% CI, 1.29–1.86) had high declination rates (Table 1).

Despite efforts to raise awareness on the importance of influenza vaccination during the COVID-19 pandemic, our influenza vaccination rate declined significantly during the COVID-19 pandemic. The reason for this decline is unclear, but it is plausible that universal masking as well as increased number of HCP working from home may have contributed. Prior studies have reported various approaches to increasing influenza vaccination rates among HCP with varying success.<sup>4–6</sup> Hospital policies requiring influenza vaccination among all HCP have been shown to dramatically improve vaccination rates.<sup>4</sup> Nonmandatory strategies that involve education, peer-to-peer vaccination, mobile carts, use

of declination forms, and prospective audit and feedback have been shown to improve vaccination uptake as well.<sup>5,6</sup> Although reasons for declination included religious objections or medical reasons, the second and third most cited reasons for declination were related to the misinformation that vaccine causes influenza or that vaccine does not prevent influenza, confirming that even medically informed individuals are influenced by misinformation regarding vaccine efficacy and safety.<sup>7,8</sup> Improving influenza vaccination uptake will require targeting common reasons for declining vaccination and tackling misinformation about vaccine efficacy and safety through educational interventions, peer advocacy, and prospective audit and feedback.

Although influenza vaccination uptake may not be directly reflective of the COVID-19 vaccine uptake, prior surveys have demonstrated that the most significant predictor for the acceptance of COVID-19 vaccine was acceptance of influenza vaccine.<sup>7,8</sup> Although vaccine acceptance among HCP is higher than among non-HCP, vaccine skepticism and hesitancy are common among medical staff.<sup>7,8</sup> In our study, HCP who are female, and work in administrative roles or in nutrition services had higher

influenza vaccine declination rate for the 2020–2021 influenza season. This information may provide guidance on target groups that may benefit from vaccine education to alleviate apprehension regarding vaccine efficacy and safety.

This study has several limitations. A high proportion of HCP did not complete the annual seasonal flu survey. HCP who were pre-employment, part-time workers, and/or contractors were included to complete the annual seasonal flu survey, and it is possible that they may have received their influenza vaccine elsewhere. Although race and ethnicity have been shown to be contributing factors to vaccine hesitancy, we were unable to obtain these data due to the limitations of our employee health system. Finally, the annual seasonal flu survey did not capture data for determining whether factors related to the COVID-19 pandemic may have contributed to the decline in influenza vaccination uptake and increase in incomplete surveys. It remains unclear whether the decline in influenza vaccination uptake will remain sustained in years to come, and additional studies will be necessary to determine the specific impact of COVID-19 on increased declination of influenza vaccination.

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## Coronavirus disease 2019 (COVID-19) vaccinations and preservation of the healthcare workforce

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*To the Editor*—Healthcare facilities have been stressed to their limits throughout the coronavirus disease 2019 (COVID-19) pandemic due to the combination of surges of patients and staffing shortages. US hospitals began vaccinating staff against COVID-19 exactly 4 months ago in mid-December 2020.

Tufts Medical Center, an urban 350-bed academic medical center with ~7,400 employees, began vaccinating staff with BNT162b2 vaccine (Pfizer) on December 16, 2020. On December 28, 2020, we incorporated the mRNA-1273 (Moderna) vaccine into our employee vaccination clinic. Gradually increasing eligibility to more groups, on January 26, 2021, eligibility was opened to all employees, including those working remotely. To date, 6,044 employees have been vaccinated with 2 doses of mRNA vaccine.

In total, 641 employees (including those working fully remotely), contractors, volunteers, interns, and students were

infected with COVID-19 between March 16, 2020, and May 3, 2021. A precipitous drop in infections was observed after these healthcare workers began to receive their second doses of mRNA vaccine (Fig. 1).<sup>1</sup> At its highest point, 90 employees were simultaneously out of work due to COVID-19–related illness. At the time of this writing, only 19 employees are out due to COVID-19, even though the incidence of COVID-19 remains high in the surrounding community.

We established a telephone hotline for employees, who were also encouraged to visit the employee health department as needed to report and discuss vaccine side effects. In total, 150 employees reported side effects, of which 12 met the criteria to be reported to the Vaccine Adverse Event Reporting System.

Our hospital continues to operate at or above capacity, not only due to COVID-19 admissions but also to the increasing acuity of illness in patients without COVID-19, possibly due to delays in care. Vaccination has enabled us to preserve our workforce and provide necessary care to patients. When first introduced, many healthcare workers, trusting the data that supported the emergency use authorization, signed up to be vaccinated despite what was for some a natural trepidation associated with the idea of a “new”

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