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Original Article

Use of a comprehensive program to review religious and personal seasonal influenza vaccination exemption requests by healthcare personnel

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Abstract

Objective: Vanderbilt University Medical Center (VUMC) requires that all faculty and staff receive the seasonal influenza vaccine annually or receive an approved vaccine exemption, either for a medical or deeply held religious or personal belief. We sought to understand the underlying principles behind these exemption requests and their interaction with a multidisciplinary exemption review process.

Design: All of the personal and religious exemption requests at VUMC for 3 consecutive influenza seasons from 2015 to 2018 were analyzed, categorizing these requests by 1 of 12 standardized employee categories and 1 of 18 unique reasons for vaccine exemption.

Setting: Tertiary-care academic medical center.

Participants: Healthcare personnel (HCP).

Results: Among the 3 influenza seasons, 1.1%–2.1% of all VUMC HCP requested religious or personal exemption from vaccination. The frequency of religious and personal exemption approval increased annually from 296 of 452 (65.5%) to 196 of 248 (80.2%) to 283 of 323 (87.6%) over the 3 seasons, representing a statistically significant increase each year. Of the 5 most common reasons against vaccination, 4 were explicitly religious in nature; the most common reason was that the "body is a temple or sacred." Nonclinical staff submitted the most religious and personal exemption requests of any job category, submitting approximately one-third of all requests every year.

Conclusions: These results demonstrate how detailed the personal or religious convictions behind vaccine avoidance can be among HCP and how vaccine avoidance stems from much more than simple misinformation regarding vaccination. The intersection between misinformation and personal or religious beliefs provides a unique opportunity to address HCP opinions toward vaccination in an exemption and appeals process like the one described here.

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In 1997, the Advisory Committee on Immunization Practices (ACIP) of the Centers for Disease Control and Prevention (CDC) first recommended universal influenza vaccination for healthcare personnel (HCP), barring any contraindication.[1] Due to traditionally low HCP influenza vaccination rates, various professional societies have increasingly supported mandatory condition of employment HCP vaccination policies over the past decade, including the Society for Healthcare Epidemiology of America (SHEA), the American College of Physicians (ACP), and the Infectious Disease Society of America (IDSA).[2-4] Although the importance of HCP influenza vaccination has been conveyed over the years, the best mechanism to maximize HCP vaccination rates has not been so apparent. Over the past 15 years, many institutions have implemented successful mandatory and condition-of-employment immunization policies that require HCP to receive the influenza vaccine in the absence of specific exclusions.[5-11] The CDC has affirmed the positive effect of such policies; the national HCP influenza vaccination rate in institutions with mandates reached 94.8% in the 2017–2018 season compared to the overall national average of 78.4%.[12] The consequences of noncompliance with mandatory policies are variable, ranging from mask wearing during influenza season to employment termination; however, the implementation of a mandatory vaccination policy with consequences for noncompliance has been associated with twice the increase in vaccination compared to the effect of mandatory policies without consequences.[13] Vanderbilt University Medical Center (VUMC) has shared this experience. In the 3 influenza seasons leading up to the current study, the VUMC employee influenza vaccination rates were 72.0% for 2012–2013, 80.0% for 2013–2014, and 91.7% for 2014–2015. The 2014–2015 season was the first to involve a formal exemption review committee, and the 2015–2016 season was the first with consequences for being noncompliant with vaccination or an approved exemption. In the subsequent 3 seasons, HCP influenza vaccination rates were 97.7% in 2015–2016, 97.6% in 2016–2017, and 97.8% in 2017–2018.[14]

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Two important variations in reported mandatory programs are the types of requested exemptions from influenza vaccination, as well as the process for evaluating these requests. The review processes vary widely and often go unreported. Of those who report their methods, they range from a simple review by the human resources department[8] to the use of large, multidisciplinary committees.[7,10,15,16]

With regard to the types of requested exemptions, institutions tend to consider exemption from vaccination in 2 general categories: (1) medical contraindication and (2) personal belief or religious reasons. Medical exemptions typically include prior allergic reaction to the vaccine or its ingredients, a severe nonallergic adverse reaction, or other compelling medical reasons provided by an HCP's primary care clinician. The various personal reasons for which HCP decline vaccination have been well described: concerns over vaccine side effects, a perceived lack of vaccine efficacy, confidence in one's own health, and inadequate vaccine access.[5,17-26] Although many facilities include a general category for religious reasons against vaccination, some may require a linkage to a formal religion, and some have allowed broader personal-belief exemptions.[27] In all their complexity, the precise nature of these religious objections as a part of a large mandatory program is largely undescribed. We analyzed the trends regarding the religious and personal-belief exemptions submitted by HCP as part of a large, mandatory influenza vaccination program and noted their interaction with a multidisciplinary exemption review process. This project was approved by the VUMC Institutional Review Board.

Methods

Exemption request and approval process

The VUMC requires that all faculty and staff members, both clinical and nonclinical, receive the seasonal influenza vaccine on an annual basis or receive an approved vaccine exemption. An exception is granted for either (1) a medical reason, which requires attestation by a separate licensed healthcare clinician, or (2) a deeply held religious or personal belief against vaccination. Medical exemptions are permanent, but those for deeply held religious or personal beliefs must be submitted on an annual basis. Requests for exemption are submitted in a free-text format before influenza season or upon hire if an HCP is a new employee during influenza season. These are reviewed on a rolling basis by a multidisciplinary review committee comprised of representatives from occupational health, infection prevention, infectious diseases, risk management, legal affairs, human resources, and allergy. Reviewers see only the exemption text itself and are blinded to all details related to the employee submitting the exemption. A request is either granted or denied. If denied, the reasoning for denial is provided to the requestor, with clarification on the rationale for denial. After denial, an appeal can be made in which further information can be provided to the review committee. A second appeal can be submitted to the institutional executive sponsors if the first appeal is denied. If an exemption is ultimately granted, requestors are required to wear a surgical mask whenever in patient care and public areas during the influenza season. Faculty who refuse vaccination and are not granted an exemption have their institutional access to all electronic systems (including those used for patient care and research administration) revoked, effectively impeding their ability to work in their designated roles (clinical, research, or administrative). Nonfaculty employees who refuse vaccination and are not granted an exemption are placed on unpaid leave until the end of influenza season, when they can return to work if they choose. All of the exemption requests were recorded in a database that included for each request a unique employee identifier, job title, free-text reason requesting exemption, and ultimate approval or denial status. To fully describe and analyze the submitted religious and personal-belief exemption requests, the database information covering the 2015–2016 through 2017–2018 influenza seasons were included in the current study analysis. For the purposes of analysis and because new employees are subject to the vaccination policy as they are hired on a rolling schedule, the seasons for vaccine requirement were selected to begin on July 1 and end on June 30 of each year.

Job categorization

Well over 100 unique job titles were submitted with exemption requests. To facilitate our analysis of exemptions by employees with similar type of role, each job title was reviewed by a single reviewer (B.C.B.) and then sorted into 1 of 12 general job categories. Each job category was then generalized by the presence or absence of patient contact (Table 1). A human resources database of employees by job type was used to serve as a denominator, when possible, of these job titles submitting requests as a percentage of the overall number of employees.

Categorization of exemption requests

When submitting an exemption request for deeply held religious or personal beliefs, requestors are allowed to explain these reasons without word limitation. All of the exemption requests were reviewed by a single reviewer (B.C.B.), and the fundamental reasons against vaccination within each exemption request were generalized into at least 1 of 18 exemption categories, with no category excluding or taking priority over another (Table 2).

Analysis of exemption approval and reasons against vaccination

Once each exemption request had been characterized by employee and exemption categories, the prevalence of each particular exemption category was then calculated as a simple percentage of the total requests submitted in a given season. Similarly, the number of faculty or staff within each job category submitting exemption requests was totaled for each year of the study. The reviewer did not have access to personally identifiable information and was blinded to the identity of the individuals who submitted the exemption requests.

Statistical analysis

Comparison of the annual exemption approval rates was performed using test of proportions with Stata version 16.0 software (StataCorp, College Station, TX).

Results

Exemption submissions and approvals

In the 2015–2016, 2016–2017, and 2017–2018 seasons, the numbers of VUMC faculty or staff who submitted deeply held religious or personal belief vaccination exemption requests were 452 (2.1% of all HCP), 248 (1.1%), and 323 (1.4%), respectively. The frequency of exemption approval increased each year from 296 of 452 (65.5%) to 196 of 248 (80.2%) to 283 of 323 (87.6%; $P < .05$ for each annual change) (Fig. 1).

Table 1. Categories and Number of Healthcare Personnel who Requested Religious/Personal Belief Exemption from the Mandatory Influenza Vaccination Policy, 2015–2018

Job Environment	Job Category	Examples	Exemptions Submitted, No. (% Total Exemptions)		
			2015–2016	2016–2017	2017–2018
Routine patient contact	Advanced practice provider	Nurse practitioner, physician assistant, nurse anesthetist	7 (1.6)	2 (0.8)	9 (2.8)
	Clinical staff	Medical receptionist, social worker, patient services specialist	48 (10.6)	17 (6.9)	31 (9.6)
	Clinical therapist	Physical therapist, occupational therapist, registered dietitian	15 (3.3)	7 (2.8)	10 (3.1)
	Medical assistant	Patient care attendant, care partner, medical assistant	28 (6.2)	9 (3.6)	19 (5.9)
	Medical/Surgical techtechnologist	Imaging technologist, sonographer, surgical technologist, telemetry	32 (7.1)	13 (5.2)	21 (6.5)
	Nurse	Registered nurse, licensed practical nurse	76 (16.8)	38 (15.3)	61 (18.9)
	Pharmacy	Staff pharmacist, pharmacy technologist	11 (2.4)	11 (4.4)	13 (4.0)
	Physician	Associate professor, clinical fellow	8 (1.8)	2 (0.8)	0 (0.0)
		Total routine patient contact	**225**	**99**	**164**
No routine patient contact	Facilities/Services	Clinical supply technologist, carpenter, food services, valet attendant	36 (8.0)	29 (11.7)	26 (8.1)
	Lab specialist	Lab scientist, lab technician	15 (3.3)	7 (2.8)	9 (2.8)
	Nonclinical staff	Financial specialist, health information specialist, medical records	150 (33.2)	98 (39.5)	112 (34.7)
	Research staff	Research assistant, biostatistician	26 (5.8)	15 (6.1)	12 (3.7)
		Total no routine patient contact	**227**	**149**	**159**

Reasons for requesting exemption from vaccination

The number of general reasons provided within a single exemption request ranged from as few as 1 to as many as 11 of the 18 categories (mean, 2.47 for 2015–2016; 2.60 for 2016–2017; and 2.71 for 2017–2018). The prevalence of each reason given for exemption requests is shown in Table 3. The most common reason provided stemmed from a belief that the human body is sacred or a temple and that vaccination would violate the sacredness of the person's body. Although many submissions were less specific in making such statements, many of the submissions cited verses from the Bible to support their reasoning. These verses included 1 Corinthians 6:19–20, which states: "Or do you not know that your body is a temple of the Holy Spirit within you, whom you have from God? You are not your own, for you were bought with a price. So glorify God in your body." Other verses cited which express similar convictions were 1 Corinthians 3:16–17, 2 Corinthians 7:1, and Romans 12:1. Not only was this reason the most commonly cited, the frequency with which it was cited increased in total requested exemptions each successive year from 146 of 452 (32%) in 2015–2016, to 117 of 248 (47%) in 2016–2017, to 188 of 323 (58%) in 2017–2018 of ($P < .01$ with each annual increase).

After the sacred-temple reasoning, 3 of the next 4 most common reasons for exemption requests were also religious in nature. These included, in decreasing order of frequency, (1) the belief in protection from influenza by a higher power, (2) an opinion that influenza vaccination was against one's generic religious beliefs, and (3) that one's belonging to a specific organized religion precluded vaccination. The frequency of citing a higher power increased year after year from 105 of 452 (23%) in 2015–2016 to 77 of 248 (31%) in 2016–2017 to 105 of 323 (33%) in 2017–2018 ($P < .002$). A similar trend occurred among those mentioning a particular organized religion, save for the final season, with the frequency changing from 81 of 452 (18%) in 2015–2016, to 65 of 248 (26%) in 2016–2017, to 80 of 323 (25%) in 2017–2018 ($P < .02$). This finding contrasts with the less specific reasoning of vaccination standing against one's generic religious beliefs, which decreased in frequency each year from 89 of 452 (20%) in 2015–2016, to 28 of 248 (11%) in 2016–2017, to 26 of 323 (8%) in 2017–2018 ($P < .001$ from year 1 to year 2, but nonsignificantly from year 2 to 3).

Exemption requests by job category

The distribution of exemption requests across all job categories is noted in Table 1. Most exemption requests all 3 years of analysis were submitted by nonclinical staff, who submitted 33.2% of all exemptions in 2015–2016, 39.5% in 2016–2017, and 34.7% in 2017–2018. Nurses submitted the second highest number of exemptions to vaccination all 3 years, submitting 16.8%, 15.3%, and 18.9% of exemptions in the same respective years. The nurses submitting exemptions represented 1.5%, 0.7%, and 1.1% of all employed nurses in those years. When job categories were grouped into those with routine patient contact and those without routine patient contact, the proportions of exemption requests for each group were similar in both the 2015–2016 and 2017–2018 seasons. In the 2016–2017 season, however, non–patient-care job categories comprised a disproportionate number of exemptions compared to patient-contact job categories (149 of 248; $P < .01$).

Discussion

The results of our study highlight in detail the types of religious and personal beliefs that form requests for exemption to mandatory

Table 2. Categories and Examples of Exemption Requests

General Category of Belief	Sample Verbiage
The body is a temple/sacred	"Our body is the temple of the Holy Ghost, which lives in you. Therefore, if my body is a temple, which is the home of my creator and loving God, I do look after my body and not pollute it."
Fitness/Homeopathy/Natural immunity	"I also adhere to regular exercise, proper vitamin D intake, adequate rest and stress management, and appropriate preventative health care."
Protection from a higher power	"It is my religious belief that if God intends for me to get the influenza virus then, it is His will."
Against my religion	"It would go against my ethics to get a flu shot as it does not align with my spiritual belief."
Cite organized religion	"I am a Christian" or "I am a Muslim."
Toxic vaccine ingredients	"The CDC lists the following as being found in the influenza vaccination: neomycin, polymyxin B, formaldehyde or formalin, thimerosal . . . gentamycin, polyoxyethylene 9-10 nonyl phenol (triton N-101, octoxynol 9) . . . and taurodeoxychoalate."
Vaccine is Ineffective	"Medical research indicates that the efficacy of the influenza vaccination is grossly exaggerated."
Violation of autonomy	"The mandatory administration is in direct violation of my right to give voluntary consent and allow for free power of choice."
I don't get the flu	"I have never taking the flu shot in over 25 years plus, and have never had the flu."
No patient contact	"I work in a research lab (nondiagnostic) and I stay in my area where there is no patient contact at all."
Concerned about side effects	"Some of the potential side effects from the vaccination include anaphylaxis, allergic asthma, redness and discomfort at the injection site, Guillain-Barre syndrome, vasculitis, body aches, paresthesia, neuropathy, seizure, facial palsy, facial paresis, Stevens-Johnson syndrome, headache, sore throat, muscle aches, cough, chills, fever, encephalitis and meningitis."
Animal tissue in vaccine	"Vaccines contain monkey, dog, cow, mouse, chicken, and insect DNA."
Other misinformation	"I believe these chemicals cause your body more harm than good, and with all these vaccines you give kids these days, it causes . . . ADD, Autism, etc."
Vaccine causes the flu/illness	"I used to take the flu vaccination in the past. I saw it as a good thing. But it consistently made me violently ill for several days."
Human fetal tissue in vaccine	"Vaccines contain DNA from aborted human fetuses."
Medical intervention is a last resort	"My religion teaches me that if it is not a life-or-death medication, that it should not be injected into our bodies."
Vaccine is experimental	"I believe that vaccination is an invasive medical procedure and based on the above, is an experimental procedure . . . in direct violation of the Nuremberg Code which states in article 1 that consent should be voluntary and allow for 'free power of choice without the intervention of any element of force, fraud, deceit, duress, over-reaching, or other ulterior form of constraint or coercion.' "
Threaten legal action	"I feel so strongly about this that I am willing to bring legal action to exempt me from it."

influenza vaccination polices at a large academic medical center. Notably, in contrast to prior studies noting that the most common reasons for objection to the vaccine had to do with misinformation and misconceptions regarding the vaccine, 4 of the 5 most common reasons in this study were religious in nature.[28] Because of their subjectivity, religious and personal belief exemptions provide a unique challenge to the reviewers. The various lawsuits brought by HCP whose religious exemptions were denied by healthcare facility leaders highlight the importance of an explicit, multidisciplinary, and reasonable exemption approval process for this phenomenon, like the one described in this study.[27] Moreover, an appeals process allows for both clarification of HCP reasoning as well as education directed toward misinformation.

After religious reasons, one of the most common reasons for exemption was an opinion that vaccine ingredients were toxic (Table 3). The CDC publishes a list of standard vaccine ingredients.[29] Most of the ingredients cited by exemption requests were either intimidating names for innocuous buffers (eg, sodium phosphate–buffered isotonic sodium chloride solution) or otherwise toxic ingredients that are present in negligible concentrations (eg, formaldehyde). The most controversial vaccine ingredient cited was thimerosal, which is notably absent from the vaccine formulations used by VUMC. A different contention asserted that the vaccine contains human fetal tissue, which is not true for this or any other FDA-approved vaccine.[29] Finally, many submissions were both lengthy and conspicuously identical, suggesting that they originated from a single common source. At least 1 institution has encountered a similar problem.[7] Indeed, we found at least 7 websites that publish examples designed to assist employees seeking exemptions from mandatory vaccination policies. We have decided not to name these websites to preserve the integrity of the exemption system.

The percentage of HCP who submitted vaccination exemption requests ranged from 1.1% to 2.2% in the 3 years of this study. This finding contrasts with those of other institutions that have reported this information, such as Cincinnati Children's Hospital, which reported a mere 0.08% of employees submitting such requests.[5] A St Louis healthcare institution of similar size to VUMC has reported that only 0.3% of employees received a religious exemption for vaccination.[8] Although personal and religious reasons against vaccination are by nature subjective to the individual, they may stem from some degree of misconception about the vaccine. Therefore, efforts are underway at VUMC to address common misconceptions to mitigate their effects on the frequency of vaccination exemption requests. Despite the higher rate of exemption requests, the HCP influenza

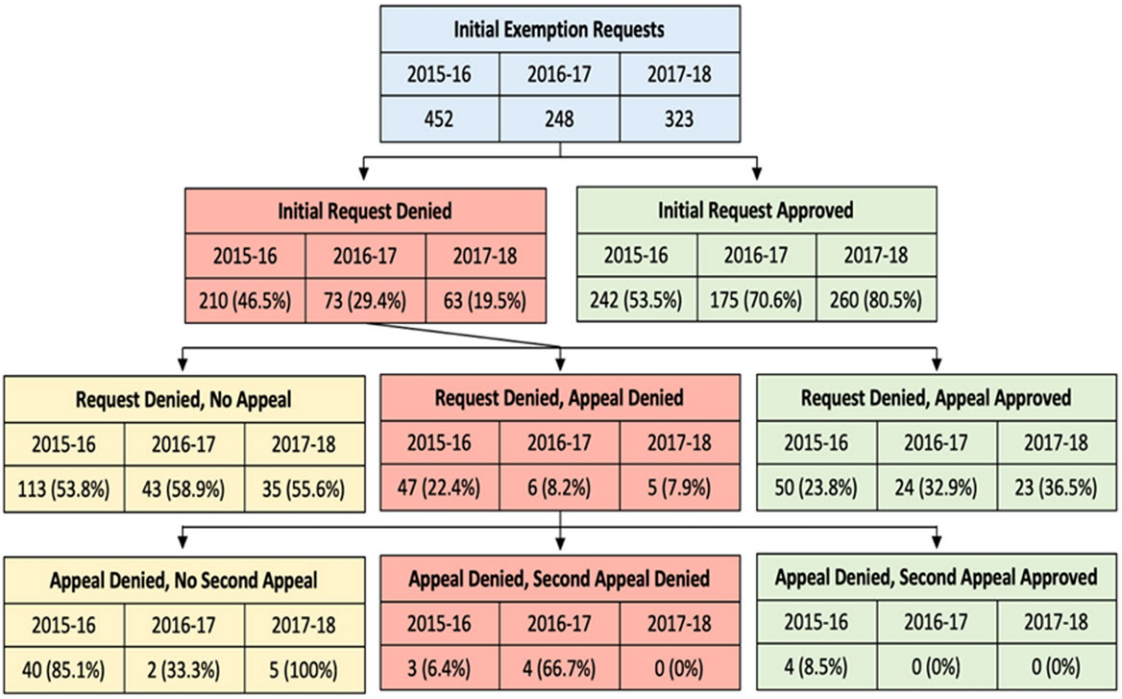

Fig. 1. The total number of exemptions for each season is shown in the first tier, expressed also as a percentage of total faculty and staff in parentheses. In tiers 2–4, the approval, denial, and appeal processes are conveyed. Total numbers are also expressed as percentages of the denominator of the tier above.

vaccination rate at VUMC is substantially higher than the national average.[12]

The exemption request approval rate increased year after year, from 65.5% to 80.2% to 87.6%. Given that the criteria for exemption approval did not change over this time, one possible reason for this increase could be an increasing realization among requestors of verbiage that does not sufficiently convey a deeply held belief. This hypothesis is supported by the annually decreasing percentage of exemption requests that include the generic reasoning "against my religion," which decreased from 20% to 11% to 8% and coincided with an increase in more specific descriptive language in the 3 most common reasons submitted (Table 3). Notably, the frequency of approval increased annually, but the number of exempted employees did not. Whether employees exempted in prior years subsequently went on to become vaccinated or stopped working at VUMC is unclear.

Nurses submitted the most exemption requests of any job category with routine patient contact; 1.5%, 0.7%, and 1.1% of all nurses submitted exemptions in each year of our study. This is not entirely surprising, as nurses represent the largest category of employees with routine patient contact. Nurses submitted exemptions less frequently than the overall employee population, however, whose rates were 2.1%, 1.1%, and 1.4% those same years. For reference, nonclinical staff submitted more than twice the number of exemption requests than nurses over the 3-year period, despite being a job category of similar size.

In the 2017–2018 influenza season in the United States as a whole, the vaccination rate among nurses was 90.5%, trailing only physicians (96.1%) and pharmacists (92.2%). All of these are notably higher than the overall HCP vaccination rate (78.6%) and that of nonclinical HCP (72.8%).[12] These national averages are lower than the VUMC vaccination rate, which was >97% in all 3 years of our study. This finding suggests that mandatory vaccination policies may increase vaccination rates, given that the VUMC vaccination rate in the 3 years prior to initiating the mandate ranged much closer to the national average, from 72.0% to 91.7%.

First and foremost, this study was intended to be a descriptive analysis of the many reasons HCP have for objecting to receipt of the seasonal influenza vaccine. The liberty given by VUMC to its HCP to describe these reasons in detail is meant to give HCP an opportunity to express their convictions without restriction. Although this open forum gives requestors the best chance to be understood, it makes perfect classification of their reasoning a challenging task. We believe that the 18 exemption categories adequately convey the subjective reasons provided by requestors against vaccination, but they are admittedly generalizations of motivations unique to each individual.

We had access to precise job descriptions of all individuals submitting exemption requests. However, because HCP are often grouped by their department rather than their specific role in the human resources database, the precise job descriptions of all VUMC personnel were not available for this study. This limitation prevented us from calculating the exact numbers of exemptions as a percentage of all individuals in a given job category. A notable exception to this was nurses, whose collective numbers were precisely known. Finally, the process of categorization of the exemption requests was made by a single investigator, which may have led to biases of classification. The investigator did regularly review his methodology and specific examples with a second investigator, which helped to limit this bias.

In conclusion, our results demonstrate how detailed the personal and religious convictions behind vaccine avoidance can be among HCP, and how vaccine avoidance stems from much more than simple misinformation regarding vaccination. The intersection between misinformation and personal and religious beliefs provides a unique opportunity to address HCP opinions toward vaccination in an exemption and appeals process. Maintaining a fair process for navigating HCP dissent regarding mandatory vaccination will increase in importance as such programs become increasingly prevalent.

Table 3. Frequency of Reasons Included in Exemption Requests, by Influenza Season

General Exemption Category	Influenza Season, %[a]		
	2015–2016 (N=452)	2016–2017 (N=248)	2017–2018 (N=323)
Body is a temple/sacred	32	47	58
Fitness/Homeopathy/Natural immunity	27	36	30
Protection from a higher power	23	31	33
Against my religion	20	11	8
Cite organized religion	18	26	25
Toxic vaccine ingredients	16	19	23
Vaccine is ineffective	14	11	12
Violation of autonomy	11	10	10
I don't get the flu	11	10	8
No patient contact	10	9	7
Concerned about side effects	9	11	11
Animal tissue in vaccine	7	8	11
Other misinformation	7	7	7
Vaccine causes the flu/illness	4	4	2
Human fetal tissue in vaccine	3	4	8
Medical intervention is a last resort	3	1	2
Vaccine is experimental	2	2	4
Threaten legal action	1	0	1

[a]N, no. of exemptions.

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Conflicts of interest. T.R.T. reports that his spouse has received research funding from Sanofi Pasteur, Sequirus, and Medimmune. All other authors report no relevant conflicts of interest.

References

1. Advisory Committee on Immunization P, Centers for Disease C, Prevention. Immunization of healthcare personnel: recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR Recomm Rep* 2011;60:1–45.
2. Talbot TR, Babcock H, Caplan AL, *et al.* Revised SHEA position paper: influenza vaccination of healthcare personnel. *Infect Control Hosp Epidemiol* 2010;31:987–995.
3. Mandatory immunization of healthcare personnel against influenza and other infectious diseases. Infectious Diseases Society of America. http://www. Idsociety.Org/Hcw_Policy/. Accessed April 11, 2019.
4. American College of Physicians calls for immunizations for all health care providers. American College of Physicians website. https://www.acponline.org/acp-newsroom/american-college-of-physicians-calls-for-immunizations-for-all-health-care-providers. Accessed on October 14, 2020.
5. Antommaria AH, Prows CA. Content analysis of requests for religious exemptions from a mandatory influenza vaccination program for healthcare personnel. *J Med Ethics* 2018;44:389–391.
6. Karanfil LV, Bahner J, Hovatter J, Thomas WL. Championing patient safety through mandatory influenza vaccination for all healthcare personnel and affiliated physicians. *Infect Control Hosp Epidemiol* 2011;32:375–379.
7. Leibu R, Maslow J. Effectiveness and acceptance of a health care-based mandatory vaccination program. *J Occup Environ Med* 2015;57:58–61.
8. Babcock HM, Gemeinhart N, Jones M, Dunagan WC, Woeltje KF. Mandatory influenza vaccination of health care workers: translating policy to practice. *Clin Infect Dis* 2010;50:459–464.
9. Ajenjo MC, Woeltje KF, Babcock HM, Gemeinhart N, Jones M, Fraser VJ. Influenza vaccination among healthcare workers: ten-year experience of a large healthcare organization. *Infect Control Hosp Epidemiol* 2010;31:233–240.
10. Rakita RM, Hagar BA, Crome P, Lammert JK. mandatory influenza vaccination of healthcare workers: a 5-year study. *Infect Control Hosp Epidemiol* 2010;31:881–888.
11. Pitts SI, Maruthur NM, Millar KR, Perl TM, Segal J. A systematic review of mandatory influenza vaccination in healthcare personnel. *Am J Prev Med* 2014;47:330–340.
12. Black CL, Yue X, Ball SW, *et al.* Influenza vaccination coverage among health care personnel—United States, 2017–18 influenza season. *Morb Mortal Wkly Rep* 2018;67:1050–1054.
13. Nowalk MP, Lin CJ, Raymund M, Bialor J, Zimmerman RK. Impact of hospital policies on health care workers' influenza vaccination rates. *Am J Infect Control* 2013;41:697–701.
14. Talbot TR, Schimmel R, Swift M, *et al.* Expanding mandatory healthcare personnel immunization beyond influenza: impact of a broad immunization program with enhanced accountability. *Infection Control Hosp Epidemiol* 2020; in press.
15. Huynh S, Poduska P, Mallozzi T, Culler F. Mandatory influenza vaccination of health care workers: a first-year success implementation by a community health care system. *Am J Infect Control* 2012;40:771–773.
16. Smith DR, Van Cleave B. Influenza vaccination as a condition of employment for a large regional healthcare system. *WMJ* 2012;111:68–71.
17. O'Reilly FW, Cran GW, Stevens AB. Factors affecting influenza vaccine uptake among healthcare workers. *Occup Med (Lond)* 2005;55:474–479.
18. Watanakunakorn C, Ellis G, Gemmel D. Attitude of healthcare personnel regarding influenza immunization. *Infect Control Hosp Epidemiol* 1993;14:17–20.
19. Weingarten S, Riedinger M, Bolton LB, Miles P, Ault M. Barriers to influenza vaccine acceptance. a survey of physicians and nurses. *Am J Infect Control* 1989;17:202–207.
20. Hofmann F, Ferracin C, Marsh G, Dumas R. Influenza Vaccination of healthcare workers: a literature review of attitudes and beliefs. *Infection* 2006;34:142–147.
21. Ludwig-Beymer P, Gerc SC. An influenza prevention campaign: the employee perspective. *J Nurs Care Qual* 2002;16:1–12.
22. McEwen M, Farren E. Actions and beliefs related to hepatitis b and influenza immunization among registered nurses in Texas. *Public Health Nurs* 2005;22:230–239.
23. Norton SP, Scheifele DW, Bettinger JA, West RM. Influenza vaccination in paediatric nurses: cross-sectional study of coverage, refusal, and factors in acceptance. *Vaccine* 2008;26:2942–2948.
24. Ofstead CL, Tucker SJ, Beebe TJ, Poland GA. Influenza vaccination among registered nurses: information receipt, knowledge, and decision-making at an institution with a multifaceted educational program. *Infect Control Hosp Epidemiol* 2008;29:99–106.
25. Palmore TN, Vandersluis JP, Morris J, *et al.* A successful mandatory influenza vaccination campaign using an innovative electronic tracking system. *Infect Control Hosp Epidemiol* 2009;30:1137–1142.
26. Song JY, Park CW, Jeong HW, Cheong HJ, Kim WJ, Kim SR. Effect of a hospital campaign for influenza vaccination of healthcare workers. *Infect Control Hosp Epidemiol* 2006;27:612–617.
27. Opel DJ, Sonne JA, Mello MM. Vaccination without litigation—addressing religious objections to hospital influenza-vaccination mandates. *N Engl J Med* 2018;378:785–788.
28. Hollmeyer HG, Hayden F, Poland G, Buchholz U. Influenza vaccination of healthcare workers in hospitals—a review of studies on attitudes and predictors. *Vaccine* 2009;27:3935–3944.
29. CDC vaccine excipient and media summary, 2019. Centers for Disease Control and Prevention website. https://Vaccine.Guide/Vaccine-Ingredients/Overview/Cdc-Vaccine-Excipient-and-Media-Summary/. Published 2019. Accessed August 13, 2020.