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Australian emergency and intensive care staff perspectives on mandating influenza vaccination post COVID-19 peak seasons. A cross-sectional study with qualitative thematic analysis

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ABSTRACT

Introduction: The COVID-19 pandemic caused significant healthcare worker shortages due to furloughs, resignations, and the redeployment of high-risk staff particularly affecting Emergency Departments (ED) and Intensive Care Units (ICU). In response, the states of Victoria and New South Wales mandated COVID-19 and influenza vaccinations for frontline clinicians. This study examined ED and ICU workforce's perspectives on mandating influenza vaccination.

Method: We employed a quantitative cross-sectional study incorporating qualitative thematic analysis. An online multi-part questionnaire for ED and ICU staff working in all Australian states and territories was conducted between 15th August – 30th November 2023.

Results: A total of 540 respondents (6.4% of the workforce) participated, 73% female. Influenza vaccination uptake in 2022 was high (89%). Overall, 58% supported mandatory vaccination and 72% believed mandates would improve uptake; this belief was strongly associated with prior vaccination ($p < 0.001$). Vaccinated respondents were more likely to have children ≤ 5 years ($p = 0.003$). While 42% felt mandates could contribute to staff resignations, most (81%) reported no impact on their own tenure, with variation across professional groups ($p = 0.021$). Qualitative findings highlighted protection of self and others and compliance as key motivators, while concerns about autonomy, trust, access, and ethics underpinned opposition.

Conclusion: Influenza vaccine uptake was high, with most respondents supporting mandates or their effectiveness. Despite concerns about autonomy and workforce impact, most did not anticipate personal job changes. Findings suggest a pragmatic balance of professional responsibility and individual ethics. Future strategies should emphasise transparent communication, access, education, clear exemptions, alongside longitudinal evaluation of workforce outcomes.

1. Introduction

Seasonal influenza vaccination is known to be a key public health intervention that reduces transmission, morbidity, and service disruption. Whether influenza vaccination should be mandated for healthcare workers has been a much-debated topic in both the scientific and lay community, with some studies demonstrating that non-mandatory

approaches increase vaccine uptake [1–4] and others contrary [5,6].

The Australian health system consists of a diverse mix of service providers, including national, state, territory, and private sector organisations. It operates under a complex funding structure involving contributions from national, state, and territory governments, as well as non-government sources such as private health insurers and individuals. Public hospitals are predominantly owned and managed by state and

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territory governments, with additional funding support from the national government under the National Health Reform Agreement [7].

On influenza vaccination, the most current position statement of the National Department of Health's⁸ Australian Health Protection Principal Committee (AHPPC) recommends, “ a range of methods, including improving access and enhanced monitoring and reporting, that are likely to be successful in increasing influenza vaccination coverage among health care, aged care and disability workers, without the need to mandate influenza vaccination (which are not considered justifiable in many jurisdictions)” [8]. Therefore in Australia, vaccination is strongly recommended for the general population and particularly for healthcare workers, but two of Australia's eight jurisdictions have mandated influenza vaccination among defined categories of healthcare workers [9,10] resulting a mixed model of mandatory and voluntary approaches.

The State of Victoria mandated annual influenza vaccination for all category A and B healthcare workers (Table 1) under a legislative amendment enacted on 25th March 2020 [9]. New South Wales (NSW) mandated influenza vaccination for category A staff only [10] as shown in Table 1. While the mandate for the related COVID-19 vaccination has been revoked recently, the mandate on influenza vaccination in Victoria and NSW States is likely to be maintained [9,10]. All other states and territories in Australia follow the National Statement and “highly recommend” vaccination for their healthcare workers [8].

Globally, most countries adopt voluntary vaccination policies, although some healthcare systems implement mandatory vaccination as a condition of employment to increase uptake and protect patients. Evidence indicates that mandatory policies generally achieve higher vaccination rates, but they may raise ethical concerns regarding autonomy and acceptance among healthcare workers [11,12].

Given the variability in the mandatory nature of vaccination nationally, we aimed to investigate the potential impact on Emergency Department (ED) and Intensive Care Unit (ICU) clinical staff (sometimes referred to as critical care specialty areas in Australia) who fall within the category A for NSW and categories A and B for Victoria by mandating the influenza vaccination.

The aim of this study was to assess the attitudes and beliefs of ED and ICU staff in relation to mandatory vaccination requirements. Our study objectives were to:

1. Examine the perspectives (attitudes, beliefs, thoughts, and opinions) of Australian ED and ICU medical and nursing staff toward the mandating of annual influenza vaccination for some Australian states.
2. Examine ED and ICU healthcare workers' perceptions of the impact of mandatory influenza vaccination on workforce retention, including perceived effects on tenure in current roles

2. Method

2.1. Study design

We undertook a voluntary, anonymous, cross-sectional survey guided by Consensus-Based Checklist for Reporting of Survey Studies (CROSS) checklist [13] at national level by recruiting through respective college registries. We targeted all ED and ICU staff with email invitations to complete the survey. Ethical approval for this study was obtained from the Austin Health Human Research Ethics Committee (HREC/94987/Austin-2023). For consent, the participant information sheet, consent form and survey were all administered electronically using REDCap (data collection and management site using electronic data capture tools hosted at The University of Melbourne). Participants were provided with the information sheet and asked to provide consent by selecting “yes” in response to the question, “Do you agree to participate in the survey?” Upon consent, the survey became accessible. If they selected “no,” the survey page closed, displaying a “Thank you for visiting” message.

Table 1
Staff categories and Australian States where Influenza Vaccination is mandated.

State	Staff Category	Category details	Date Vaccination expected
New South Wales (NSW)	Category A	<i>The category position involves either:</i> • Direct physical contact with: - o patients or clients - o deceased persons or body parts - o blood, body substances, infectious material or surfaces, or equipment that might contain these (e.g., soiled linen, surgical equipment, syringes), or - o contact that would allow the acquisition or transmission of diseases that are spread by respiratory means, including: • workers with frequent or prolonged face-to-face contact with patients or clients (e.g., interviewing or counselling individual clients or small groups; performing reception duties in an emergency or outpatients department) • where the normal work location is in a clinical area such as: - o a ward - o an emergency department - o an outpatient clinic (including ward clerks and patient transport officers) - o workers who are required to attend clinical areas frequently throughout their working week, such as workers employed in food services who deliver meals and maintenance workers. <i>All students who undertake clinical placements within NSW Health facilities are considered Category A workers.</i>	<i>must be vaccinated prior to 1 June each year</i>
	Category B	<i>Healthcare workers whose role rarely requires them to have direct physical contact with patients, clients, deceased persons or body parts, blood, body substances, infectious material or surfaces or equipment that might contain these.</i>	
Victoria	Category A	<i>Healthcare workers whose role requires them to have direct physical contact with patients, clients, deceased persons or body parts, blood, body substances, infectious material, or surfaces</i>	<i>annually by 15 August</i>
	Category B	<i>Healthcare workers whose role rarely requires them to have direct physical contact with patients, clients, deceased persons or body parts, blood, body substances, infectious material or surfaces or equipment that might contain these.</i>	

2.2. Developing the questionnaire

The questionnaire was created, reviewed, and revised by members of the study team, as there was no existing validated questionnaire suitable for our study. Following the design and development phase which involved multiple rounds of discussions and reviews by the study team, the final draft was validated by conducting survey pre-testing which involved non-study team members representing the targeted work

groups (ED and ICU Medical and Nursing staff) completing the questionnaire and providing feedback on it which was mainly editing and was incorporated. The final questionnaire consisted of two parts: part A, included 13 multiple-choice and Likert scale questions focusing on socio-demographic details, while part B comprised nine questions concerning the influenza vaccination. The questions were multi-formatted including multiple-choice, "yes/no", Likert scale, branch logic open-ended inquiries, open-ended questions asking about vaccine mandate in participants state/territory, their opinion about mandating the vaccine in certain states and their perception on the impact of mandating the vaccine and finally, in the open ended questions, they were asked about anything they need to say on the mandating of the vaccine and further, whether they had anything else to say on critical care staff vaccination uptake. A copy of the questionnaire is included as supplementary 1.

We collected the following demographic information; gender, age range, participants' workplace specialty, participants disciplines or craft groups, state/territory of primary employment, healthcare risk category for Victoria and NSW employees as defined in Table 1 [9,10], employment category, domestic contact with; children <5 years, elderly >65 years or immunocompromised person(s) and whether the influenza vaccination was mandated in their state/territory. Demographic and other variables were further evaluated with assessment of measure of association with the vaccination uptake of respondents.

We gathered specific data on the attitudes of healthcare workers toward mandated influenza vaccination. This encompassed inquiries about their influenza vaccination status in 2022 and their intentions regarding influenza vaccination in 2023. The survey assessed participants' perceptions of whether mandatory influenza vaccination would influence their decision to remain in their current role and to comment on any impact on staff attrition. Direct measures of workforce attrition or interstate migration were not collected.

2.3. Recruitment

Purposive sampling was employed to target a total of approximately 8500 ED and ICU staff across Australia who were members of either; College of Emergency Nursing Australia (CENA), Australian College of Emergency Medicine (ACEM), Australian College of Critical Care Nursing (ACCCN) and Australian and New Zealand Intensive Care Society (ANZICS) as provided in the college's websites. Recruitment efforts involved project announcements by the respective colleges through their members portals and electronic newsletters which displayed QR code and a link directing individuals to a REDCap electronic data capture tools hosted at the University of Melbourne which outlined the study's aims and provided instructions on accessing the survey. A plain language statement detailing the study was made available via the provided link. Upon accessing the survey site, participants were presented with information about the study aims and asked to provide consent. Upon selecting 'yes,' participants gained access to the questionnaire. Study team members also posted the invitation to participants in their social media networks (LinkedIn and groups Facebook pages) once during the data collection period.

2.4. Data collection and analysis

Data were collected from 15th August to 30th November 2023, using online survey software (REDCap). The questionnaire responses were exported to STATA 18e statistical software for analysis [14]. Following exportation to STATA, the open-ended responses were retrieved from the software's data editor and transcribed into a Microsoft[®] Excel spreadsheet. Using a thematic analysis approach [15], after familiarization with the data, each response was coded into a theme. Upon completion of coding by study lead AO, study team members (GB and GE) convened to review and discuss each theme considering the related quote. In cases where there were discrepancies in codes/themes, the

group reached a consensus on which themes to include considering the study aim.

2.5. Statistical analysis

Numerical data are presented as counts and percentages accompanied by 95% confidence intervals (95% CI). In instances of missing values, data are denoted as n (number of cases)/N (total number of instances where the value was known), without making assumptions about the missing data.

For non-normally distributed data, differences were assessed using the regression or *t*-test while categorical data differences were evaluated using the Chi-square or Fisher's exact test, as appropriate. Where regression analyses were performed, reported 95% confidence intervals reflect the estimated regression coefficients and their precision, rather than odds ratios or risk estimates. A two-sided level of significance was set at $p < 0.05$.

A priori sample size calculation was not performed, as this study employed a purposive, non-probability sampling approach within an exploratory mixed-methods design. The study was not designed to test a single primary hypothesis but to examine vaccination uptake, attitudes toward mandatory influenza vaccination, and perceived workforce impacts among ED and ICU healthcare workers. Sample adequacy was assessed post hoc based on the ability to conduct planned analyses, identify statistically significant associations, and achieve thematic saturation in qualitative responses.

3. Results

3.1. Quantitative results

3.1.1. Participant characteristics

Participants comprised 540 ED and ICU clinicians from all Australian states and territories, with representation across genders, disciplines, and employment categories. The majority were female (73%, $n = 394$), worked in ICU settings (72%, $n = 389$), and were from nursing disciplines (73%, $n = 394$). Respondents were predominantly mid-career, with 80% ($n = 432$) aged between 36 and 55 years, and the largest age group being 46–55 years (28%, $n = 151$). Participants were geographically diverse, with the highest representation from Victoria (43%, $n = 232$) and New South Wales (20%, $n = 108$). Most respondents were employed full-time or part-time (95%, $n = 513$) and reported substantial clinical experience (mean = 11 years of total practice; mean = 16 years at current workplace). Majority reported likely contact with vulnerable populations at home, including young children (38%, $n = 205$) and older adults aged ≥ 65 years (55%, $n = 297$). Overall, 62% ($n = 335$) worked in jurisdictions where influenza vaccination was mandated based on risk category. Detailed characteristics are reported in Table 2. Measures of association between demographic and other variables and vaccination uptake in 2022 ($n = 451$ (89%)) are presented in Table 3.

3.1.2. Influenza vaccination uptake in 2022

Among the 507 respondents who reported their influenza vaccination status in 2022 (89% ($n = 451$) received the vaccine, and 11% ($n = 56$) did not receive). To better understand the reasons underpinning their decision to vaccinate or not, an open-ended question regarding the reason was asked. A total of 459 (91%) complete responses were collected and subsequently thematically analysed. Six themes emerged, as reported under the qualitative response section.

3.1.3. Attitudes toward mandatory vaccination

Of the 507 respondents, 58% ($n = 295$) agreed with the mandates set by NSW and Victoria for the influenza vaccination among healthcare workers in certain categories of which, 71% ($n = 209$) of these respondents were from NSW and Victoria and the rest ($n = 86$) were from other states where the vaccination was not mandated. One hundred and

Table 2
Participant Characteristics $n = 540$.

Variable	Type	Frequency
Gender	Female	394 (73%)
	Male	142 (26.3%)
Age group	Prefer not to say	4 (0.7%)
	18 ≤ 25 years	12 (2%)
	26 ≤ 35 years	96 (18%)
	36 ≤ 45 years	146 (27%)
	46 ≤ 55 years	153 (28%)
	>55 years	133 (25%)
Primary Practice area ($n = 539$)	ED*	152 (28%)
	ICU*	387 (72%)
Discipline	Nursing	394 (73%)
	Med	122 (23%)
	Other	24 (4%)
	ACT±	6 (1%)
	NSW±	108 (20%)
	NT±	18 (3%)
Primary State/Territory of work ($n = 537$)	Queensland	94 (18%)
	SA±	26 (5%)
	Tasmania	11 (2%)
	Victoria	229 (43%)
	WA±	45 (8%)
	A	491 (91%)
Healthcare category ($n = 539$)	B	35 (7%)
	C**	13 (2%)
Total years of practice	Minimum	<1 yr
	Mean	11 yrs
	Maximum	50 yrs
Years of practice in current workplace	Minimum	<1 yr
	Mean	16 yrs
	Maximum	50 yrs
	Fulltime	266 (49%)
Employment category	Part-time	246 (46%)
	Casual	23 (4%)
	Bank	5 (1%)
	Most likely	133 (25%)
Likelihood of contact with children ≤5 years old at home	Likely	73 (13%)
	Unlikely	322 (60%)
	Not sure	12 (2%)
	Most likely	148 (27%)
Likelihood of contact with older person ≥65 years old at home	Likely	152 (28%)
	Unlikely	229 (43%)
	Not sure	11 (2%)
	Most likely	46 (9%)
Likelihood of contact with immunocompromised persons at home	Likely	71 (13%)
	Unlikely	388 (72%)
	Not sure	35 (6%)
Influenza vaccination mandate in state/territory depending on risk category	Yes	336 (62%)
	No	158 (29%)
	I don't know	46 (9%)

*ED- Emergency Department; ICU-Intensive Care Unit. **Influenza vaccination not mandated.

±ACT- Australian Capital Territory; NSW- New South Wales; NT-Northern Territory; SA-South Australia; WA-Western Australia.

Table 3
Demographic variables associated with vaccination uptake in 2022 ($n = 451$).

Variable	p value, CI
Age Group	$p = 0.124, -0.045$ to 0.005
Practice area	$p = 0.158, -0.017$ to 0.105
Professional belonging/discipline	$p = 0.204, -0.094$ to 0.020
Older persons ≥65 years old at home	$p = 0.705, -0.028$ to 0.0187
Immunocompromised individuals at home	$p = 0.351, -0.039$ to 0.014
Children ≤5 years old at home	$p = 0.003, 0.013$ to 0.063
Vaccine as pre-requisite to employment [§]	$p = 0.003, 0.017$ to 0.086

[§] 63% of respondents were from NSW and Victoria where vaccine is mandated.

fifty-seven respondents (31%) disagreed with mandatory vaccination, and 51% ($n = 80$) of these respondents were from NSW and Victoria.

Forty-seven participants (9%) were unsure, and eight participants provided other reasons.

Regarding the mandate by the two States on vaccination and its potential impact on staff vaccination uptake, among 507 respondents, 72% ($n = 367$) believed it will most likely or likely improve the uptake of which, 66% ($n = 243$) of these were from NSW and Victoria and the rest ($n = 124$) were from the other states, while 10% ($n = 52$) believed it will not. The remaining 17% were unsure. This observation also demonstrated a statistically significant relationship with the 2022 vaccine uptake ($p < 0.001$, 95% CI = -0.857 to -0.349).

3.2. Mandatory vaccination and staff movement

To explore the potential workforce impact of mandatory influenza vaccination, respondents were asked about their perceptions of staff attrition and the effect of mandates on their own employment decisions. Among them, 42% ($n = 213$) believed it would most likely or likely cause staff resignation (55%, ($n = 117$) of these were from NSW and Victoria), while 23% ($n = 119$) thought it was unlikely (82% ($n = 97$) of these were from NSW and Victoria). Additionally, 35% ($n = 175$) were unsure about this possibility. Inquiries were specifically directed at participants from the two States where the vaccine mandate was implemented ($n = 337$) to estimate the proportion of attrition resulting from the mandates. Among the targeted participants, 156 (46.3%) responded, and the distribution of their responses is depicted in Fig. 1. Table 5 indicates the number of staff in Victoria and NSW who didn't have the vaccine in 2022, their intention for 2023 and the likelihood impact on the continuity of their role. All these respondents reported belonging to workforce category A [9,10].

When asked about the potential impact of mandating the vaccine on their tenure in their current role ($n = 506$), 81% ($n = 410$) of participants responded as 'unlikely' with states (Victoria and NSW) where vaccines were mandated leading 53% ($n = 266$), while 11% ($n = 56$) stated 'most likely' or 'likely', and the remaining respondents were unsure. There was no significant association with age group ($p = 0.904$, 95% CI = -0.058 to 0.065), area of specialty (ED/ICU) of practice ($p = 0.105$, 95% CI = -0.026 to 0.273) and duration of practice ($p = 0.751$, 95% CI = -0.005 to 0.007) indicating older, longer practicing clinicians in either ICU or ED did not believe that vaccination impacted tenure. However, a statistically significant relation was found with participants' discipline whether Nursing/Medicine/Other ($p = 0.021$, 95% CI = -0.300 to -0.024).

3.3. Self-reported intention for vaccination in 2023

Regarding future vaccination plans for 2023 (as the study took place pre-2023 vaccination period), 85% of the 507 respondents answered, 'most likely' or 'likely' of which 67% ($n = 289$) of these were from NSW and Victoria, while 12% responded 'unlikely' and the remaining respondents were unsure. This showed no statistically significant association with age groups ($p = 0.832$, 95% CI = -0.053 to 0.066), area of practice ($p = 0.097$, 95% CI = -0.268 to 0.022), discipline ($p = 0.804$, 95% CI = -0.118 to 0.152), years of experience ($p = 0.698$, 95% CI = -0.004 to 0.005). However, it demonstrated statistically significant association with having received the vaccine in 2022 ($p < 0.001$, 95% CI = -1.78 to -1.479).

When examining vaccination plans for 2023 against having close family contact with different risk groups, there was no statistically significant relationship found for children ≤5 years old, older persons ≥65 years old, or immunocompromised individuals ($p = 0.063$, 95% CI = -0.114 to 0.003 ; $p = 0.583$, 95% CI = -0.070 to 0.040 and $p = 0.986$, 95% CI = -0.062 to 0.063 respectively). Subsequently, specific inquiries on whether their decision to take the 2023 vaccination was influenced by mandate were directed at employees working in NSW and Victoria. Thirty-one percent ($n = 106$) responded 'yes'.

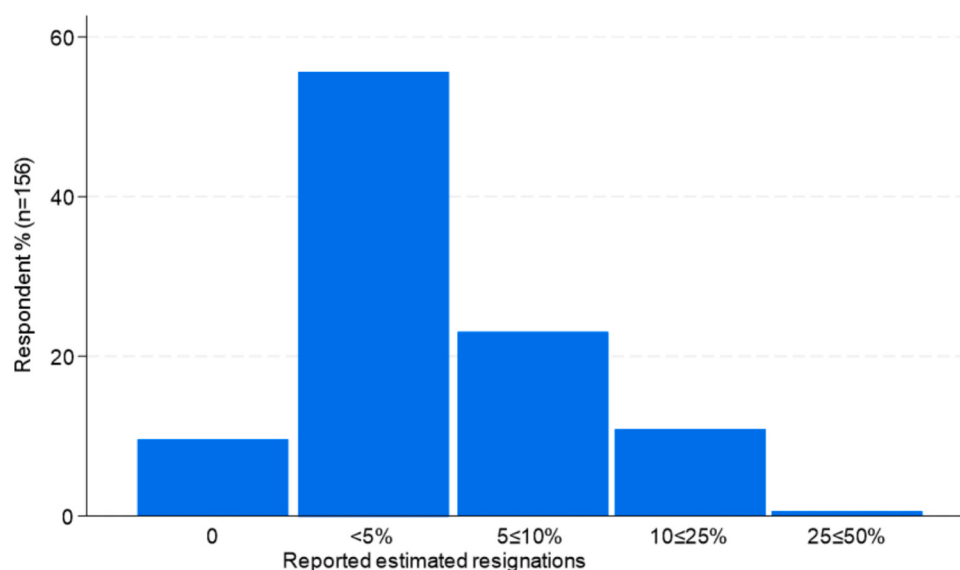


Fig. 1. Distribution of estimated resignation rate in NSW and Victoria following mandating of influenza vaccination in 2022.

3.4. Qualitative thematic analysis of open-ended responses

3.4.1. Common themes from those who were vaccinated

Prevention or protect self/vulnerable was the main reason, based on frequency of themes, participants reasons of getting vaccinated was to protect themselves, their loved ones, the community, and those under their care as well as to prevent individuals from contracting or transmitting the virus to others. **Mandate** was another high frequency theme for vaccination where respondents reported vaccination was mandated by their state, and noncompliance could mean risking loss of their job.

Common themes from those who were not vaccinated.

- **Personal choice:** Respondents identified the importance of the “right to choose” and being able to exercise informed consent.
- **Lack of Trust:** Respondents expressed concern that State mandates were based upon a perceived lack of scientific evidence on efficacy.
- **Time scarcity:** Respondents expressed concern that time constraints limited vaccine access with participants being time constrained.
- **Contraindication:** Some respondents identified vaccine contraindications including allergic and previous reactions.

The summary of findings from this analysis is presented in Table 4.

3.4.2. Perspectives regarding mandatory vaccination

Eight participants who provided other reasons in relation to their perspectives on mandatory vaccination stated as listed below.

“I think if choose not to then should have higher PPE requirements.”

“When mandated all vaccines should be made available free to all staff including those with allergies to the common vaccine.”

“I resent the fact the my right as a health care worker has been taken away from us. We advocate for our patient's and their rights to choose. Why has it been taken away from healthcare workers who have the knowledge to make decisions for themselves.”

“Should be free when mandated including an antibiotic free variety for those allergic to the antibiotic in the free vaccine.”

“I think it is justified during this high risk period where an influenza pandemic/ epidemic is likely.”

“Not if they have health problems that would affect them from having it.”

3.4.3. Mandatory vaccination impact on staff tenure

Respondents who felt that mandated vaccination was ‘most likely’ or ‘likely’ to impact on their tenure articulated their perspectives within ethical frameworks, offering examples such as these.

“Bodily autonomy should be upheld and respected, forcing a person to take vaccinations against their will should never have been used on the health force let alone the entire world.If people choose to have the vaccine, then that should be their choice.”

“It is a gross breach of ethical conduct to mandate any medical therapy or investigation.”

“If forced to vaccinate I will leave the hospital system. Covid mandates was soul destroying and unfair.”

“Vaccination mandates from covid demonstrated that despite claims made, vaccination does not always protect patients and staff. Both covid and influenza vaccines do not prevent contraction of the virus, nor do they completely prevent transmission, there is therefore not enough scientific basis to override individual choice in vaccination - as it does not provide significant protection of both staff and patients. The risks involved with vaccination, however small, remain risks that people should have a choice to accept- and not risk losing their livelihoods over it. Some of my fellow staff members have had significant ongoing health issues post covid vaccination (chronic demyelination syndrome for example). Staff should not have to accept this risk for a vaccine that will not prevent contraction or transmission.”

3.4.4. Themes on self-reported intention for vaccination in 2023

Participants were asked an open-ended question about whether they had additional comments. Two hundred and thirty complete responses were collected and subsequently thematically analysed. Four themes were identified:

- **Saves lives:** Participants believed that vaccination would impact morbidity and mortality positively. Therefore, they had no issues with mandating it.
- **Supports mandating:** Some participants supported the vaccine mandate, stating that it is the right thing to do, especially for healthcare workers in ED and ICU specialties.
- **Vaccine efficacy/safety:** Those opposed to the mandating expressed concerns about efficacy and safety as their primary reasons.

Table 4

Thematic analysis with frequencies of the codes and selected quotes on mandating of influenza vaccination (n = 459).

Code	Frequency of codes	Selected quote related code	Selected quote(s)
Protect Self/ Vulnerable	183	PSV013	"Working with vulnerable patients require a workforce that will protect them from respiratory viruses. Vaccinations are proven to protect the community, therefore, I am vaccinated to protect myself, my family and the patients I care for"
		PSV040	"I saw a patient die of fluB who was 36 years old with no significant health/medical history. I got it the next day as well as my children's. I had intended on getting it but assumed I had more time. I apparently did not"
		PSV042	"Work casual do not want to risk multiple days off due to influenza. Do not want to get sick risk of exposure high at work"
		PSV044	"important to keep myself safe and I have a responsibility to both patients and my family to maintain my own vaccination status. I have elderly parents and an immunocompromised daughter and work with vulnerable ICU patients"
Preventive purpose	119	P034	"I don't think it's mandated, but certainly encouraged. I get mine for public health reasons, to lessen my own risk of getting sick, and it's freely available to all staff at my hospital."
		P114	"I believe the influenza vaccination is an effective measure for reducing the volume and severity of annual influenza cases so it has public health benefit I want to reduce my risk of developing influenza and developing severe complications from influenza I want to reduce risks in those around me (patients, co-workers and family/friends)"
Mandated	107	M007	"I have the vaccine because my employer threatened me and those who did not like to have the vaccine that we would lose our job! I had no option because I was the sole breadwinner during the pandemic."
		M040	"Mandated vaccinations should NOT be in effect for Nurses. Forcing us to take medications and unknown ingredients into our body is inhumane and against the Nuremberg Code/ principles. We are not given an option to access the vaccination on our own free will, we are coerced in to taking vaccines in order to keep our jobs."
Personal choice/ Contraindication	21	PC001	"My body my choice. if I take a vaccine or not is between me and my doctor, not between me and a corrupt government. Access to
		PC006	

Table 4 (continued)

Code	Frequency of codes	Selected quote related code	Selected quote(s)
			employment must be based on skills, qualifications and expertise and not be based on vaccination status."
			"I do not agree with mandated vaccines. In 15 years never caught flu from work, never had influenza virus. It should be an individual choice and after the covid mandates I have had enough of being forced to inject chemicals into my body. It has risks and I should not have my informed consent removed to keep my job."
Lack of trust	18	LT001	"Mistrust of any vaccine especially forced vaccination to maintain employment. Previously had an allergic reaction to influenza vaccine"
		LT006	"It has not been demonstrated in high quality study to reduce mortality or morbidity from influenza, and while it may reduce time lost to work I have only had 10 days sick leave since 2021 including a week of mandatory COVID isolation. Thus, the benefit does not seem worth the effort."
		LT011	"It is the only vaccine recommended for health professionals based on a calculated 'guess' as to what flu strain will be circulated that year. Calculated guesses are not scientific enough for me. I believe in vaccinations that eradicate disease, or significantly prevents transmission. The flu can never be eradicated as its rate of mutation does not permit this to happen, and I do not believe that being vaccinated with the flu 'jab' will significantly prevent transmission (point in case being the covid vaccine, supposedly 90% of the population got jabbed, but we all ended up getting covid anyway....)."
Time scarcity	7	TS002	"Just didn't get round to it. Vaccination days where I work was not on a day I attended the workplace"
		TS003	"I had the vaccine in 2023, but not 2022. I missed the vaccine scheduling and did not follow up. Also did not see a lot of respiratory illness. Still masked at work, and still more socially aware of masking in public places. Not a lot of noise from WHO or AVIC about circulating flu virus at that stage"

- **Personal choice/autonomy:** Participants on both sides emphasized the importance of respecting individuals' personal choices and autonomy instead of mandating the vaccine.

Table 6 presents the themes/codes performance and select related quotes.

Table 5

Victoria and NSW staff who didn't have the influenza vaccination in 2022 and their intention for 2023.

State	Reason for not having the vaccine	Impact on continuity of the role	2023 Vaccine plan
Victoria 4.8% (n = 11)	my body my choice. if I take a vaccine or not is between me and my doctor, not between me and a corrupt government.access to employment must be based on skills, qualifications and expertise and not be based on vaccination status.	Most likely	Unlikely
	unable due to medical history I do no agree with mandated vaccines.In 15 years never caught flu from work, never had influenza virus.It should be an individual choice and after the covid mandates I have had enough of being forced to inject chemicals into my body.It has risks and I should not have my informed consent removed to keep my job.	Likely Most likely	Unlikely Unlikely
	my body, my choice.a corrupt government should not mandate vaccines. What about the patient doctor relationship?if I take a vaccine or not is between me and my doctor and not between me and a corrupt government.Nurses need to be employed based on skills, qualifications and experience and not on vaccine status!When will the ACCCN stand up for "unvaccinated" nurses?	Most likely	Unlikely
	Previous reaction	Most likely	Unlikely
	Ceased employment in ICU	Most likely	Unlikely
	I have been injured by the flu vaccine previously when I was coerced into having it at 2 am in the morning on a night shift when I had said no previously. I had never needed it before and believe I still don't need it as a young adult, who will not go to work if I am unwell.	Most likely	Unlikely
	had influenza in April	Unlikely	Unlikely
	Adverse reaction Short duration of working Masks and hand hygiene are sufficient if fit tested	Most likely	Unlikely
	I don't feel the risk benefit ratio for me or my patients warrants having the vaccine	Not sure	Unlikely
	Contraindication	Likely	Unlikely
	I was wearing a mask at work I have never had the "Flu Vaccine" have nurses for 36 years: signed exemptions each year don't think it is needed don't think it should be mandated	Most likely Most likely	Unlikely Unlikely
NSW 8.3% (n = 9)	I had had 3 Covid vaccines and was unwell after each one. I did not want to further stress my immune system with a flu Vax.	Likely	Likely
	I think it is overkill, I don't want to be injecting myself with things that my immune system can manage.	Likely	Unlikely
	Mandated vaccinations should NOT be in effect for Nurses. Forcing us to take medications and unknown ingredients into our body is inhumane and against the Nuremberg Code/principles. We are not given an option to access the vaccination on our own free	Most likely	Unlikely

Table 5 (continued)

State	Reason for not having the vaccine	Impact on continuity of the role	2023 Vaccine plan
	will, we are coerced in to taking vaccines in order to keep our jobs.		
	allergic reaction	Most likely	Unlikely
	It was mandatory to continue employment, but due to staff changes I was not chased up - and did not seek vaccination	Most likely	Unlikely
	I do not think there is sufficient data on serial yearly vaccination and potential IgG4 modification.	Unlikely	Unlikely
	Focus was on covid vaccine.	Unlikely	Most likely

Themes.

on responses regarding influenza vaccination.

Finally, we asked the participants if they had anything else to say on critical care staff influenza vaccination uptake, and we had 144 complete responses. Upon thematic analysis of the responses, three themes were identified:

- **No compulsion** (n = 63): The respondents supported the idea that there should be no compulsion regarding vaccination. Below are some of the quotes from this theme.

"If you really care about your citizens receiving the healthcare they need and deserve, and want to retain every single qualified and experience RN out there in your health care system, get. rid. of. the. Mandate." (NC013).

"Critical Care staff are scarce - and I look forward to the results of this, because I think they should be taken into consideration before making a mandate in other states - also actual facts and figures from Vic & NSW since they already are mandating it." (NC046)

- **Healthcare not a choice** (n = 30): Some participant's expressed the view that if an individual is not willing to be vaccinated, they should leave as healthcare is not meant for you as the appropriate profession. Below are some of the related quotes.

"Health promotion is at the core of our profession. If you don't want to vaccinate yourself to protect all parties you should not be working in a critical care environment let alone be a nurse. As a nurse you should lead by example by promoting all available vaccinations as a means to prevention or less severity of symptoms in the community as a whole." HC008.

"Mandating vaccinations is an additional layer of security to ensure critical care staff are protected from contracting and spreading the virus to compromised individuals receiving our care. It's imperative that all category A workers receive the vaccine, and I hope the vaccine mandate continues." HC025

- **More education/awareness** (n = 22): These participants supported the idea of more campaigns, education, and awareness regarding the broader aspects of vaccination. Below are some related quotes.

"I am disappointed to hear that the uptake of vaccines in general is poor particularly when nurses are highly trained health professionals with good health literacy and generally care for the wellbeing of others. Vaccines in Australia are completely safe - our TGA and medicine approval system is one of the strictest in the world. Furthermore, if you're not vaccinating for yourself, you should vaccinate to protect those around you and those who can't get the vaccine due to health reasons/age/acute illness." (EDU002).

"Education is the answer. Not political grandstanding and enforcing things that people would willingly do given the right education and

Table 6

Thematic analysis with frequencies of the codes and selected quotes on influenza vaccination uptake (n = 459).

Code	Frequency of codes	Selected quote related code	Selected quote(s)
Personal choice/ Autonomy	95	PC008	"I know plenty of staff who felt like they had no choice or body autonomy. They had to choose between feeding their families or getting the vaccination. i Will not put my body through another flu shot ever again, I spent months bed ridden."
		PC030	"Government and public health departments should not be mandating health care interventions (such as vaccinations) for staff. People have a right to work and should have a right to determine whether or not they want a vaccine. The same way that a patient can refuse to have chemotherapy if they are competent. I have the vaccine each year but I respect the right of other to not want the vaccine - this is important and creates trust. The people and organisations who mandate mandatory vaccinations mean well, but it is a slippery slope. Let people decide for themselves."
Supports mandating	78	SM009	"It should be mandated across the country and if an individual does not want to be vaccinated for a non-medical reason (ie allergy) then they have no buisness in working with sick and vulnerable patients who cannot protect themselves again respiratory viruses"
		SM016	"This is an effective and impactful public health measure. Although refusal to participate is couched in pseudophilosophical language around rights to refuse, this reveals a deep ignorance of how vaccines work, their importance and the need to sacrifice a small period of potential discomfort for the preservation of the health of one's patients, coworkers and wider community. I welcome the dismissal of people who refuse vaccination on the grounds of personal freedom as their lack of scientific understanding and selfishness compromises their capacity to provide effective and safe care. This has also been a long-standing requirement in Victoria, and has set the expectation that participation in the health professions requires up to date vaccination except in the case of adverse effects or religious dissent (which I also consider incompatible with participation in the health professions due to the frequent, if not 100% co-incidence with other beliefs that harm patients and the community)."
Saves lives	31	SL003	"I think its a great idea. Influenza is a vaccine preventable illness that can have a huge economic burden on the health care system, and society due to increased sick days, loss of income, ongoing dependence on family/ friends due to the need for ongoing treatment secondary to
		SL027	

Table 6 (continued)

Code	Frequency of codes	Selected quote related code	Selected quote(s)
			complications. Improves the quality of life for people who are immune, protects the very young, very old and those unable to be vaccinated. I think vaccination programs are one of the greatest public health initiatives we have ever seen. They have saved countless lives and protected our health care systems. No one should be dying of a VPD in this day and age!"
			"I believe it is important as a healthcare worker to lead and assist with the implementation of public health mandates such as vaccination. As I society I feel it is important to look after those more "vulnerable" "within our community and I believe vaccinations assist with this. I struggle to understand other people's decisions to go against this who work within the health system so should have a good understanding of this."
Vaccine efficacy/ safety	24	VE006	"I'm not sure if the science supporting vaccination has been taken onboard- I feel managers are justifying the mandate as "that is what you need to do""; that is telling people what they must do; rather than why vaccination is beneficial. I think when the data is presented about the benefit and safety of vaccination; all other stories loose authority."
		VE014	No evidence that higher uptake, particularly through mandating, will improve outcomes at the individual or population level
		VE022	"I have never had the vaccine nor had Influenza. I have reactions to many medications so do not unnecessarily want to put my self at risk of a reaction. Unfortunately, I don't meet the criteria for an exemption "

reassurance. Don't mandate vaccines. It gives them a bad name and gives fuel to the conspiracy theorists." (EDU025).

4. Discussion

The ED and ICU staff responses indicate positive attitude toward the mandating of the influenza vaccination by Victoria and NSW States and targeting of healthcare workers, such as frontline clinicians who work in high risk settings with particular vulnerable patient groups [5,9,10] which has important implication for planning and policy development. Debate on the legality and ethical standing of mandating influenza vaccination among healthcare workers is long standing [16]. Following the challenges posed by COVID-19 pandemic [17,18], literature advocating for the mandatory administration of the vaccine is currently emerging [19]. Despite the emerging supportive evidence, a national consensus mandating influenza vaccination in our setting remains incomplete [8].

In Australia, the states of Victoria and New South Wales experienced high levels of healthcare worker shortage during the peak COVID-19 pandemic with confirmed healthcare worker COVID-19 infection rates of 148.64 per 100,000 and 133.71 per 100,000 respectively, compared

to the national rate of 90.19 per 100,000 and low vaccination coverage [20–22]. However, our study has shown a high rate of influenza vaccination and vaccine intention with 89% of respondents reporting being vaccinated in 2022 and 85% intending to be vaccinated in 2023 in contrast to the lower rates reported prior to the pandemic [21,22] with Oceania reported to be as low as 48.7% [23]. Our results are like those reported post pandemic by the studies of Lymon and Parry et al. [24,25]

Some respondents in this study who commented on vaccine efficacy and safety made negative statements suggesting opposition to vaccination and this aligns with what has been reported by another study previously [26].

Other participants of this study who had confidence with the vaccine's effectiveness have reported supporting the vaccination in congruent with Hall et al [27] mainly under the themes of “perceived vulnerability” and “trust”.

Australian healthcare workers influenza vaccination uptake has been historically low [1,3]. Literature has shown the positive impact mandating of vaccines has on uptake [2,5]. The new direction taken by the two Australian states who have mandated the vaccines is showing promising results based on this study and may result a wider national policy implication for healthcare worker vaccination.

5. Limitations

This study has several strengths, including the ability to compare jurisdictions within the same country where influenza vaccination mandates differ. Although the survey relied on self-reported data and had a low response rate, it represents the largest study of its kind to date. Nevertheless, the sample size and response rate may limit generalisability.

A purposive, non-probability sampling strategy was used, and participation was voluntary. A priori sample size calculation was not performed, as the study employed an exploratory mixed-methods design and was not intended to test a single primary hypothesis or estimate population parameters with predefined precision. Instead, sample adequacy was considered post hoc. While the achieved sample size was sufficient to detect statistically significant associations and achieve thematic saturation in the qualitative analysis, the findings should be interpreted as reflective of respondent perspectives rather than definitive population-level estimates.

As a result of the sampling approach, the sample may not be fully representative of all ED and ICU healthcare workers in Australia, and self-selection bias cannot be excluded, as individuals with stronger views on vaccination or mandatory policies may have been more likely to participate. In addition, nearly two-thirds of respondents were from jurisdictions with vaccination mandates (NSW and Victoria), which may have influenced the distribution of attitudes observed.

Demographic variables such as ethnicity and religion were not collected and may have influenced participants' views. Response bias and inaccurate self-reporting are also possible. Importantly, objective data on staff attrition or interstate migration were not available; therefore, reported findings reflect participants' perceptions rather than confirmed workforce outcomes and should be interpreted with caution. The cross-sectional design further precludes conclusions regarding causality.

Future studies incorporating longitudinal designs and administrative workforce data are needed to determine whether perceived workforce risks associated with vaccination mandates translate into measurable attrition or migration.

6. Conclusion

Influenza vaccination uptake among ED and ICU healthcare workers was high, although attitudes toward mandatory vaccination were mixed. While many respondents supported mandates and perceived improved uptake, concerns regarding autonomy, ethics, and potential

workforce impacts persisted, despite most reporting that mandates were unlikely to affect their own tenure.

These findings highlight the need for vaccination policies that balance patient safety with workforce acceptability. Future approaches should prioritise transparent communication, improved access, targeted education, and clear exemption pathways to support uptake while minimising perceived workforce risks. Further research linking vaccination policies with longitudinal workforce data is needed to determine whether perceived risks translate into actual staff attrition or interstate migration.

CRedit authorship contribution statement

Abdi D. Osman: Writing – review & editing, Writing – original draft, Visualization, Validation, Resources, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Daryl Jones:** Writing – review & editing, Visualization, Validation, Resources, Methodology, Investigation, Conceptualization. **Glenn Eastwood:** Writing – review & editing, Visualization, Validation, Resources, Methodology, Investigation, Conceptualization. **Louisa Lam:** Writing – review & editing, Visualization, Validation, Resources, Methodology, Investigation, Conceptualization. **Eli Johnson:** Writing – review & editing, Visualization, Validation, Resources, Methodology, Investigation, Conceptualization. **George Braitberg:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Resources, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jvacx.2026.100825>.

Data availability

Data will be made available on request.

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