

# COVID-19 VACCINE OVERVIEW

## Note

This overview includes all vaccines in Phases 2/3, Phase 3 and Phase 4 trials. It can be used both internally and externally as educational material, as part of documents, reports, presentations etc.

The present version is update 12 and is accurate up to 17 June 2021.

**Yellow highlighted text** indicates changes and updates since the previous version.

## Important information

Only manufacturers of the **grey highlighted** vaccines in the table have published peer-reviewed results or detailed FDA EUA documentation from Phase 3 efficacy trials.

The rest of the results are either indicative or non-peer-reviewed data from company press briefs, news stories etc. While important to understand possible efficacy levels, these 'results' are not necessarily 100% valid.

## Disclaimer

This document and its content are part of correspondence with the receiving company under valid programme number. The information shared in this document is for education purposes only and shall not be considered as replacement for medical advice.

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## Vaccine efficacy versus effectiveness

The two terms 'efficacy' and 'effectiveness' can easily be confused. See below for a simple definition.

- Efficacy: Trial data based on perfect or near-perfect conditions measuring the relative difference in infections between a vaccinated and a placebo group.
- Effectiveness: Real-world data based on how well the vaccine work in non-controlled populations. Comparing the vaccination status of a group of confirmed cases with the vaccination status of a group that doesn't have the infection can determine the effectiveness.

Unless otherwise stated, the data in the table is from efficacy trials.

## Variant names

We have adopted the new variant names defined by the WHO:

- Alpha (known as the B.1.1.7 variant - first documented in UK),
- Beta (Known as the B.1.351 variant – first documented in South Africa),
- Gamma (Known the as P.1 variant - first documented in Brazil),
- Delta (Known as the B.1.617.2 variant – first documented in India)

Please refer to the International SOS Pandemic site for an overview of variants:

<https://pandemic.internationalsos.com/2019-ncov/covid-19-variants>

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## **Inactivated / killed whole virus**

Polio (IPV), Influenza, Hepatitis A, Japanese Encephalitis, Rabies vaccines use this technology.

These vaccines are based on the SARS-CoV-2 virus itself, which is grown in significant amounts in laboratory settings and then killed. Vaccines based on inactivated viruses are generally not as effective as vaccines based on live virus and often require multiple injections to stimulate an adequate immune response. They are however very safe and cannot replicate in the body.

## **Non-Replicating Viral Vector**

Ebola vaccines use this technology.

This type of vaccine is based on a genetically modified virus that cannot replicate itself and therefore is not able to cause illness. Instead, the virus is injected with a piece of the SARS-CoV-2 virus that makes the virus produce a protein, resulting in an immune response by the body towards COVID-19.

## **mRNA and DNA vaccines**

What is injected in the body is simply the genetic instructions to make a viral protein such as the spike protein. Cells in your body then use the instructions to make the protein inside the body for your immune cells to see and respond to.

The DNA is delivered as a ring of DNA called a plasmid. Best results are obtained by administration via “electroporation” (electric pulse to enhance entry into the cells). mRNA and DNA vaccines are thought to initiate a strong cellular immunity and they can be produced and altered rapidly.

## **Protein subunit**

A protein subunit vaccine only contain ‘dead’ parts of a pathogen, and contrary to inactivated and RNA vaccines, the protein subunit vaccine does not have any genetic material, only subunits – in this case a protein.

## **Virus-like Particles**

These are special class of subunit vaccines, where element of proteins (peptides) are self – assembled (synthesized) into particles that are intended to look like viruses to the human immune system.

# COVID-19 VACCINE OVERVIEW

INACTIVATED VIRUS

Company/vaccine name (country)	Doses (1)	Storage temperature & shelf-life (2)	Age suitability	Wholesale price in US dollars (47)	Implemented in # of countries (4)	WHO Emergency Use Listing (11)	Efficacy: preventing OLD variant	Efficacy: preventing NEW variants	Lasting immunity: length and efficacy/ effectiveness
<b>Sinovac/CoronaVac®</b> (China)	 2 doses (day 0 & 14)	4°C	18+	<b>\$9.50-</b> <b>\$32.52</b>	30	yes	<b>Brazil Phase 3 trial (5, 25):</b> symptomatic disease 50.7% - moderate to severe disease 100% <b>Turkey Phase 3 trial (25):</b> symptomatic disease 84% - hospitalisation 100% <b>Chile Phase 3 trial (25):</b> symptomatic disease 67% - hospitalisation 85% <b>Indonesia Phase 3 trial (25):</b> symptomatic disease 65%	<b>Brazil Phase 3 trial (25):</b> might be effective against circulating <b>Gamma</b> variant: clinical disease 50%  <b>Chile Phase 3 trial (25):</b> might be effective against circulating <b>Gamma</b> and <b>Alpha</b> variants: symptomatic disease 67% - hospitalisation 85%	-
<b>Beijing/Sinopharm/BBIBP</b> (China)	 2 doses (day 0 & 21)	4°C	18+	\$15-\$40	<b>44 (-11)</b>	yes	<b>UAE, Bahrain, Egypt, Jordan Phase 3 trials</b> expected December 2021 (7). <i>Interim results</i> from the multi-country trials suggest (26): overall 78.1% - hospitalization 78%	-	-
<b>Wuhan/Sinopharm</b> (China)	 2 doses (day 0 & 21)	4°C	18+	-	2	-	-	-	-
<b>Chinese Academy of Medical Sciences</b> (China)	 2 doses (day 0 & 28)	-	18+	-	<b>1 (+1)</b>	-	<b>Phase 3 trial</b> data expected July 2022 (39)	-	-
<b>Shenzhen Kangtai Biological Products Co., Ltd.</b> (China)	 2 doses (day 0 & 28)	-	18+	-	-	-	<b>Phase 3 trial</b> data expected November 2022 (23)	-	-
<b>Bharat Biotech/Covaxin®</b> (India)	 2 doses (day 0 & 28) <sup>5</sup>	2 to 8°C	18+	<b>\$5.45-\$35</b>	6	-	<b>Phase 3 trial</b> data expected December 2022 (8)	-	-
<b>Shifa Pharmed Industrial Co / COVIran Barakat</b> (Iran)	 2 doses (day 0 & 14)	-	18+	-	-	-	-	-	-
<b>Research Institute/Qazcovid-In®</b> (Kazakhstan)	 2 doses (day 0 & 21)	-	18+	-	1 (+1)	-	<b>Phase 3 trial</b> data expected July 2021 (27)	-	-
<b>Valneva / National Institute for Health Research / VLA2001</b> (France & UK)	 2 doses (day 0 & 21)	2 to 8°C (54)	18+	-	-	-	<b>Phase 3 trial</b> data expected June 2022 (53)	-	-

# COVID-19 VACCINE OVERVIEW

NON-REPLICATING VIRAL VECTOR

Company/vaccine name (country)	Doses (1)	Storage temperature & shelf-life (2)	Age suitability	Wholesale price in US dollars (47)	Implemented in # of countries (4)	WHO Emergency Use Listing (11)	Efficacy: preventing OLD variant	Efficacy: preventing NEW variants	Lasting immunity: length and efficacy/ effectiveness
<b>ReiThera / Leukocare / Univercells / GRAd-COV2</b> (Belgium, Germany and Italy)	 1 dose (day 0)	2 to 8°C (50)	18+	-	-	-	Phase 3 trial data expected April 2022 (24)	-	-
<b>CanSino Biologics/Beijing Institute of Biotechnology/Convidicea®</b> (China)	 1 dose (day 0)	4°C	18+	\$27.15	4 (+1)	-	Phase 3 trial data expected July 2021 and January 2022 (28)  Interim / non-published results (6): symptomatic disease 65.7% - severe disease 90.98%	-	-
<b>University of Oxford/AstraZeneca/ Covishield®</b> (UK)	 2 doses (day 0 & 28-84)	-80 to -60°C (6 mths) -25 to -15°C (2 wks) (15)	18+	\$2.19-\$13.27	178 (+7)	yes	<b>Brazil and UK Phase 3 trials (16):</b> overall 70.4% - symptomatic disease 60.3% (UK 2x standard doses) - symptomatic disease 90% (UK 1 low + 1 standard dose) – symptomatic disease 64.2% (Brazil 2x standard doses)  <b>US, Chile, and Peru Phase 3 trial interim analysis (21):</b> symptomatic disease 79% - severe disease and hospitalisation 100% - efficacy among >65 80%	<b>South Africa variant efficacy trial (19):</b> sufficient efficacy <u>not</u> established against <b>Beta</b> : clinical disease 10.4% - mild to moderate disease 21.9%  <b>UK variant efficacy trial non-peer reviewed (29):</b> sufficient efficacy established against <b>Alpha</b> : symptomatic disease 74.6%  <b>England effectiveness real-life study non-peer reviewed (55):</b> sufficient efficacy established against <b>Alpha</b> and <b>Delta</b> : infection with Alpha 66.1% - infection with Delta 59.8%.	-
<b>Gamaleya/Sputnik V®</b> (Russia)	 2 doses (day 0 & 21)	-20°C 4°C (1 mths)	18+	\$3-27.15	45 (+2)	-	<b>Russia Phase 3 trial (18):</b> symptomatic disease 92% - severe disease 100%	-	-
<b>Johnson &amp; Johnson/ Janssen Pharmaceutical</b> (USA)	 1 dose (day 0)	2 to 8°C (50)	18+	\$8.50-\$10	26 (+2)	yes	<b>Multi-country Phase 3 trial (9, 30):</b> moderate to severe disease 66.9% (overall after day 14) - moderate to severe disease 66.1% (overall after day 28) - severe to critical disease 76.7% (overall after day 14) severe to critical disease 85.4% (overall after day 28)	<b>Multi-country Phase 3 trial (31):</b> sufficient efficacy established against <b>Beta</b> and <b>Zeta</b> : moderate to severe disease 52% (after day 14) - moderate to severe disease 64% (after day 28) severe to critical disease 73.1% (after day 14) severe to critical disease 81.7% (after day 28)	-

DNA

<b>Inovio / International Vaccine Institute / Advaccine</b> (China & USA)	 2 doses (day 0 & 28)	-	18+	-	-	-	Phase 3 trial data expected December 2022 (40)	-	-
<b>Zydus Cadila / ZyCoV-D</b> (India)	 3 doses (day 0, 28 & 56)	2 to 8°C (42)	18+	-	-	-	Phase 3 trial data expected 2022 (43)	-	-
<b>AnGes / Takara Bio / Osaka University</b> (Japan)	 2 doses (day 0 & 14)	-	18+	-	-	-	Phase 3 trial data expected March 2022 (41)	-	-
<b>Inovio / International Vaccine Institute / Advaccine</b> (China & USA)	 2 doses (day 0 & 28)	-	18+	-	-	-	Phase 3 trial data expected December 2022 (40)	-	-

# COVID-19 VACCINE OVERVIEW

mRNA

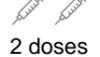
Company/vaccine name (country)	Doses (1)	Storage temperature & shelf-life (2)	Age suitability	Wholesale price in US dollars (47)	Implemented in # of countries (4)	WHO Emergency Use Listing (11)	Efficacy: preventing OLD variant	Efficacy: preventing NEW variants	Lasting immunity: length and efficacy/ effectiveness
<b>Academy of Military Science (AMS) / Walvax Biotechnology / Suzhou Abogen Biosciences (China)</b>	 2 doses (day 0 & 14 OR day 0 & 21)	2 to 8°C (50)	18+	-	-	-	<b>Phase 3 trial</b> data expected May 2023 (49)	-	-
<b>Curevac (Germany)</b>	 2 doses (day 0 & 21)	4°C	18+	\$11.84	-	-	<b>Phase 3 trial</b> data expected April, June and September 2022 (32)	-	-
<b>Pfizer/BioNTech/Fosun/ Comirnaty® (Germany &amp; USA)</b>	 2 doses (day 0 & 21-84)	-80 to -60°C (6 mths) -25 to -15°C (2 wks) (15)	16+ 12+ (Canada, EU & USA)	\$6.75-\$19.50	104 (+0)	yes	<b>Argentina, Brazil, South Africa and the US Phase 3 trial (13):</b> symptomatic disease 95% <b>England effectiveness real-life study (pre-print) (34):</b> asymptomatic and symptomatic disease 86% <b>Israel effectiveness real-life study (health care workers) (33):</b> symptomatic disease 90.5% - symptomatic disease 89-91% (during days 15-28 after first dose) <b>Israel effectiveness real-life study (general population) (34):</b> overall effectiveness 95.3% - symptomatic disease 97% - asymptomatic infection 91.5% - hospitalisation 97.2% - severe/critical hospitalisation 97.5% - deaths 96.7%	<b>Israel effectiveness real-life study (general population) (34):</b> sufficient efficacy established against <b>Alpha</b> : overall effectiveness 95.3% - symptomatic disease 97% - asymptomatic infection 91.5% - hospitalisation 97.2% - severe/critical hospitalisation 97.5% - deaths 96.7% <b>Qatar effectiveness real-life study (35):</b> sufficient efficacy established against <b>Alpha</b> and <b>Beta</b> : infection with Alpha 89.5% - infection with Beta 75% - severe, critical or fatal disease with <b>Alpha</b> or <b>Beta</b> 100% <b>England effectiveness real-life study non-peer reviewed (55):</b> sufficient efficacy established against <b>Alpha</b> and <b>Delta</b> : infection with Alpha 93.4% - infection with Delta 87.9%.	<b>6-month follow up analysis non-peer reviewed (12):</b> overall effectiveness 91.3% - severe disease 95.3/100%
<b>Moderna (USA)</b>	 2 doses (day 0 & 28)	-20°C 4°C (1 mths)	18+	\$15-\$34.50	54 (+5)	yes	<b>The US Phase 3 trial (17):</b> symptomatic disease 94.1% - severe and fatal disease 100%	<b>Booster efficacy trial non-peer reviewed (10):</b> preliminary results suggest sufficient efficacy against <b>Beta</b> and <b>Gamma</b> : no efficacy results available. The trial evaluates a booster shot based on the B1351 variant strain, a multistrain version, and the original vaccine.	<b>6-month follow-up analysis (14):</b> overall effectiveness 94%

VIRUS LIKE PARTICLE

<b>Medicago Inc. / CoVLP (Canada)</b>	 2 doses (day 0 & 21)	2 to 8°C (51)	18+	-	-	-	<b>Phase 3 trial</b> data expected April 2022 (52)	-	-
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# COVID-19 VACCINE OVERVIEW

 PROTEIN  
SUBUNIT

Company/vaccine name (country)	Doses (1)	Storage temperature & shelf-life (2)	Age suitability	Wholesale price in US dollars (47)	Implemented in # of countries (4)	WHO Emergency Use Listing (11)	Efficacy: preventing OLD variant	Efficacy: preventing NEW variants	Lasting immunity: length and efficacy/ effectiveness
Anhui Zhifei Longcom / RBD-Dimer (ZF2001) (China)	 2 or 3 doses (day 0 & 28 / 0, 28 & 56)	-	18+	-	1	-	-	-	-
Clover Biopharmaceuticals Inc./GSK/Dynavax (China, UK & USA)	 2 doses (day 0 & 21)	-	18+	-	-	-	Phase 3 trial data expected July 2022 (38)	-	-
Center for Genetic Engineering and Biotechnology (CIGB) / Absala (CIGB-66) (Cuba)	 3 doses (day 0, 14 & 28 / 0, 28 & 56)	-	19+	-	1	-	-	-	-
Instituto Finlay de Vacunas / SOBERANA 02 (Cuba)	 2 doses (day 0 & 28)	-	19+	-	1	-	-	-	-
Sanofi Pasteur / GSK / VAT00002 (France & UK)	 2 doses (day 0 & 21)	4°C (46)	18+	\$9.30-\$10.50	-	-	Phase 3 trial data expected April 2022 and January 2023 (44, 45)	-	-
FBRI <sup>3</sup> / EpiVacCorona / Vector Institute (Russia)	 2 doses (day 0 & 21)	-	18+	\$5.51	2	-	-	-	-
Vaxxinity /UB-612 (USA)	 2 doses (day 0 & 28)	2 to 8°C (48)	18+	\$20	-	-	Phase 3 trial data expected March 2023 (47)	-	-
Novavax (USA)	 2 doses (day 0 & 21)	4°C	18+	\$3	-	-	Phase 3 trial data expected January 2022 and June 2023 (36)  England Phase 3 trial interim analysis (20): overall (original+variant strains) symptomatic disease 89.7% - symptomatic disease 96.4% (original strain) - hospitalisation 100% - deaths 100%	England Phase 3 trial interim analysis (20): preliminary results suggest sufficient efficacy against Alpha: symptomatic disease 86.3% - hospitalisation 100% - deaths 100%  South Africa Phase 1-2 trial (37): non-efficacy trial results suggest efficacy against Beta: symptomatic disease 51%	-

# COVID-19 VACCINE OVERVIEW

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## Foot notes

- <sup>2</sup> The prices listed are the wholesale price paid by countries, it is not the final prices for consumers. Prices vary between countries.
- <sup>3</sup> Federal Budgetary Research Institution (Russia)
- <sup>5</sup> There is a discrepancy between the manufacturer stated interval (28 days between doses) and the interval stated by WHO (21 days between doses). See the manufacturer statement here: <https://www.bharatbiotech.com/covaxin.html>
- <sup>6</sup> The efficacy data is higher for the P.2 lineage than for the B.1.351