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A. Institutional Publications

Keystone Law

Will employers mandate COVID-19 vaccinations for employees in 2022? (2022)

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The question of whether UK employers may begin to require their employees to be vaccinated is certainly one that will rumble into 2022. In this article, employment partner Emma Clark offers guidance on the current legal position of compulsory vaccination in the workplace and suggests how this issue may develop in the new year. What is the current situation in the UK? The UK Government has mandated that frontline workers in the health and social care sectors have to be fully vaccinated as a condition of employment. By November 2021, all care workers were required to be fully vaccinated unless medically exempt, whilst frontline NHS staff workers must be vaccinated from April 2022. This requirement has not been accepted without challenge. In November 2021, two care workers lost their judicial review in which they challenged the Government's legal requirement for care workers to be vaccinated. The judge considered the requirement to be lawful, to protect the elderly residents, and held that any discriminatory impact on workers could be justified. For other professions, the Government has not suggested it will mandate compulsory vaccinations as a condition of employment. However, individual employers may consider whether they can or wish to mandate such a requirement themselves.

B. Original Research

1. **COVID-19 vaccination intention in the first year of the pandemic: A systematic review.**
   Al-Amer Journal of Clinical Nursing (John Wiley & Sons, Inc.) 2022;31(1/2):62-86.

   Aims and objectives: To synthesise evidence regarding vaccination intention, identify factors contributing to vaccine hesitancy among healthcare professionals and the general populations globally. Background: As COVID-19 vaccine becomes available worldwide, attention is being directed to community vaccine uptake, to achieve population-wide immunity. A number of factors have been reported to influence vaccine intention. Methods: Following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, a systematic search of COVID-19 vaccination intention related literature published on or before 31 December 2020 from seven databases was undertaken. Results: Thirty articles were included in this systematic review. Overall COVID-

19 vaccination intention during the first year of the pandemic ranged from 27.7% to 93.3%. Findings highlighted that socio-demographic differences, perceptions of risk and susceptibility to COVID-19 and vaccine attributes influenced vaccination intention. Healthcare professionals particularly, nurses have higher vaccine hesitancy reportedly due to concerns regarding vaccine safety and efficacy and mistrust of health authorities. Negative information about COVID-19 vaccines in the social media and low confidence in the health system were associated with lower acceptability among the community. Interestingly, cumulative increase in COVID-19 caseloads of countries over time was not associated with vaccination intention. Conclusions: The significant variability in vaccine intention rates worldwide would hamper efforts to achieve immunity against COVID-19. Nurses' concerns about vaccine safety and efficacy need to be addressed to increase vaccine acceptance and maximise their influence on vaccination decision in the community. As misinformation through social media negatively impacts vaccination uptake, authoritative and reliable information on vaccine attributes, disease risks and vaccination benefits are needed. Relevance to clinical practice: Concerns about vaccine safety and efficacy including misinformation are important contributors to vaccine hesitancy. Addressing these factors, particularly among nurses who are considered trusted influencers of vaccination decisions in the community is an important strategy for pandemic preparedness.

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2. **Factors influencing australian healthcare workers' covid-19 vaccine intentions across settings: A cross-sectional survey**
Kaufman J. Vaccines 2022;10(1):No page numbers.

Healthcare workers' COVID-19 vaccination coverage is important for staff and patient safety, workforce capacity and patient uptake. We aimed to identify COVID-19 vaccine intentions, factors associated with uptake and information needs for healthcare workers in Victoria, Australia. We administered a cross-sectional online survey to healthcare workers in hospitals, primary care and aged or disability care settings (12 February-26 March 2021). The World Health Organization Behavioural and Social Drivers of COVID-19 vaccination framework informed survey design and framing of results. Binary regression results adjusted for demographics provide risk differences between those intending and not intending to accept a COVID-19 vaccine. In total, 3074 healthcare workers completed the survey. Primary care healthcare workers reported the highest intention to accept a COVID-19 vaccine (84%, 755/898), followed by hospital-based (77%, 1396/1811) and aged care workers (67%, 243/365). A higher proportion of aged care workers were concerned about passing COVID-19 to their patients compared to those working in primary care or hospitals. Only 25% felt they had sufficient information across five vaccine topics, but those with sufficient information had higher vaccine intentions. Approximately half thought vaccines should be mandated. Despite current high vaccine rates, our results remain relevant for booster programs and future vaccination rollouts.
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3. **Immunogenicity after two doses of inactivated virus vaccine in healthcare workers with and without previous COVID-19 infection: Prospective observational study.**
Yalçın Tuğba Y. Journal of medical virology 2022;94(1):279-286.

Vaccines have been seen as the most important solution for ending the coronavirus disease 2019 (COVID-19) pandemic. The aim of this study is to evaluate the antibody levels after inactivated virus vaccination. We included 148 healthcare workers (74 with prior COVID-19 infection and 74 with not). They received two doses of inactivated virus vaccine

(CoronaVac). Serum samples were prospectively collected three times (Days 0, 28, 56). We measured SARS-CoV-2 IgGsp antibodies quantitatively and neutralizing antibodies. After the first dose, antibody responses did not develop in 64.8% of the participants without prior COVID-19 infection. All participants had developed antibody responses after the second dose. We observed that IgGsp antibody titers elicited by a single vaccine dose in participants with prior COVID-19 infection were higher than after two doses of vaccine in participants without prior infection (geometric mean titer: 898 and 607 AU/ml). IgGsp antibodies, participants with prior COVID-19 infection had higher antibody levels as geometric mean titers at all time points ($p < 0.001$). We also found a positive correlation between IgGsp antibody titers and neutralizing capacity ($rs = 0.697$, $p < 0.001$). Although people without prior COVID-19 infection should complete their vaccination protocol, the adequacy of a single dose of vaccine is still in question for individuals with prior COVID-19. New methods are needed to measure the duration of protection of vaccines and their effectiveness against variants as the world is vaccinated. We believe quantitative IgGsp values may reflect the neutralization capacity of some vaccines.

4. **Inactive SARS-CoV-2 vaccine generates high antibody responses in healthcare workers with and without prior infection.**
Dinc Harika Oyku Vaccine 2022;40(1):52-58.

BACKGROUND AND OBJECTIVESHealthcare workers (HCWs) were among the first groups to be vaccinated in Turkey. The data to be obtained by the vaccination of HCWs would guide wide spread vaccination programs.MATERIALS AND METHODSThe study included 330 HCWs working at Istanbul University-Cerrahpaşa, Cerrahpaşa Medical Faculty Hospital and vaccinated with inactive CoronaVac (Sinovac Life Sciences, China) SARS-CoV-2 vaccine in two doses (28 days apart). Anti-Spike /RBD IgG levels were measured 14 days after the first dose and 28 days after the second dose. Chemiluminescent microparticle immunoassay (CMIA) (ARCHITECT IgG II Quant test, Abbott, USA), which is 100% compatible with plaque reduction neutralization test (PRNT), was used.RESULTSOf the participants, 211 (63.9%) were female, 119 (36.1%) were male, and mean age was 39.6 ± 7.7 years. In those without prior COVID-19 history; (n = 255) antibody positivity was detected as 48.2% (95% CI: 42.1-54.3) 14 days after the first dose of vaccine, and 99.2% (95% CI: 98.1-100) at day 28 after the second dose. Antibody titers were significantly lower in patients with hypertension ($p = 0.011$). In those with prior history of COVID-19 (n = 75); both the antibody positivity rates after the first vaccine (48.2% vs 100%, $p = 0.000$) and the anti-spike/RBD antibody levels after the second vaccine (with a ≥ 1050 AU/mL titer equivalent to PRNT 1/80 dilution) was significant than infection-naive group (25.9% vs. 54.7%, $p = 0.000$). Antibody positivity after two doses of vaccination for all study group was 99.4% (95% CI: 98.6-100).CONCLUSIONSTwo doses CoronaVac produce effective humoral immunity in HCWs. Antibody response is significantly higher in those with prior history of COVID-19 than infection-naive group. Given no significant benefit of the second dose, a single shot of vaccination may be sufficient for those with prior history of COVID-19. Monitoring humoral and cellular immune responses, considering new variants, is required to validate this approach.

5. **Two-dose ChAdOx1 nCoV-19 vaccine protection against COVID-19 hospital admissions and deaths over time: a retrospective, population-based cohort study in Scotland and Brazil.**
Katikireddi Srinivasa Vittal Lancet (London, England) 2022;399(10319):25-35.

BACKGROUNDReports suggest that COVID-19 vaccine effectiveness is decreasing, but whether this reflects waning or new SARS-CoV-2 variants-especially delta (B.1.617.2)-is unclear. We investigated the association between time since two doses of ChAdOx1 nCoV-19 vaccine and risk of severe COVID-19 outcomes in Scotland (where delta was dominant),

with comparative analyses in Brazil (where delta was uncommon).METHODSIn this retrospective, population-based cohort study in Brazil and Scotland, we linked national databases from the EAVE II study in Scotland; and the COVID-19 Vaccination Campaign, Acute Respiratory Infection Suspected Cases, and Severe Acute Respiratory Infection/Illness datasets in Brazil) for vaccination, laboratory testing, clinical, and mortality data. We defined cohorts of adults (aged ≥18 years) who received two doses of ChAdOx1 nCoV-19 and compared rates of severe COVID-19 outcomes (ie, COVID-19 hospital admission or death) across fortnightly periods, relative to 2-3 weeks after the second dose. Entry to the Scotland cohort started from May 19, 2021, and entry to the Brazil cohort started from Jan 18, 2021. Follow-up in both cohorts was until Oct 25, 2021. Poisson regression was used to estimate rate ratios (RRs) and vaccine effectiveness, with 95% CIs.FINDINGS1 972 454 adults received two doses of ChAdOx1 nCoV-19 in Scotland and 42 558 839 in Brazil, with longer follow-up in Scotland because two-dose vaccination began earlier in Scotland than in Brazil. In Scotland, RRs for severe COVID-19 increased to 2·01 (95% CI 1·54-2·62) at 10-11 weeks, 3·01 (2·26-3·99) at 14-15 weeks, and 5·43 (4·00-7·38) at 18-19 weeks after the second dose. The pattern of results was similar in Brazil, with RRs of 2·29 (2·01-2·61) at 10-11 weeks, 3·10 (2·63-3·64) at 14-15 weeks, and 4·71 (3·83-5·78) at 18-19 weeks after the second dose. In Scotland, vaccine effectiveness decreased from 83·7% (95% CI 79·7-87·0) at 2-3 weeks, to 75·9% (72·9-78·6) at 14-15 weeks, and 63·7% (59·6-67·4) at 18-19 weeks after the second dose. In Brazil, vaccine effectiveness decreased from 86·4% (85·4-87·3) at 2-3 weeks, to 59·7% (54·6-64·2) at 14-15 weeks, and 42·2% (32·4-50·6) at 18-19 weeks.INTERPRETATIONWe found waning vaccine protection of ChAdOx1 nCoV-19 against COVID-19 hospital admissions and deaths in both Scotland and Brazil, this becoming evident within three months of the second vaccine dose. Consideration needs to be given to providing booster vaccine doses for people who have received ChAdOx1 nCoV-19.FUNDINGUK Research and Innovation (Medical Research Council), Scottish Government, Research and Innovation Industrial Strategy Challenge Fund, Health Data Research UK, Fiocruz, Fazer o Bem Faz Bem Programme; Conselho Nacional de Desenvolvimento Científico e Tecnológico, Fundação Carlos Chagas Filho de Amparo à Pesquisa do Estado do Rio de Janeiro.TRANSLATIONFor the Portuguese translation of the abstract see Supplementary Materials section.

6. **Covid-19 immunisation, willingness to be vaccinated and vaccination strategies to improve vaccine uptake in Australia**
Wang B. Vaccines 2021;9(12):No page numbers.

The COVID-19 vaccine rollout is crucial to lifting community and economic restrictions. This cross-sectional study aimed to assess: (a) COVID-19 vaccine uptake and associated factors; (b) COVID-19 vaccine intentions and associated factors; (c) community support for COVID-19 vaccination strategies and associated factors. The survey was conducted between May and July 2021 in Australia. Of 3003 participants, 30% reported they were already vaccinated and 39% indicated they would get vaccinated. Low socioeconomic and education levels, non-English speaking backgrounds and being parents were associated with decreased vaccine willingness and/or vaccination rates. High levels of support for vaccination strategies were demonstrated with mandatory vaccination being less preferable. Respondents from non-English speaking backgrounds were more likely to support a mandatory vaccination policy. Respondents with the highest socioeconomic level were more likely to support vaccination requirements for international travel, visiting nursing homes and working in healthcare settings. Respondents who were aged >=70 years were more likely to support all proposed vaccination strategies. Targeted campaigns should be implemented for parents and those who live in socioeconomic disadvantaged areas and have lower educational attainment. Concise and clear vaccine information should be provided in lay and multiple languages to improve vaccine confidence. Vaccine enforcement policies should be considered and implemented with caution.
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7. **Final efficacy analysis, interim safety analysis, and immunogenicity of a single dose of recombinant novel coronavirus vaccine (adenovirus type 5 vector) in adults 18 years and older: an international, multicentre, randomised, double-blinded, placebo-controlled phase 3 trial.**
   Halperin Scott A. Lancet (London, England) 2021;:No page numbers.

   BACKGROUNDThe Ad5-nCoV vaccine is a single-dose adenovirus type 5 (Ad5) vectored vaccine expressing the SARS-CoV-2 spike protein that was well-tolerated and immunogenic in phase 1 and 2 studies. In this study, we report results on the final efficacy and interim safety analyses of the phase 3 trial.METHODSThis double-blind, randomised, international, placebo-controlled, endpoint-case driven, phase 3, clinical trial enrolled adults aged 18 years older at study centres in Argentina, Chile, Mexico, Pakistan, and Russia. Participants were eligible for the study if they had no unstable or severe underlying medical or psychiatric conditions; had no history of a laboratory-confirmed SARS-CoV-2 infection; were not pregnant or breastfeeding; and had no previous receipt of an adenovirus-vectored, coronavirus, or SARS-CoV-2 vaccine. After informed consent was obtained, 25 mL of whole blood was withdrawn from all eligible participants who were randomised in a 1:1 ratio to receive a single intramuscular dose of 0·5 mL placebo or a 0·5 mL dose of 5 × 1010 viral particle (vp)/mL Ad5-nCoV vaccine; study staff and participants were blinded to treatment allocation. All participants were contacted weekly by email, telephone, or text message to self-report any symptoms of COVID-19 illness, and laboratory testing for SARS-CoV-2 was done for all participants with any symptoms. The primary efficacy objective evaluated Ad5-nCoV in preventing symptomatic, PCR-confirmed COVID-19 infection occurring at least 28 days after vaccination in all participants who were at least 28 days postvaccination on Jan 15, 2021. The primary safety objective evaluated the incidence of any serious adverse events or medically attended adverse events postvaccination in all participants who received a study injection. This trial is closed for enrolment and is registered with ClinicalTrials.gov (NCT04526990).FINDINGSStudy enrolment began on Sept 22, 2020, in Pakistan, Nov 6, 2020, in Mexico, Dec 2, 2020, in Russia and Chile, and Dec 17, 2020, in Argentina; 150 endpoint cases were reached on Jan 15, 2021, triggering the final primary efficacy analysis. One dose of Ad5-nCoV showed a 57·5% (95% CI 39·7-70·0, p=0·0026) efficacy against symptomatic, PCR-confirmed, COVID-19 infection at 28 days or more postvaccination (21 250 participants; 45 days median duration of follow-up [IQR 36-58]). In the primary safety analysis undertaken at the time of the efficacy analysis (36 717 participants), there was no significant difference in the incidence of serious adverse events (14 [0·1%] of 18 363 Ad5-nCoV recipients and 10 [0·1%] of 18 354 placebo recipients, p=0·54) or medically attended adverse events (442 [2·4%] of 18 363 Ad5-nCoV recipients and 411 [2·2%] of 18 354 placebo recipients, p=0·30) between the Ad5-nCoV or placebo groups, or any serious adverse events considered related to the study product (none in both Ad5-nCoV and placebo recipients). In the extended safety cohort, 1004 (63·5%) of 1582 of Ad5-nCoV recipients and 729 (46·4%) of 1572 placebo recipients reported a solicited systemic adverse event (p<0·0001), of which headache was the most common (699 [44%] of Ad5-nCoV recipients and 481 [30·6%] of placebo recipients; p<0·0001). 971 (61·3%) of 1584 Ad5-nCoV recipients and 314 (20·0%) of 1573 placebo recipients reported an injection-site adverse event (p<0·0001), of which pain at the injection site was the most frequent; reported by 939 (59%) Ad5-nCoV recipients and 303 (19%) placebo recipients.INTERPRETATIONOne dose of Ad5-nCoV is efficacious and safe in healthy adults aged 18 years and older.FUNDINGCanSino Biologics and the Beijing Institute of Biotechnology.

8. **Predictors of COVID-19 vaccine acceptance and hesitancy among healthcare workers in Southern California: Not just "anti" vs. "pro" vaccine**
   Dubov A. Vaccines 2021;9(12):No page numbers.

In this study, we evaluated the status of and attitudes toward COVID-19 vaccination of healthcare workers in two major hospital systems (academic and private) in Southern California. Responses were collected via an anonymous and voluntary survey from a total of 2491 participants, including nurses, physicians, other allied health professionals, and administrators. Among the 2491 participants that had been offered the vaccine at the time of the study, 2103 (84%) were vaccinated. The bulk of the participants were middle-aged college-educated White (73%), non-Hispanic women (77%), and nursing was the most represented medical occupation (35%). Political affiliation, education level, and income were shown to be significant factors associated with vaccination status. Our data suggest that the current allocation of healthcare workers into dichotomous groups such as "anti-vaccine vs. pro-vaccine" may be inadequate in accurately tailoring vaccine uptake interventions. We found that healthcare workers that have yet to receive the COVID-19 vaccine likely belong to one of four categories: the misinformed, the undecided, the uninformed, or the unconcerned. This diversity in vaccine hesitancy among healthcare workers highlights the importance of targeted intervention to increase vaccine confidence. Regardless of governmental vaccine mandates, addressing the root causes contributing to vaccine hesitancy continues to be of utmost importance.
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