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Australian healthcare workers and COVID-19 vaccination: Is mandating now or for future variants necessary?

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Eighteen months on from the declaration of a pandemic, coronavirus disease 2019 (COVID-19) continues to restrict freedom of movement and inflict severe social and economic disruption.[1] Worldwide, governments are promoting vaccination to curb excess deaths, i.e. deaths beyond what would be expected in ordinary times, attributed to COVID-19, estimated to be 3 million in 2020.[2]

Aside from Australia's lag in commencing vaccination rollout, access, extended periods of low community transmission engendering complacency[3] and rare cases of thrombosis with thrombocytopenia syndrome linked to the Astra Zeneca (AZ) vaccine, which the Federal Government determined "the majority of Australians will receive"[4] have hindered timely vaccination. Healthcare workers' (HCWs) attitudes and intentions about vaccination have implications beyond their personal wellbeing.[5] This study aimed to examine vaccination acceptance among HCWs, defined as anyone who works in a healthcare setting, in the context of safety and efficacy information.

The survey was advertised on the Local Health District's intranet and staff bulletin and via flyers with the survey QR code. Respondents completed the self-administered questionnaire through SurveyMonkey. A modified World Health Organization tool that aligned with the stage of the vaccination rollout sought responses during May and June 2021 from staff of two hospitals, one of which is a designated COVID-19 facility, in New South Wales (NSW), Australia. Convenience sampling was done mainly via the organisation's intranet homepage. Consenting respondents were assured of anonymity and right to opt out. The study was approved by the District's Human Research Ethics Committee (2021/ETH00448)

Responses to having booked an appointment or planning to be vaccinated determined vaccine acceptance. Chi-square and Fisher's exact test assessed association between covariates and acceptance, trust and concern about COVID-19 vaccination. Cochran-Armitage trend test assessed effect of age-group.

A total of 403 HCWs responded to the survey (Table 1). Respondents' gender, role and years of experience were comparable to the hospitals' workforce: 24.6 vs 28.7% male; 62.6 vs 76.7% clinicians; 43.7 vs 41.5% ≥10 years in their role. Respondents' mean age was 41.9 years and experience in one's role was 10.1 years; 75.4% were female. Respondents included nurses (27.9%), allied health (18.2%), administration staff (17.9%) and doctors (16.5%).

The vast majority (n=314; 90.0%) were accepting of vaccination; 82.5% had a vaccination appointment. Most (85.5%) trusted the vaccine. Trust was positively associated with vaccine acceptance (96.7% v 53.2%; $p<0.0001$). Staff at the designated COVID-19 hospital were less likely to have concerns about COVID-19 vaccination than staff at the other hospital (25 vs 48%), but were comparably accepting (91 vs 85%) and trusting (85 vs 83%) of the vaccine.

Almost one-third (31.9%) were concerned about serious reactions. Vaccine acceptance was high (78.2%) for those respondents, though significantly lower than among respondents with little or no concerns (96.3%) ($\chi^2=26.09$, $p<0.0001$).

Work-role was significantly associated with trust ($\chi^2=10.43$, $p=0.03$), as was gender ($\chi^2=5.62$, $p=0.02$); administration workers were least trusting. Trust was negatively associated with concerns ($\chi^2=41.55$, $p<0.0001$). Concern was more common

Table 1: Respondent characteristics and attitudes towards COVID-19 vaccination (n=403).

Respondent characteristics	N (%)	Vaccine acceptance: Yes[c]	χ2	Trust in vaccine: moderate to very much	χ2	Concern about serious reaction to vaccine: moderate to very much	χ2
		n (%)		n (%)		n (%)	
Demographics							
Gender							
Male	75 (24.6)	69 (92.0)	0.17	71 (94.7)	5.62*	16 (21.3)	4.47*
Female	230 (75.4)	207 (90.4)		193 (83.9)		79 (34.3)	
Age (years)							
<30	78 (26.9)	70 (89.7)	-1.04[a]	69 (88.5)	0.52[a]	32 (41.0)	2.45*[a]
30-39	61 (21.0)	54 (88.5)		49 (80.3)		22 (36.1)	
40-49	56 (19.3)	51 (91.1)		48 (85.7)		8 (14.3)	
50 and older	95 (32.8)	89 (93.7)		85 (89.5)		26 (27.4)	
Chronic illness							
Yes	56 (16.4)	50 (92.6)	0.36	45 (88.2)	0.17	16 (31.4)	0.01
No	286 (83.6)	251 (90.0)		222 (86.0)		79 (30.6)	
Current role in organisation[d]							
Doctor	58 (16.5)	54 (98.2)	5.91	48 (98.0)	10.43*	6 (12.2)	13.34**
Nurse	98 (27.9)	83 (86.5)		73 (83.9)		32 (37.2)	
Allied Health	64 (18.2)	55 (88.7)		51 (83.6)		17 (27.9)	
Administrative worker	63 (18.0)	56 (91.8)		46 (78.0)		25 (42.4)	
Other	68 (19.4)	59 (89.4)		54 (90.0)		19 (31.7)	
Years of experience							
<10	197 (56.3)	171 (89.1)	0.76	155 (86.6)	0.11	64 (35.8)	3.44
10 or more	153 (43.7)	136 (91.9)		116 (85.3)		35 (25.9)	

Notes:
** p<0.05, ** p<0.01*
a: Cochran-Armitage trend test (not χ2)
c: Respondents who had booked an appointment to be vaccinated or who planned to do so were categorised as accepting of the vaccine
d: 'Doctor' includes two dentists; 'Other' includes executives (n=5) other dental worker (n= 2), cleaners (n=1), and unspecified other workers

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among females (χ^2=4.47, p=0.03), younger HCWs (Z=2.45, p=0.01) and varied by work-role (χ^2=13.34, p=0.01).

Vaccine acceptance is high among HCWs despite some having concerns about serious reaction. Females, young HCWs and administration workers expressed heightened concern about post-vaccination reactions, likely influenced by reports identifying those most at risk.[6] Reasons posited for Australian HCWs' greater acceptance, well above the 27.7% to 77.3% reported internationally,[7,8] include: Australians' generally positive attitude and behaviour towards vaccination, which is mostly perceived as safe, necessary and effective[9] – just 1.3% recorded a conscientious objection to childhood vaccination in 2015;[10] and awareness of virus susceptibility,[11] exemplified by neighbouring Melbourne's May 2021 spike in new cases triggering vaccine demand in NSW where there had been no locally acquired cases in the two weeks prior.[12]

Strategies must promote government transparency to build trust, address misunderstandings to assuage concerns,[13] and build public confidence in vaccine efficacy and safety[14] by engaging effective communicators.

Limitations for consideration are those inherent to cross-sectional designs, and sampling bias that precludes generalisability of findings despite commonalities among HCWs.

This study identified exceptionally high vaccination acceptance among HCWs in Australia, indicating that mandatory vaccination may be unwarranted. Targeted interventions addressing apprehensions, alongside ready access to vaccination, should abrogate any form of enforcement for maximising participation among the healthcare workforce.

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