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Supplemental information

**COVID-19 vaccine access in Africa:
Global distribution, vaccine platforms,
and challenges ahead**

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Supplemental appendix: references associated with Table 2

<p>BNT162 (Pfizer BioNtech) Efficacy versus B1.351 & B1.1.7 & B1.617.2 (Wall et al., 2021) Effectiveness data in Qatar (Abu-Raddad et al., 2021) Effectiveness in Israel (Haas et al., 2021)</p>
<p>ChAdOx1 (AstraZeneca) Overall efficacy (Voysey et al., 2021) Efficacy versus B1.351 (Madhi et al., 2021) Efficacy versus B1.1.7 (Emary et al., 2021) Effectiveness versus B.1.617.2 (Stowe et al., 2021)</p>
<p>Ad26.COVS (Johnson & Johnson) Overall efficacy and efficacy versus B1.351 (Sadoff et al., 2021)</p>
<p>mRNA-1273 (Moderna) Overall efficacy (Emery et al., 2021) Efficacy versus B1.351 (Wu, Werner, et al., 2021) Antibody persistence (Wu, Werner, et al., 2021) Booster effect mRNA-1273.351 or mRNA-1273 (Wu, Choi, et al., 2021)</p>
<p>Sputnik V (Gamaleya Institute) Overall efficacy (Logunov et al., 2021) Efficacy versus B1.351 & B1.1.7 (Ikigame et al., 2021) Evaluation in Guinea: https://www.rfi.fr/fr/afrique/20201231-la-guinee-commence-la-vaccination-de-sa-population-avec-le-sputnik-v</p>
<p>BBIBP-CorV /Vero Cell (Sinopharm) Overall efficacy (Al Kaabi et al., 2021) Efficacy versus B1.351 & B1.1.7 (Huang et al., 2021) and (Wang et al., 2021)</p>
<p>Coronavac (Sinovac) Overall efficacy in Brazil (Hitchings et al., 2021) Efficacy versus B1.351 & B1.1.7 (Wang et al., 2021)</p>
<p>Covaxin (Barhat Biotech) Overall efficacy (2d interim analysis) https://www.bharatbiotech.com/images/press/covaxin-phase3-clinical-trials-interim-results.pdf and (Thiagarajan, 2021)</p>
<p>SARS-CoV-2 rS/Matrix-M1 Adjuvant (Novavax) Overall efficacy and efficacy versus B.1.351 (Shinde et al., 2021) Overall efficacy (US and Mexico) https://ir.novavax.com/news-releases/news-release-details/novavax-covid-19-vaccine-demonstrates-90-overall-efficacy-and</p>
<p>GRAd-COV2 (ReiThera) https://reitheras.com/2021/03/18/reitheras-covid-19-vaccine-candidate-enters-phase-2-3-clinical-study/</p>
<p>hAd5-S+N (ImmunityBio) https://immunitybio.com/immunitybio-announces-single-prime-had5-covid-19-vaccination-induces-a-10-fold-increase-in-t-cell-response-equivalent-to-t-cell-responses-from-patients-previously-infected-with-sars-cov-2/</p>

Abu-Raddad, L.J., Chemaitelly, H., and Butt, A.A.; National Study Group for COVID-19 Vaccination (2021). Effectiveness of the BNT162b2 Covid-19 Vaccine against the B.1.1.7 and B.1.351 Variants. N. Engl. J. Med. 10.1056/NEJMc2104974.

Al Kaabi, N., Zhang, Y., Xia, S., Yang, Y., Al Qahtani, M.M., Abdulrazzaq, N., Al Nusair, M., Hassany, M., Jawad, J.S., Abdalla, J., et al. (2021). Effect of 2 Inactivated SARS-CoV-2 Vaccines on Symptomatic COVID-19 Infection in Adults: A Randomized Clinical Trial. *JAMA*. 10.1001/jama.2021.8565. PubMed

>Emary, K.R.W., Golubchik, T., Aley, P.K., Ariani, C.V., Angus, B., Bibi, S., Blane, B., Bonsall, D., Cicconi, P., Charlton, S., et al.; COVID-19 Genomics UK consortium; AMPHEUS Project; Oxford COVID-19 Vaccine Trial Group (2021). Efficacy of ChAdOx1 nCoV-19 (AZD1222) vaccine against SARS-CoV-2 variant of concern 202012/01 (B.1.1.7): an exploratory analysis of a randomised controlled trial. *Lancet* 397, 1351–1362. 10.1016/S0140-6736(21)00628-0.

Haas, E.J., Angulo, F.J., McLaughlin, J.M., Anis, E., Singer, S.R., Khan, F., Brooks, N., Smaja, M., Mircus, G., Pan, K., et al. (2021). Impact and effectiveness of mRNA BNT162b2 vaccine against SARS-CoV-2 infections and COVID-19 cases, hospitalisations, and deaths following a nationwide vaccination campaign in Israel: an observational study using national surveillance data. *Lancet* 397, 1819–1829. 10.1016/S0140-6736(21)00947-8.

Hitchings, M. D. T., Ranzani, O.T., Torres, S.S., Barbosa de Oliveira, S., Almiron, M., Said, R., Borg, R., Schulz, W.L., Dias de Oliveira, R. Vieira da Silva, P., et al. (2021). Effectiveness of CoronaVac in the setting of high SARS-CoV-2 P.1 variant transmission in Brazil: A test-negative case-control study. medRxiv. doi: 10.1101/2021.04.07.21255081.

Huang, B., Dai, L., Wang, H., Hu, Z., Yang, X., Tan, W., and Gao, G.F. (2021). Serum sample neutralisation of BBIBP-CorV and ZF2001 vaccines to SARS-CoV-2 501Y.V2. *Lancet*. 10.1016/S2666-5247(21)00082-3. PubMed

Ikegame, S., Siddiquey, M., Hung, C.T., Haas, G., Brambilla, L., Oguntuyo, K., Kowdle, S., Vilardo, A., Edelstein, A., Perandones, C., Kamil, J., Lee, B. (2021). Neutralizing activity of Sputnik V vaccine sera against SARS-CoV-2 variants. *Res. Sq.* doi: 10.21203/rs.3.rs-400230/v1.

Logunov, D.Y., Dolzhikova, I.V., Shcheblyakov, D.V., Tukhvatulin, A.I., Zubkova, O.V., Dzharullaeva, A.S., Kovyshina, A.V., Lubenets, N.L., Grousova, D.M., Erokhova, A.S., et al.; Gam-COVID-Vac Vaccine Trial Group (2021). 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* 397, 671–681. 10.1016/S0140-6736(21)00234-8. PubMed

Madhi, S. A., Baillie, V., Cutland, C.L., Voysey, M., Koen, A.L., Fairlie, L., Padayachee, S.D., Dheda, K., Barnabas, S.L. et al. (2021) Efficacy of the ChAdOx1 nCoV-19 Covid-19 Vaccine against the B.1.351 Variant. *New England Journal of Medicine*. doi: 10.1056/NEJMoa2102214.

Sadoff, J., Gray, G., Vandebosch, A., Cardenas, V., Shukarev, G., Grinsztejn, B., Goepfert, P.A., Truyers, C., Fennema, H., Spiessens, b., et al. (2021) Safety and Efficacy of Single-Dose Ad26.COV2.S Vaccine against Covid-19. *New England Journal of Medicine*. doi: 10.1056/NEJMoa2101544.

Shinde, V., Bhikha, S., Hoosain, Z., Archary, M., Bhorat, Q., Fairlie, L., Lalloo, U., Masilela, M.S.L., Moodley, D., Hanley, S., et al.; 2019nCoV-501 Study Group (2021). Efficacy of NVX-CoV2373 Covid-19 Vaccine against the B.1.351 Variant. *N. Engl. J. Med.* 384, 1899–1909. 10.1056/nejmoa2103055.

Stowe, J., et al. Effectiveness of COVID-19 vaccines against hospital admission with the Delta (B.1.617.2) variant. Available at: <https://khub.net/documents/135939561/479607266/Effectiveness+of+COVID-19+vaccines+against+hospital+admission+with+the+Delta+%28B.1.617.2%29+variant.pdf/1c213463-3997-ed16-2a6f-14e5deb0b997?t=1623689315431>

Thiagarajan, K. (2021). What do we know about India’s Covaxin vaccine? *BMJ* 373, n997. 10.1136/bmj.n997.

Voysey, M., Clemens, S.A.C., Madhi, S.A., Weckx, L.Y., Folegatti, P.M., Aley, P.K., Angus, B., Baillie, V.L., Barnabas, S.L., Bhorat, Q.E., et al.; Oxford COVID Vaccine Trial Group (2021). Safety and efficacy of the ChAdOx1 nCoV-19 vaccine (AZD1222) against SARS-CoV-2: an interim analysis of four randomised controlled trials in Brazil, South Africa, and the UK. *Lancet* 397, 99–111. 10.1016/S0140-6736(20)32661-1.

Wall, E.C., Wu, M., Harvey, R., Kelly, G., Warchal, S., Sawyer, C., Daniels, R., Hobson, P., Hatipoglu, E., Ngai, Y., et al. (2021). Neutralising antibody activity against SARS-CoV-2 VOCs B.1.617.2 and B.1.351 by BNT162b2 vaccination. *Lancet* 397, 2331–2333. 10.1016/S0140-6736(21)01290-3.

Wang, G.-L., Wang, Z.Y., Duan, L.J., Meng, Q.C., Jiang, M.D., Cao, J., Yao, L., Zhu, K.L., Cao, W.C., and Ma, M.J. (2021). Susceptibility of Circulating SARS-CoV-2 Variants to Neutralization. *N. Engl. J. Med.* 384, 2354–2356. 10.1056/NEJMc2103022.

Wu, K., Choi, A., et al. (2021a) 'Preliminary Analysis of Safety and Immunogenicity of a SARS-CoV-2 Variant Vaccine Booster', medRxiv. p. 2021.05.05.21256716. doi: 10.1101/2021.05.05.21256716.

Wu, K., Werner, A.P., Koch, M., Choi, A., Narayanan, E., Stewart-Jones, G.B.E., Colpitts, T., Bennett, H., Boyoglu-Barnum, S., Shi, W., et al. (2021b). Serum Neutralizing Activity Elicited by mRNA-1273 Vaccine. *N. Engl. J. Med.* 384, 1468–1470. 10.1056/nejmc2102179.