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For background on KEI: http://keionline.org							
Vaccine Manufacturing Capacity sheet maps the manufacturers currently involved in COVID vaccine manufacturing							
Vaccine Manufacturing Possible Capacity sheet highlights potential COVID vaccine manufacturing facilities but also includes a number of other vaccine manufacturers							
More information							
KEI page on vaccine manufacturing	https://www.keionline.org/covid-19-vaccine-manufacturing-capacity						
KEI page on COVID-19 contracts	https://www.keionline.org/covid-contracts						
KEI listserver on vaccine manufacturing	http://lists.keionline.org/mailman/listinfo/vaccine-manufacturing_lists.keionline.org						
KEI Feb 19 roundtable on manufacturing	https://www.keionline.org/35271						
Examples of COVID-19 outsourcing/tech transfer deals	https://docs.google.com/spreadsheets/d/1ozD5-ebf7txlGQa0wpbVVXkrM3Nii04Quws5OUhOSVA/edit?usp=sharing						

Country	Company	Function	Vaccine Platform	Production Quantity Estimate / Time	Notes on Production Capacity	Location	Sources
Algeria	Saidal	Manufacture (Sputnik V)	VVnr			Constantine	https://www.reuters.com/business/healthcare-pharmaceuticals/algeria-start-russias-sputnik-v-vaccine-production-september-2021-04-07/
Argentina	mAbience of INSUD Group	Produce active ingredient (AstraZeneca)	VVnr	250 million doses in 2021 (in conjunction with the facility in Mexico)		Garin and Munro	https://www.reuters.com/article/us-health-coronavirus-argentina-vaccine-idUSKCN25A2Y1
	Richmond Laboratories	Manufacture (Sputnik V)	VVnr				https://www.reuters.com/business/healthcare-pharmaceuticals/argentina-begins-sputnik-v-vaccine-production-after-getting-russian-ok-2021-06-02/?aid=60b7c021ef94f0001b64f9&utm_campaign=trueanthem&utm_medium=trueanthem&utm_source=twitter
Australia	CSL	Manufacturing (AstraZeneca)	VVnr	30 - 50 million doses, beginning early 2021		Broadmeadows, Melbourne	https://www.csllab.com/news/2020/20201108-csl-commences-manufacturing-of-oxford-astrazeneca-vaccine-candidate
	Seqirus (A CSL Company)	Fill and Finish (AstraZeneca)	VVnr	30 million doses		Parkville, Melbourne	https://www.seqirus.com/news/csl-covid-19-vaccine-agreements-with-australian-government
	Luina Bio	Manufacturing (Griffith University)	LAV		Capacity for bacterial and yeast recombinant projects		https://luinabio.com.au/luina-bio-and-griffith-university-position-to-develop-coronavirus-vaccine/
Austria	Polymun Scientific Immun Biologische Forshung GmbH	Manufacturer of lipid nano particles (Pfizer)	RNA	Unknown	Limited ability to scale up production Bottleneck in shipping product to Pfizer factory in Puurs	Klosterneuburg	https://www.wsj.com/articles/if-one-leading-coronavirus-vaccine-works-thank-this-tiny-firm-in-rural-austria-11604664001
	Novartis	Manufacture (CureVac)	RNA	50 million doses 2021 200 million doses 2022	Novartis is upgrading their plant to manufacture mRNA candidate CureVac	Kundl	https://www.wsj.com/articles/novartis-to-help-make-curevac-covid-19-vaccine-11614859271
Bahrain	Mumtalakat	Manufacture (Sputnik V)	VVnr				https://rdif.ru/Eng_FullNews/6865/
Bangladesh	Globe Biotech Limited	Manufacturing own vaccine (Bongavax)	DNA	Unknown		Dhaka	
Belarus	Belpharmprom (Belmedpreparaty)	Manufacture (Sputnik V)	VVnr		Preparing for future production	Minsk	https://www.reuters.com/article/health-coronavirus-russia-belarus-idUSKBN2930P6
Belgium	Catalent Inc.	Fill and Finish (AstraZeneca)	VVnr	200 million units of syringe filling capacity per year		Brussels	https://www.catalent.com/catalent-news/catalent-to-showcase-aseptic-filling-expertise-and-patient-centric-dose-form-technologies-at-pharmapack/
	Pfizer	Manufacturing	RNA	100 million between Puurs and Kalamazoo facility in the US by the end of 2020	This site is dedicated to COVID vaccine production	Puurs	
	Novasep	Large scale VV manufacture (AstraZeneca)	VVnr	31 million doses in first quarter of 2021	Lines up to 2,000L	Senefte	https://www.pharmaceutical-technology.com/comment/covid-19-vaccine-manufacturing-disruptions/#:~:text=Novasep%20site%20is%20AstraZeneca%20vaccine%20production%20by%2060%25%20and%20will%20only%20deliver%20only%2031%20million%20doses.
	GlaxoSmithKline	Manufacture (CureVac)	RNA	100 million doses in 2021 (up to)		Wavre	https://www.ft.com/content/56ef96f3-7433-484b-84fb-f67b3d8a5e47
	Ajinomoto Bio-Pharma Services	Manufacture Small Molecule (AstraZeneca)	VVnr			Wetteren	https://ajibio-pharma.com/news-post/ajinomoto-bio-pharma-services-expands-manufacturing-agreement-with-astrazeneca-to-include-drug-product-manufacturing/
Brazil	Butantan Institute	Manufacture (Sinovac)	IV (possibly others)	100 million doses ready by September 2021.	New facility construction underway - estimated by Jan 2020.	São Paulo	https://www.reuters.com/article/us-health-coronavirus-brazil-sinovac-idUSKBN27P246
	Fiocruz (Bio-Manguinhos)	Manufacture (AstraZeneca)	VVnr	200 million doses a year		Rio de Janeiro	https://www.reuters.com/article/us-health-coronavirus-brazil-vaccines-in-idUSKBN29W141
	Uniao Quimica	Manufacture (Sputnik V)	VVnr	Up to 8 million doses a month, as of 2021		Brasilia	https://www.reuters.com/article/us-health-coronavirus-brazil-sputnik-idUSKBN29D2XM
	Tecpar	Manufacture (Sputnik V)	VVnr	Unknown		Curitiba	https://www.reuters.com/article/uk-health-coronavirus-brazil/brazilian-state-agrees-to-produce-russian-covid-19-vaccine-idUKKCN2582M8
Canada	Biologics Manufacturing Centre	Manufacturing (Novavax)	VVnr, VVr, VLP & PS	2 million doses a month	4,000 L a month	Expected to be ready for production in July 2021 - first vaccines will then be available early 2022	https://nrc.canada.ca/en/covid-19-response-building-infrastructure
	GlaxoSmithKline	Manufacturing adjuvant for Medicago	VLP	100 million doses by the end of 2021		Ste.-Foy, Quebec	https://ipolitics.ca/2020/12/08/sanofi-wont-use-its-canadian-facility-to-make-a-covid-vaccine/
	Providence Therapeutics	Manufacturer	RNA	50,000 vials a day - each vial containing 10 doses	Their vaccine candidate is ongoing clinical trials	Calgary, Alberta	https://globalnews.ca/news/7643740/canada-made-coronavirus-vaccine-providence-therapeutics/
	Therapure (now CDMO asset of Resilience Biotechnology)	Manufacturer (VBI Vaccines)	VLP		136,000ft ² cGMP facility	Mississauga, Ontario	https://www.therapurebio.com/news/therapure-biopharma-inc/therapure-biomanufacturing-deal-with-vaccines-for-coronavirus-vaccine-candidates
China	Sinovac Biotech Ltd.	Manufacture (Sinovac)	IV	300 million doses a year in 2020 and increase capacity to an annual production of 600 million doses		Beijing	https://www.globaltimes.cn/content/1210460.shtml
	Tibet Rhodiola Pharmaceutical Holding Co.	Manufacture (Sputnik V)	VVnr	Enough doses to inoculate at least 20 million people by 2021		Beijing	https://www.reuters.com/article/health-coronavirus-vaccine-russia-idUSKBN27R21E
	Shanghai Fosun Pharmaceutical Group Ltd	Manufacture (Pfizer)	RNA	100 million doses in 2021		Shanghai	https://www.globenewswire.com/news-release/2020/12/16/2145881/0/en/BioNTech-and-Fosun-Pharma-to-Supply-China-with-mRNA-based-COVID-19-Vaccine.html
	Shenzhen Kangtai Biological Products	Manufacture (AstraZeneca)	VVnr	400 million doses per year		Shenzhen	https://www.reuters.com/article/health-coronavirus-astrazeneca-kangtai-b-astrazeneca-in-deal-with-kangtai-bio-to-supply-potential-covid-19-vaccine-in-china-idUSL4N2F82B1
	TopRidge Pharma	Manufacture (Sputnik V)	VVnr	100 million doses a year			https://rdif.ru/Eng_FullNews/6681/
	Shenzhen Yuanxing Gene-tech	Manufacture (Sputnik V)	VVnr	60 million	Commercial production beginning May 2021	Shenzhen	https://rdif.ru/Eng_FullNews/6675/
	China National Biotec Group (Sinopharm subsidiary)	Manufacture (Sinopharm)	IV	300 million doses - 1 billion doses a year (when new manufacturing site completed)		Beijing & Wuhan	https://www.globaltimes.cn/content/1209776.shtml
	Sinovac (Dalian) Vaccine Technology Co	Manufacture (Sinovac)	IV, PS & LAV	Upwards of 20 million per year		Dalian	https://www.sec.gov/Archives/edgar/data/1084201/000110465909067210/a09-34417_1ex99d1.htm
	Advaccine	Manufacture (Inovio)	DNA	100 million per year		Suzhou	https://www.pnwswire.com/news-releases/inovio-and-advaccine-announce-exclusive-partnership-to-commercialize-covid-19-dna-vaccine-candidate-ino-4800-in-greater-china-301200000.html#:~:text=Advaccine%20will%20leverage%20its%20innovative%20DNA%20vaccine%20oper%20year.

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	Beijing Minhai Biotechnology Co., Ltd	Manufacturing	IV	Unknown	They are attempting to develop their own COVID vaccine, but are only in Phase I	Beijing	http://en.biominhai.com/
	Institute of Medical Biology	Manufacturing	IV		Ability to manufacture their own COVID vaccine (Phase III)	Kunming, Yunnan Province	http://english.nmpa.gov.cn/2020-06/22/c_502093.htm
	Walvax Biotechnology Co.	Manufacture (their own COVID candidate)	RNA	Estimated capacity of 200 million doses a year, starting in mid-2021		Kunming	https://www.reuters.com/article/uk-health-coronavirus-china-vaccine-idUKKBN291OCR
	JHL biotech	Manufacture (antigen for Adimmune)	PS			Wuhan, China	https://www.edenbiologics.com/latest-news/jhl-biotech-to-develop-and-manufacture-qmp-grade-antigen-for-taiwans-leading-covid-19-vaccine-produced-by-adimmune/
	Clover Biopharmaceuticals	Manufacturing (their own COVID candidate)	PS	1 billion doses of COVID antigen annually	Four times 2,000L single use bioreactor capacity	Huzhou, Zhejiang	https://www.cloverbiopharma.com/manufacturing/
	Anhui Zhifei Lincrom Biopharmaceutical	Manufacturing (their own COVID candidate; ZF2001)	PS	300 million doses per year			https://www.globallimes.cn/page/202103/1217214.shtml
	Hualan Biological Bacterin (Engineering)	Manufacture (Sputnik)	VVnr	100 million doses per year		Henan Province	http://www.mingmima.com/article.asp?issn=2347-7946;year=2020;volume=7;issue=2;spage=86;epage=96;aulast=Ghosh https://rdif.ru/Eng_fullNews/6720/
Cuba							
	Center for Biotechnology and Bioengineering (CIBG), coordinated by the Finlay Institute	Manufacture	PS	100 million doses a year (2021)		Havana	
	BioCubaFarma	Manufacture (Finlay)	PS	Unknown		Havana	https://www.biocubafarma.cu/
Czech Republic							
	Praha Vaccines a.s. (Cyrus Poonawalla Group)	Manufacture antigen (Novavax)	PS	1 billion doses a year		Bohumil	https://ir.novavax.com/news-releases/news-release-details/novavax-expands-large-scale-global-manufacturing-capacity
Denmark							
	AGC Biologics	Matrix-M adjuvant (Novavax)	PS		Three 500L mammalian bioreactors Two 1,500L microbial bioreactors	Copenhagen	https://www.agc.com/en/news/detail/1201206_2814.html https://www.fiercepharma.com/manufacturing/agc-biologics-plots-new-194-6m-building-at-copenhagen-site-to-build-global
	Bavarian Nordic	Manufacture (AdaptVac)	VLP / PS	Unknown		Copenhagen	https://www.globenewswire.com/news-release/2020/07/22/2065534/0/en/Bavarian-Nordic-and-AdaptVac-Sign-Final-License-Agreement-on-COVID-19-Vaccine.html
Egypt							
	VACSERA	Manufacturer (Sinovac)	IV	Unknown		Giza	https://www.egypttoday.com/Article/1/95437/Egypt-to-obtain-0-5-M-COVID-19-doses-by
	Minapharm	Manufacture (Sputnik)	VVnr	40 million a year		Cairo	https://rdif.ru/Eng_fullNews/6727/
France							
	Recipharm AB	Formulate, fill and finish mRNA-1273 (Moderna)	RNA	Unknown		Monts, France	https://drug_dev.com/recipharm-announces-signature-of-letter-of-intent-for-aseptic-fill-finish-manufacturing-of-modernas-covid-19-vaccine-candidate/
	Novasep	Large scale VV manufacture (AstraZeneca)	VVnr		Bioreactors of 50 - 2,000L	Chasse-sur-Rhône	https://www.novasep.com/home/about-novasep/media-events/press-release/novasep-opens-%E2%82%AC27m-new-viral-vector-commercial-production-facility.html
	Fareva	Fill and Finish Manufacturing (CureVac)	RNA	Millions, exact estimate unknown	Beginning May 2021	Pau (Pyrénées-Atlantiques) and Val-de-Reuil (Eure)	https://www.lefigaro.fr/societes/covid-19-queles-sont-les-sites-qui-produiront-les-vaccins-en-france-20210203 https://www.curevac.com/2020/12/09/curevac-and-fareva-sign-agreement-for-fill-finish-manufacturing-of-curevacs-covid-19-vaccine-candidate-cvncov/
	Delpharm	Manufacturing (Pfizer-BioNTech)	RNA	Several tens of millions, exact estimate unknown	From April 2021	Saint-Rémy-sur-Avre	https://www.lefigaro.fr/societes/covid-19-queles-sont-les-sites-qui-produiront-les-vaccins-en-france-20210203
	Sanofi Pasteur	Fill & Finish (Pfizer-BioNTech)	RNA	125 million doses			https://www.reuters.com/article/us-health-coronavirus-vaccines-sanofi-idUSKBN29V23Y ; https://www.sanofi.com/en/media-room/press-releases/2021/2021-01-27-07-30-00
	Sanofi Pasteur	Fill and Finish (J&J)	VVnr	144 million doses a year		Neuville sur Saône	https://www.sanofi.com/en/media-room/press-releases/2021/2021-02-22-11-40-00-2178318
Germany							
	BioNTech	Manufacture (Pfizer)	RNA	250 million doses first half of 2021 (with Marberg facility)	500m*2 cleanroom area	Idar-Oberstein	https://www.biotech-imfs.de/en/facility/
	BioNTech	Manufacture (Pfizer)	RNA	750 million doses		Marberg	https://www.reuters.com/article/health-coronavirus-vaccines-baxter-rti/update-1-baxter-to-start-production-in-germany-of-biotech-pfizer-vaccine-by-early-march-idUKL8N2JQ32D
	BioNTech	Manufacture (Pfizer)	RNA	250 million doses first half of 2021 (with Idar Oberstein facility)		Mainz	
	Sanofi Pasteur	Manufacture (Pfizer)	RNA	125 million doses beginning summer 2021		Frankfurt	https://www.sanofi.com/en/media-room/press-releases/2021/2021-01-27-07-30-00
	Dermapharm	Fill and Finish, bulk lipid supply for encapsulation (Pfizer)	RNA	Unknown	Potential bottleneck in lipid supply (see also Polymun)	Brehna	https://www.thechemicalengineer.com/news/attention-turns-to-vaccine-production-following-successful-trials-may/
	Baxter BioPharma Solutions	Fill and Finish (Novavax)	RNA	Unknown		Halle	https://www.baxter.com/baxter-newsroom/baxter-biopharma-solutions-announces-sterile-manufacturing-agreement-novavax-covid
	Bayer	Manufacturing (CureVac)	RNA	160 million doses	Beginning 2022	Wuppertal	https://www.fiercepharma.com/manufacturing/vaccine-manufacturing-greenhorn-bayer-to-make-160m-doses-curevac-s-covid-19-mrna-shot#:~:text=As%20part%20of%20a%20recently,in%20a%20press%20briefing%20Monday.
	IDT Biologika	Fill & Finish (J&J)	VVnr	Unknown	Capacities at Dessau site that were reserved for Takeda now being used to fill and finish J&J COVID-19 vaccine. This agreement is only for three months.	Dessau-Rosslau	https://idt-biologika.com/idt-biologika-and-takeda-support-production-of-the-johnson-and-johnson-single-shot-covid-19-vaccine
	IDT Biologika	Manufacturing (AstraZeneca)	VVnr	Unknown	Vaccine manufacturer IDT Biologika will jointly invest in additional production capacities at its headquarters in Dessau with pharmaceutical group AstraZeneca.	Dessau-Rosslau	https://idt-biologika.com/joint-investment-in-production-capacities-at-the-dessau-site
	Rentschler Biopharma	Manufacturing (CureVac)	RNA	100 million doses annually		Laupheim, Germany	https://european-biotechnology.com/up-to-date/latest-news/news/rentschler-biopharma-to-produce-100m-doses-of-curevac-vaccine.html
	Rentschler Biopharma	Manufacture (Pfizer)	RNA		Downstream processes		https://www.rentschler-biopharma.com/news/press-releases-and-announcements/detail/view/joining-forces-against-sars-cov-2/
	CureVac	Manufacturing (CureVac)	RNA	Unknown	Facility in development	Tubingen, Frankfurt	https://www.gsk.com/en-gb/media/press-releases/gsk-and-curevac-to-develop-next-generation-mrna-covid-19-vaccines/#:~:text=CureVach%20is%20the%20headquarters%20in%20T%20Frankfurt%2C%20and%20Boston%2C%20USA.
	Richter-Helm BioLogics	Manufacture (Novio)	DNA				http://ir.novio.com/news-releases/news-releases-details/2020/NOVIO-Expands-Manufacturing-of-COVID-19-DNA-Vaccine-NO-4800-With-New-Funding-from-CEPI/default.aspx
	R-Pharm	Manufacture (Sputnik V)	VVnr			Ilertissen	https://www.ema.europa.eu/en/news/ema-starts-rolling-review-sputnik-v-covid-19-vaccine https://www.augsburger-allegemeine.de/illertissen/R-Pharm-in-Ilertissen-beantragt-Zulassung-des-Corona-Impfstoffs-Sputnik-V-id59245171.html
	Siegfried	Fill and Finish (Pfizer)	RNA	Unknown	And the drug services firm Siegfried reports in an email that it will start large-scale filling and packaging of Pfizer's vaccine in Hameln, Germany, at the beginning of July 2021	Hameln	https://www.siegfried.ch/?nub=278&id=0 https://www.siegfried.ch/siegfried+and+biotech+sign+contract+for+the+aseptic+fill+%2526+finish+of+a+covid+19+vaccine/news-en/5746
	Evonik	Lipid Nano Particles (Pfizer)	RNA			Hanau Dossenheim	https://cen.acs.org/business/outsourcing/Pfizer-Moderna-ready-vaccine-manufacturing/8846 https://corporate.evonik.com/en/evonik-strengthens-strategic-partnership-with-biotech-on-covid-19-vaccine-152784.html

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	Celonic	Manufacture (CureVac)	RNA	100 million doses		Heidelberg	https://www.curevac.com/2021/03/30/celonic-and-curevac-announce-agreement-to-manufacture-over-100-million-doses-of-curevacs-covid-19-vaccine-candidate-cvncov/
Kazakhstan	Karaganda	Manufacture (Sputnik V)	VVnr	2 million doses	Intended to begin production in 2021		https://www.reuters.com/article/us-health-coronavirus-vaccine-kazakhstan-idUSKBN28V12J
India	Serum Institute of India Pvt. Ltd.	Manufacturing (AstraZeneca)	VVnr	100 million doses a month as of March 2021	Agreement to manufacture 1 billion doses	Pune	https://theconversation.com/vaccine-production-in-south-africa-how-an-industry-in-its-infancy-can-be-developed-153204
	Serum Institute of India Pvt. Ltd.	Manufacturing (Novavax)	PS	100 million doses a month as of March 2021			
	Bharat Biotech International Limited	Manufacturing (Covaxin)	IV, PS, VLP	120 million doses a year		Hyderabad and other 3 facilities	https://timesofindia.indiatimes.com/india/bharat-biotech-aims-to-make-700-million-doses-of-covid-19-vaccine-in-2021/articleshow/80097743.cms
	Virchow Biotech	Manufacturing (Sputnik V)	VVnr	expected by july: 50 million a month			
	Haffkine Institute	Manufacturing (Covaxin)	IV	228 million doses a year		Mumbai	https://www.hindustantimes.com/cities/mumbai-news/haffkine-gets-maharashtra-govt-nod-94-crore-grant-for-covaxin-101619638059512.html
	Stelis Biopharma	Manufacturing (Sputnik V)	VVnr	produce a minimum of 200 million doses		Bengaluru	
	Hetero Biopharma	Manufacturing (Sputnik V)	VVnr	More than 100 million doses every year		Hyderabad	https://health.economictimes.indiatimes.com/news/pharma/rdi-hetero-to-produce-over-100-million-doses-of-sputnik-v-vaccine-in-india/79443469
	Biological E Ltd.	Manufacturing (J&J)	VVnr, PS	600 million doses a year		Hyderabad	https://www.reuters.com/article/idUSKBN2AA0IV
	Indian Immunologicals	Manufacturing (Moderna), on-going talks as of January 2021	RNA	Unknown		Hyderabad	https://theprint.in/health/vaccine-maker-ii-other-companies-in-touch-with-moderna-to-bring-its-covid-vaccine-to-india/58288/
	Indian Immunologicals	Manufacturing (Covaxin)	IV			Hyderabad	https://www.pib.gov.in/PressReleaseDetail.aspx?PRID=1712271
	Dr Reddy's Laboratories	Manufacturing (Sputnik V)	VVnr	100 million doses (unknown time frame)		Hyderabad	https://www.contractpharma.com/contents/view_online_exclusives/2020-10-20/india-emerges-as-hot-spot-for-manufacturing-covid-19-vaccines/
	CPL biologicals Pvt. Ltd (a joint venture of Cadila Pharmaceuticals and Novavax)	Manufacturing (Novavax)	VLP & IV (cell based)	60 million doses per year		Ahmedabad	https://www.fiercepharma.com/biotech/novavax-and-cpl-biologicals-break-ground-on-new-influenza-vaccine-manufacturing-facility#:~:text=The%20CPL%20biologicals%20facility%20is,on%20Novavax%20VLP%20vaccine%20technology.
	Cadila Healthcare Limited	Manufacturing (iCov vaccine)	DNA	100 million doses per year		Ahmedabad	https://www.businesstoday.in/current/corporate/zydus-cadila-covid-vaccine-to-be-ready-by-march-second-vaccine-under-development/story419971.html
	Panacea Biotech Ltd	Manufacturing (unamed vaccine)	LAV, VLP & PS	500 million doses early 2021 1 billion doses in 2022		Two locations: District Solan District Mohali	https://www.reuters.com/article/health-coronavirus-panacea-biotech/panacea-biotech-aims-to-make-1-billion-doses-of-covid-19-vaccine-candidate-in-2022-idINKN2491BL7edition-redirect=in
	Panacea Biotech Ltd	Manufacturing (Sputnik V)	VVnr	100 million doses a year			https://rdif.ru/Eng_fullNews/668/
	Verily Pharmaceuticals	Manufacturing / Distributing (AstraZeneca)	VVnr				https://www.reuters.com/article/us-health-coronavirus-canada-vaccine-idUSKBN2A21JU
	Gland Pharma	Manufacture (Sputnik V)	VVnr	252 million doses		Hyderabad	https://www.reuters.com/article/health-coronavirus-russia-vaccine-india/indias-gland-pharma-to-make-up-to-252-million-sputnik-v-vaccine-doses-idUSKBN2B812S
	Hester Biosciences	Manufacturing (Covaxin)	IV		from August 2021	Gujarat	https://economictimes.indiatimes.com/industry/healthcare/biotech/pharmaceuticals/pact-signed-between-bharat-biotech-gujarat-covid-vaccine-consortium-hester-biosciences/articleshow/83012906.cms?from=mdr
	Shilpa Biologics	Manufacture (Sputnik V)	VVnr	100 - 200 million doses			https://www.reuters.com/article/us-health-coronavirus-india-vaccine-idUSKBN2BU0OG
Indonesia							https://www.japantimes.co.jp/news/2020/11/27/asia-pacific/covid-19-vaccine-indonesia/
	Bio Farma	Manufacturing (Merah Putih)	PS	Unknown		Bandung	https://www.universityworldnews.com/post.php?story=20200915121452749
	Bio Farma	Manufacturing (Sinovac)	IV	16 - 17 million doses per month		Bandung	https://www.reuters.com/article/us-health-coronavirus-indonesia-idUSKBN29G0RP https://www.abc.net.au/news/2021-01-13/indonesia-starts-rolling-out-jabs-of-chinas-covid-19-vaccine/13051430
Iran	Shifa Pharmed	Manufacture (their own COVID vaccine)	IV	12 million doses a month (if trial successful)		Tehran	https://www.reuters.com/article/us-health-coronavirus-iran-vaccine-idUSKBN2930RE
	Cinnagen	Manufacture (Sputnik V)	VVnr				https://www.premswire.com/news-releases/rdif-celebro-una-reunion-del-consejo-internacional-de-expertos-con-la-participacion-del-presidente-ruso-vladimir-putin-con-ocasion-del-spief-2021-855796995.html
Israel	Israel Institute for Biological Research	Manufacturing	VVnr	15 million doses estimated ready by July 2021		Ness Ziona, Israel	https://www.timesofisrael.com/israel-begins-mass-producing-coronavirus-vaccines-ahead-of-human-trials/ https://www.timesofisrael.com/israeli-vaccine-clears-first-stage-as-no-major-side-effects-reported/
Italy	Catalent, Inc	Fill and Finish (J&J)	VVnr	Unknown		Anagni, Italy	https://www.fiercepharma.com/manufacturing/i-touts-covid-vaccine-supply-chain-stability-eyes-plans-for-2022
	Catalent Inc.	Manufacture (AstraZeneca)	VVnr	Hundreds of millions of doses between August 2020 and March 2022		Anagni, Italy	https://www.catalent.com/catalent-news/catalent-signs-agreement-with-astrazeneca-to-manufacture-covid-19-vaccine-candidate/ https://www.fiercepharma.com/manufacturing/catalent-pumps-50m-into-indiana-fill-finish-capacity-covid-19-vaccine-contracts-hand
	IRBM	Manufacture (AstraZeneca)	VVnr	16 million doses in first 3 months of 2021 70 million			https://www.reuters.com/article/uk-health-coronavirus-italy-vaccine/italy-set-for-16-million-astrazeneca-covid-19-shots-in-early-2021-source-idUKBN2841KY ; https://www.advent-gmp.com/news/irbms-advent-announces-manufacture-of-13000-doses-of-covid-19-vaccine-for-use-in-phase-2-3-clinical-trials-by-the-university-of-oxford/
	ReiThera	Manufacturing	VVnr	Aiming to produce 100 million doses per year		Castel Romano, Rome	https://www.ansa.it/english/news/general_news/2021/01/05/new-reithera-vaccine-safe-response-peak-at-4-wks_a2f0ac15-22f5-4c79-9501-b55161d50352.html
	Adienne Pharma & Biotech	Manufacture (Sputnik V)	VVnr	Beginning in June producing 10 million in 2021		Caponago MB	https://hass.com/economy/1263597 https://www.swissinfo.ch/eng/swiss-based-pharma-group-to-produce-sputnik-vaccine-in-italy/46433126
	Biotech SA	Manufacture (Sputnik V)	VVnr				https://hass.com/economy/1263597
	Avara Liscate	Manufacture (Sputnik V)	VVnr				https://www.premswire.com/news-releases/rdif-celebro-una-reunion-del-consejo-internacional-de-expertos-con-la-participacion-del-presidente-ruso-vladimir-putin-con-ocasion-del-spief-2021-855796995.html
Japan	Takara Bio	Manufacture (Agnes and Osaka University)	DNA	1 million doses by March 2021		Kusatsu	https://asia.nikkei.com/Spotlight/Coronavirus/Japan-to-ready-1m-doses-of-coronavirus-vaccine-for-swift-distribution
	Takeda	Manufacture (Novavax)	PS	Approx. 250 million doses a year 90 million (time frame not listed)	Establishing capability to manufacture Novavax in Japan		https://www.takeda.com/newsroom/newsreleases/2020/takeda-expands-covid-19-vaccine-supply-in-japan-through-partnership-with-moderna-and-government-of-japan/
	JCR Pharmaceuticals (Daiichi Sankyo and Meiji)	Manufacture (AstraZeneca)	VVnr	30 million by March 2021		Kobe	https://www.fiercepharma.com/manufacturing/astrazeneca-taps-jcr-pharmaceuticals-daiichi-sankyo-and-other-local-pharmas-to-supply

Country	Company	Function	Vaccine Platform	Production Quantity Estimate / Time	Notes on Production Capacity	Location	Sources
	AGC Biologics	Manufacture (Osaka University)	DNA	Unknown		Tokyo	https://www.agc.com/en/news/detail/1200775_2814.html#:~:text=Tokyo%2C%20May%2021%2C%202020%2F2%80%93_COVID%2D19%20DNA%20vaccine%20intermediate
	Kaneka Corp	Manufacture (Novio)	DNA	Unknown		Takasago Osaka	https://www.reuters.com/article/us-health-coronavirus-inovio-pharma-idUSKBN28D1ZE
	Unigen Inc.	Manufacturing (UMN Pharma Vaccine)	PS			Akita	https://www.shionogi.com/global/en/news/2020/06/e_200619.html
	Nipro Corporation	Manufacture (AstraZeneca)	VVnr	90 million doses, beginning June 2021	From June 2021	Osaka	https://www.nipro.co.jp/en/news/document/210526.pdf
	KM Biologics	Manufacture (AstraZeneca)	VVnr			Kumomoto Prefecture	https://www.reuters.com/article/us-health-coronavirus-japan-vaccine-japans-km-biologics-begins-clinical-trial-of-covid-19-vaccine-candidate-idUSKBN2BE0Y
Kazakhstan							
	Karaganda Pharmaceutical Enterprises	Manufacturing (Sputnik V)	VVnr	Around 2 million doses per year			https://tass.com/economy/1237699 https://www.ruptly.tv/en/videos/20210221-017-Kazakhstan-Production-of-Russia-s-Sputnik-V-vaccine-begins-in-Karaganda
	Research Institute for Biological Safety Problems (RIBSP)	Manufacturing (Qaz-Covid-In vaccine)	IV	Unknown		Gvardeisky	https://astanatimes.com/2020/12/kazakhstan-begins-vaccinating-3000-volunteers-with-self-made-qazcovid-in/
Lebanon							
	Arwan Pharmaceutical Industries	Manufacturing (Sputnik)	VVnr				https://tass.com/economy/1296181
Malaysia							
	Pharmaniaga Berhad	Manufacture, fill and finish (Sinovac)	IV	12 million doses beginning April 2021			https://www.reuters.com/article/health-coronavirus-malaysia-idCNL1N2JQ09
	Duopharma (M) Sdn Bhd	Manufacturing (Sputnik V)	VVnr	6.4 million doses, beginning end of March			https://www.malaymail.com/news/malaysia/2021/01/26/health-ministry-malaysia-secures-18.4-million-doses-of-russian-chinese-covi-1944232
Mexico							
	Laboratorios Liofmont (mAbxience of INSUD Group)	Fill and Finish (AstraZeneca)	VVnr	685,000 daily doses 250 million doses in 2021 (in conjunction with the facility in Argentina)	In conjunction with manufacturing facility in Argentina to supply all of Latin America (except Brazil)	Ocoyoacac, State of Mexico	https://mexico-now.com/685000-daily-vaccines-against-covid-19-will-be-packaged-in-mexico/ https://www.mabxience.com/mabxience-enters-info-an-agreement-with-astrazeneca-to-produce-covid-19-vaccine/ https://www.ft.com/content/198943-landsteiner-scientific-to-distribute-russian-covid-19-vaccine-in-mexico ; https://www.theucatanimes.com/2020/09/ministry-of-health-denies-arrival-of-sputnik-v-vaccine-in-mexico/
	Landsteiner Pharmaceutical	Manufacture (Sputnik V)	VVnr				https://www.gob.mx/sre/prensa/the-first-covid-19-vaccines-packaged-in-mexico-leave-the-drugmex-plant
	Drugmex	Fill & Finish (CanSino)	VVnr			Querétaro	
Pakistan							
	Ali Gohar Pharmaceuticals	Manufacture (Sputnik V)	VVnr				https://www.reuters.com/article/us-health-coronavirus-pakistan-vaccine/pakistan-lab-expects-sputnik-v-doses-for-commercial-sale-in-a-week-idUSKBN2AE06D
	AJM Pharma Pvt	Manufacture (CanSino)	VVnr	20 million			https://www.bloomberg.com/news/articles/2021-01-22/china-vaccine-maker-cansino-to-offer-pakistan-20-million-doses
	National Institute of Health	Fill and Finish (CanSino)	VVnr	200,000 doses in May 2021			https://www.brecorder.com/news/40076698/pakistan-soon-to-start-manufacturing-covid-vaccine-by-using-technology-transfer-from-china
	Searle Company Limited	Manufacture (Livzon Mapharm V-01)				Islamabad	https://www.arabnews.pk/node/1836216/pakistan
Philippines							
	Glovax Biotech	Manufacture (EuCorVac-19)	PS	Unknown			https://www.pna.gov.ph/articles/1132120
Poland							
	Mabion SA	Manufacture (Novavax)	PS				https://www.reuters.com/business/healthcare-pharmaceuticals/poland-strikes-deal-produce-novavax-covid-19-vaccine-2021-03-03/
Republic of South Korea							
	GC Pharma	Manufacturer (partnered with CEPI)	PS	500 million doses a year		Seoul	
	GL Rapha	Manufacturing (Sputnik V)	VVnr	More than 150 million doses per year		Seoul	https://www.reuters.com/article/health-coronavirus-russia-vaccine-idINKN27T0KO
	SK Bioscience	Manufacturing antigen (Novavax)	PS	Unknown	40 million for South Korea, and more for global supply	Andong	https://ir.novavax.com/news-releases/news-release-details/novavax-and-sk-bioscience-announce-collaboration-novavax-covid
	SK Bioscience	Manufacture (AstraZeneca)	VVnr	Unknown		Andong	https://fr.yna.co.kr/view/AFR20201118001100884
	LG Chem	Manufacturing (Cellid)	VVnr			Seoul	https://www.koreabiomed.com/news/articleView.html?idxno=9876
	Huons Global Co Ltd	Manufacture (Sputnik V)	VVnr	100 million doses a year			https://www.reuters.com/business/healthcare-pharmaceuticals/skorean-consortium-produce-100-mln-doses-month-russias-sputnik-v-vaccine-2021-04-16/
	Samsung Biologics	Fill and finish (Moderna)	RNA	500 million doses	Begin production third quarter of 2021	Incheon	https://investors.modernatx.com/news-releases/news-release-details/moderna-and-samsung-biologics-announce-agreement-fill-finish https://www.fiercepharma.com/pharma/samsung-adds-mma-vaccine-substance-capacity-will-have-one-stop-site-for-manufacture-moderna
	Hanmi Pharm	Manufacture (Genexin)	DNA				https://www.reuters.com/article/health-coronavirus-southkorea-vaccine/skorea-genexin-signs-covid-19-vaccine-candidate-manufacturing-deal-with-hanmi-idUSL3N2H50XZ
Russia							
	Binnopharm	Manufacturing (Sputnik V)	VVnr	500 million doses a year		Moscow	https://www.firstpost.com/tech/science/russias-covid-19-vaccine-to-enter-production-deliver-first-batch-of-doses-in-two-weeks-8700091.html
	R-Pharm	Manufacturing (Sputnik V)	VVnr	20 million doses a month (when factory reaches full capacity)		Yaroslavl	https://www.cleanroomtechnology.com/news/article_page/Wiskind_assists_Moscow_R_Pharm_to_build_Covid-19_vaccine_plant/173321
	R-Pharm	Manufacturing (AstraZeneca)	VVnr	Unknown		Moscow	https://www.reuters.com/article/health-coronavirus-cyber-russia-vaccine-idINKN2411X9
	R-Pharm (SEZ Technopolis Moscow)	Manufacturing (Sputnik V)	VVnr	Unknown		Moscow, Pechatniki	
	BIOCAD Company	Manufacturing (Sputnik V)	VVnr	1 million doses of Sputnik in December 2020 + 3-4 million doses per month		St Petersburg	https://tass.com/society/1225549
	Petrovax	Manufacture (CanSino)	VVnr			Moscow	https://www.bnbloomberg.ca/russia-s-richest-man-seeks-global-market-for-local-covid-19-drug-1.1527470 https://petrovax.com/press_centre/news/2020/1881/
	Pharmasintez	Manufacture (Sputnik V)	VVnr			St Petersburg	https://pharmasintez.com/en/press-center/news/pharmasintez-will-produce-the-covid-19-sputnik-v-vaccine/?phrase_id=15954
	Chumakov	Manufacture (Covi-Vac)	IV	500,000 doses a month			https://www.reuters.com/article/us-health-coronavirus-russia-vaccine-idUSKBN2AK07H
Serbia							
	Generium	Manufacturing (Sputnik V)	VVnr	60 - 100 million vaccine doses a year		Vladimir Region, Serbia	https://www.osw.waw.pl/en/publikacje/analyses/2020-11-26/russian-vaccines-a-production-bottleneck
	Torlak	Manufacture (Sinopharm)	IV				https://balkaninsight.com/2021/03/12/serbia-unveils-plan-to-produce-chinese-vaccine-jointly-with-uae/
South Africa							
	Pharmacare Limited (Aspen Pharmacare)	Fill and Finish (J&J)	VVnr	More than 300 million doses per year		Located in Port Elizabeth, South Africa	https://www.aspenpharma.com/2020/11/02/aspens-announces-agreement-with-johnson-johnson-to-manufacture-investigational-covid-19-vaccine-candidate/ https://www.aspenpharma.com/2020/11/02/aspens-announces-agreement-with-johnson-johnson-to-manufacture-investigational-covid-19-vaccine-candidate/

Country	Company	Function	Vaccine Platform	Production Quantity Estimate / Time	Notes on Production Capacity	Location	Sources
	Biovac Institute	Fill and Finish and some manufacturing (ImmunityBio)	VVnr	Up to 30 million doses per year	Currently distributing the AstraZeneca vaccine. Will collaborate with ImmunityBio to manufacture second generation COVID-19 vaccine mRNA manufacturing hub	Cape Town	https://www.biovac.co.za/manufacturing/ https://www.timeslive.co.za/sunday-times/news/2021-02-07-a-home-grown-covid-19-vaccine-deal-is-near-says-biovac-ceo/ https://www.timeslive.co.za/news/south-africa/2021-03-18-cape-town-company-to-manufacture-covid-19-vaccine/
	Afrigen Biologics and Vaccines	Manufacturing	RNA		will be part of Africa's mRNA manufacturing hub		https://www.who.int/news/item/21-06-2021-who-supporting-south-african-consortium-to-establish-first-covid-mrna-vaccine-technology-transfer-hub
Spain							
	Laboratorios Farmaceuticos Rovi	Fill and Finish (Moderna)	RNA	120 million syringes to 300 million units			https://www.reuters.com/article/us-health-coronavirus-moderna/moderna-signs-deal-with-spains-rovi-to-supply-potential-covid-19-vaccine-outside-u-s-idUSKBN24A1SV
	Biofabri	Manufacture (Novavax)	PS	Reserved capacity of 500 million doses for CEPI Unclear how many doses estimated for Novavax			https://www.pharmamanufacturing.com/industrynews/2020/novavax-doubles-covid-vax-manufacturing-capacity/ https://zendal.com/en/biofabri-of-zendal-group-has-been-selected-by-the-capi-as-a-strategic-facility-to-increase-the-manufacturing-capacity-of-covid-19-vaccines-at-an-international-scale/
	mAbxience	Manufacturing (AstraZeneca)	VVnr	200 million a year	2,000L lines	Léon	https://www.mabxience.com/spanish-group-insud-pharma-signs-agreement-with-astrazeneca-to-manufacture-covid-19-vaccine-candidate/
	Reig Jofre	Manufacture (J&J)	VVnr	50 million a year			https://www.reigjofre.com/en/noticias/item/reig-jofre-announces-technology-transfer-of-the-large-scale-manufacturing-in-spain-for-a-covid-19-vaccine-candidate/
Sweden							
	Novavax AB	Matrix-M adjuvant (Novavax)	PS	Unknown		Uppsala	https://www.pharmamanufacturing.com/industrynews/2020/novavax-doubles-covid-vax-manufacturing-capacity/
	PolyPeptide Group	Intermediary used in Matrix-M (Novavax)	PS	Unknown	6,000L total reactor capacity for solution phase 600L capacity for solid phase		https://www.pharmamanufacturing.com/industrynews/2020/novavax-doubles-covid-vax-manufacturing-capacity/
Switzerland							
	Lonza Group AG	Manufacturing ingredients (Moderna)	RNA	300 million doses		Visp	https://www.bloomberg.com/news/articles/2020-11-19/moderna-vaccine-production-is-gearing-up-partner-lonza-says
	Novartis	Manufacturing (Pfizer)	RNA	Unknown	First shipment expected to be released in third quarter of 2021	Stein am Rhein Supporting production of Pfizer-BioNTech	https://www.pharmaweb.com/pwtoday-story/novartis-signs-initial-agreement-to-provide-manufacturing-capacity-for-pfizer-biontech-covid-19-vaccine
Thailand							
	Siam Bioscience	Manufacturing (AstraZeneca)	VVnr	200 million doses		Bangkok	https://www.voanews.com/covid-19-pandemic/thai-firm-joins-astrazeneca-make-covid-19-vaccine-southeast-asia
Taiwan							
	Adimmune Corporation	Manufacture and supply antigen for COVID vaccine	PS	Unknown	Two sterile filling lines		http://www.adimmune.com.tw/en/news_content.php?id=161 http://www.jhibiotech.com/latest-news/jhi-biotech-to-develop-and-manufacture-gmp-grade-antigen-for-taiwans-leading-covid-19-vaccine-produced-by-adimmune/
	TTY Biopharm Copmany	Manufacture (Pfizer)	RNA				https://focustaiwan.tw/sci-tech/202011100025 https://fr.ri.org.tw/news/view/id/92973
	Medigen Vaccine Biologics Co.	Manufacturing	PS	20 million doses in 2021	Ability to manufacture their own COVID vaccine (Phase II)		https://www.taipetimes.com/News/biz/archives/2020/11/04/2003746299
The Netherlands							
	HALIX B.V.	Manufacturing (AstraZeneca)	VVnr	Unknown		Leiden	https://www.reuters.com/article/us-health-coronavirus-halix-astrazeneca-idUSKBN28I24E
	Wacker Chemie	Manufacturing (CureVac)	RNA	100 million doses in 2021		Amsterdam	https://www.wacker.com/cms/en-us/about-wacker/press-and-media/press/press-releases/detail-150656.html
	MedImmune Pharma B.V. (subsidiary recently renamed Astra Zeneca)	Manufacturing (biologics)		Unknown	Unclear whether AZ COVID vaccine will be manufactured at this site	Nijmegen	
	BioConnection BV	Manufacturing (AdaptVac)	PS	200-500 million doses	Fill and finish capacity of 40 to 50 million vials per year - and looking to help with COVID vaccine production	Oss	https://bioconnection.eu/news/adaptvac-partners-with-bioconnection-to-manufacture-their-covid-19-vaccine/ https://innovationorigins.com/dutch-province-of-brabant-is-leading-the-way-in-the-med-tech-and-e-health-field/
	Janssen	Manufacturing (J&J)	VVnr	300 million doses a year		Leiden	https://www.politico.eu/article/moderna-to-double-eu-vaccine-manufacturing-with-new-dutch-site-7-utm_medium=Social&utm_source=Twitter#Echobox=1622619513
	Lonza	Manufacturing (Moderna)	RNA	300 million doses a year		Geleen	
Turkey							
	VisCoran Ilac Sanayii A.S.	Manufacture (Sputnik V)	VVnr	Unknown			https://www.bloomberg.com/news/articles/2021-02-03/secretive-russia-deal-allows-erdogan-ally-to-produce-sputnik-v
	Cinnagen	Manufacture (Sputnik V)	VVnr				https://www.premswire.com/news-releases/rdif-celebro-una-reunion-del-consejo-internacional-de-expertos-con-la-participacion-del-presidente-ruso-vladimir-putin-con-ocasion-del-spief-2021-85578898.html
United Arab Emirates							
	Gulf Pharmaceutical Industries PSC (Group 42)	Manufacture (Sinopharm)	IV	2 million doses a month		Ras al-Khaimah	https://www.reuters.com/article/us-health-coronavirus-emirates-china-idUSKBN2BJ0H3 https://www.bloomberg.com/news/articles/2021-03-28/julphar-signs-deal-with-abu-dhabi-firm-to-produce-sinopharm-shot
United Kingdom							
	Croda Polymer Additives	Lipid-based excipients (Pfizer)	RNA	Unknown		Cowick Hall, Snaith Goole	
	CP Pharmaceuticals	Fill and Finish (AstraZeneca)	VVnr	300 million doses a year		Wrexham	https://www.business-live.co.uk/manufacturing/uk-factories-making-astrazeneca-vaccine-15708380
	FUJIFILM Diosynth Biotechnologies	Manufacturing - antigens (Novavax)	PS	About 180 million doses annually		Billingham, Stockton-on-Tees	https://www.fujifilmdiosynth.com/about-us/press-releases/novavax-and-uk-government-announce-collaboration-and-purchase-agreement-for-novavax-covid-19-vaccine-candidate/
	Valneva	Manufacturing (Valneva +NIH)	IV	Up to 60 million jabs manufactured by the end of 2021 Further 130 million doses if proven to be safe and effective		Livingston, West Lothian, Scotland	https://www.gov.uk/government/news/large-scale-coronavirus-vaccine-manufacturing-begins-in-scotland

Country	Company	Function	Vaccine Platform	Production Quantity Estimate / Time	Notes on Production Capacity	Location	Sources
	Oxford Biomedica (Oxbox production plant)	Manufacturing viral vectors (AstraZeneca)	VVnr	Unknown	Four dedicated suites for viral vector production Two suits for fill and finish 1,000L of reserved capacity for AstraZeneca	Oxfordshire	https://www.fiercepharma.com/manufacturing/oxford-biomedica-earns-uk-nod-for-4th-manufacturing-suite-to-boost-covid-19
	Cobra Biologics	Manufacturing (AstraZeneca)	VVnr	1 million doses a month		Keele University	https://www.reuters.com/article/health/coronavirus-vaccine-cobra-biologi-idUSL8N2D1YB
	GlaxoSmithKline (GSK)	Manufacturing (CureVac)	RNA	Up to 100 million doses in 2021	Unclear what GSK sites will be manufacturing CureVac		https://www.fiercepharma.com/pharma/gsk-amid-sanofi-delay-teams-curevac-multivalent-covid-19-vaccine-to-tackle-variants
	GlaxoSmithKline (GSK)	Fill & Finish (Novavax)	PS	60 million doses	Beginning as early as May 2021	Barnard Castle	https://www.ft.com/content/55f1776f-84bb-45bd-83cc-bdc825817879
	Wockhardt	Fill and Finish (partially for AstraZeneca)	VVnr	Up to 240 million doses	One line dedicated to AstraZeneca	Wrexham, North Wales	https://www.fiercepharma.com/manufacturing/az-laps-indian-pharma-wockhardt-for-u-k-shot-finishing
United States							
	Emergent BioSolutions	Manufacturing (J&J)	VVnr	More than 1 billion doses		Baltimore	https://www.wbaltv.com/article/covid-19-vaccine-johnson-and-johnson-to-be-made-in-baltimore-emergent-biosolutions/35354774# https://www.reuters.com/article/uk-health-coronavirus-johnson-johnson-idUKKCN2253U4
	Exelrad	Manufacturing (Pfizer) - lipid nanoparticles	RNA			Indianapolis	https://www.exelradbiopharma.com/news/ixelrad-helps-manufacture-pfizer-biotech-covid-19-vaccine
	Emergent BioSolutions	Clinical test quantities (Novavax)	PS			Baltimore	https://www.contractpharma.com/content-microsite/covid-19/2020-03-10/emergent-biosolutions-novavax-enter-covid-19-pact
	Emergent BioSolutions	Manufacturing (AstraZeneca)	VVnr		Agreement worth \$174 million	Gaithersburg, Maryland Baltimore Winnipeg, Canada	https://investors.emergentbiosolutions.com/news-releases/news-release-details/emergent-biosolutions-signs-agreement-astrazeneca-expand
	Grand River Aseptic Manufacturing	Manufacturing, Fill and Finish (J&J)	VVnr	Up to 100 million doses		Grand Rapids, MI	https://www.pmnwire.com/news-releases/gram-partners-with-johnson-johnson-on-manufacturing-in-fight-against-covid-19-301137866.html https://www.fiercepharma.com/manufacturing/johnson-johnson-signs-michigan-s-grand-river-to-help-covid-19-vaccine-finishing-work
	Catalent, Inc.	Fill and Finish (J&J)	VVnr	80 million additional vials per year		Bloomington, Indiana	https://www.fiercepharma.com/manufacturing/catalent-pumps-50m-into-indiana-fill-finish-capacity-covid-19-vaccine-contracts-hand https://www.npr.org/sections/health-shots/2020/12/17/947628608/how-will-moderna-meet-the-demand-for-its-covid-19-vaccine https://www.bloomberg.com/news/articles/2021-03-23/j-j-partner-catalent-gets-key-u-s-approval-to-make-vaccine
	Catalent, Inc.	Fill and Finish (Moderna)	RNA	100 million initial doses 180 million total		Bloomington, Indiana	https://investor.catalent.com/financial-news/news-details/2020/Moderna-and-Catalent-Announce-Collaboration-for-Fill-Finish-Manufacturing-of-Moderna-s-COVID-19-Vaccine-Candidate/default.aspx
	Catalent, Inc.	Manufacture viral vector (AstraZeneca)	VVnr	Unknown		Harmans/BWI, Baltimore	https://www.catalent.com/catalent-news/catalent-signs-agreement-with-astrazeneca-to-expand-manufacturing-support-for-covid-19-vaccine-azd1222/
	Catalent, Inc.	Manufacturing (Arcturus)	RNA	Unknown		Madison, Wisconsin	https://www.catalent.com/catalent-news/arcturus-therapeutics-and-catalent-announce-partnership-to-manufacture-mrna-based-covid-19-vaccine/
	Pfizer	Incubates DNA to make mRNA (Pfizer)	RNA	100 million doses by the end of 2020 and 1.3 billion by 2021		Andover, Massachusetts	
	Pfizer	mRNA-containing lipid nanoparticles constructed and sterilised (Pfizer) Manufacturing, fill & finish	RNA	100 million doses between Kalamazoo and Puurs, Belgium by the end of 2020	Expected to produce 132 million doses a month starting March 2021	Kalamazoo, Michigan	https://www.independent.co.uk/news/world/americas/where-covid-vaccine-made-portage-michigan-pfizer-b1766819.html https://www.pfizer.com/products/pfizer-global-supply-us-manufacturing-sites/kalamazoo
	Pfizer	Plasmids for vaccine (Pfizer)	RNA	Unknown	Unknown	St. Louis, Missouri	https://www.pfizer.com/science/research-development/centers/mo_st_louis https://www.bizjournals.com/stlouis/news/2020/11/09/pfizer-covid-vaccine-chester-field-st-louis.html According to Pfizer, the local plant is the primary site of raw materials production for the vaccine, producing plasmids
	Pfizer	Fill and Finish	RNA		14 million sq ft.	Rocky Mount, North Carolina	https://www.pfizer.com/products/pfizer-global-supply-us-manufacturing-sites/rocky-mount
	CordenPharma	Lipid supply for mRNA (Moderna)	RNA			Boulder, Colorado	
	Catalent, Inc.	Manufacturing (Moderna)	RNA			Houston and Madison	https://www.npr.org/sections/health-shots/2020/12/17/947628608/how-will-moderna-meet-the-demand-for-its-covid-19-vaccine
	Lonza Group AG	Manufacturing (Moderna)	RNA	100 million doses		Portsmouth, New Hampshire	https://www.bloomberg.com/news/articles/2020-11-19/moderna-vaccine-production-is-gearing-up-partner-lonza-says
	Endo International	Manufacture & Fill and Finish (Novavax)	PS				https://investor.endo.com/news-releases/news-release-details/endo-announces-fill-finish-manufacturing-and-services-agreement
	AGC Biologics	Intermediary used in Matrix-M (Novavax)	PS	Enough of the adjuvant component for billions of doses in 2020 and 2021	Enough of the adjuvant component for billions of doses in 2020 and 2021	Seattle	https://www.pharmamanufacturing.com/industrynews/2020/novavax-doubles-covid-vax-manufacturing-capacity/ https://asia.nikkei.com/Business/Pharmaceuticals/Japan-s-AGC-to-expand-vaccine-agent-production-for-Novavax
	FUJIFILM Diosynth Biotechnologies	Manufacturing (Novavax)	PS	Unknown	6 x 20,000L bioreactors 14 x 2,000L cell culture trains	North Carolina and Texas	https://www.pharmamanufacturing.com/industrynews/2020/novavax-doubles-covid-vax-manufacturing-capacity/ https://www.fujifilm.eu/en/news/article/fujifilm-diosynth-biotechnologies-stands-ready-to-manufacture-lilly-covid-19-antibody-for-low-and-m https://fujifilm-diosynth.com/about-us/press-releases/fujifilm-diosynth-biotechnologies-begins-production-of-two-covid-19-vaccine-candidates-at-texas-facility/ Fujifilm is subcontractor of Texas A&M University System Center for Innovation in Advanced Development & Manufacturing (CIADM), where CIADM contract is with BARDA.
	Albany Molecular Research Inc	Manufacturing (AstraZeneca)	VVnr	Millions of doses annually (unclear in what time frame)		Albuquerque, New Mexico	https://www.reuters.com/article/uk-health-coronavirus-astrazeneca-amr-idUKKB25U24K
	Medicago	Manufacturer (Medicago)	VLP			Durham, North Carolina	https://politics.ca/2020/12/08/sanofi-wont-use-its-canadian-facility-to-make-a-covid-vaccine/
	Moderna	Manufacturer (Moderna - clinical scale facility)	RNA			Norwood, Mass	https://www.npr.org/sections/health-shots/2020/12/17/947628608/how-will-moderna-meet-the-demand-for-its-covid-19-vaccine
	Recipharm	Fill and Finish (Moderna)	RNA				https://www.recipharm.com/press/recipharm-announces-signature-letter-intent-aseptic-fill-finish-manufacturing-moderna%E2%80%99s-covid
	Vibalogics	Manufacturing (J&J)	VVnr	Unknown	New 'virotherapy' facility set to come online in the second half of 2021. 2,000L bioreactor capacity	Near Boston	https://www.fiercepharma.com/manufacturing/new-ceo-board-germany-s-vibalogics-lays-out-150m-for-boston-viral-vector-site
	PolyPeptide Group	Matrix-M components (Novavax)	PS	Unknown		San Diego and Torrance, California	https://manufacturingchemist.com/news/article_page/Biotech_chooses_PolyPeptide_Group_for_vaccine_adjuvant_intermediates/166644 https://www.polypeptide.com/contact-quotation-request/facilities/san-diego-and-torrance-usa/
	Pall (subsidiary of Danaher)	Manufacturing (AstraZeneca)	VVnr	Unknown	Unknown	Port Washington, NY	https://www.cbsnews.com/amp/news/coronavirus-vaccine-astrazeneca-ramping-up-production/
	Thermo Fisher Scientific	Manufacturing (Inovio)	DNA	100 million annually	Unknown	Austin, TX (Thermo Fisher HQ here - specific site of manufacture unclear)	http://ir.inovio.com/news-releases/news-releases-details/2020/NOVIO-Adds-Thermo-Fisher-Scientific-To-Global-Manufacturing-Consortium/default.aspx
	Ology Bioservices	Manufacturing (Inovio)	DNA	Unknown	Unknown	Alachua, Florida	https://www.pmnwire.com/news-releases/ology-bioservices-inovio-partner-to-manufacture-covid-19-dna-vaccine-with-11-9-million-department-of-defense-grant-301028626.html

Country	Company	Function	Vaccine Platform	Production Quantity Estimate / Time	Notes on Production Capacity	Location	Sources
	TriLink (Maravai LifeSciences company)	Manufacturing self-amplifying RNA (saRNA) (Imperial college london)	RNA	Unknown	Provider of cap analog component for RNA technology manufacture	San Diego, California	https://www.trilinkbiotech.com/press-releases/trilink-biotechnologies-and-imperial-college-london-announce-collaboration-to-produce-sarna-for-covid-19-vaccine-development
	Cytovance Biologics	Manufacturer (Akhshaya Bio)			up to 2,000L bioreactors	Oklahoma City	https://www.cytovance.com/manufacturing https://www.contractpharma.com/contents/view_breaking-news/2020-04-24/cytovance-and-akhshaya-enter-vaccine-collaboration/
	AveXis (subsidiary of Novartis)	Manufacturing (AAV) COVID vaccine program Massachusetts Eye and Ear and Massachusetts General Hospital)		Unknown	Unknown	Bannockburn, Illinois	https://masseyandear.org/news/press-releases/2020/05/aav-covid-vaccine-program-enters-manufacturing-agreement-with-avexis
	Kindred Biosciences, Inc	Manufacture (Vaxart)	VVnr				https://kindredbio.com/frontpage/kindred-biosciences-announces-expansion-of-manufacturing-agreement-with-vaxart-for-covid-19-and-other-vaccine-candidates/
	Merck & Co.	Manufacturer (J&J)	VVnr	Unknown	US government is providing 269million to support Merck to adapt and make available facilities for J&J production	Rockingham; West Point	https://www.nytimes.com/2021/03/02/us/politics/merck-johnson-johnson-vaccine.html
	Ocugen	Manufacture (Covaxin)	IV				https://www.globenewswire.com/news-release/2021/02/02/2168331/0/en/Ocugen-and-Bharat-Biotech-Announce-Execution-of-Definitive-Agreement-for-the-Commercialization-of-COVAXIN-in-the-US-Market.html
	Lonza	Manufacture (Altimmune)	VVnr			Houston	https://r.altimmune.com/news-releases/news-release-details/altimmune-announces-manufacturing-partner-supply-adcovidtm-its https://www.reuters.com/article/us-health-coronavirus-lonza-altimmune-idUSKBN2B40K8
	Vigene Biosciences	Manufacture (Altimmune)	VVnr				https://r.altimmune.com/news-releases/news-release-details/altimmune-announces-manufacturing-agreement-vigene-biosciences
	Ajinomoto Bio-Pharma	Fill and Finish (AstraZeneca)	VVnr			San Diego	https://ajbio-pharma.com/news-post/ajinomoto-bio-pharma-services-expands-manufacturing-agreement-with-astrazeneca-to-include-drug-product-manufacturing/
	Avid Bioservices	Manufacturer (TerraCoV2)			11,000 litres.	Tustin, California	https://www.oragenics.com/news-media/press-releases/detail/110/oragenics-signs-process-development-and-manufacturing
	Baxter Biopharma	Fill and Finish (Moderna)	RNA	60-90 million doses per year		Indiana	https://www.baxter.com/baxter-newsroom/baxter-biopharma-solutions-and-moderna-announce-agreement-fill/finish-manufacturing
Usbekistan							
	LAXISAM	Manufacture (Sputnik V)	VVnr	10 million doses in 2020			https://www.prnnews.co.uk/news-releases/rdif-and-laxisam-agree-to-supply-up-to-35-million-doses-of-sputnik-v-vaccine-to-uzbekistan-653729566.html
Viet Nam							
	Vabiotech	Manufacturer	PS (potential VVr & VVnr)	Unknown	Signed Memorandum of Understanding with Finlay Vaccine Institute Partnership with University of Bristol (UK)		https://vietnam.vnnet.vn/english/vabiotech---a-leading-vaccine-manufacturer-in-vietnam/450213.html

Country	Company	Function	Vaccine Platform	Production Quantity Estimate / Time	Notes on Production Capacity and Availability	Location	Sources
Argentina	Sinergium Biotech S.A.	Manufacturing (influenza, HPV & pneumococcal)	IV, VLP, PS & LAV	17 million doses per year (influenza)		Garin	https://iapreport.org/img/pdf/Sinergium_Biotech_Lobos_IAP_2018_Submission_website.pdf
	Biosidus	Manufacturing (biosimilars)		Unknown	2 sites: one for "production of APIs, equipped with bacterial fermentation capacities and also hosting mass cell culture areas", another for "filling, lyophilization and packaging operations"	Buenos Aires	https://www.infobae.com/salud/ciencia/2020/12/03/la-conexion-local-de-la-vacuna-rusa-sputnik-v-que-laboratorios-podrian-producirla-en-la-argentina/ https://www.gemabiotech.com/?page_id=2723#at-a-glance https://www.biosidus.com/institucional.php
	Gema biotech (member of Amega Biotech)	Manufacturing (biologics)		Unknown	Cell engineering to Active Pharmaceutical Ingredient (API) to Finished Product (PT)	Santa Fe	https://www.infobae.com/salud/ciencia/2020/12/03/la-conexion-local-de-la-vacuna-rusa-sputnik-v-que-laboratorios-podrian-producirla-en-la-argentina/
	HLB Pharma	Manufacturing (biosimilars)		Unknown		Buenos Aires	https://www.infobae.com/salud/ciencia/2020/12/03/la-conexion-local-de-la-vacuna-rusa-sputnik-v-que-laboratorios-podrian-producirla-en-la-argentina/
Australia	CSL / Seqirus	Manufacturing (University of Queensland vaccine)	PS and IV	51 million doses beginning mid 2021	Development of University of Queensland Vaccine has been suspended so potential for another PS candidate to be manufactured here.	Melbourne	https://www.cslbehiring.com/vita/2020/csl-starts-manufacturing-a-potential-covid-19-vaccine https://www.livemint.com/news/world/brazil-approves-emergency-use-of-astrazeneca-sinovac-vaccines-against-covid-19-11610928409770.html
	Thermo Fisher (Patheon)	Manufacturing Biologics	Various platforms (specifics unknown)		Has infrastructure for large-scale vaccine production Has experience with all mammalian cell lines 250-2000L fed batch	Brisbane	https://www.lsq.com.au/queensland-companies-to-lead-the-way-in-on-shore-covid-19-vaccine-manufacture/
Bangladesh	Incepta Pharmaceuticals Ltd	Manufacturing	Various platforms (specifics unknown)	270 million doses of bacterial antigens per year 20 million doses of various viral antigens per year 500 million vials per year fill & finish	Confirmed additional capacity They can start with Fill and Finish but would want to do more in the future.	Dhaka	http://inceptavaccine.com/antigen-bulk.php
	Sanofi	Manufacturing (biologics / MABs)		Unknown	Suspension and continuous mammalian cell culture production Suspension cell culture contains 2 x 10,000L bioreactors Perfusion cell culture contains 3 x 4,000L bioreactors	Geel	https://www.pharmaceutical-technology.com/projects/sanofi-biologics-plant-expansion-geel/
Brazil	Sanofi (Medley)	Manufacturing	Various platforms (specifics unknown)	Unknown		Campinas, Sao Paulo	https://www.sanofi.com/~/media/Project/One-Sanofi/Web/Websites/Globat/Sanofi-COM/Home/common/docs/download-center/CSR-Report-Sanofi-Brazil-2017.pdf?ia=en
	Libbs Farmaceutica	Manufacturing (biologics)		Unknown		Sao Paulo	https://butantan.gov.br/instituto-butantan/main-products
Canada	Biolyse Pharma	Manufacturer (mAb/sterile injectibles)	VVns	400,000 per week	Confirmed additional capacity: Biolyse can repurpose their facility in a few months to help manufacture COVID-19 vaccines if given the technology transfer / license	St. Catharines, Ontario	
	PnuVax	Manufacturer biologics	LAV and PS		Confirmed capacity 150,000 ft ² 75,000L production Could do 20 - 100 million a year depending on the yield	Montreal, Quebec	https://www.theglobeandmail.com/canada/article-president-of-montreal-company-pnuvax-says-ottawa-passed-on-its-offer/
	Emergent BioSolutions	Aseptic filling, packaging and warehousing				Winnipeg, Manitoba	https://www.emergentbiosolutions.com/node/148
China	Changchun BCBT Biotechnology Co.	Manufacture (influenza)	LAV and IV	Unknown		Jilin 4 production lines	https://www.cbcbt.net/changchun-bcbt-biotechnology-co-ld.html
	Sanofi Pasteur	Manufacture (influenza)	IV & PS (egg based, cell based and recombinant)	25 - 50 million doses per year (influenza)	25 million doses of influenza vaccine per season	Shenzhen	https://www.scmp.com/article/617256/sanofi-aventis-invest-700m-yuan-shenzhen-flu-vaccine-factory https://www.manufacturingchemist.com/news/article_page/Sanofi-Aventis_vaccine_plant_in_China_sets_new_record/40343
	Chongqing Zhifei Biological Products Co., Ltd.	Manufacturing (biologics)	PS and IV	Unknown	Their own COVID-19 vaccine is currently in Phase I trials	Chongqing	http://en.zhifeishengwu.com/about/zfgk/
	United Biopharma	Manufacturing (mAb)		Unknown	two 2,000L production lines and can be upgraded to twelve 2,000L lines	HuKou, Tawain & Yangzhou, China	http://www.unitedbiopharma.com/news_detail.php?id=369
	Pfizer (recently sold to WuXi Biologics)	Manufacturing (biologics)			Two 2,000L bioreactors (with room for more) A 50,000m ² facility	Hangzhou	https://www.fiercepharma.com/pharma-asia/pfizer-halts-biosimilar-programs-china-amid-ever-crowded-market-sells-plant-to-wuxi
	CMAB Biopharma	Manufacturing (biologics)		Unknown	Specializes in mammalian cell derived biologic products GMP 200L/500L/2000L facility	Suzhou	
Denmark					Confirmed additional capacity: They have capacity to manufacture 'millions' of vaccines. They have gone public about this capacity and have approached the Danish government but there is no concrete progress. They are looking for concrete proposals and want to engage in production		
	Bavarian Nordic	Manufacturing	RNA	240 million doses a year	They would be willing to speak to C-TAP and not against exploring compulsory licensing.	Kvistgaard	https://www.thelocal.dk/20210202/danish-company-offers-to-help-with-covid-19-vaccine-production
	Novo Nordisk	Manufacturing (insulin and biologics)		Unknown	Facilities to make vaccines Potentially in discussions with Danish government	Kalundborg	https://www.reuters.com/article/health-coronavirus-denmark-vaccine-idUSL1N2LD0QG
Egypt	Pharco Pharmaceuticals	API Manufacturer			Potentially manufacturing covid-19 vaccines		
Finland	Biovian Oy	Manufacturing (Viral Vectors, microbial production of recombinant proteins and GMP plasmid DNA)		Unknown	Agreement signed with a European biopharmaceutical company for a Covid-19 vaccine developing and manufacturing (not specified).	Turku	https://www.nature.com/articles/d43747-020-00920-9 https://biovia.com/wp-content/uploads/2020/06/Biovian_signs_a_deal_about_COVID_19_vaccine_development_and_manufacturing.pdf

Country	Company	Function	Vaccine Platform	Production Quantity Estimate / Time	Notes on Production Capacity and Availability	Location	Sources
France	Sanofi Pasteur	Manufacturing	IV & PS (egg based, cell based and recombinant)			Val-de-Reuil Marcy-L'Étoile	https://www.lefigaro.fr/societes/covid-19-queles-sont-les-sites-qui-produiront-les-vaccins-en-france-20210203
	Sanofi Pasteur	Manufacturing (antigen)	IV & PS (egg based, cell based and recombinant)			Vitry-sur-Seine	https://www.lefigaro.fr/societes/covid-19-queles-sont-les-sites-qui-produiront-les-vaccins-en-france-20210203
	Servier	Manufacturing		Unknown	Up to 2,000L bioreactor capacity	Gidy	
	Novasep	Manufacturing (biologics)		Unknown	Purification of APIs and chromatography	Pompey	https://www.novasep.com/home/about-novasep/our-locations-worldwide.html
Catalent Inc.	Fill and Finish			Unknown	Limoges		
Hungary	Fluart Innovative Vaccines Kft	Manufacture (influenza)	IV or PS	Unknown		Pilisborosjeno	
Iceland	Alvotech	Biosimilar Manufacturer		Unknown		Reykjavik	
India	Cipla				Interested if know-how for API production is available	Mumbai	
	USV Biologics	Biosimilars production		Unknown		Mumbai	
	Kemwell Biopharma	Biologics and biosimilars production		Unknown	Over 4,000L bioreactors capacity	Bengaluru	https://www.kemwellbiopharma.com/sites/default/files/2019-08/Kemwell-services-overview.pdf
	Biological E Ltd.	Manufacturing	PS (VLP?)	Unknown	Bulk manufacturing facility	Ranga Reddy District	
	BioMead Pvt. Ltd	Manufacturing	PS & IV	Unknown		Ghaziabad	
	Cadila Healthcare Limited	Manufacturing	PS, IV & VLP	Unknown		Ahmedabad	
	Chiron Behering	Manufacturing (rabies)	IV	Unknown		Ankleshwar, Bharuch	
	Dano Vaccine & Biological Pvt. Ltd	Manufacturing	PS	Unknown		Hyderbad	
	Green Signal BioPharma	Manufacturing (BCG vaccine)	LAV	Unknown		Gummidiipoondi Chennai	
	Ranbaxy Lab	Manufacturing	PS	Unknown		Bangalore	
	Shantha Biotechnics Ltd.	Manufacturing	LAV, VLP, PS	Unknown		Two locations	
	GlaxoSmithKline (GSK)	Manufacturing	PS	Unknown		Ambad-Pathardi, Nashik	
	Sanofi Pasteur	Manufacturing	PS, IV, LAV	Unknown			
	Reliance Life Science	Manufacturing	PS	Unknown	API manufacturing facility They also have their own COVID vaccine in the pipeline	Navi Mumbai	
	Biocon (Syngene)	Manufacturing		Unknown	Syngene is in collaboration to provide reagents for vaccines	Bangalore and Chennai	https://www.biocon.com/biocon-presented-insights-into-clinical-study-that-enabled-dcg-approval-of-tolizumab-for-covid-19
Pfizer	Fill and Finish		Unknown		Visakhapatnam	https://www.fiercepharma.com/manufacturing/pfizer-sterile-plant-india-slapped-warning-letter	
Haffkine Biopharmaceutical Corporation	Manufacturing		Unknown				
Iran	Bayerpaul Group	Manufacture (influenza)	IV (& LAV?)	20 million doses		Tehran	http://www.bayerpaul.com/en-Posts-204/VACCINES#:~:text=Human%20vaccine%20production%20line%20with,requirements%20and%20also%20WHO%20standards
Ireland	Merck Sharp & Dohme	Formulate and Fill		Unknown	One facility in operation and another facility in Carlow under construction and operational in 2023	Carlow	https://msd-ireland.com/about-us/msd-ireland-our-sites
	Merck Sharp & Dohme	Manufacturing	VVnr - likely more	Unknown		Brinny, Co.Cork	https://msd-ireland.com/about-us/msd-ireland-our-sites
	Merck Sharp & Dohme	Manufacturing	VVnr - likely more	Unknown		Swords	https://msd-ireland.com/about-us/msd-ireland-our-sites
	Merck Sharp & Dohme	Manufacturing	VVnr - likely more	Unknown	Six times 15,000L lines	Cruiserath	https://msd-ireland.com/about-us/msd-ireland-our-sites
	Janssen	Manufacturing		Unknown	Four times 15,000L lines Unclear if they will manufacture J&J vaccine at this location	Ringaskiddy, Co.Cork	
	WuXi Biologics	Manufacturing (biologics)	Not specified	Unknown	6,000L bioreactor capacity and 48,000L fed-batch. WuXi Vaccines dedicated to vaccine manufacturing, expected to begin in 2024. Unclear if Covid-19 vaccine will be manufactured.	Dundalk	https://www.wuxibiologics.com/News_Media_Press_Release/2022-03_11_WuXi_Biologics_Completes_Weather_Tight_Seal_of_its_Biologics_Manufacturing_Facility_in_Ireland.html
Pfizer	Manufacturing, Fill and Finish	PS	Unknown	Aiding with quality testing for the Pfizer facility in Belgium	Grange Castle	https://www.pfizer.ie/operations	
Israel	Mapi Pharma Ltd.	Manufacturing and storage	Not specified	Unknown	If facility approved, able to support supply of COVID vaccines	Jerusalem	https://en.globes.co.il/en/article-mapi-pharma-in-talks-to-produce-covid-19-vaccine-in-israel-100134946
Teva	Manufacturing				In discussion with originators of original vaccines to co-produce		https://www.reuters.com/article/us-teva-pharm-ind-covid-exclusive/exclusive-teva-pharm-in-talks-to-co-produce-covid-19-vaccines-ceo-says-idUSKBN2AA20D
Italy	BiOMvis	Manufacturing (Outer Membrane Vesicles OMVs)	PS	Unknown	Possibly manufacturing the University of Trento COVID vaccine candidate	Siena	https://www.toscana1lifesciences.org/it/2020/04/covid-19-piattaforma-di-biomvis-si-dimosta-efficace-nella-ricerca-di-un-possibile-vaccino-2/
	Biomedica Foscama	Manufacturing (Sputnik V)	VVnr	Unknown	No contract has been signed yet.	Ferentino	https://www.alesioporcuc.it/articoli/vaccino-sputnik-pronte-biomedica-accs-dobfar/
	Acs Dobfar	Manufacturing (Sputnik V)	VVnr	Unknown	No contract has been signed yet.	Anagni	https://www.alesioporcuc.it/articoli/vaccino-sputnik-pronte-biomedica-accs-dobfar/
	ACG Biologics	Manufacturing (Cell therapy and viral vectors)		Unknown	1 x stream for 200L lentiviral and retroviral vector manufacturing in fixed-bed bioreactor	Milan, Bresso	
Japan	Daiichi Sankyo	Manufacture (LNP-encapsulated mRNA)	RNA & IV (cell based and egg based)	Unknown	Developing large scale production system	Kitamoto City, Saitama Prefecture	https://www.daiichisankyo.com/media/press_release/detail/index_3124.html
	BIKEN Co., Ltd	Manufacturing (influenza)	IV or PS	Unknown		Kanonji	https://www.sciencedirect.com/science/article/pii/S0264410X20315851?dgcid=rss_sd_all#s0080
	Denka Seiken Co., Ltd	Manufacturing (influenza)	IV or PS	Unknown		Chuo-ku, Tokyo & Gosen City, Niigata Prefecture	https://www.sciencedirect.com/science/article/pii/S0264410X20315851?dgcid=rss_sd_all#s0080
	KM Biologics Co., Ltd.	Manufacturing (influenza)	IV or PS (egg and cell based)	Unknown	Produce vaccines for 57 million people in an influenza pandemic	Koshi-shi, Kumamoto	https://www.kmbiologics.com/en/about_us/locations.html
	Sanofi Pasteur	Manufacturing (influenza)	IV or PS (egg based, cell based and recombinant)	Unknown			https://www.sciencedirect.com/science/article/pii/S0264410X20315851?dgcid=rss_sd_all#s0080
	Roche (Chugai Pharmaceuticals)	Manufacture (no covid candidate but has facilities)	RNA (possibly)	Unknown	36,000L of antibody production capacity (large capacity)	Utsunomiya and Ukima	https://www.biopharma-reporter.com/Article/201511028/Roche-s-Chugai-investing-300m-in-antibody-production-capacity
Laboratories for Biological and Reagents (Birmex)	Manufacturing (influenza) Fill and Finish		Unknown	Small capacity	Cuatitlan	https://www.researchgate.net/publication/51750854_Public_vaccine_manufacturing_capacity_in_the_Latin_American_and_Caribbean_region_Current_status_and_perspectives	

Country	Company	Function	Vaccine Platform	Production Quantity Estimate / Time	Notes on Production Capacity and Availability	Location	Sources
Mexico	Sanofi Pasteur	Manufacturing antigen (influenza)	IV and PS (egg based, cell based and recombinant)	30 million doses per year (influenza)			https://www.researchgate.net/publication/51229908_Domestic_influenza_vaccine_production_in_Mexico_A_state-owned_and_a_multinational_company_working_together_for_public_health--text%20this%20agreement%20%20sanofi%20pasteur.inactivated%20split%20viral%20influenza%20vaccine
Nicaragua	Mechnikov Institute	Manufacture (influenza)		Unknown			
Poland	Polpharma Biologics	Manufacture (biologics)		Unknown	Mammalian cells capacity 3 x 500L, 4 x 2,000L Expansion available to 30,000L Confirmed additional capacity:	Warsaw	https://polpharmabiologics.com/en/about-us/our-sites#warsaw
Pakistan	Getz Pharma	Manufacturer	Various platforms		Looking to scale up and upgrade facilities Possibility for 20million vials a year of fill and finish (in six months) Possibility for end-to-end vaccine manufacturing (18 months incl. tech transfer) Happy to engage with C-TAP		
Republic of Korea	Eubiologics	Manufacturer		Unknown	1,000L mammalian cell 600L microbial fermentation	Gangwon-do	http://www.eubiologics.com/en/gmp_plant/plant_overview.php
	Hanmi Pharmaceutical co., ltd.	Manufacturer	RNA			Seoul	https://www.reuters.com/business/healthcare-pharmaceuticals/exclusive-skorea-talks-with-mrna-vaccine-makers-make-up-1-bln-doses-govt-2021-07-05/
	Quratis Co Ltd.	Manufacturer	RNA			Seoul	https://www.reuters.com/business/healthcare-pharmaceuticals/exclusive-skorea-talks-with-mrna-vaccine-makers-make-up-1-bln-doses-govt-2021-07-05/
Russia	Microgen	Manufacturing (no known COVID plans)	IV and LAV	Unknown		Moscow. State owned facility	
	SPbNIIVS	Manufacturer		Unknown		St Petersburg	https://www.sciencedirect.com/science/article/pii/S0264410X20307957
	FORT National Biopharma	Manufacture		Unknown		Ryazan	https://tadviser.com/index.php/Company/Fort_Biopharmaceutical_company
Saudi Arabia	Arabio	Manufacturer (influenza, amongst others)	IV, PS (possibly LAV & VLP)	Unknown	Two separate process lines (Vial and Syringe)	Makkah	http://www.arabio.com/Facility-07.html#:~:text=The%20capacity%20of%20the%20system,production%20capacity%201%20C270%20lit%20ph
Senegal	Institut Pasteur	Manufacture (yellow fever vaccine)	IV (egg based)		Potential manufacture agreement (letter of intent to collaborate) with Univercells to supply COVID-19 vaccine shots to countries across West Africa	Dakar	https://www.reuters.com/world/africa/exclusive-boost-africa-senegal-aims-make-covid-shots-next-year-2021-06-06/
Singapore	GlaxoSmithKline (GSK)	Manufacturer Fill and Finish		Unknown	Possibly fulfilling Fill and Finish capabilities for a COVID vaccine	Tuas	https://www.businessinsider.com/government-economy/pharmaceutical-firms-to-manufacture-vaccine-in-singapore
	Lonza AG	Manufacturer	RNA	Unknown	Potential that Moderna candidate to be manufactured at this facility in the future Bioreactor at 2,000L and 20,000L batches	Tuas	https://www.straitstimes.com/singapore/health/singapore-boosting-capacity-for-fast-production
	Takeda	Manufacturer (biologics)				Woodlands Industrial Park, Singapore	https://pharma.lonza.com/about/locations/tuas-singapore
	Amgen	Manufacturer			Fixed bioreactor vessels with 20,000L of cells and growth media	Tuas	https://www.amgenscience.com/features/the-next-generation-of-biotech-manufacturing/
Sweden	AstraZeneca	Manufacturing		Unknown	Large capacity	Södertälje	
Switzerland	Lonza Group AG	Fill and Finish		Unknown		Stein	
	Emergent Biosolutions	Manufacturing		Unknown		Bern	
Thailand	Bionet-Asia	Manufacturing	DNA			Bangkok	https://bionet-asia.com/update-on-thailands-covid-19-vaccine/
Taiwan	Mycenax	Fill and Finish Manufacturing of plasmid DNA for DNA vaccines Biologics Manufacturing	DNA and potentially others	Unknown	Six single use 2,000L bioreactors		http://www.mycenax.com.tw/en/oem.php?act=view&id=18 http://www.mycenax.com.tw/#:~:text=Mycenax%20protein%20drug%20manufacturing%20process,in%20the%20development%20of%20biopharmaceuticals
Tunisia	Institute Pasteur Tunis	Manufacturing (vaccines, biologics)				Tunis	http://www.pasteur.tn/index.php?option=com_content&view=article&id=161&Itemid=199
The Netherlands	Bilthoven Biologicals (acquired by the Serum Institute)	Manufacturer (Inactivated polio, diphtheria-tetanus-polio and bacillus Calmette-Guérin vaccines)		20 million doses a year		Bilthoven	https://www.cyrusponawallgroup.com/our-companies/bilthoven-biologicals.php
	MedImmune Pharma B. V. (subsidiary recently renamed AstraZeneca)	Manufacturing (biologics)		Unknown	Unclear whether AZ COVID vaccine will be manufactured at this site	Nijmegen	
	BioConnection BV	Manufacturing (AdaptVac) Fill and Finish	PS	200-500 million doses	Confirmed fill and finish capacity available from april: Fill and finish capacity of 40 to 50 million vials per year - and looking to help with COVID vaccine production	Oss	https://bioconnection.eu/news/adaptvac-partners-with-bioconnection-to-manufacture-their-covid-19-vaccine/ https://innovationorigins.com/dutch-province-of-brabant-is-leading-the-way-in-the-med-tech-and-e-health-field/
United Kingdom	Seqirus	Manufacturing (influenza) Fill and Finish	IV (egg and cell based)	Unknown		Liverpool	https://www.segirus.com/manufacturing/global-manufacturing-network
	Lonza AG	Manufacturing monoclonal antibodies and recombinant proteins for mammalian drugs		Unknown	Five 1,000L bioreactors	Slough	https://pharma.lonza.com/about/locations/slough-uk#:~:text=Biopharmaceutical%20development%20and%20manufacturing&text=Slough%20is%20a%20226%20C000%20H2,development%20facility%20for%20Mammalian%20Biopharmaceuticals
	AstraZeneca	Manufacturing (influenza)	LAV	20 million doses a year		Speke	https://www.thebusinessdesk.com/northwest/news/2061559-european-supply-deal-struck-for-potential-covid-19-vaccine https://careers.astrazeneca.com/united-kingdom
	CP Pharmaceuticals (subsidiary of Wockhardt)	Fill and Finish (partially for AstraZeneca)	VVnr	Up to 240 million doses	One line dedicated to AstraZeneca	Wrexham, North Wales	https://www.fiercepharma.com/manufacturing/az-taps-indian-pharma-wockhardt-for-u-k-shot-finishing
	Emergent BioSolutions	Manufacture (broad)		Unknown	Mammalian cell cultures Viral vector Up to 4000L bioreactors	Lansing	https://hubspotusercontent10.net/hubfs/7114862/Emergent_CDMO_Brochure_2020.pdf?_hstc=202637902_32a10215f555ca4a66ce8e989f9e29d161338846975_161338846975_161338846975_161338846975&_hsqc=202637902_12161338846975&_hstid=3780488330&hscta=Tracking=ae797ea2-347e-488f-99de-f729583d992a%7C4432cfcf-9790-4186-a16b-59838a76f96c

Country	Company	Function	Vaccine Platform	Production Quantity Estimate / Time	Notes on Production Capacity and Availability	Location	Sources
United States	PCI Pharma Services						
	Lonza Group AG	Manufacture (viral vectors)		Unknown	300,000 square feet 2 x 1,000L, 2x 2,000L bioreactors	Hayward	https://www.pnnewswire.com/news-releases/lonza-opens-worlds-largest-dedicated-cell-and-gene-therapy-manufacturing-facility-in-pearland-greater-houston-tx-usa-300627193.html https://pharma.lonza.com/about/locations/hayward-california-usa
	Takeda	Manufacture (biologics)	IV (cell based)	Unknown	22,000L 215,000 sq ft	Brooklyn Park	https://www.biopharma-reporter.com/Article/2016/01/08/Takeda-buys-Baxalta-Minnesota-biologics-plant
	Takeda	Manufacture (biologics)		Unknown	4x2000L	Lexington / Cambridge	https://www.biopharma-reporter.com/Article/2014/02/18/Shire-s-single-use-site-receives-US-FDA-approval-to-make-VPRIV
	Sanofi Pasteur	Manufacture (biologics)	IV or PS (egg based, cell based and recombinant)	Unknown	100,000 sq ft	Frammingham	https://www.biopharmadive.com/news/sanofi-upgrades-biotech-manufacturing-with-new-massachusetts-plant/565061/
	Sanofi Pasteur	Manufacture (vaccines)	IV	Unknown	140,000ft ² 170 million influenza vaccine doses	Swiftwater, Pennsylvania	https://www.pharmaceutical-technology.com/projects/sanofipasteurvaccine/
	GlaxoSmithKline (GSK)	Manufacturing (adjuvant)	Not specified	Unknown	Large	Hamilton, Montana North Carolina Rockville	https://us.gsk.com/en-us/media/press-releases/gsk-invests-100-million-to-expand-long-term-vaccine-manufacturing-capabilities-in-hamilton-nt/ https://www.epa.gov/sites/production/files/2020-12/documents/gsk-hamilton_fact_sheet_mtp00103.pdf
	Merck & Co.	Manufacturer (vaccines)	VLP (currently HPV)	Unknown	1.2million sq ft	Rockingham	https://www.virginiabusiness.com/article/merck-plans-1-billion-expansion-in-rockingham/
	Merck & Co.	Manufacturer (vaccines and biologics)		Unknown	Largest Merck manufacturing facility	West Point, PA	https://jobs.merck.com/us/en/west-point-pennsylvania
	IDT Biologika	Manufacturer (early stage clinical samples and late stage)	VVnr	Unknown	Unknown	Rockville Prev. contract with NIH	https://idt-biologika.com/idt-biologika-awarded-new-task-order-in-the-scope-of-10-year-nih-contract-to-manufacture-vaccines-and-biologics-for-infectious-diseases
	Bristol-Myers Squibb	Manufacturer		Unknown		Devens	
	Ritedose (partner with Apuleia)	Fill and Finish		45 million doses per month		Columbia, S C	
	AbbVie CMO	Manufacturer (biosimilars)		Unknown		Puerto Rico, Barceloneta	
	Catalent Inc.	Manufacturer (biosimilars)		Unknown	32,000 sq. ft. Cell Therapy clinical facility, 8 clean rooms, 3 process development labs, and quality control labs.	Houston	https://www.catalent.com/our-locations/north-america/houston-usa/
	Catalent Inc.	Manufacturer (viral vector)		Unknown	128,000+ ft. 2	Baltimore	https://www.catalent.com/our-locations/north-america/baltimore-usa/
	Catalent Inc.	Manufacturer (viral vector)		Unknown	50,000+ ft2	Rockville Gaithersburg	https://www.catalent.com/our-locations/north-america/rockville-usa/ https://www.catalent.com/our-locations/north-america/gaithersburg-usa/
	Catalent Inc.	Manufacturer (biosimilars)		Unknown	Mammalian cell line engineering	Madison	https://www.catalent.com/our-locations/north-america/madison-usa/
	VGXI	Manufacturer (biosimilars/DNA plasmid)	DNA & RNA	Unknown	Confirmed capacity (plasmid & perhaps more): Capabilities in DNA vaccine manufacturing and non-GMP production of RNA. Has existing capacity and a new manufacturing facility under construction. Interested in new clients.	Multiple sites in Texas - Houston, Conroe, Woodlands	https://bioprocessintl.com/bioprocess-insider/facilities-capacity/vgxi-buys-site-and-starts-designing-gene-therapy-and-dna-vaccine-plant/ https://bioprocessintl.com/bioprocess-insider/facilities-capacity/vgxi-adis-ma-suite-to-tap-growing-cell-and-gene-therapy-market/ https://vgxil.com/vgxi-celebrates-grand-opening-of-new-flex-scale-production-plant-for-gmp-ma-and-dna-therapeutics-manufacturing/
	Nantkwest	Manufacturer (adenovirus)		Unknown	100 million doses by year-end	Torrey Pines/Culver City/EI Segundo California	https://nantkwest.com/immunitybio-immunitybio-selected-for-operation-warp-speed-to-develop-novel-adenovirus-covid-19-vac/ Currently developing Ad5-Covid-S/N candidate funded by CWS, but have manufacturing capacity. In phase II trials. Subsidiary of NantWorks
	Aji Bio-Pharma	Manufacturer		Unknown	Ajility platform - accelerate manufacturing process	San Diego, California	https://www.contractpharma.com/contents/view_breaking-news/2020-06-30/ajimoto-bio-pharma-launches-ajility/
	Genopsis	Manufacturer		Unknown (small)	500L	San Diego, California	https://www.genopsis.com/uncategorized/03-16-20-covid-19-vaccine-manufacturing-capacity/ https://www.pnnewswire.com/news-releases/genopsis-plasmid-dna-manufacturer-in-san-diego-to-launch-gmp-contract-manufacturing-business-300978458.html
	Abzena	Manufacturer		Unknown	Large	San Diego, California	https://endpts.com/abzena-plots-6th-biologics-plant-as-demand-for-mammalian-cell-line-production-continues-to-grow/
	Argonaut	Manufacturer (incl. fill and finish)		Unknown	Argonaut is willing to talk to state and federal governments to provide surge support to help the scale-up of COVID-19 vaccine production. While not the largest manufacturing facility, they have availability from May 2021 onwards for formulation, fill & finish	Carlsbad, California	https://www.pnnewswire.com/news-releases/immediate-covid-19-vaccine-therapeutic-fill/finish-production-availability-announced-by-argonaut-manufacturing-services-301027920.html
	Roche (Genentech)	Manufacturer (biologics)		Unknown	90,000 liters. Large scale biologics manufacturer	Yacaville, California	https://www.gene.com/contact-us/visit-us/oceanside
	Siegfried	Manufacturer (biologics)		Unknown	Unknown	Irvine, California	https://www.siegfried.ch/drug-products
	Boehringer Ingelheim	Manufacturer (biosimilars)		Unknown	Unknown Mammalian Cell Culture Stainless Steel and Single-Use Bioreactors Perfusion and fully continuous manufacturing	Fremont, California	https://www.bioxcellence.com/global-network/fremont
	JOINN Biologics	Manufacturer (biologics)		Unknown	500L single use and 1,000L stainless steel Has the capacity to produce a protein subunit vaccine. They have bioreactors available in second half of 2021	Richmond, California	https://www.fiercepharma.com/manufacturing/joinn-biologics-nabs-60m-to-use-for-biologics-capacity
	AGC Biologics	Manufacturer (biologics)		Unknown	Confirmed capacity: 3,000L x2 + 2,000L x6 (Seattle) 2x 20,000L (Boulder) Mammalian Cell Cultures Most capacity in the near term is being used, but some additional capacity at Boulder facility. They have many products in their pipeline. They do not expect that have much remaining capacity	Seattle Boulder, Colorado	http://www.agcbio.com/facilities/seattle_facilities http://www.agcbio.com/facilities/boulder_facilities

Country	Company	Function	Vaccine Platform	Production Quantity Estimate / Time	Notes on Production Capacity and Availability	Location	Sources
	Aldevron	Manufacturer (biologics)		Unknown	Confirmed capacity: Plasmid DNA, mRNA 70,000 sq ft Aldevron has the capacity to generate biologics support for COVID-19 workflows (plasmid DNA, RNA and proteins)	Fargo, North Dakota	https://www.nature.com/articles/d43747-020-00631-1
	Novartis	Manufacturer (biologics)		Unknown		Longmont, Colorado Libertyville, Illinois	https://bioprocessintl.com/bioprocess-insider/facilities-capacity/novartis-opens-its-largest-gene-therapy-plant-to-support-zolgensma/
	KBI	Manufacturer (biologics)		Unknown	Due for expansion in North Carolina 6 x 2000L bioreactors. Up by Q1 2022.	Boulder, Colorado	https://www.kbibioharma.com/our-resources/kbi-biopharma-expands-us-operations
	Patheon (by Thermo Fisher)	Manufacturer (biologics, viral vectors) Fill-finish		Unknown	16x 2000L bioreactors in St Louis	St. Louis, Missouri Greenville, North Carolina	https://patheon.com/covid-19-mobilization/ https://patheon.com/viral-vector-services/ https://bioprocessintl.com/bioprocess-insider/facilities-capacity/patheon-doubling-global-biologics-capacity-50m-missouri-spend/
	Cognate Bioservices	Manufacturer (biologics)		Unknown	cGMP capacity: 80,000 sq ft.	Memphis, Tennessee Baltimore, Maryland	https://www.cognatebioservices.com/facilities#
	Alcami	Manufacturer (biologics)		Unknown		Wilmington, North Carolina	https://www.alcamingw.com/blog/alcami-announces-enhanced-laboratory-services-in-wilmington-nc-headquarters
	Biogen	Manufacturer (biologics)		Unknown	120,000L bioreactor capacity	RTP, North Carolina	https://www.fluor.com/projects/biogen-idec-biotech-manufacturing-epc
	GSK	Manufacturer (vaccines)		Unknown	Unclear - large	Rockville, Maryland	https://www.gsk.com/en-gb/media/press-releases/gsk-opens-new-global-vaccines-rd-center-in-rockville-md-usa/
	GSK	Manufacturer (biologics)		Unknown	Unclear - large. Cell cultures.	Upper Merion, PA	https://us.gsk.com/en-us/media/press-releases/gsk-invests-120-million-in-next-generation-us-biopharmaceutical-manufacturing-facility/
	AstraZeneca	Manufacturer (biologics)		Unknown	4x15,000L (at least)	Frederick, Maryland	https://www.lifescienceleader.com/doc/astrazeneca-s-biologics-veteran-applying-a-risk-based-approach-to-plan-for-capacity-0001
	Novo Nordisk	Manufacturer		Unknown	195,000 square feet	West Lebanon, NH	https://www.novonordisk-us.com/content/dam/nncorp/us/en_us/homepage/about-us/who-we-are/pdf/New%20Hampshire%20Facilities%202020.pdf
	Amgen	Manufacturer (biologics)		Unknown	120,000 sq ft	West Greenwich, RI	https://www.prnnewswire.com/news-releases/amgen-announces-rihode-island-will-be-location-of-first-us-next-generation-biomanufacturing-plant-300627393.html
	Rentschler	Manufacturer (mRNA + others)	RNA	Unknown		Milford, CT	https://www.rentschler-biopharma.com/about-us/
Viet Nam	Institute of Vaccines and Medical Biologicals	Manufacturer (influenza) Fill and Finish		Unknown		Nha Trang	http://en.ivac.com.vn/san-pham/1/vaccine/vien-vac-xin.html

Platform Acronym	Platform Description	Notable Vaccine Candidates
PS	Protein Subunit	Novavax: SARS-CoV-2 rS/Matrix M1-Adjuvant Instituto Finlay de Vacunas: FINLAY-FR anti-SARS-CoV-2 VAccine (R B D + adjuvant) CSL Ltd. + Seqirus + University of Queensland: MF59 adjuvant SARS-CoV-2 Sclamp vaccine
VVnr	Viral Vector (non-replicating)	AstraZeneca + University of Oxford: ChAdOx1-S - (AZD1222) (Covishield) Janssen Pharmaceutical: Ad26.COVID.S Gamaleya Research Institute - Health Ministry of the Russian Federation: GAM-COVID-Vac Adeno-based (rAd26-S+rAd5-S) CanSino: Recombinant novel coronavirus vaccines (adenovirus type 5 vector)
DNA	Deoxyribonucleic Acid	Inovio Pharmaceuticals + International Vaccine Institute + Advaccine (Sizhou) Biopharmaceutical Co., Ltd: INO-4800+electroporation
IV	Inactivated Virus	Sinovac Research and Development Co., Ltd: SARS-CoV-2 vaccine
RNA	Ribonucleic Acid	Pfizer/BioNTech: BNT162 (3 LNP-mRNAs) Moderna + NIAID: mRNA-1273 CureVac AG: CVnCoV Vaccine
VVr	Viral Vector (replicating)	
VLP	Virus Like Particle	Serum Institute of India + Accelagen Pty + Spy Biotech: R B D SARS-COV-2 HBsAG VLP vaccine Medicago Inc.; Coronavirus-Like-Particle COVID-19 (CoVLP)
VVr + APC	Viral Vector (replicating) + Antigen Presenting Cell	
LAV	Live Attenuated Virus	
VVnr + APC	Viral Vector (non-replicating) + Antigen Presenting Cell	

Resource	URL	Notes
An open source-based map of COVID-19 candidate vaccines and manufacturing capacity.	http://vaxmap.org/	Edward Hammond
Potential LMIC vaccine manufacturers	https://www.dcvmn.org/Members-126	
UNICEF summary dashboard	https://www.unicef.org/supply/covid-19-vaccine-market-dashboard	
COVID-19 Vaccine Purchasing & Manufacturing Agreements	https://www.knowledgeportalia.org/covid19-vaccine-arrangements	