Saskatchewan Health Authority

University of Saskatchewan

COVID-19 Evidence Support Team
EVIDENCE SEARCH REPORT

Review Question:	What is known about safety/efficacy of global vaccines not approved in Canada? What are the impacts on international travel and vaccination policies?
Context:	Identified vaccines to review are Sinovac-Coronavac, Sinopharm, Covaxin and Sputnik V. What is considered "fully vaccinated" in context of these with Canadian-approved vaccines? Also, what is known about mix/matching for these vaccines?
Review Code:	INF210701 ESR **Complete Date:** July 16, 2021
Cite As:	Miller, L, Howell-Spooner, B. What is known about safety/efficacy of global vaccines not approved in Canada? What are the impacts on international travel and vaccination policies? 2021 Jul 16, Document no.: INF210701 ESR. In: COVID-19 Rapid Evidence Reviews [Internet]. SK: SK COVID Evidence Support Team, c2021. 24 p. (CEST evidence search report).

Librarian Notes & Comments

Hi,

We could find limited clinical evidence on the comparative efficacy and mixing and matching of vaccines in a global context.

The database search provided only references to clinical trials and single studies, with any review articles in the mix drawing upon extremely limited evidence.

Some editorials were found to provide some input and context.

Interestingly, the CDC (USA) seems to have little/no information for international visitors/travelers in order to determine if their vaccines constitute being “fully vaccinated”. This may be complicated by the fact individual states might have jurisdiction over this! Surely this will be a hot topic for the coming months, however.

Sincerely,
Lukas

Search Results: Guidelines, Summaries & Other Grey Literature

Disclaimer

Agencies

WHO

- COVID-19 vaccine tracker and landscape. July 13, 2021. https://www.who.int/publications/m/item/draft-landscape-of-covid-19-candidate-vaccines
- The Sinopharm COVID-19 vaccine: What you need to know. May 10, 2021. https://www.who.int/news-room/feature-stories/detail/the-sinopharm-covid-19-vaccine-what-you-need-to-know

European Medicines Agency

- EMA starts rolling review of the Sputnik V COVID-19 vaccine. March 4, 2021. https://www.ema.europa.eu/en/news/ema-starts-rolling-review-sputnik-v-covid-19-vaccine

Research Centres

Prevent Epidemics

- Early COVID-19 vaccination rollout top performers. January 12, 2021. https://preventepidemics.org/covid19/science/review/december-19-2020-january-8-2021/

Government of Canada / Health Canada

- COVID-19 vaccinated travellers entering Canada https://travel.gc.ca/travel-covid/travel-restrictions/covid-vaccinated-travellers-entering-canada
- Drug and vaccine authorizations for COVID-19: Overview. https://www.canada.ca/en/health-canada/services/drugs-health-products/covid19-industry/drugs-vaccines-treatments/authorization.html
- Drug and vaccine authorizations for COVID-19: List of applications received July 9, 2021. https://www.canada.ca/en/health-canada/services/drugs-health-products/covid19-industry/drugs-vaccines-treatments/authorization/applications.html

NHS (UK)

- NHS COVID Pass. July 20, 2021. https://www.nhs.uk/conditions/coronavirus-covid-19/covid-pass/
    - Lists approved vaccines for travel and defines “fully vaccinated.”

European Commission (European Union)

- EU Digital COVID Certificate. N.d. https://ec.europa.eu/info/live-work-travel-eu/coronavirus-response/safe-covid-19-vaccines-europeans/eu-digital-covid-certificate_en
    - Lists approved vaccines for travel and defines “fully vaccinated.”

Australian Government Department of Health

- COVID-19 vaccines: FAQ. https://www.australia.gov.au/internationalfaqs
    -

Search Results: News, Blogs, & Social Media

News

CBC

- Vaccinated Canadians overseas frustrated that they were left out of new entry rules. June 15, 2021. https://www.cbc.ca/news/world/vaccinated-canadians-frustrated-1.6064933
- How COVID-19 vaccines developed in China, Russia and elsewhere could impact the pandemic. May 10, 2021. https://www.cbc.ca/news/science/vaccines-china-russia-india-1.6016645
- EU report says Russia, China taking aim at trust in Western vaccines. April 28, 2021. https://www.cbc.ca/news/world/european-union-report-russia-china-mistrust-western-vaccine-1.6005864
- Lancet gives the nod to Russia's coronavirus vaccine, giving a beleaguered Putin a soft-power victory. February 11, 2021. https://www.cbc.ca/news/world/russia-sputnik-lancet-1.5908369
- How the Novavax COVID-19 vaccine differs from those already approved in Canada. February 3, 2021. https://www.cbc.ca/news/health/novavax-explainer-1.5897946
- Russia says its COVID vaccine is 95% effective. So why is there still Western resistance to it?. December 2, 2020. https://www.cbc.ca/news/world/russia-vaccine-covid-19-coronavirus-chris-brown-1.5819331

Nature

- Mounting evidence suggests Sputnik COVID vaccine is safe and effective. July 6, 2021. https://www.nature.com/articles/d41586-021-01813-2
- WHO approval of Chinese CoronaVac COVID vaccine will be crucial to curbing pandemic. June 4, 2021. https://www.nature.com/articles/d41586-021-01497-8

The Lancet

- Sputnik V COVID-19 vaccine candidate appears safe and effective. February 2, 2021. https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(21)00191-4/fulltext

Reuters

- Explainer: Are Chinese COVID-19 shots effective against the Delta variant?. June 28, 2021. https://www.reuters.com/world/china/are-chinese-covid-19-shots-effective-against-delta-variant-2021-06-29/

The Conversation

- What are the Sinopharm and Sinovac vaccines? And how effective are they? Two experts explain. June 21, 2021. https://theconversation.com/what-are-the-sinopharm-and-sinovac-vaccines-and-how-effective-are-they-two-experts-explain-162258

Global News

- WHO asks Western countries to recognize China’s COVID-19 vaccines. July 1, 2021. https://globalnews.ca/news/7996100/who-decision-covid-vaccines/
- Over 270k Canadians got the Covishield vaccine. They may not be eligible for EU travel. June 30, 2021. https://globalnews.ca/news/7992959/covid-coronavirus-vaccine-passport-europe-eu-travel-covishield/

iPolitics

- Health Canada considers approving Covaxin vaccine. 15 July 2021. https://ipolitics.ca/2021/07/15/health-canada-considers-approving-covaxin-vaccine/

COVID19 Vaccine Tracker

- https://covid19.trackvaccines.org/
- Tracks trials and approvals/regulations of vaccine by country and manufacturer
- (no comparison)

Search Results: Journal Articles (includes preprints)

Sorted by newest-oldest.

1. Abu-Hammad O, Alduraidi H, Abu-Hammad S, et al. Side Effects Reported by Jordanian Healthcare Workers Who Received COVID-19 Vaccines. Vaccines (Basel). 2021;9(6):01. DOI: 10.3390/vaccines9060577
ABSTRACT: Background Distribution of COVID-19 vaccines has been surrounded by suspicions and rumors making it necessary to provide the public with accurate reports from trustworthy experts such as healthcare professionals. Methods We distributed a questionnaire in Jordan among physicians, dentists and nurses who received a COVID-19 vaccine to explore the side effects (SE) they encountered after the first or the second dose of one of three vaccines namely: AstraZeneca Vaxzevria (AZ), Pfizer-BioNTeck (PB), and SinoPharm (SP) vaccines. Results A total of 409 professionals participated. Approximately 18% and 31% of participants reported no SE after the first dose and second dose, respectively. The remainder had mostly local side effects related to injection site (74%). Systemic side effects in the form of fatigue (52%), myalgia (44%), headache (42%), and fever (35%) prevailed mainly after the first dose. These were significantly associated with AZ vaccine, and age </= 45 years (p = 0.000 and 0.01, respectively). No serious SE were reported. Conclusions We can conclude that SE of COVID-19 vaccines distributed in Jordan are within the common range known so far for these vaccines. Further studies are needed to include larger sample size and longer follow-up period to monitor possible serious and long-term SE of the vaccines.
URL: https://www.ncbi.nlm.nih.gov/pubmed/34205917
DOI: 10.3390/vaccines9060577

2. Akova M, Unal S. A randomized, double-blind, placebo-controlled phase III clinical trial to evaluate the efficacy and safety of SARS-CoV-2 vaccine (inactivated, Vero cell): a structured summary of a study protocol for a randomised controlled trial. Trials. 2021;22(1):276. DOI: 10.1186/s13063-021-05180-1
ABSTRACT: OBJECTIVES: The primary objective is to evaluate the efficacy of an inactivated and aluminium hydroxide adsorbed SARS-CoV-2 vaccine (Sinovac, China) in voluntary participants after 14 days of the second dose against RT-PCR confirmed symptomatic COVID-19 cases. The secondary objectives include evaluating the efficacy after at least one dose of the vaccine against RT-PCR confirmed symptomatic COVID-19 cases; the efficacy of two doses of the vaccine on the rates of hospitalization and death; the safety of the vaccine including adverse reactions up to one year after the 2(nd) dose of vaccination; and the immunogenicity of the vaccine and its duration up to 120 days. TRIAL DESIGN: This is a phase III, randomized, double-blind, placebo-controlled case driven clinical trial to assess the efficacy and safety of the vaccine. The study is planned to be carried out within two separate cohorts in voluntary participants aged between 18-59 years old. The first cohort includes healthcare professionals actively working in healthcare units, who are assumed to have higher risk of acquiring COVID-19, and the second cohort includes other immunocompetent subjects in the same age group, who are at a regular risk for COVID-19 disease. In Cohort 1, healthcare professionals will be randomized to receive two intramuscular doses of investigational product or the placebo in a 1:1 ratio and they will be monitored for 12 months by active surveillance of COVID-19. In Cohort 2, immunocompetent subjects will be randomized to receive vaccine or the placebo in a 2:1 ratio. PARTICIPANTS: Healthcare professionals of both genders, including medical doctors, nurses, cleaners, hospital technicians, and administrative personnel who work in any department of a healthcare unit and immunocompetent individuals of both genders are included. Pregnant (confirmed by positive beta-hCG test) and breastfeeding women as well as those intending to become pregnant within three months after vaccination are excluded. Other exclusion criteria include history of COVID-19 test positivity (PCR or immunoglobulin test results), any form of immunosuppressive therapy including corticosteroids within 6 months, history of bleeding disorders, asplenia, and administration of any form of immunoglobulins or blood products within 3 months. Exclusion criteria for the second dose include any serious adverse events related with the vaccine, anaphylaxis or hypersensitivity

after vaccination, or any confirmed or suspected autoimmune or immunosuppressive disease (including HIV infection). Participants are only included after signing the voluntary informed consent form, ensuring cooperation in visits, undergoing screening for evaluation, and conforming to all the inclusion and exclusion criteria. All clinical sites are located in Turkey. INTERVENTION AND COMPARATOR: The vaccine was manufactured by Sinovac Research & Development Co., Ltd. It is a preparation made from a novel coronavirus (strain CZ02) grown in the kidney cell cultures (Vero Cell) of the African green monkey and contains inactivated SARS-CoV-2 virus, aluminium hydroxide, disodium hydrogen phosphate, sodium dihydrogen phosphate, and sodium chloride. A dose of 0.5 mL contains 600 SU of SARS-CoV-2 virus antigen. The placebo contains aluminium hydroxide, disodium hydrogen phosphate, sodium dihydrogen phosphate, and sodium chloride (0.5mL/dose). Scheduled visits and additional unscheduled weekly visits will be performed for the first 13 weeks and neutralizing antibody test, IgG test, T-Cell activation test, pregnancy test, and RT-PCR tests along with total antibody test will be performed. Adverse events and serious adverse events during the follow-up will be recorded on diary cards. Diary cards will collect information on the timing and severity of COVID-19 symptoms and solicited adverse events recorded by the subjects during one-year follow-up period. All serious adverse events will be managed and necessary treatment will be ensured according to the local regulations. All serious adverse events following vaccination will be reported to the ethics committee, the Ministry of Health, and the study sponsor within 24 hours of detection. MAIN OUTCOMES: The primary efficacy endpoint is the incidence of symptomatic cases of COVID-19 disease confirmed by RT-PCR two weeks after the second dose of vaccination. Secondary efficacy endpoints are the incidence of hospitalization/mortality rates among one or two dose regimens, duration of immunogenicity rates up to 120 days, the seroconversion rate, the seropositivity rate, neutralizing antibody titer, and IgG levels 14 days after each dose of vaccination. The primary safety endpoint is the severity and frequency of local and systemic adverse reactions during the period of one week after vaccination. The study would be terminated if more than 15% of the subjects have grade >/=3 adverse events related to vaccination including local reactions. RANDOMISATION: Eligible subjects will be randomized at their Study Day 0 to two study groups using an Interactive Web Response System (IWRS; developed by Omega CRO, Ankara, Turkey) in both risk groups. The IWRS system customizes the randomization algorithm. After enrolment in the study, each participant will be randomly assigned to either of the two treatment arms at a ratio of 1:1 in the high-risk group and at a ratio of 2:1 in the normal risk group. Each enrolled participant will be assigned to a code and will receive the treatment labelled with the code. BLINDING (MASKING): The trial is a double-blind study to avoid introducing bias. The blinding may be broken by the investigator in the event of a medical emergency in which knowledge of the identity of the study vaccine is critical for management of the subject's immediate treatment. The Data and Safety Monitoring Board is to be contacted in case of breaking the blinding for a study object. The blood samples will be taken from both placebo and vaccinated groups, in order not to break the blinding. NUMBERS TO BE RANDOMISED (SAMPLE SIZE): The study is planned to be carried out with two separate cohorts. The Cohort 1 includes healthcare professionals working in healthcare units and the Cohort 2 consists of immunocompetent subjects having normal risk for COVID-19 disease. The Cohort 2 will be initiated after the evaluation of the interim safety report of the Cohort 1 by the Data and Safety Monitoring Board. Both cohorts will be followed-up via RT-PCR to confirm symptomatic COVID-19 cases. If the clinical efficacy of the vaccine is shown in the Cohort 1 or 2, the subjects randomized into the placebo arm will also be vaccinated. In the Cohort 1, 588 subjects should be included in both arms with the assumption that the risk of infection with COVID-19 will be 5% for the placebo arm and 2% for the vaccine arm in the high-risk group. Considering 10% of drop-out rate and 5% of seropositivity or PCR positivity at baseline, 680 subjects should be screened at both arms of the Cohort 1. Group sample sizes of 7545 SARS-CoV-2 vaccine and 3773 placebo suits at a two-sided 95% confidence interval for the difference in population proportions with a width equal to 1.0%, when the estimated incidence rate for vaccinated group is 1.0% and the estimated incidence rate for placebo group is 2.0%. Drop-out rate is assumed to be 10% and seropositivity or PCR positivity at baseline is assumed to be 5%; accordingly, 13000 participants are needed to be enrolled totally in both cohorts. The remaining 11640 subjects will be screened in the Cohort 2 and eligible subjects will be randomized at a ratio of 2:1. TRIAL STATUS: Protocol version 6.0 - 15 October 2020. Recruitment started on 15.09.2020 and is expected to end on February 2022. TRIAL REGISTRATION: ClinicalTrials.gov, NCT04582344 . Registered 8 October 2020 FULL PROTOCOL: The full protocol of the trial is attached as an additional file, accessible from the Trials website (Additional file 1). In the interest in expediting dissemination of this material, the familiar formatting has been eliminated; this Letter serves as a summary of the key elements of the full protocol.

URL: https://www.ncbi.nlm.nih.gov/pubmed/33849629

DOI: 10.1186/s13063-021-05180-1

3. Akpolat T, Uzun O. Reduced mortality rate after coronavac vaccine among healthcare workers. J Infect. 2021;09:09. DOI: 10.1016/j.jinf.2021.06.005
URL: https://www.ncbi.nlm.nih.gov/pubmed/34116073
DOI: 10.1016/j.jinf.2021.06.005

4. Baraniuk C. Covid-19: What do we know about Sputnik V and other Russian vaccines? BMJ. 2021;372:n743. DOI: 10.1136/bmj.n743
URL: https://www.ncbi.nlm.nih.gov/pubmed/33741559
DOI: 10.1136/bmj.n743

5. Baraniuk C. What do we know about China's covid-19 vaccines? BMJ. 2021;373:n912. DOI: 10.1136/bmj.n912
URL: https://www.ncbi.nlm.nih.gov/pubmed/33836994
DOI: 10.1136/bmj.n912

6. Bayram A, Demirbakan H, Gunel Karadeniz P, et al. Quantitation of antibodies against SARS-CoV-2 spike protein after two doses of CoronaVac in healthcare workers. J Med Virol. 2021;21:21. DOI: 10.1002/jmv.27098
ABSTRACT: Quantitation of antibodies to the spike protein of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was performed for the detection of adaptive immune response in healthcare workers (HCWs) vaccinated with CorovaVac. We prospectively recruited HCWs from a university hospital in Turkey. Serum samples from 1072 HCWs were obtained following 28 days of the first, and 21 days of the second dose. Detection and quantitation of SARS-CoV-2 antispike antibodies were performed by the chemiluminescent microparticle immunoassay (SARS-CoV-2 IgG II Quant; Abbott). Results greater than or equal to the cutoff value 50.0 AU/ml were reported as positive. After the first dose, antispike antibodies were detected in 834 of 1072 (77.8%) HCWs. Seropositivity was higher among females (84.6%) than males (70.6%) ($p < 0.001$) and was found to be highest in both women and men between the ages of 18-34. After the second dose, antibodies were detected in 1008 of 1012 (99.6%) HCWs. Antibody titers were significantly higher in those who had coronavirus disease-2019 before vaccination than those who did not ($p < 0.001$). Antibody positivity and median antibody titers were significantly less in HCWs with chronic diseases compared to those without ($p < 0.05$ and $p < 0.001$, respectively). In conclusion, our findings indicated that a relatively high frequency (99.6%) of humoral immunity was produced in HCWs aged 18-59 after two doses of CoronaVac. Quantitation of antibodies may help facilitate longitudinal monitoring of the antibody response, which will be especially useful in deciding the dose of the vaccine in vulnerable groups such as those over 60 years of age and those with chronic diseases.
URL: https://www.ncbi.nlm.nih.gov/pubmed/34019704
DOI: 10.1002/jmv.27098

7. Bucci EM, Berkhof J, Gillibert A, et al. Data discrepancies and substandard reporting of interim data of Sputnik V phase 3 trial. Lancet. 2021;397(10288):1881-3. DOI: 10.1016/S0140-6736(21)00899-0
URL: https://www.ncbi.nlm.nih.gov/pubmed/33991475
DOI: 10.1016/S0140-6736(21)00899-0

8. Burgos-Salcedo J. A rational strategy to support approved COVID-19 vaccines prioritization. Hum Vaccin Immunother. 2021:1-4. DOI: 10.1080/21645515.2021.1922060
ABSTRACT: The World Health Organization (WHO) proposed a set of criteria to be considered for the prioritization of COVID-19 candidate vaccines for further development of phase II/III clinical trials, thinking in a target audience that includes vaccine scientists, product developers, manufacturers, regulators, and funding agencies. In this paper, a knowledge-based or rational strategy is employed to perform a prioritization matrix of approved COVID-19 vaccines: BBIBP-CorV, JANSSEN, CORONAVAC, SPUTNIK V, MODERNA, PFIZER, and VAXZEVRIA, based on those proposed criteria by WHO, related to safety, efficacy, stability, implementation, and availability. We found that JANSSEN vaccine is the one with the highest score in the present study, but our analysis suggests that the WHO criteria could be more useful if they are considered separately, taking into account the social, demographic and economic characteristics of each country.

URL: https://www.ncbi.nlm.nih.gov/pubmed/34114939
DOI: 10.1080/21645515.2021.1922060

9. Calil V, Palmeira P, Zheng Y, et al. CoronaVac can induce the production of anti-SARS-CoV-2 IgA antibodies in human milk. Clinics (Sao Paulo). 2021;76:e3185. DOI: 10.6061/clinics/2021/e3185
URL: https://www.ncbi.nlm.nih.gov/pubmed/34190859
DOI: 10.6061/clinics/2021/e3185

10. Calzetta L, Ritondo BL, Coppola A, et al. Factors Influencing the Efficacy of COVID-19 Vaccines: A Quantitative Synthesis of Phase III Trials. Vaccines (Basel). 2021;9(4):01. DOI: 10.3390/vaccines9040341
ABSTRACT: To date, there is still a paucity of data from Phase III trials concerning the efficacy of vaccines against COVID-19. Furthermore, no studies investigated the variables that may modulate the efficacy of vaccination. The aim of this analysis was to assess whether there are modifying factors that may potentially influence the clinical efficacy of COVID-19 vaccines. A quantitative synthesis of data from Phase III trials was performed via pairwise and network meta-analyses, along with meta-regression analysis. Data from Phase III trials are currently available only for AZD1222, BNT162b2, mRNA-1237, and Sputnik V. Vaccination resulted to be generally effective (90.0%, 95%CI 72.6-96.4; $p < 0.001$), although the efficacy of AZD1222 (62.1%) introduced a significant level of heterogeneity in the meta-analysis (I(2) 92.17%, $p < 0.001$). No significant modifying factors resulted from the meta-regression analysis. However, considering the mRNA-based vaccines, a trend toward significance ($p = 0.081$) resulted for age. The network meta-analysis provided the following rank of effectiveness: BNT162b2 approximately mRNA-1273 > Sputnik V >> AZD1222. In conclusion, no modifying factors seem to modulate the efficacy of vaccines against COVID-19. This quantitative synthesis will need to be updated as soon as further clinical results on the efficacy profile are available from Phase III trials for further licensed COVID-19 vaccines.
URL: https://www.ncbi.nlm.nih.gov/pubmed/33916222
DOI: 10.3390/vaccines9040341

11. Chatterjee P. Covid-19: India authorises Sputnik V vaccine as cases soar to more than 180 000 a day. BMJ. 2021;373:n978. DOI: 10.1136/bmj.n978
URL: https://www.ncbi.nlm.nih.gov/pubmed/33853766
DOI: 10.1136/bmj.n978

12. Chen Y, Shen H, Huang R, et al. Serum neutralising activity against SARS-CoV-2 variants elicited by CoronaVac. Lancet Infect Dis. 2021;27:27. DOI: 10.1016/S1473-3099(21)00287-5
URL: https://www.ncbi.nlm.nih.gov/pubmed/34051887
DOI: 10.1016/S1473-3099(21)00287-5

13. Doroftei B, Ciobica A, Ilie OD, et al. Mini-Review Discussing the Reliability and Efficiency of COVID-19 Vaccines. Diagnostics (Basel). 2021;11(4):24. DOI: 10.3390/diagnostics11040579
ABSTRACT: Severe Acute Respiratory Syndrome Coronavirus 2 is a novel strain of human beta-coronavirus that has produced over two million deaths and affected one hundred million individuals worldwide. As all the proposed drugs proved to be unstable, inducing side effects, the need to develop a vaccine crystallized in a short time. As a result, we searched the databases for articles in which the authors reported the efficacy and safety of the use of several vaccines vaccines by sex, age group, and frequency of adverse reactions. We identified a total of 19 relevant articles that were discussed throughout this manuscript. We concluded that from all eleven vaccines, three had an efficacy >90% (Pfizer-BioNTech (~95%), Moderna (~94%), and Sputnik V (~92%)) except for Oxford-AstraZeneca (~81%). However, Moderna, Sputnik V, and Oxford-AstraZeneca also alleviate severe adverse reactions, whereas in Pfizer-BioNTech this was not revealed. The remaining five (Convidicea (AD5-nCOV); Johnson & Johnson (Ad26.COV2.S); Sinopharm (BBIBP-CorV); Covaxin (BBV152), and Sinovac (CoronaVac)) were discussed based on their immunogenicity, and safety reported by the recipients since only phases 1 and 2 were conducted without clear evidence published regarding their efficacy. CoviVac and EpiVacCorona have just been approved, which is why no published article could be found. All adverse events reported following the administration of one of the four vaccines ranged from mild to moderate; limited exceptions in which the patients either developed

severe forms or died, because most effects were dose-dependent. It can be concluded that aforementioned vaccines are efficient and safe, regardless of age and sex, being well-tolerated by the recipients.
URL: https://www.ncbi.nlm.nih.gov/pubmed/33804914
DOI: 10.3390/diagnostics11040579

14. Espinoza MA, Guzman J, Soto J, et al. PIN63 Choosing the Right COVID-19 Vaccine: A Multiple Stakeholder Multicriteria Decision Analysis For the Assessment of Available Vaccines in Latin America. Value in Health. 2021;24 (Supplement 1):S117.
URL: https://ovidsp.ovid.com/ovidweb.cgi?T=JS&CSC=Y&NEWS=N&PAGE=fulltext&D=emexb&AN=2012832688

15. Estofolete CF, Banho CA, Campos GRF, et al. Case Study of Two Post Vaccination SARS-CoV-2 Infections with P1 Variants in CoronaVac Vaccinees in Brazil. Viruses. 2021;13(7):26. DOI: 10.3390/v13071237
ABSTRACT: The rapid development of efficacious and safe vaccines against coronavirus disease 2019 (COVID-19) has been instrumental in mitigating the transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Moreover, the emergence of SARS-CoV-2 variants raised concerns on the efficacy of these vaccines. Herein, we report two cases of breakthrough infections with the P1 variant in patients vaccinated with CoronaVac, which is one of the two vaccines authorized for emergency use in the Brazilian immunization program. Our observations suggest that the vaccine reduced the severity of the disease and highlight the potential risk of illness following vaccination and subsequent infection with the P1 variant as well as for continued efforts to prevent and diagnose infection in vaccinated persons.
URL: https://www.ncbi.nlm.nih.gov/pubmed/34206727
DOI: 10.3390/v13071237

16. Garcia-Montero C, Fraile-Martinez O, Bravo C, et al. An Updated Review of SARS-CoV-2 Vaccines and the Importance of Effective Vaccination Programs in Pandemic Times. Vaccines (Basel). 2021;9(5):27. DOI: 10.3390/vaccines9050433
ABSTRACT: Since the worldwide COVID-19 pandemic was declared a year ago, the search for vaccines has become the top priority in order to restore normalcy after 2.5 million deaths worldwide, overloaded sanitary systems, and a huge economic burden. Vaccine development has represented a step towards the desired herd immunity in a short period of time, owing to a high level of investment, the focus of researchers, and the urge for the authorization of the faster administration of vaccines. Nevertheless, this objective may only be achieved by pursuing effective strategies and policies in various countries worldwide. In the present review, some aspects involved in accomplishing a successful vaccination program are addressed, in addition to the importance of vaccination in a pandemic in the face of unwillingness, conspiracy theories, or a lack of information among the public. Moreover, we provide some updated points related to the landscape of the clinical development of vaccine candidates, specifically, the top five vaccines that are already being assessed in Phase IV clinical trials (BNT162b2, mRNA-1273, AZD1222, Ad26.COV2.S, and CoronaVac).
URL: https://www.ncbi.nlm.nih.gov/pubmed/33925526
DOI: 10.3390/vaccines9050433

17. Graham F. Daily briefing: The evidence is stacking up for Sputnik V vaccine. Nature. 2021;06:06. DOI: 10.1038/d41586-021-01864-5
URL: https://www.ncbi.nlm.nih.gov/pubmed/34234322
DOI: 10.1038/d41586-021-01864-5

18. Han B, Song Y, Li C, et al. Safety, tolerability, and immunogenicity of an inactivated SARS-CoV-2 vaccine (CoronaVac) in healthy children and adolescents: a double-blind, randomised, controlled, phase 1/2 clinical trial. Lancet Infect Dis. 2021;28:28. DOI: 10.1016/S1473-3099(21)00319-4
ABSTRACT: BACKGROUND: A vaccine against SARS-CoV-2 for children and adolescents will play an important role in curbing the COVID-19 pandemic. Here we aimed to assess the safety, tolerability, and immunogenicity of a candidate COVID-19 vaccine, CoronaVac, containing inactivated SARS-CoV-2, in children and adolescents aged 3-17 years. METHODS: We did a double-blind, randomised, controlled, phase 1/2 clinical trial of CoronaVac in healthy children and adolescents aged 3-17 years old at Hebei Provincial Center for Disease Control and Prevention in

Zanhuang (Hebei, China). Individuals with SARS-CoV-2 exposure or infection history were excluded. Vaccine (in 0.5 mL aluminum hydroxide adjuvant) or aluminum hydroxide only (alum only, control) was given by intramuscular injection in two doses (day 0 and day 28). We did a phase 1 trial in 72 participants with an age de-escalation in three groups and dose-escalation in two blocks (1.5 mug or 3.0 mug per injection). Within each block, participants were randomly assigned (3:1) by means of block randomisation to receive CoronaVac or alum only. In phase 2, participants were randomly assigned (2:2:1) by means of block randomisation to receive either CoronaVac at 1.5 mug or 3.0 mug per dose, or alum only. All participants, investigators, and laboratory staff were masked to group allocation. The primary safety endpoint was adverse reactions within 28 days after each injection in all participants who received at least one dose. The primary immunogenicity endpoint assessed in the per-protocol population was seroconversion rate of neutralising antibody to live SARS-CoV-2 at 28 days after the second injection. This study is ongoing and is registered with ClinicalTrials.gov, NCT04551547. FINDINGS: Between Oct 31, 2020, and Dec 2, 2020, 72 participants were enrolled in phase 1, and between Dec 12, 2020, and Dec 30, 2020, 480 participants were enrolled in phase 2. 550 participants received at least one dose of vaccine or alum only (n=71 for phase 1 and n=479 for phase 2; safety population). In the combined safety profile of phase 1 and phase 2, any adverse reactions within 28 days after injection occurred in 56 (26%) of 219 participants in the 1.5 mug group, 63 (29%) of 217 in the 3.0 mug group, and 27 (24%) of 114 in the alum-only group, without significant difference (p=0.55). Most adverse reactions were mild and moderate in severity. Injection site pain was the most frequently reported event (73 [13%] of 550 participants), occurring in 36 (16%) of 219 participants in the 1.5 mug group, 35 (16%) of 217 in the 3.0 mug group, and two (2%) in the alum-only group. As of June 12, 2021, only one serious adverse event of pneumonia has been reported in the alum-only group, which was considered unrelated to vaccination. In phase 1, seroconversion of neutralising antibody after the second dose was observed in 27 of 27 participants (100.0% [95% CI 87.2-100.0]) in the 1.5 mug group and 26 of 26 participants (100.0% [86.8-100.0]) in the 3.0 mug group, with the geometric mean titres of 55.0 (95% CI 38.9-77.9) and 117.4 (87.8-157.0). In phase 2, seroconversion was seen in 180 of 186 participants (96.8% [93.1-98.8]) in the 1.5 mug group and 180 of 180 participants (100.0% [98.0-100.0]) in the 3.0 mug group, with the geometric mean titres of 86.4 (73.9-101.0) and 142.2 (124.7-162.1). There were no detectable antibody responses in the alum-only groups. INTERPRETATION: CoronaVac was well tolerated and safe and induced humoral responses in children and adolescents aged 3-17 years. Neutralising antibody titres induced by the 3.0 mug dose were higher than those of the 1.5 mug dose. The results support the use of 3.0 mug dose with a two-immunisation schedule for further studies in children and adolescents. FUNDING: The Chinese National Key Research and Development Program and the Beijing Science and Technology Program.
URL: https://www.ncbi.nlm.nih.gov/pubmed/34197764
DOI: 10.1016/S1473-3099(21)00319-4

19. Hatmal MM, Al-Hatamleh MAI, Olaimat AN, et al. Side Effects and Perceptions Following COVID-19 Vaccination in Jordan: A Randomized, Cross-Sectional Study Implementing Machine Learning for Predicting Severity of Side Effects. Vaccines (Basel). 2021;9(6):26. DOI: 10.3390/vaccines9060556
ABSTRACT: BACKGROUND: Since the coronavirus disease 2019 (COVID-19) was declared a pandemic, there was no doubt that vaccination is the ideal protocol to tackle it. Within a year, a few COVID-19 vaccines have been developed and authorized. This unparalleled initiative in developing vaccines created many uncertainties looming around the efficacy and safety of these vaccines. This study aimed to assess the side effects and perceptions following COVID-19 vaccination in Jordan. METHODS: A cross-sectional study was conducted by distributing an online survey targeted toward Jordan inhabitants who received any COVID-19 vaccines. Data were statistically analyzed and certain machine learning (ML) tools, including multilayer perceptron (MLP), eXtreme gradient boosting (XGBoost), random forest (RF), and K-star were used to predict the severity of side effects. RESULTS: A total of 2213 participants were involved in the study after receiving Sinopharm, AstraZeneca, Pfizer-BioNTech, and other vaccines (38.2%, 31%, 27.3%, and 3.5%, respectively). Generally, most of the post-vaccination side effects were common and non-life-threatening (e.g., fatigue, chills, dizziness, fever, headache, joint pain, and myalgia). Only 10% of participants suffered from severe side effects; while 39% and 21% of participants had moderate and mild side effects, respectively. Despite the substantial variations between these vaccines in the presence and severity of side effects, the statistical analysis indicated that these vaccines might provide the same protection against COVID-19 infection. Finally, around 52.9% of participants suffered before vaccination from vaccine hesitancy and anxiety; while after vaccination, 95.5% of participants have advised others to get vaccinated, 80%

felt more reassured, and 67% believed that COVID-19 vaccines are safe in the long term. Furthermore, based on the type of vaccine, demographic data, and side effects, the RF, XGBoost, and MLP gave both high accuracies (0.80, 0.79, and 0.70, respectively) and Cohen's kappa values (0.71, 0.70, and 0.56, respectively). CONCLUSIONS: The present study confirmed that the authorized COVID-19 vaccines are safe and getting vaccinated makes people more reassured. Most of the post-vaccination side effects are mild to moderate, which are signs that body's immune system is building protection. ML can also be used to predict the severity of side effects based on the input data; predicted severe cases may require more medical attention or even hospitalization.
URL: https://www.ncbi.nlm.nih.gov/pubmed/34073382
DOI: 10.3390/vaccines9060556

20. Ikegame S, Siddiquey M, Hung CT, et al. Neutralizing activity of Sputnik V vaccine sera against SARS-CoV-2 variants. Res Sq. 2021;08:08. DOI: 10.21203/rs.3.rs-400230/v1
ABSTRACT: The novel pandemic betacoronavirus, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has infected at least 120 million people since its identification as the cause of a December 2019 viral pneumonia outbreak in Wuhan, China1,2. Despite the unprecedented pace of vaccine development, with six vaccines already in use worldwide, the emergence of SARS-CoV-2 'variants of concern' (VOC) across diverse geographic locales have prompted re-evaluation of strategies to achieve universal vaccination3. All three officially designated VOC carry Spike (S) polymorphisms thought to enable escape from neutralizing antibodies elicited during initial waves of the pandemic4-8. Here, we characterize the biological consequences of the ensemble of S mutations present in VOC lineages B.1.1.7 (501Y.V1) and B.1.351 (501Y.V2). Using a replication-competent EGFP-reporter vesicular stomatitis virus (VSV) system, rcVSV-CoV2-S, which encodes S from SARS coronavirus 2 in place of VSV-G, and coupled with a clonal HEK-293T ACE2 TMPRSS2 cell line optimized for highly efficient S-mediated infection, we determined that only 1 out of 12 serum samples from a cohort of recipients of the Gamaleya Sputnik V Ad26 / Ad5 vaccine showed effective neutralization (IC90) of rcVSV-CoV2-S: B.1.351 at full serum strength. The same set of sera efficiently neutralized S from B.1.1.7 and showed only moderately reduced activity against S carrying the E484K substitution alone. Taken together, our data suggest that control of some emergent SARS-CoV-2 variants may benefit from updated vaccines.
URL: https://www.ncbi.nlm.nih.gov/pubmed/33851150
DOI: 10.21203/rs.3.rs-400230/v1

21. Ikegame S, Siddiquey MNA, Hung CT, et al. Qualitatively distinct modes of Sputnik V vaccine-neutralization escape by SARS-CoV-2 Spike variants. medRxiv. 2021;03:03. DOI: 10.1101/2021.03.31.21254660
ABSTRACT: The novel pandemic betacoronavirus, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has infected at least 120 million people since its identification as the cause of a December 2019 viral pneumonia outbreak in Wuhan, China. Despite the unprecedented pace of vaccine development, with six vaccines already in use worldwide, the emergence of SARS-CoV-2 'variants of concern' (VOC) across diverse geographic locales suggests herd immunity may fail to eliminate the virus. All three officially designated VOC carry Spike (S) polymorphisms thought to enable escape from neutralizing antibodies elicited during initial waves of the pandemic. Here, we characterize the biological consequences of the ensemble of S mutations present in VOC lineages B.1.1.7 (501Y.V1) and B.1.351 (501Y.V2). Using a replication-competent EGFP-reporter vesicular stomatitis virus (VSV) system, rcVSV-CoV2-S, which encodes S from SARS coronavirus 2 in place of VSV-G, and coupled with a clonal HEK-293T ACE2 TMPRSS2 cell line optimized for highly efficient S-mediated infection, we determined that 8 out of 12 (67%) serum samples from a cohort of recipients of the Gamaleya Sputnik V Ad26 / Ad5 vaccine showed dose response curve slopes indicative of failure to neutralize rcVSV-CoV2-S: B.1.351. The same set of sera efficiently neutralized S from B.1.1.7 and showed only moderately reduced activity against S carrying the E484K substitution alone. Taken together, our data suggest that control of emergent SARS-CoV-2 variants may benefit from updated vaccines.
URL: https://www.ncbi.nlm.nih.gov/pubmed/33821288
DOI: 10.1101/2021.03.31.21254660

22. Jahromi M, Al Sheikh MH. Partial protection of Sinopharm vaccine against SARS COV2 during recent outbreak in Bahrain. Microb Pathog. 2021:105086. DOI: 10.1016/j.micpath.2021.105086

ABSTRACT: BACKGROUND: In order to impart immunity against SARS COV 2 in the community, the oil rich countries of the Gulf Cooperation Council (GCC) provided citizens and expatriates with free vaccination. Different types of vaccination brands were utilized for this purpose. The purpose of this study is to determine the efficacy of the different types of vaccinations used. METHODS: This is an observational analytical case study of one Bahraini family who were vaccinated with 1st, 2nd or no dose. RESULTS: Out of 22 double dose recipients of SARS COV2 vaccine, 20 were infected. Those 20 were vaccinated against SARS COV 2 using Sinopharm, the rest (2) were in direct contact with the source but were vaccinated against SARS COV 2 using other type of vaccine. Out of 26 single dose recipients of Sinopharm vaccine, 23 were infected. The other three were not in direct contact with the infected source. Social gathering has been the main source of transmission. The infection has been mild with headache, chest pain. From 20 cases with double dose vaccinations only one had a lung infection and needed hospitalization. Out of 23 cases with single dose vaccinations 10 were hospitalized due to lung infections. All family members who were not vaccinated were infected, three were hospitalized one of which was deceased due to diabetes mellitus complications. CONLCUSION: Sinopharm provides partial protection against SARS COV 2 infection. That might be due to lack of its potential to detect recent variations in the protein structure of spike(S) protein of virus.
URL: https://www.ncbi.nlm.nih.gov/pubmed/34260903
DOI: 10.1016/j.micpath.2021.105086

23. Jara A, Undurraga EA, Gonzalez C, et al. Effectiveness of an Inactivated SARS-CoV-2 Vaccine in Chile. N Engl J Med. 2021;07:07. DOI: 10.1056/NEJMoa2107715
ABSTRACT: BACKGROUND: Mass vaccination campaigns to prevent coronavirus disease 2019 (Covid-19) are occurring in many countries; estimates of vaccine effectiveness are urgently needed to support decision making. A countrywide mass vaccination campaign with the use of an inactivated severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) vaccine (CoronaVac) was conducted in Chile starting on February 2, 2021. METHODS: We used a prospective national cohort, including participants 16 years of age or older who were affiliated with the public national health care system, to assess the effectiveness of the inactivated SARS-CoV-2 vaccine with regard to preventing Covid-19 and related hospitalization, admission to the intensive care unit (ICU), and death. We estimated hazard ratios using the extension of the Cox proportional-hazards model, accounting for time-varying vaccination status. We estimated the change in the hazard ratio associated with partial immunization (>/=14 days after receipt of the first dose and before receipt of the second dose) and full immunization (>/=14 days after receipt of the second dose). Vaccine effectiveness was estimated with adjustment for individual demographic and clinical characteristics. RESULTS: The study was conducted from February 2 through May 1, 2021, and the cohort included approximately 10.2 million persons. Among persons who were fully immunized, the adjusted vaccine effectiveness was 65.9% (95% confidence interval [CI], 65.2 to 66.6) for the prevention of Covid-19 and 87.5% (95% CI, 86.7 to 88.2) for the prevention of hospitalization, 90.3% (95% CI, 89.1 to 91.4) for the prevention of ICU admission, and 86.3% (95% CI, 84.5 to 87.9) for the prevention of Covid-19-related death. CONCLUSIONS: Our results suggest that the inactivated SARS-CoV-2 vaccine effectively prevented Covid-19, including severe disease and death, a finding that is consistent with results of phase 2 trials of the vaccine. (Funded by Agencia Nacional de Investigacion y Desarrollo and others.).
URL: https://www.ncbi.nlm.nih.gov/pubmed/34233097
DOI: 10.1056/NEJMoa2107715

24. Jones I, Roy P. Sputnik V COVID-19 vaccine candidate appears safe and effective. Lancet. 2021;397(10275):642-3. DOI: 10.1016/S0140-6736(21)00191-4
URL: https://www.ncbi.nlm.nih.gov/pubmed/33545098
DOI: 10.1016/S0140-6736(21)00191-4

25. Kandeil A, Mostafa A, Hegazy RR, et al. Immunogenicity and Safety of an Inactivated SARS-CoV-2 Vaccine: Preclinical Studies. Vaccines (Basel). 2021;9(3):03. DOI: 10.3390/vaccines9030214
ABSTRACT: Since the emergence of SARS-CoV-2 at the end of 2019, 64 candidate vaccines are in clinical development and 173 are in the pre-clinical phase. Five types of vaccines are currently approved for emergency use in many countries (Inactivated, Sinopharm; Viral-vector, Astrazeneca, and Gamaleya Research Institute; mRNA, Moderna, and BioNTech/Pfizer). The main challenge in this pandemic was the availability to produce an effective

vaccine to be distributed to the world's population in a short time. Herein, we developed a whole virus NRC-VACC-01 inactivated candidate SARS-CoV-2 vaccine and tested its safety and immunogenicity in laboratory animals. In the preclinical studies, we used four experimental animals (mice, rats, guinea pigs, and hamsters). Antibodies were detected as of week three post vaccination and continued up to week ten in the four experimental models. Safety evaluation of NRC-VACC-01 inactivated candidate vaccine in rats revealed that the vaccine was highly tolerable. By studying the effect of booster dose in the immunological profile of vaccinated mice, we observed an increase in neutralizing antibody titers after the booster shot, thus a booster dose was highly recommended after week three or four. Challenge infection of hamsters showed that the vaccinated group had lower morbidity and shedding than the control group. A phase I clinical trial will be performed to assess safety in human subjects.
URL: https://www.ncbi.nlm.nih.gov/pubmed/33802467
DOI: 10.3390/vaccines9030214

26. Kaya F, Pirincci E. Determining the frequency of serious adverse reactions of inactive SARS-COV-2 vaccine. Work. 2021;26:26. DOI: 10.3233/WOR-210473
ABSTRACT: BACKGROUND: Vaccines are a new combat strategy against COVID-19. The success of a large number of vaccines and the continued development of vaccines will change the course of the current pandemic. OBJECTIVE: The aim of the study was to determine the frequency of serious adverse reactions caused by the administration of inactive vaccine administration on healthcare workers during the COVID-19 pandemic. METHODS: The prospective study was conducted among healthcare professionals working in city a Training and Research Hospital and applied to have the second dose of CoronaVac vaccine. The number of personnel included in the study were 329. The data were recorded in the SPSS 23 program and the chi-square test was used for statistical analysis. RESULTS: The average age of the participants in the study was 35.77+/-9.07. Of the participants, 28.1%were physicians. The frequency ratio of those who stated that they had serious adverse reactions after vaccination was 33.2%. Three most common systemic serious adverse reactions were headache, state of sleep/fatigue, and nausea and vomiting respectively. Serious adverse reactions occurred within 1.14+/-04 days after vaccine administration. The average duration of serious adverse reactions was determined as 1.68+/-0.77 days. 62.2%of the participants with serious side effects were women ($p < 0.001$). Of the participants who had serious adverse reactions, 77.5%were health care professionals ($p < 0.01$). CONCLUSION: No life-threatening serious adverse reaction was determined regarding the CoronaVac vaccine administered in this study. However, local serious adverse reactions, nausea/vomiting, fever and sleepiness/fatigue occurred frequently. Further studies are required on the newly introduced vaccine.
URL: https://www.ncbi.nlm.nih.gov/pubmed/34219684
DOI: 10.3233/WOR-210473

27. Kumar VM, Pandi-Perumal SR, Trakht I, et al. Strategy for COVID-19 vaccination in India: the country with the second highest population and number of cases. NPJ Vaccines. 2021;6(1):60. DOI: 10.1038/s41541-021-00327-2
ABSTRACT: Free vaccination against COVID-19 commenced in India on January 16, 2021, and the government is urging all of its citizens to be immunized, in what is expected to be the largest vaccination program in the world. Out of the eight COVID-19 vaccines that are currently under various stages of clinical trials in India, four were developed in the country. India's drug regulator has approved restricted emergency use of Covishield (the name employed in India for the Oxford-AstraZeneca vaccine) and Covaxin, the home-grown vaccine produced by Bharat Biotech. Indian manufacturers have stated that they have the capacity to meet the country's future needs for COVID-19 vaccines. The manpower and cold-chain infrastructure established before the pandemic are sufficient for the initial vaccination of 30 million healthcare workers. The Indian government has taken urgent measures to expand the country's vaccine manufacturing capacity and has also developed an efficient digital system to address and monitor all the aspects of vaccine administration.
URL: https://www.ncbi.nlm.nih.gov/pubmed/33883557
DOI: 10.1038/s41541-021-00327-2

28. Lau O, Vadlamudi N. PIN5 Immunogenicity and Safety of the COVID-19 Vaccines Compared to Controls in Healthy Adults: A Systematic Review. Value in Health. 2021;24 (Supplement 1):S106.
URL: https://ovidsp.ovid.com/ovidweb.cgi?T=JS&CSC=Y&NEWS=N&PAGE=fulltext&D=emexb&AN=2012831918

29. Lawton G. Sputnik V vaccine goes global. New Sci. 2021;250(3331):10-1. DOI: 10.1016/S0262-4079(21)00671-0
ABSTRACT: Non-Western vaccines are serious players in the global effort against covid-19, but we need more transparent data, reports Graham Lawton.
URL: https://www.ncbi.nlm.nih.gov/pubmed/33935343
DOI: 10.1016/S0262-4079(21)00671-0

30. Logunov DY, Dolzhikova IV, Shcheblyakov DV. Data discrepancies and substandard reporting of interim data of Sputnik V phase 3 trial - Authors' reply. Lancet. 2021;397(10288):1883-4. DOI: 10.1016/S0140-6736(21)00894-1
URL: https://www.ncbi.nlm.nih.gov/pubmed/33991474
DOI: 10.1016/S0140-6736(21)00894-1

31. Logunov DY, Dolzhikova IV, Shcheblyakov DV, et al. Safety and efficacy of an rAd26 and rAd5 vector-based heterologous prime-boost COVID-19 vaccine: an interim analysis of a randomised controlled phase 3 trial in Russia. Lancet. 2021;397(10275):671-81. DOI: 10.1016/S0140-6736(21)00234-8
ABSTRACT: BACKGROUND: A heterologous recombinant adenovirus (rAd)-based vaccine, Gam-COVID-Vac (Sputnik V), showed a good safety profile and induced strong humoral and cellular immune responses in participants in phase 1/2 clinical trials. Here, we report preliminary results on the efficacy and safety of Gam-COVID-Vac from the interim analysis of this phase 3 trial. METHODS: We did a randomised, double-blind, placebo-controlled, phase 3 trial at 25 hospitals and polyclinics in Moscow, Russia. We included participants aged at least 18 years, with negative SARS-CoV-2 PCR and IgG and IgM tests, no infectious diseases in the 14 days before enrolment, and no other vaccinations in the 30 days before enrolment. Participants were randomly assigned (3:1) to receive vaccine or placebo, with stratification by age group. Investigators, participants, and all study staff were masked to group assignment. The vaccine was administered (0.5 mL/dose) intramuscularly in a prime-boost regimen: a 21-day interval between the first dose (rAd26) and the second dose (rAd5), both vectors carrying the gene for the full-length SARS-CoV-2 glycoprotein S. The primary outcome was the proportion of participants with PCR-confirmed COVID-19 from day 21 after receiving the first dose. All analyses excluded participants with protocol violations: the primary outcome was assessed in participants who had received two doses of vaccine or placebo, serious adverse events were assessed in all participants who had received at least one dose at the time of database lock, and rare adverse events were assessed in all participants who had received two doses and for whom all available data were verified in the case report form at the time of database lock. The trial is registered at ClinicalTrials.gov (NCT04530396). FINDINGS: Between Sept 7 and Nov 24, 2020, 21 977 adults were randomly assigned to the vaccine group (n=16 501) or the placebo group (n=5476). 19 866 received two doses of vaccine or placebo and were included in the primary outcome analysis. From 21 days after the first dose of vaccine (the day of dose 2), 16 (0.1%) of 14 964 participants in the vaccine group and 62 (1.3%) of 4902 in the placebo group were confirmed to have COVID-19; vaccine efficacy was 91.6% (95% CI 85.6-95.2). Most reported adverse events were grade 1 (7485 [94.0%] of 7966 total events). 45 (0.3%) of 16 427 participants in the vaccine group and 23 (0.4%) of 5435 participants in the placebo group had serious adverse events; none were considered associated with vaccination, with confirmation from the independent data monitoring committee. Four deaths were reported during the study (three [<0.1%] of 16 427 participants in the vaccine group and one [<0.1%] of 5435 participants in the placebo group), none of which were considered related to the vaccine. INTERPRETATION: This interim analysis of the phase 3 trial of Gam-COVID-Vac showed 91.6% efficacy against COVID-19 and was well tolerated in a large cohort. FUNDING: Moscow City Health Department, Russian Direct Investment Fund, and Sberbank.
URL: https://www.ncbi.nlm.nih.gov/pubmed/33545094
DOI: 10.1016/S0140-6736(21)00234-8

32. Lopes NT, Efrain Ortega Pinilla C, Carlos Gerbase A. Erythema multiforme after CoronaVac vaccination. J Eur Acad Dermatol Venereol. 2021;08:08. DOI: 10.1111/jdv.17495
ABSTRACT: In January 2021, SARS-CoV-2 vaccine, CoronaVac developed by Sinovac Life Sciences (Beijing, China) was approved for use in Brazil by its National Health Surveillance. It is an inactivated SARS-CoV-2 virus adsorbed on aluminum hydroxide and diluted in sodium chloride and phosphate-buffered saline.(1) Like other novel vaccines against COVID-19, it can induce cutaneous adverse reactions, generally mild.(1) Erythema multiforme (EM) is an

acute and usually self-limited immune-mediated mucocutaneous disorder.(2) It's related to infections in 90% of cases - mainly herpes simplex virus (HSV) infections - and in 10% of cases, to drugs.(2) Unusually, it has also been documented following vaccination.(3) We report a case of EM after CoronaVac vaccination.
URL: https://www.ncbi.nlm.nih.gov/pubmed/34236724
DOI: 10.1111/jdv.17495

33. Mallapaty S. WHO approval of Chinese CoronaVac COVID vaccine will be crucial to curbing pandemic. Nature. 2021;594(7862):161-2. DOI: 10.1038/d41586-021-01497-8
URL: https://www.ncbi.nlm.nih.gov/pubmed/34089030
DOI: 10.1038/d41586-021-01497-8

34. Mehraeen E, SeyedAlinaghi S, Karimi A. Can children of the Sputnik V vaccine recipients become symptomatic? Hum Vaccin Immunother. 2021:1-2. DOI: 10.1080/21645515.2021.1933689
ABSTRACT: Sputnik V is one of the most promising vaccines, utilizing an Adenovirus vector to cause immunity against SARS-CoV-2. Concerns existed against Adenovirus infection with this vaccine, although seemed to be a rare event. In this study, we observed that 15/18 (83%) of the children of the Sputnik V recipients became symptomatic and developed transient fever and chills for 1-2 days starting after 2-5 days following the vaccination of their parents that can be related to an Adenovirus infection. To our knowledge, this is the first study reporting such symptoms in the children of Sputnik V recipients, and the results should be validated by larger studies.
URL: https://www.ncbi.nlm.nih.gov/pubmed/34241575
DOI: 10.1080/21645515.2021.1933689

35. Montastruc JL, Biron P, Sommet A. Efficacy of Covid-19 vaccines: several modes of expression should be presented in scientific publications. Fundam Clin Pharmacol. 2021;11:11. DOI: 10.1111/fcp.12715
ABSTRACT: Several vaccines are being developed as part of the Covid-19 pandemic. Results of clinical trials for these vaccines were published with efficacy values more than 90%, using mainly Relative Risk (RR). In this paper, we decided to reanalyse the data using the different validated methods of risk expression. Using main publications, Absolute Risks (AR), AR Reduction (ARR), Number Needed to Treat (NNT) were calculated for five Covid-19 vaccines (tozinameran Comirnaty(R), Moderna, Vaxzevria(R), Janssen, Sputnik V vaccines). AR, ARR, NNT and RR values varied according to Covid-19 vaccines. The order of the different vaccines was not the same according to the chosen efficacy parameters. This is a further example of the need to express results of clinical trials, using not only RR, but also AR, ARR and NNT in order to clearly present the clinical interest of drugs.
URL: https://www.ncbi.nlm.nih.gov/pubmed/34250637
DOI: 10.1111/fcp.12715

36. Muena NA, Garcia-Salum T, Pardo-Roa C, et al. Long-lasting neutralizing antibody responses in SARS-CoV-2 seropositive individuals are robustly boosted by immunization with the CoronaVac and BNT162b2 vaccines. medRxiv. 2021;18:18. DOI: 10.1101/2021.05.17.21257197
ABSTRACT: The durability of circulating neutralizing antibody (nAb) responses to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection and their boosting by vaccination remains to be defined. We show that outpatient and hospitalized SARS-CoV-2 seropositive individuals mount a robust neutralizing antibody (nAb) response that peaks at days 23 and 27 post-symptom onset, respectively. Although nAb titers remained higher in hospitalized patients, both study groups showed long-lasting nAb responses that can persist for up to 12 months after natural infection. These nAb responses in previously seropositive individuals can be significantly boosted through immunization with two doses of the CoronaVac (Sinovac) or one dose of the BNT162b2 (BioNTech/Pfizer) vaccines, suggesting a substantial induction of B cell memory responses. Noteworthy, three obese previously seropositive individuals failed to mount a booster response upon vaccination, warranting further studies in this population. Immunization of naive individuals with two doses of the CoronaVac vaccine or one dose of the BNT162b2 vaccine elicited similar levels of nAbs compared to seropositive individuals 4.2 to 13.3 months post-infection with SARS-CoV-2. Thus, this preliminary evidence suggests that both, seropositive and naive individuals, require two doses of CoronaVac to ensure the induction of robust nAb titers.
URL: https://www.ncbi.nlm.nih.gov/pubmed/34031662
DOI: 10.1101/2021.05.17.21257197

37. Naniche D, Hotez P, Bottazzi ME, et al. Beyond the jab: A need for global coordination of pharmacovigilance for COVID-19 vaccine deployment. EClinicalMedicine. 2021;36:100925. DOI: 10.1016/j.eclinm.2021.100925
URL: https://www.ncbi.nlm.nih.gov/pubmed/34099998
DOI: 10.1016/j.eclinm.2021.100925

38. Pagotto V, Ferloni A, Mercedes Soriano M, et al. Active monitoring of early safety of Sputnik V vaccine in Buenos Aires, Argentina. Medicina (B Aires). 2021;81(3):408-14.
ABSTRACT: This study describes the incidence of early events supposedly attributable to vaccination or immunization (ESAVI) that occurred in healthcare workers who had been inoculated with the first component of the Sputnik V vaccine. Safety at 72 h post-immunization was analyzed based on a self-reported form. Between January 5 and January 20, 2021, in Buenos Aires, Argentina, a total of 707 healthcare workers (median age 35 yrs, female 67%) were vaccinated. The response rate was 96.6% (n: 683) and 487 (71.3%) participants reported at least one ESAVI. The incidence rate was 6.3 per 1000 person/hours. The total number of ESAVIs was 1434. A total of 469 local reactions were reported, 57% of the participants reported pain at the injection site, and 11% had redness and swelling. A total of 968 systemic reactions were informed, including new or worsened muscle pain, referred by 58% of the participants, fever referred by 40%, and diarrhea referred by 5%. Five percent (n: 34) had serious adverse events and one participant had to be hospitalized. The ESAVI rate was higher in females than males (66.4% versus 51.4%; HR 1.38; 95% CI 1.13-5.38) and in workers younger than 55 yrs old (63.0% versus 28.0%; HR 2.66; 95% CI 1.32-5.38). This study demonstrates high rates of early local and systemic reactions. However, serious events were rare. Studies on long-term safety, stratified by sex and age, are needed.
URL: https://www.ncbi.nlm.nih.gov/pubmed/34137701

39. Ramasamy MN, Jessop LJ. CoronaVac: more data for regulators and policy makers. Lancet. 2021;08:08. DOI: 10.1016/S0140-6736(21)01543-9
URL: https://www.ncbi.nlm.nih.gov/pubmed/34246359
DOI: 10.1016/S0140-6736(21)01543-9

40. Riad A, Sagiroglu D, Ustun B, et al. Prevalence and Risk Factors of CoronaVac Side Effects: An Independent Cross-Sectional Study among Healthcare Workers in Turkey. J Clin Med. 2021;10(12):15. DOI: 10.3390/jcm10122629
ABSTRACT: BACKGROUND: COVID-19 vaccine hesitancy is a serious threat to mass vaccination strategies that need to be accelerated currently in order to achieve a substantial level of community immunity. Independent (non-sponsored) studies have a great potential to enhance public confidence in vaccines and accelerate their uptake process. METHODS: A nationwide cross-sectional study for the side effects (SE) of CoronaVac was carried out in February 2021 among Turkish healthcare workers who were recently vaccinated. The questionnaire inquired about local and systemic SEs that occurred in the short-term, within four weeks, following vaccination. RESULTS: A total of 780 healthcare workers were included in this study; 62.5% of them experienced at least one SE. Injection site pain (41.5%) was the most common local SE, while fatigue (23.6%), headache (18.7%), muscle pain (11.2%) and joint pain (5.9%) were the common systemic SEs. Female healthcare workers (67.9%) were significantly more affected by local and systemic SEs than male colleagues (51.4%). Younger age, previous infection, and compromised health status (chronic illnesses and regular medicines uptake) can be associated with an increased risk of CoronaVac SEs; Conclusions: The independent research shows a higher prevalence of CoronaVac SEs than what is reported by phase I-III clinical trials. In general, the results of this study confirm the overall safety of CoronaVac and suggest potential risk factors for its SEs. Gender-based differences and SEs distribution among age groups are worth further investigation.
URL: https://www.ncbi.nlm.nih.gov/pubmed/34203769
DOI: 10.3390/jcm10122629

41. Rogliani P, Chetta A, Cazzola M, et al. SARS-CoV-2 Neutralizing Antibodies: A Network Meta-Analysis across Vaccines. Vaccines (Basel). 2021;9(3):05. DOI: 10.3390/vaccines9030227
ABSTRACT: Background: There are no studies providing head-to-head comparison across SARS-CoV-2 vaccines. Therefore, we compared the efficacy of candidate vaccines in inducing neutralizing antibodies against SARS-CoV-2.

Methods: A network meta-analysis was performed to compare the peak levels of SARS-CoV-2 neutralizing antibodies across candidate vaccines. Data were reported as standardized mean difference (SMD) since the outcome was assessed via different metrics and methods across the studies. Results: Data obtained from 836 healthy adult vaccine recipients were extracted from 11 studies. BBIBP-CorV, AZD1222, BNT162b2, New Crown COVID-19, and Sputnik V induced a very large effect on the level of neutralizing antibodies (SMD > 1.3); CoVLP, CoronaVac, NVX-CoV2373, and Ad5-nCoV induced a large effect (SMD > 0.8 to </=1.3); and Ad26.COV2.S induced a medium effect (SMD > 0.5 to </=0.8). BBIBP-CorV and AZD122 were more effective (p < 0.05) than Ad26.COV2.S, Ad5-nCoV, mRNA-1237, CoronaVac, NVX-CoV2373, CoVLP, and New Crown COVID-19; New Crown COVID-19 was more effective (p < 0.05) than Ad26.COV2.S, Ad5-nCoV, and mRNA-1237; CoronaVac was more effective (p < 0.05) than Ad26.COV2.S and Ad5-nCoV; and Sputnik V and BNT162b2 were more effective (p < 0.05) than Ad26.COV2.S. In recipients aged </=60 years, AZD1222, BBIBP-CorV, and mRNA-1237 were the most effective candidate vaccines. Conclusion: All the candidate vaccines induced significant levels of SARS-CoV-2 neutralizing antibodies, but only AZD1222 and mRNA-1237 were certainly tested in patients aged >/=70 years. Compared with AZD1222, BNT162b and mRNA-1237 have the advantage that they can be quickly re-engineered to mimic new mutations of SARS-CoV-2.
URL: https://www.ncbi.nlm.nih.gov/pubmed/33807818
DOI: 10.3390/vaccines9030227

42. Sapkal G, Yadav PD, Ella R, et al. Neutralization of B.1.1.28 P2 variant with sera of natural SARS-CoV-2 infection and recipients of inactivated COVID-19 vaccine Covaxin. J Travel Med. 2021;17:17. DOI: 10.1093/jtm/taab077
URL: https://www.ncbi.nlm.nih.gov/pubmed/34002240
DOI: 10.1093/jtm/taab077

43. Sapkal GN, Yadav PD, Ella R, et al. Inactivated COVID-19 vaccine BBV152/COVAXIN effectively neutralizes recently emerged B.1.1.7 variant of SARS-CoV-2. J Travel Med. 2021;28(4):01. DOI: 10.1093/jtm/taab051
URL: https://www.ncbi.nlm.nih.gov/pubmed/33772577
DOI: 10.1093/jtm/taab051

44. Seyahi E, Bakhdiyarli G, Oztas M, et al. Antibody response to inactivated COVID-19 vaccine (CoronaVac) in immune-mediated diseases: a controlled study among hospital workers and elderly. Rheumatol Int. 2021;41(8):1429-40. DOI: 10.1007/s00296-021-04910-7
ABSTRACT: OBJECTIVE: To assess antibody response to inactivated COVID-19 vaccine in patients with immune-mediated diseases (IMD) among hospital workers and people aged 65 and older. METHODS: In this cross-sectional study, we studied 82 hospital workers with IMD (mean age: 42.2 +/- 10.0 years) and 300 (mean age: 41.7 +/- 9.9 years) controls. Among + 65 aged population, we studied 22 (mean age: 71.4 +/- 4.5 years) patients and 47 controls (mean age: 70.9 +/- 4.8 years). All study subjects had a negative history for COVID-19. Sera were obtained after at least 21 days following the second vaccination. Anti-spike IgG antibody titers were measured quantitatively using a commercially available immunoassay method. RESULTS: Patients with IMD were significantly less likely to have detectable antibodies than healthy controls both among the hospital workers (92.7% vs 99.7%, p < 0.001) and elderly population (77.3% vs 97.9%, p = 0.011). Among patients with IMD, those using immunosuppressive or immune-modulating drugs (64/75, 85.3%) were significantly less likely to have detectable antibodies compared to those off treatment (29/29, 100%) (p = 0.029). Additionally, a negative association between age and the antibody titer categories among patients (r = - 0.352; p < 0.001) and controls (r = - 0.258; p < 0.001) were demonstrated. CONCLUSIONS: Among hospital workers, the vast majority of patients with IMD and immunocompetent controls developed a significant humoral response following the administration of the second dose of inactivated COVID-19 vaccine. This was also true for the elderly population, albeit with lower antibody titers. Immunosuppressive use, particularly rituximab significantly reduced antibody titers. Antibody titers were significantly lower among those aged >/= 60 years both in patient and control populations. Whether these individuals should get a booster dose warrants further studies.
URL: https://www.ncbi.nlm.nih.gov/pubmed/34109466
DOI: 10.1007/s00296-021-04910-7

45. Shapiro J, Dean NE, Madewell ZJ, et al. Efficacy Estimates for Various COVID-19 Vaccines: What we Know from the Literature and Reports. medRxiv. 2021:2021.05.20.21257461. DOI: 10.1101/2021.05.20.21257461
ABSTRACT: In this report, we provide summary estimates, from publications and reports, of vaccine efficacy (VE) for the COVID-19 vaccines that are being rolled out on a global scale. We find that, on average, the efficacy against any disease with infection is 85% (95% CI: 71 - 93%) after a fully course of vaccination. The VE against severe disease, hospitalization or death averages close to 100%. The average VE against infection, regardless of symptoms, is 84% (95% CI: 70 - 91%). We also find that the average VE against transmission to others for infected vaccinated people is 48% (95% CI: 45 - 52%). Finally, we prove summary estimates of the VE against any disease with infection for some of the variants of concern (VOC). The average VE for the VOC γ (P1) is 61% (95% CI: 43 - 73%). The average VE for the VOC α (B.1.1.7), β (B.1.351), and δ (B.1.617.2) after dose 1 are 48% (95% CI: 44 - 51%), 35% (95% CI: -11 - 62%), and 33% (95% CI: 21 - 43%), respectively. The average VE for the VOC α (B.1.1.7), β (B.1.351), and δ (B.1.617.2) after dose 2 are 85% (95% CI: 25 - 97%), 57% (95% CI: 14 - 78%), and 78% (95% CI: 28 - 93%), respectively.Competing Interest StatementThe authors have declared no competing interest.Funding StatementThis work was partially funded by NIH grants R01AI139761 and R56AI148284.Author DeclarationsI confirm all relevant ethical guidelines have been followed, and any necessary IRB and/or ethics committee approvals have been obtained.YesThe details of the IRB/oversight body that provided approval or exemption for the research described are given below:All relevant ethical guidelines have been followed. Only summary data have been used. These summary data are completely deidentified All necessary patient/participant consent has been obtained and the appropriate institutional forms have been archived.YesI understand that all clinical trials and any other prospective interventional studies must be registered with an ICMJE-approved registry, such as ClinicalTrials.gov. I confirm that any such study reported in the manuscript has been registered and the trial registration ID is provided (note: if posting a prospective study registered retrospectively, please provide a statement in the trial ID field explaining why the study was not registered in advance).YesI have followed all appropriate research reporting guidelines and uploaded the relevant EQUATOR Network research reporting checklist(s) and other pertinent material as supplementary files, if applicable.YesWe agree to make data used to compile this paper available
URL: https://www.medrxiv.org/content/medrxiv/early/2021/06/18/2021.05.20.21257461.full.pdf
DOI: 10.1101/2021.05.20.21257461

46. Sharma R, Anand A. The Effect of Pandemic Prevalence on the Reported Efficacy of SARS-CoV-2 Vaccine Candidates: A Systematic Review and Meta-analysis. medRxiv. 2021:2021.06.05.21258394. DOI: 10.1101/2021.06.05.21258394
ABSTRACT: Importance The efficacy of SARS-CoV-2 vaccine candidates reported in Phase 3 trials varies from ∼45% to ∼95%. It is important to explain the reasons for this heterogeneity.Objective To test the hypothesis that the efficacy of SARS-CoV-2 vaccine candidates falls with increasing prevalence of the COVID-19 pandemic.Data Sources ClinicalTrials.gov, WHO, McGill and LSHTM trackers of COVID-19 candidate vaccines, peer reviewed publications, and press releases were searched until March 31st, 2021.Study Selection All RCTs reporting efficacy outcomes from Phase 3 trials till March 31st, 2021 were included. Of the 11 vaccine candidates that had started their Phase 3 trials by November 1, 2020. Phase 3 efficacy outcomes were available for 8 vaccine candidates. (PROSPERO CRD42021243121).Data Extraction and Synthesis Both authors independently extracted the data required from identified sources, using PRISMA guidelines. The analysis included all RCTs reported in peer reviewed publications and publicly available sources. A random effects model with restricted maximum likelihood estimator was used to summarize the treatment effects. Cochrane Risk of Bias Assessment Tool was used to assess risk of bias. Certainty of evidence was assessed using the GRADE tool.Main Outcomes and Measures SARS-CoV-2 infections per protocol in vaccine and placebo groups, risk ratio, prevalence of the COVID-19 infection rate in the populations where the Phase 3 trials were conducted.Results 8 vaccine candidates had reported efficacy data from a total of 20 independent Phase 3 trials, representing a total of 221,968 subjects, 453 infections across the vaccinated groups and 1,554 infections across the placebo groups. The overall estimate of the risk-ratio is 0.24 (95% CI, 0.17-0.34, p < 0.01), with an I2 statistic of 88.73%. The meta-regression analysis with pandemic prevalence as the moderator explains almost half the variance in risk ratios across trials (R2=49.06%, p<0.01).Conclusion and Relevance Pandemic prevalence explains almost half of the between-trial variance in reported efficacies. Efficacy of SARS-CoV-2 vaccine candidates declines as the pandemic prevalence increases.Question Does the prevalence of the COVID-19 pandemic explain the heterogeneity in efficacies reported across Phase 3 trials of SARS-CoV-2 vaccine

candidates?Findings Almost 50% of the variance in efficacies reported across Phase 3 trials can be explained by differences in COVID-19 infection rate prevailing across trials. Efficacy of evaluated SARS-CoV-2 vaccine candidates falls significantly with increasing prevalence of the COVID-19 pandemic across trial sites.Meaning Efficacy of SARS-CoV-2 vaccine candidates needs to be interpreted in conjunction with the prevalence of the COVID-19 pandemic. Adjustment for location-level prevalence analysis would provide better insights into the efficacy results of Phase 3 trials.Competing Interest StatementThe authors have declared no competing interest.Funding StatementNo funding was received for this work.Author DeclarationsI confirm all relevant ethical guidelines have been followed, and any necessary IRB and/or ethics committee approvals have been obtained.YesThe details of the IRB/oversight body that provided approval or exemption for the research described are given below:IRB approval not required for systematic review and meta-analysis.All necessary patient/participant consent has been obtained and the appropriate institutional forms have been archived.YesI understand that all clinical trials and any other prospective interventional studies must be registered with an ICMJE-approved registry, such as ClinicalTrials.gov. I confirm that any such study reported in the manuscript has been registered and the trial registration ID is provided (note: if posting a prospective study registered retrospectively, please provide a statement in the trial ID field explaining why the study was not registered in advance).YesI have followed all appropriate research reporting guidelines and uploaded the relevant EQUATOR Network research reporting ch cklist(s) and other pertinent material as supplementary files, if applicable.YesAll data used in the manuscript is included in the manuscript and supplementary material.
URL: https://www.medrxiv.org/content/medrxiv/early/2021/06/07/2021.06.05.21258394.full.pdf
DOI: 10.1101/2021.06.05.21258394

47. Siddique S, Ahmed S. COVID-19 Vaccines in Pakistan: Efficacy, Adverse Effects and Availability. Journal of Islamabad Medical & Dental College. 2021;10(2):125-30. DOI: 10.35787/jimdc.v10i2.723
DOI: 10.35787/jimdc.v10i2.723

48. Souza WM, Amorim MR, Sesti-Costa R, et al. Neutralisation of SARS-CoV-2 lineage P.1 by antibodies elicited through natural SARS-CoV-2 infection or vaccination with an inactivated SARS-CoV-2 vaccine: an immunological study. Lancet Microbe. 2021;08:08. DOI: 10.1016/S2666-5247(21)00129-4
ABSTRACT: Background: Mutations accrued by SARS-CoV-2 lineage P.1-first detected in Brazil in early January, 2021-include amino acid changes in the receptor-binding domain of the viral spike protein that also are reported in other variants of concern, including B.1.1.7 and B.1.351. We aimed to investigate whether isolates of wild-type P.1 lineage SARS-CoV-2 can escape from neutralising antibodies generated by a polyclonal immune response. Methods: We did an immunological study to assess the neutralising effects of antibodies on lineage P.1 and lineage B isolates of SARS-CoV-2, using plasma samples from patients previously infected with or vaccinated against SARS-CoV-2. Two specimens (P.1/28 and P.1/30) containing SARS-CoV-2 lineage P.1 (as confirmed by viral genome sequencing) were obtained from nasopharyngeal and bronchoalveolar lavage samples collected from patients in Manaus, Brazil, and compared against an isolate of SARS-CoV-2 lineage B (SARS.CoV2/SP02.2020) recovered from a patient in Brazil in February, 2020. Isolates were incubated with plasma samples from 21 blood donors who had previously had COVID-19 and from a total of 53 recipients of the chemically inactivated SARS-CoV-2 vaccine CoronaVac: 18 individuals after receipt of a single dose and an additional 20 individuals (38 in total) after receipt of two doses (collected 17-38 days after the most recent dose); and 15 individuals who received two doses during the phase 3 trial of the vaccine (collected 134-230 days after the second dose). Antibody neutralisation of P.1/28, P.1/30, and B isolates by plasma samples were compared in terms of median virus neutralisation titre (VNT50, defined as the reciprocal value of the sample dilution that showed 50% protection against cytopathic effects). Findings: In terms of VNT50, plasma from individuals previously infected with SARS-CoV-2 had an 8.6 times lower neutralising capacity against the P.1 isolates (median VNT50 30 [IQR <20-45] for P.1/28 and 30 [<20-40] for P.1/30) than against the lineage B isolate (260 [160-400]), with a binominal model showing significant reductions in lineage P.1 isolates compared with the lineage B isolate (p</=0.0001). Efficient neutralisation of P.1 isolates was not seen with plasma samples collected from individuals vaccinated with a first dose of CoronaVac 20-23 days earlier (VNT50s below the limit of detection [<20] for most plasma samples), a second dose 17-38 days earlier (median VNT50 24 [IQR <20-25] for P.1/28 and 28 [<20-25] for P.1/30), or a second dose 134-260 days earlier (all VNT50s below limit of detection). Median VNT50s against the lineage B isolate were 20 (IQR 20-30) after a first dose of CoronaVac 20-23 days earlier, 75 (<20-263) after a second dose 17-38 days earlier, and 20 (<20-30) after a second

dose 134-260 days earlier. In plasma collected 17-38 days after a second dose of CoronaVac, neutralising capacity against both P.1 isolates was significantly decreased (p=0.0051 for P.1/28 and p=0.0336 for P.1/30) compared with that against the lineage B isolate. All data were corroborated by results obtained through plaque reduction neutralisation tests. Interpretation: SARS-CoV-2 lineage P.1 might escape neutralisation by antibodies generated in response to polyclonal stimulation against previously circulating variants of SARS-CoV-2. Continuous genomic surveillance of SARS-CoV-2 combined with antibody neutralisation assays could help to guide national immunisation programmes. Funding: Sao Paulo Research Foundation, Brazilian Ministry of Science, Technology and Innovation and Funding Authority for Studies, Medical Research Council, National Council for Scientific and Technological Development, National Institutes of Health. Translation: For the Portuguese translation of the abstract see Supplementary Materials section.
URL: https://www.ncbi.nlm.nih.gov/pubmed/34258603
DOI: 10.1016/S2666-5247(21)00129-4

49. Tanriover MD, Doganay HL, Akova M, et al. Efficacy and safety of an inactivated whole-virion SARS-CoV-2 vaccine (CoronaVac): interim results of a double-blind, randomised, placebo-controlled, phase 3 trial in Turkey. Lancet. 2021;08:08. DOI: 10.1016/S0140-6736(21)01429-X
ABSTRACT: BACKGROUND: CoronaVac, an inactivated whole-virion SARS-CoV-2 vaccine, has been shown to be well tolerated with a good safety profile in individuals aged 18 years and older in phase 1/2 trials, and provided a good humoral response against SARS-CoV-2. We present the interim efficacy and safety results of a phase 3 clinical trial of CoronaVac in Turkey. METHODS: This was a double-blind, randomised, placebo-controlled phase 3 trial. Volunteers aged 18-59 years with no history of COVID-19 and with negative PCR and antibody test results for SARS-CoV-2 were enrolled at 24 centres in Turkey. Exclusion criteria included (but were not limited to) immunosuppressive therapy (including steroids) within the past 6 months, bleeding disorders, asplenia, and receipt of any blood products or immunoglobulins within the past 3 months. The K1 cohort consisted of health-care workers (randomised in a 1:1 ratio), and individuals other than health-care workers were also recruited into the K2 cohort (randomised in a 2:1 ratio) using an interactive web response system. The study vaccine was 3 mug inactivated SARS-CoV-2 virion adsorbed to aluminium hydroxide in a 0.5 mL aqueous suspension. Participants received either vaccine or placebo (consisting of all vaccine components except inactivated virus) intramuscularly on days 0 and 14. The primary efficacy outcome was the prevention of PCR-confirmed symptomatic COVID-19 at least 14 days after the second dose in the per protocol population. Safety analyses were done in the intention-to-treat population. This study is registered with ClinicalTrials.gov (NCT04582344) and is active but no longer recruiting. FINDINGS: Among 11 303 volunteers screened between Sept 14, 2020, and Jan 5, 2021, 10 218 were randomly allocated. After exclusion of four participants from the vaccine group because of protocol deviations, the intention-to-treat group consisted of 10 214 participants (6646 [65.1%] in the vaccine group and 3568 [34.9%] in the placebo group) and the per protocol group consisted of 10 029 participants (6559 [65.4%] and 3470 [34.6%]) who received two doses of vaccine or placebo. During a median follow-up period of 43 days (IQR 36-48), nine cases of PCR-confirmed symptomatic COVID-19 were reported in the vaccine group (31.7 cases [14.6-59.3] per 1000 person-years) and 32 cases were reported in the placebo group (192.3 cases [135.7-261.1] per 1000 person-years) 14 days or more after the second dose, yielding a vaccine efficacy of 83.5% (95% CI 65.4-92.1; p<0.0001). The frequencies of any adverse events were 1259 (18.9%) in the vaccine group and 603 (16.9%) in the placebo group (p=0.0108) with no fatalities or grade 4 adverse events. The most common systemic adverse event was fatigue (546 [8.2%] participants in the vaccine group and 248 [7.0%] the placebo group, p=0.0228). Injection-site pain was the most frequent local adverse event (157 [2.4%] in the vaccine group and 40 [1.1%] in the placebo group, p<0.0001). INTERPRETATION: CoronaVac has high efficacy against PCR-confirmed symptomatic COVID-19 with a good safety and tolerability profile. FUNDING: Turkish Health Institutes Association.
URL: https://www.ncbi.nlm.nih.gov/pubmed/34246358
DOI: 10.1016/S0140-6736(21)01429-X

50. Thiagarajan K. What do we know about India's Covaxin vaccine? BMJ. 2021;373:n997. DOI: 10.1136/bmj.n997
URL: https://www.ncbi.nlm.nih.gov/pubmed/33879478
DOI: 10.1136/bmj.n997

51. Tuba S, Widyati W, Syed Sulaiman SA. A Review of COVID-19 Vaccines: What Needs to Be Known and Its Expected Effect on the Human Population? Preprints. 2021. DOI: 10.20944/preprints202104.0468.v1
ABSTRACT: The COVID-19 pandemic is a devastating blow to the entire world community and changes the order of human life. All efforts and strategies are being carried out to contain and reduce the spread of the SARS-COV-2 virus, both by tightening the health protocol and using vaccines to the public. Currently, several vaccines are available and have passed phase 3 clinical trials, such as vector vaccines (Gamaleya Sputnik V Russia, University of Oxford/AstraZeneca, CanSino, and Janssen Pharmaceutical Companies), mRNA-based vaccines (Moderna/BioNTech/Fosun Pharma/Pfizer), inactivated vaccines (SinoVac and SinoPharm from China, Covaxin from Bharat Biotech India), and adjuvanted recombinant protein nanoparticles (Novavax from the USA) are expected to be able to suppress the spread of the virus and produce a minimum of 70 percent herd-immunity in a population. Each vaccine's efficacy varies from the lowest, namely the Sinovac vaccine (CoronaVac) 50% to the highest the Novavax vaccine (NVX-Cov2373) 96% effectivity value. Moreover, further rigorous research is still being carried out for the development of an effective and efficient vaccine.
URL: https://www.preprints.org/manuscript/202104.0468/v1
DOI: 10.20944/preprints202104.0468.v1

52. Tyagi K, Ghosh A, Nair D, et al. Breakthrough COVID19 infections after vaccinations in healthcare and other workers in a chronic care medical facility in New Delhi, India. Diabetes Metab Syndr. 2021;15(3):1007-8. DOI: 10.1016/j.dsx.2021.05.001
ABSTRACT: BACKGROUND AND AIMS: Vaccinations for COVID19 are now open to all adults in India. However, spread of COVID19 infection continues unabated. We aimed to ascertain number of breakthrough COVID19 infections after vaccinations in a chronic care, diabetes-centric healthcare facility. METHODS: We reviewed rigorously maintained data of vaccinations, health status, symptoms of COVID19 & RT-PCR testing of all staff (doctors, nurses, paramedical workers, and other staff) in our health care facility from January 16, 2021 till date. RESULTS: Out of 123 employees, 113 were vaccinated (Covaxin, 28, Covishield, 85). Second dose was completed in 107 (94.7%) and first dose in 6 persons (5.3%). Symptomatic COVD19 infections occurred in 19 persons (16.9%) post any dose of vaccine. Symptomatic breakthrough infections > 14 days after second dose occurred in 15 persons (13.3%). Except one (required hospitalization), all 14 had mild COVID19 disease. CONCLUSIONS: We report mild symptomatic breakthrough infections as seen in our health care facility. Research in breakthrough infections in India should be extended to other institutions and community to obtain larger data.
URL: https://www.ncbi.nlm.nih.gov/pubmed/33991805
DOI: 10.1016/j.dsx.2021.05.001

53. Ulhaq ZS, Soraya GV, Indriana K. Breakthrough COVID-19 case after full-dose administration of CoronaVac vaccine. Indian J Med Microbiol. 2021;04:04. DOI: 10.1016/j.ijmmb.2021.05.017
URL: https://www.ncbi.nlm.nih.gov/pubmed/34099338
DOI: 10.1016/j.ijmmb.2021.05.017

54. Wu Z, Hu Y, Xu M, et al. Safety, tolerability, and immunogenicity of an inactivated SARS-CoV-2 vaccine (CoronaVac) in healthy adults aged 60 years and older: a randomised, double-blind, placebo-controlled, phase 1/2 clinical trial. Lancet Infect Dis. 2021;21(6):803-12. DOI: 10.1016/S1473-3099(20)30987-7
ABSTRACT: BACKGROUND: A vaccine against COVID-19 is urgently needed for older adults, in whom morbidity and mortality due to the disease are increased. We aimed to assess the safety, tolerability, and immunogenicity of a candidate COVID-19 vaccine, CoronaVac, containing inactivated SARS-CoV-2, in adults aged 60 years and older. METHODS: We did a randomised, double-blind, placebo-controlled, phase 1/2 clinical trial of CoronaVac in healthy adults aged 60 years and older in Renqiu (Hebei, China). Vaccine or placebo was given by intramuscular injection in two doses (days 0 and 28). Phase 1 comprised a dose-escalation study, in which participants were allocated to two blocks: block 1 (3 mug inactivated virus in 0.5 mL of aluminium hydroxide solution per injection) and block 2 (6 mug per injection). Within each block, participants were randomly assigned (2:1) using block randomisation to receive CoronaVac or placebo (aluminium hydroxide solution only). In phase 2, participants were randomly assigned (2:2:2:1) using block randomisation to receive either CoronaVac at 1.5 mug, 3 mug, or 6 mug per dose, or placebo. All participants, investigators, and laboratory staff were masked to treatment allocation. The primary safety endpoint was adverse reactions within 28 days after each injection in all participants who received at least

one dose. The primary immunogenicity endpoint was seroconversion rate at 28 days after the second injection (which was assessed in all participants who had received the two doses of vaccine according to their random assignment, had antibody results available, and did not violate the trial protocol). Seroconversion was defined as a change from seronegative at baseline to seropositive for neutralising antibodies to live SARS-CoV-2 (positive cutoff titre 1/8), or a four-fold titre increase if the participant was seropositive at baseline. This study is ongoing and is registered with ClinicalTrials.gov (NCT04383574). FINDINGS: Between May 22 and June 1, 2020, 72 participants (24 in each intervention group and 24 in the placebo group; mean age 65.8 years [SD 4.8]) were enrolled in phase 1, and between June 12 and June 15, 2020, 350 participants were enrolled in phase 2 (100 in each intervention group and 50 in the placebo group; mean age 66.6 years [SD 4.7] in 349 participants). In the safety populations from both phases, any adverse reaction within 28 days after injection occurred in 20 (20%) of 100 participants in the 1.5 mug group, 25 (20%) of 125 in the 3 mug group, 27 (22%) of 123 in the 6 mug group, and 15 (21%) of 73 in the placebo group. All adverse reactions were mild or moderate in severity and injection site pain (39 [9%] of 421 participants) was the most frequently reported event. As of Aug 28, 2020, eight serious adverse events, considered unrelated to vaccination, have been reported by seven (2%) participants. In phase 1, seroconversion after the second dose was observed in 24 of 24 participants (100.0% [95% CI 85.8-100.0]) in the 3 mug group and 22 of 23 (95.7% [78.1-99.9]) in the 6 mug group. In phase 2, seroconversion was seen in 88 of 97 participants in the 1.5 mug group (90.7% [83.1-95.7]), 96 of 98 in the 3 mug group (98.0% [92.8-99.8]), and 97 of 98 (99.0% [94.5-100.0]) in the 6 mug group. There were no detectable antibody responses in the placebo groups. INTERPRETATION: CoronaVac is safe and well tolerated in older adults. Neutralising antibody titres induced by the 3 mug dose were similar to those of the 6 mug dose, and higher than those of the 1.5 mug dose, supporting the use of the 3 mug dose CoronaVac in phase 3 trials to assess protection against COVID-19. FUNDING: Chinese National Key Research and Development Program and Beijing Science and Technology Program.
URL: https://www.ncbi.nlm.nih.gov/pubmed/33548194
DOI: 10.1016/S1473-3099(20)30987-7

55. Xia S, Zhang Y, Wang Y, et al. Safety and immunogenicity of an inactivated SARS-CoV-2 vaccine, BBIBP-CorV: a randomised, double-blind, placebo-controlled, phase 1/2 trial. Lancet Infect Dis. 2021;21(1):39-51. DOI: 10.1016/S1473-3099(20)30831-8
ABSTRACT: BACKGROUND: The ongoing COVID-19 pandemic warrants accelerated efforts to test vaccine candidates. We aimed to assess the safety and immunogenicity of an inactivated severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) vaccine candidate, BBIBP-CorV, in humans. METHODS: We did a randomised, double-blind, placebo-controlled, phase 1/2 trial at Shangqiu City Liangyuan District Center for Disease Control and Prevention in Henan Province, China. In phase 1, healthy people aged 18-80 years, who were negative for serum-specific IgM/IgG antibodies against SARS-CoV-2 at the time of screening, were separated into two age groups (18-59 years and >/=60 years) and randomly assigned to receive vaccine or placebo in a two-dose schedule of 2 mug, 4 mug, or 8 mug on days 0 and 28. In phase 2, healthy adults (aged 18-59 years) were randomly assigned (1:1:1:1) to receive vaccine or placebo on a single-dose schedule of 8 mug on day 0 or on a two-dose schedule of 4 mug on days 0 and 14, 0 and 21, or 0 and 28. Participants within each cohort were randomly assigned by stratified block randomisation (block size eight) and allocated (3:1) to receive vaccine or placebo. Group allocation was concealed from participants, investigators, and outcome assessors. The primary outcomes were safety and tolerability. The secondary outcome was immunogenicity, assessed as the neutralising antibody responses against infectious SARS-CoV-2. This study is registered with www.chictr.org.cn, ChiCTR2000032459. FINDINGS: In phase 1, 192 participants were enrolled (mean age 53.7 years [SD 15.6]) and were randomly assigned to receive vaccine (2 mug [n=24], 4 mug [n=24], or 8 mug [n=24] for both age groups [18-59 years and >/=60 years]) or placebo (n=24). At least one adverse reaction was reported within the first 7 days of inoculation in 42 (29%) of 144 vaccine recipients. The most common systematic adverse reaction was fever (18-59 years, one [4%] in the 2 mug group, one [4%] in the 4 mug group, and two [8%] in the 8 mug group; >/=60 years, one [4%] in the 8 mug group). All adverse reactions were mild or moderate in severity. No serious adverse event was reported within 28 days post vaccination. Neutralising antibody geometric mean titres were higher at day 42 in the group aged 18-59 years (87.7 [95% CI 64.9-118.6], 2 mug group; 211.2 [158.9-280.6], 4 mug group; and 228.7 [186.1-281.1], 8 mug group) and the group aged 60 years and older (80.7 [65.4-99.6], 2 mug group; 131.5 [108.2-159.7], 4 mug group; and 170.87 [133.0-219.5], 8 mug group) compared with the placebo group (2.0 [2.0-2.0]). In phase 2, 448 participants were enrolled (mean age 41.7 years [SD 9.9]) and were randomly assigned to receive the vaccine

(8 mug on day 0 [n=84] or 4 mug on days 0 and 14 [n=84], days 0 and 21 [n=84], or days 0 and 28 [n=84]) or placebo on the same schedules (n=112). At least one adverse reaction within the first 7 days was reported in 76 (23%) of 336 vaccine recipients (33 [39%], 8 mug day 0; 18 [21%], 4 mug days 0 and 14; 15 [18%], 4 mug days 0 and 21; and ten [12%], 4 mug days 0 and 28). One placebo recipient in the 4 mug days 0 and 21 group reported grade 3 fever, but was self-limited and recovered. All other adverse reactions were mild or moderate in severity. The most common systematic adverse reaction was fever (one [1%], 8 mug day 0; one [1%], 4 mug days 0 and 14; three [4%], 4 mug days 0 and 21; two [2%], 4 mug days 0 and 28). The vaccine-elicited neutralising antibody titres on day 28 were significantly greater in the 4 mug days 0 and 14 (169.5, 95% CI 132.2-217.1), days 0 and 21 (282.7, 221.2-361.4), and days 0 and 28 (218.0, 181.8-261.3) schedules than the 8 mug day 0 schedule (14.7, 11.6-18.8; all p<0.001). INTERPRETATION: The inactivated SARS-CoV-2 vaccine, BBIBP-CorV, is safe and well tolerated at all tested doses in two age groups. Humoral responses against SARS-CoV-2 were induced in all vaccine recipients on day 42. Two-dose immunisation with 4 mug vaccine on days 0 and 21 or days 0 and 28 achieved higher neutralising antibody titres than the single 8 mug dose or 4 mug dose on days 0 and 14. FUNDING: National Program on Key Research Project of China, National Mega projects of China for Major Infectious Diseases, National Mega Projects of China for New Drug Creation, and Beijing Science and Technology Plan.
URL: https://www.ncbi.nlm.nih.gov/pubmed/33069281
DOI: 10.1016/S1473-3099(20)30831-8

56. Yadav PD, Sapkal GN, Ella R, et al. Neutralization of Beta and Delta variant with sera of COVID-19 recovered cases and vaccinees of inactivated COVID-19 vaccine BBV152/Covaxin. J Travel Med. 2021;06:06. DOI: 10.1093/jtm/taab104
URL: https://www.ncbi.nlm.nih.gov/pubmed/34230972
DOI: 10.1093/jtm/taab104

57. Zhang MX, Zhang TT, Shi GF, et al. Safety of an inactivated SARS-CoV-2 vaccine among healthcare workers in China. Expert Rev Vaccines. 2021:1-8. DOI: 10.1080/14760584.2021.1925112
ABSTRACT: Background: Although the inactivated SARS-CoV-2 vaccine (CoronaVac) has undergone preclinical tests and clinical trials evaluating its efficacy and safety, few data have been reported in the post-licensure real-world setting. We aimed to assess the safety of the vaccine among healthcare workers.Methods: A self-administered online survey on monitoring adverse reactions post vaccination was conducted among the staff who worked at and were vaccinated in a tertiary hospital in Taizhou, China, from February 24 to 7 March 2021. A total of 1526 subjects responded to the questionnaire when they received an e-mail or an e-poster on WeChat.Results: The incidences of overall adverse reactions after the first and second injections were 15.6% (238/1526) and 14.6% (204/1397), respectively. The most common adverse reaction was localized pain at the injection site, with an incidence of 9.6% and 10.7% after each dose, accounting for 61.8% and 73.0% of adverse reactions, respectively. Fatigue, muscle pain, and headache were the most common systemic adverse reactions.Conclusions: These findings implied that the inactivated CoronaVac vaccine has an acceptable safety profile among healthcare workers due to the low incidence of self-reported adverse reactions. This may boost public confidence in nationwide mass vaccination campaigns.
URL: https://www.ncbi.nlm.nih.gov/pubmed/33929930
DOI: 10.1080/14760584.2021.1925112

58. Zhang Y, Zeng G, Pan H, et al. Safety, tolerability, and immunogenicity of an inactivated SARS-CoV-2 vaccine in healthy adults aged 18-59 years: a randomised, double-blind, placebo-controlled, phase 1/2 clinical trial. Lancet Infect Dis. 2021;21(2):181-92. DOI: 10.1016/S1473-3099(20)30843-4
ABSTRACT: BACKGROUND: With the unprecedented morbidity and mortality associated with the COVID-19 pandemic, a vaccine against COVID-19 is urgently needed. We investigated CoronaVac (Sinovac Life Sciences, Beijing, China), an inactivated vaccine candidate against COVID-19, containing inactivated severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), for its safety, tolerability and immunogenicity. METHODS: In this randomised, double-blind, placebo-controlled, phase 1/2 clinical trial, healthy adults aged 18-59 years were recruited from the community in Suining County of Jiangsu province, China. Adults with SARS-CoV-2 exposure or infection history, with axillary temperature above 37.0 degrees C, or an allergic reaction to any vaccine component were excluded. The experimental vaccine for the phase 1 trial was manufactured using a cell factory process

(CellSTACK Cell Culture Chamber 10, Corning, Wujiang, China), whereas those for the phase 2 trial were produced through a bioreactor process (ReadyToProcess WAVE 25, GE, Umea, Sweden). The phase 1 trial was done in a dose-escalating manner. At screening, participants were initially separated (1:1), with no specific randomisation, into two vaccination schedule cohorts, the days 0 and 14 vaccination cohort and the days 0 and 28 vaccination cohort, and within each cohort the first 36 participants were assigned to block 1 (low dose CoronaVac [3 mug per 0.5 mL of aluminium hydroxide diluent per dose) then another 36 were assigned to block 2 (high-dose Coronavc [6 mug per 0.5 mL of aluminium hydroxide diluent per dse]). Within each block, participants were randomly assigned (2:1), using block randomisation with a block size of six, to either two doses of CoronaVac or two doses of placebo. In the phase 2 trial, at screening, participants were initially separated (1:1), with no specific randomisation, into the days 0 and 14 vaccination cohort and the days 0 and 28 vaccination cohort, and participants were randomly assigned (2:2:1), using block randomisation with a block size of five, to receive two doses of either low-dose CoronaVac, high-dose CoronaVac, or placebo. Participants, investigators, and laboratory staff were masked to treatment allocation. The primary safety endpoint was adverse reactions within 28 days after injection in all participants who were given at least one dose of study drug (safety population). The primary immunogenic outcome was seroconversion rates of neutralising antibodies to live SARS-CoV-2 at day 14 after the last dose in the days 0 and 14 cohort, and at day 28 after the last dose in the days 0 and 28 cohort in participants who completed their allocated two-dose vaccination schedule (per-protocol population). This trial is registered with ClinicalTrials.gov, NCT04352608, and is closed to accrual. FINDINGS: Between April 16 and April 25, 2020, 144 participants were enrolled in the phase 1 trial, and between May 3 and May 5, 2020, 600 participants were enrolled in the phase 2 trial. 743 participants received at least one dose of investigational product (n=143 for phase 1 and n=600 for phase 2; safety population). In the phase 1 trial, the incidence of adverse reactions for the days 0 and 14 cohort was seven (29%) of 24 participants in the 3 ug group, nine (38%) of 24 in the 6 mug group, and two (8%) of 24 in the placebo group, and for the days 0 and 28 cohort was three (13%) of 24 in the 3 mug group, four (17%) of 24 in the 6 mug group, and three (13%) of 23 in the placebo group. The seroconversion of neutralising antibodies on day 14 after the days 0 and 14 vaccination schedule was seen in 11 (46%) of 24 participants in the 3 mug group, 12 (50%) of 24 in the 6 mug group, and none (0%) of 24 in the placebo group; whereas at day 28 after the days 0 and 28 vaccination schedule, seroconversion was seen in 20 (83%) of 24 in the 3 mug group, 19 (79%) of 24 in the 6 mug group, and one (4%) of 24 in the placebo group. In the phase 2 trial, the incidence of adverse reactions for the days 0 and 14 cohort was 40 (33%) of 120 participants in the 3 mug group, 42 (35%) of 120 in the 6 mug group, and 13 (22%) of 60 in the placebo group, and for the days 0 and 28 cohort was 23 (19%) of 120 in the 3 mug group, 23 (19%) of 120 in the 6 mug group, and 11 (18%) of 60 for the placebo group. Seroconversion of neutralising antibodies was seen for 109 (92%) of 118 participants in the 3 mug group, 117 (98%) of 119 in the 6 mug group, and two (3%) of 60 in the placebo group at day 14 after the days 0 and 14 schedule; whereas at day 28 after the days 0 and 28 schedule, seroconversion was seen in 114 (97%) of 117 in the 3 mug group, 118 (100%) of 118 in the 6 mug group, and none (0%) of 59 in the placebo group. INTERPRETATION: Taking safety, immunogenicity, and production capacity into account, the 3 mug dose of CoronaVac is the suggested dose for efficacy assessment in future phase 3 trials. FUNDING: Chinese National Key Research and Development Program and Beijing Science and Technology Program.
URL: https://www.ncbi.nlm.nih.gov/pubmed/33217362
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Appendix 1: Evidence Search Details

Filters, Limits & Exclusions:	English only 2021-Current

Sources Searched:	• Ovid Embase • Ovid MEDLINE • medRxiv • Health Canada • Government of Canada •	• Google • Google Scholar • WHO Website • CDC Website • NHS website • WHO website
Librarian(s):	Lukas Miller, Clinical Librarian, Saskatchewan Health Authority Brianna-Howell Spooner, Clinical Librarian, Saskatchewan Health Authority	

Appendix 2: Search Strategies

Embase, Ovid MEDLINE(R)

#	Searches	Results
1	(sinovac or coronavac).ti,ab.	115
2	(sinopharm or "bbibp-corv" or "bbibp corv").ti,ab.	50
3	("sputnik v" or "sputnik 5" or "gam-covid-vac").ti,ab.	63
4	1 or 2 or 3	206
5	limit 4 to english language	184
6	limit 5 to yr="2021 -Current"	132
7	remove duplicates from 6	83
8	(covaxin).ti,ab.	26

Search history sorted by search number ascending