OXFAM MEDIA BRIEFING
22 April 2021

A shot at recovery

Measuring corporate commitments towards a free, fair, and accessible COVID-19 vaccine - an update of the original published in October 2020

Summary

Scientists have delivered multiple safe and effective vaccines, but pharmaceutical corporations and governments are still failing to make enough doses and facilitate their distribution everywhere. Vaccines could indeed get us back to our lives and our global economy going again, but only if they are accessible to everyone, everywhere, as soon as possible.

US taxpayers paid more than $12 billion to private corporations to develop vaccines, not to mention critical early investments from various other governments, such as the UK and the European Union, too. Yet, these corporations simply cannot produce the needed doses this year on their own. While companies are promising to deliver ten billion doses this year, only around 900 million have been produced collectively so far. By providing these corporations exclusive rights to the technology and know-how for vaccine manufacturing, distribution and pricing, governments are artificially constraining the supply of vaccines, allowing the virus to continue spreading largely unchecked, leading to countless more needless deaths and a rapidly mutating virus.

COVID anywhere is COVID everywhere. That's why we need a People's Vaccine: patent-free, mass produced, distributed fairly, and made available free of charge, to every individual, rich and poor alike, around the world. To protect everyone, everywhere, corporations must commit to openly sharing their vaccine technology to enable billions of doses to be made as soon as possible at the lowest possible price. Amidst troubling opacity, especially on purchasing agreements and vaccine prices, we found that the commitments made by the five leading US-funded vaccine developers highlighted in this brief are far from what is needed. To address this unprecedented global crisis, we need corporations and governments to do everything in their power to deliver a free, fair and accessible COVID-19 vaccine—a People's Vaccine.

Overview

Three million lives have been lost and billions of people are struggling to survive, pay their bills, and stay healthy because of the COVID-19 pandemic.

Since the first publication of this media brief in October of last year, we have witnessed astonishing scientific developments that now give humanity the upper hand against the coronavirus. Of the leading US-funded vaccines, three highly effective vaccines have been approved and are being administered in the United States, with at least two more in route to providing protection around the world today. Where people can benefit from these vaccines, hope is on the rise. A way out of the pandemic seems right around the corner.

But that hope is still out of reach for the majority of the world's people who have witnessed as the wealthiest and most powerful countries quickly captured and hoarded virtually the entire world's vaccine supply. The United States, for example, has already secured deals to control over one billion doses of the vaccines discussed in this brief this year. If exercising the options in its contracts, it could secure a total of 2.3 billion doses. Assuming the companies meet their ambitious production pledges of 10 million doses collectively, that means in principle that the United States—with less than 4% of the world's population—may have already captured up to a quarter of the total supply of these vaccines. Even as healthy college students line up for vaccination in the US, healthcare workers on the front lines in many countries are left without access to these same vaccines. In most countries, COVID remains an ever-present danger, with no vaccine spring blooming anytime soon.

The irony about these deep global vaccine inequities is that the public—everyday people paying their taxes—were the early investors in the development of these vaccines. Alongside investments from the UK and the European Union (among others), US taxpayers contributed $12 billion to develop these vaccines, mostly through the Biomedical Advanced Research and Development Authority (BARDA) that is part of the US Department of Health and Human Services (HHS). Twelve billion dollars is equivalent to every single person in the United States pitching in $37 each in this grand collective endeavor to protect each other from this virus.

One might think that this public investment should yield a public good—for all people everywhere. After all, with variants on the rise and with the global economy on eggshells in fear of new lockdowns, it is in the interest of everyone single one of us that vaccines become available at sufficient levels across the globe.

Yet, instead of ensuring an all-of-society initiative to make COVID vaccines available to all, governments continue to allow Big Pharma to seize this opportunity to extend their "business as usual" model—to make billions off of taxpayer-funded research, charging sky-high prices, funneling profits to rich investors while artificially restricting increased vaccine production. In the case of COVID-19, this is resulting in protection for the few and disaster for the many.

While companies discussed in this brief have together promised to expand production capacity to roughly 10 billion doses in 2021, only around 900 million have been produced as of mid-April, far,

far too few to meet the urgent need.[1] The reality is that the vaccine developers simply are unable to produce the quantities of doses needed to meet global demand in the coming years. The spread of easily transmissible and potentially more deadly new variants threatens to accelerate the devastation and could threaten to decrease the effectiveness of our vaccines.

Worse yet, neither the US government nor the pharmaceutical industry are taking the necessary steps now to ensure that there is maximum supply of COVID-19 vaccines to match the global need. Mass production requires not only investments in at-risk production, but also a requirement that pharmaceutical corporations share their intellectual property, know-how, and data as widely as possible so that there are multiple suppliers for new vaccines. Getting rid of artificial supply barriers, such as monopoly control over production, will help many countries around the world protect the most vulnerable and at-risk populations and set us on the right path to defeating COVID-19 as quickly as possible. Every additional dose, in the places that most need it, matters. In the end, defeating COVID-19 is not only in the interest of those that haven't been vaccinated, but also by those that have.

A People's Vaccine to Save Lives and Livelihoods

Learning from the tragedy of the HIV/AIDS epidemic, we know that the COVID-19 vaccines must be universally accessible. That's why public health experts joined more than 140 former and current heads of state, the UN Secretary General, and Nobel laureates calling for COVID 19 vaccines to be free of charge to the public, fairly distributed on the basis of need and risk, and produced at a mass scale: a People's Vaccine.[2]

To be free of charge to the public, the COVID-19 vaccine must be sold at a low enough price so that governments around the world can afford to purchase a vaccine for their people without going into debt. Toward that end, the price should be as close to the actual cost of production as possible. Furthermore, the public must have full transparency into the actual cost of production, the contributions of governments, philanthropies, universities, and multilateral agencies towards the development of a vaccine, and the terms and conditions that companies and governments enter into to purchase the vaccines.

To be fairly allocated based on need and risk, not wealth, countries, including the US, must stop hoarding the vaccine supply and must agree fairly distribute the vaccines within and between countries to save as many lives as possible. Within countries, too, this will require prioritizing those who are bearing the brunt of the disease burden, including frontline health and social-care workers, older people, and people at higher risk due to underlying health conditions. We have lost much time already, so now it is even more vital that vaccine supplies are shared between countries to ensure those who truly need the vaccines first receive them, no matter where they live.

Toward that aim, vaccines will need to be produced at a scale to meet global demand. This urgent life-saving task cannot fall victim to monopoly control over production. Intellectual property, deep technology transfer and know-how to make a COVID-19 vaccine must be shared openly with the

world to quicken the pace of production and drive down costs. Complementary investments in regional vaccine development and production hubs could bear fruit within months to help put an end to this pandemic and prepare for future pandemics.[3]

In this brief, which has been updated since its first edition in October of 2020, we take a look at the five leading US-funded COVID-19 vaccines (approved and still in clinical trial) to better understand the commitments made by the corporations to a free, fair and accessible COVID-19 vaccine. For perspective, we also place these commitments to an accessible COVID-19 vaccine in the context of the companies' other financial commitments to shareholder payouts and CEO compensation.[4] Note that for reasons of scope and availability of information, this brief does not attempt to cover the commitments of other advanced COVID-19 vaccine developers, such as those developed in Russia and China.

Two key lessons can be distilled from this evaluation. First, differences do emerge between companies partly because of civil society pressure and effective government initiative. Second, while some companies' commitments go further than others, company goodwill alone will not lead us to a people's vaccine and out of the pandemic. Government coordination and proactive measures are paramount to ensuring a free, fair, and accessible COVID-19 vaccine. Given the fact that the US taxpayers (through the US government) remain the world's largest investor in the development and manufacturing of the COVID-19 vaccines explored in this brief, we conclude with several recommendations for companies, and for the Biden Administration in particular, to ensure these scientific breakthroughs benefit all people and bring this crisis to a rapid end.

TABLE 1: COMPARING MAJOR VACCINE DEVELOPER COMMITMENTS TO DELIVER A PEOPLE'S VACCINE

	FREE		**FAIRLY DISTRIBUTED**	**GLOBAL PUBLIC GOOD**
	Transparent contracts	*Low price*	*Between countries*	*Openly-licensed, with shared technology & know-how*
AstraZeneca/Oxford				
J & J				
Moderna/NIH				
Novavax				
Pfizer/BioNTech				

In this assessment, each company was scored for their commitments to key elements of ensuring a free, fair and accessible COVID-19 vaccine—a People's Vaccine. Red implies no commitment (or active opposition), yellow implies partial commitment and green a close to full commitment, in comparison to other companies. Company commitments are described in detail below, as of March 28, 2021. Note that these are rough approximations based on limited public information and are only snapshots in time which will change with new developments.

TABLE 2: SUMMARIZING MEASURABLE INDICATORS TOWARD A PEOPLE'S VACCINE

Company	**Public Funding** (est.)[5]	**Price per course** [6] (est.)	**COVID Vaccine Sales** (est. 2021)	**COVID Vaccine Profit** (est. 2021)	**Dose Distribution** High-Income Countries (est.)	**Dose Distribution** Low- & Middle-Income Countries (est.)	**CEO pay** (FY2020)	**Shareholder payouts** (FY2020)
AstraZeneca / Oxford University AZD1222	$2.7 billion	$4.38 to $10	$1.9 billion	Undisclosed	1 billion doses (33%)	2 billion doses (67%)	$21,089,782	$3.6 bn in dividends (AstraZeneca)
Johnson & Johnson Ad26COVS1	$1.5 billion	$8.50 to $10	Undisclosed	Undisclosed	901 million doses (43%)	1.2 billion doses (57%)	$29,575,974	$10.5 bn in dividends + $3.2 bn in share buybacks = Total $13.7 billion
Moderna / NIH mRNA-1273	$5.75 billion	$24 to $74	$18.2 billion	$5 billion	1.25 billion (97%)	35.2 million (3%)	$12,855,275	Zero
Novavax NVX-CoV2373	$2 billion	$6 to $8.36	Undisclosed	Undisclosed	914 million (59%)	645 million (41%)	$2,400,000 (FY2019)	Zero
Pfizer / BioNTech BNT-162	$2.5 billion	$13.50 to $39	$7.5 billion (Pfizer) $7.5 billion (BioNTech)	$2 billion (Pfizer) $2 billion (BioNTech)	1.67 billion (85%)	290 million (15%)	$21,033,570 (Pfizer)	$8.44 bn in dividends (Pfizer)

AstraZeneca and Oxford University (AZD1222)

Research and development

AstraZeneca licensed its viral vector-based vaccine from the University of Oxford.[7] Phase 1 trials for the vaccine began in late April 2020.[8] In November 2020, AstraZeneca issued a press release reporting interim results from Oxford-led clinical trials from the UK, Brazil and South Africa.[9] The data demonstrated that the vaccine was well tolerated and effective at preventing symptomatic COVID-19 with an efficacy of 70.4%. An analysis published in *The Lancet* showed that efficacy increased with longer inter-dose interval of at least 12 weeks or more.[10] Primary analysis from US

Phase III trials in March 2021 found 76% vaccine efficacy at preventing symptomatic COVID-19 and 100% efficacy against severe or critical disease and hospitalization.[11] The vaccine was found to be efficacious for all adult age groups with efficacy of 85% in participants over 65 years.[12] Real-world studies from Public Health England (PHE) and Public Health Scotland have demonstrated the vaccine to be up to 94% effective in preventing hospitalizations even in elderly populations.

AstraZeneca first obtained emergency authorization from the UK Medicines and Healthcare Products Regulatory Agency (MHRA) for two doses of the vaccine, with the second dose to be given four to twelve weeks after the first, on 30 December 2020.[13] The vaccine also received conditional marketing authorization from the European Medicines Agency (EMA) on 29 January 2021.[14] On February 15, 2021, the World Health Organization (WHO) granted Emergency Use Listing (EUL) to the vaccine produced by both AstraZeneca's Republic of Korea partner and the Serum Institute of India (SII), AstraZeneca's single largest supply partner, which has a license to manufacture the vaccine for many low- and middle-income countries.[15]

While the AstraZeneca vaccine was deemed 75% effective against the B.1.1.7 variant,[16] pre-clinical data has also indicated that a similar level of efficacy could be achieved against the P.1 variant.[17] Preliminary data indicates the vaccine was significantly less effective against the B.1.351 variant for mild to moderate disease (with insufficient data for severe disease).[18] This led the South African government to halt use of the vaccine in February 2021 shortly after initiating immunization with the vaccine.[19] AstraZeneca and Oxford have announced that development is underway of booster shots for variants, if that is deemed necessary, which would be available by the end of 2021.[20,21] In February 2021, WHO issued policy recommendations supporting worldwide use of the vaccine in all adults over the age of 18, including for individuals over the age of 65, and for use in countries even in countries with the B.1.351 variant.[22]

In March 2021, many European countries suspended the vaccine's use following a small number of reports of people who had received the vaccine developing a rare blood clot. The European Medicines Agency and the MHRA found that benefits still outweigh the risks and further research is being conducted.[23]

Public funding

In May 2020, the company announced a partnership with the US government. US taxpayers (via BARDA) agreed to contribute up to $1.2 billion for the development and supply of the vaccine, which includes a contractual commitment to supply 300 million doses of the vaccine.[24] Additionally, CEPI and Gavi, the Vaccine Alliance, announced a $750 million agreement in June 2020 with the company to manufacture, procure and distribute the vaccine.[25] AstraZeneca also signed an agreement in August 2020 with the European Union for up to 400 million doses that includes an upfront payment of 336 million Euros that would be used, in part, to fund manufacturing and liability costs.[26] Although the total sum of the agreement remains undisclosed, it is likely to be for a total of 750 million Euros, which was previously agreed upon by a smaller group of EU countries prior to the EC assuming control of the negotiations.[27]

Previously in 2018, CEPI gave Oxford $18 million to develop vaccines for viruses, including older coronaviruses, such as MERS.[28] Since then, CEPI funds have shifted to fund COVID-19 vaccine efforts at Oxford.[29]

Since the start of the pandemic, the UK Government has provided total of £88.7 million in funding to support the AZD1222 vaccine development[30].

Pre-clinical stage trials for Oxford's vaccine also utilized American taxpayer money, because the trials were partly run by the National Institute of Health.[31] In a pre-print article, researchers for Universities Allied for Essential Medicines identified that public funding accounted for 97.1-99.0% of the funding towards the R&D for the Oxford-AstraZeneca vaccine and the underlying ChAdOx technology.[32]

Transparency

The UK and European Union have published copies of their contracts with AstraZeneca, though clauses including prices and delivery schedule were redacted.

As of publication, AstraZeneca has not, however, committed to publishing the contracts with manufacturing partners or their licensing agreement with Oxford University. The company has not published the cost of R&D and manufacturing of the vaccine making the non-profit pledge on the vaccine impossible to verify. The company has stated that in addition to the manufacturing costs, it is incurring costs in excess of a billion dollars globally that include clinical development, regulatory, distribution, pharmacovigilance and other expenses. To cover these additional expenses, the company stated it will add an amount equivalent to a maximum of 20% of the manufacturing costs to ensure there is no material impact on its finances.[33]

Pricing, revenue and profits

In 2020, according to AstraZeneca, the company "has prioritized broad and equitable supply of a vaccine throughout the world at no profit during the pandemic."[34] Oxford and AstraZeneca went on to announce that its vaccine will be available at a non-profit price, reported in the press for approximately $3 per dose, globally throughout the pandemic.[35] According to the company, the exact price would vary slightly depending on the complexity and volumes of the respective supply chains.

In 2020, it was revealed that AstraZeneca, at least according to one contract signed between the company and a Brazilian manufacturer, retains the sole right (in good faith) to declare the end of the so-called 'pandemic period' as early as July 2021, at which point the company would no longer be obligated to market the vaccine at the lower pandemic price.[36]

In a letter to sell-side analysts, the company said that "given the vaccine will be provided on a not-for-profit basis for the duration of the coronavirus pandemic (and in perpetuity in *low- and middle-income* countries), no material benefit to operating profit is expected in 2021."[37]

The UNICEF Vaccine Market Dashboard reports a per dose price variance of between $2.19 (European Union) and $5 (Philippines) that countries have paid.[38] Reports in the media that

Uganda had agreed to a $7 per dose were clarified by the head of the country's immunization program as planning figures, with the likely price to be around $4.[39,40]

In terms of overall sales, a well-regarded financial analyst projected $1.9 billion in revenues for the AstraZeneca shot in 2021 and $3 billion in 2022.[41]

Manufacturing and production

Oxford partnered with AstraZeneca to further develop and manufacture the vaccine at scale.[42] The companies have deals and enabled technology transfer with more than 20 supply partners around the world in over 15 countries,[43] including the licensing agreement with SII to supply 1 billion doses for low- and middle-income countries.[44] The Serum Institute, which is one of the largest partners that is manufacturing the vaccine, has received a funding contribution of up to $300 million from the Gates Foundation to produce at least 200 million doses of the AstraZeneca vaccine at a price of no more than $3 per dose as part of the Gavi COVAX AMC, a mechanism within the COVAX Facility.[45] AstraZeneca also entered into an agreement with the Carlos Slim Foundation to supply Latin America, with manufacturing provided by companies in Argentina and Mexico.[46] Altogether, AstraZeneca's production target could reach approximately 3 billion doses.[47] In February 2021, Astra Zeneca announced that it would build a new manufacturing facility in Germany with a local manufacturer to supply the EU.[48]

Sharing intellectual property, technologies and know-how

The intellectual property of this vaccine is owned by Oxford University. AstraZeneca/Oxford has agreed to sub-licensing deals in various countries as described above, including India, Brazil, China and Russia, which includes technology transfer for manufacturing, although the terms and conditions of such technology transfer are not disclosed. Yet, the partners have not yet made a broader, public commitment in support of joining COVID-19 Technology Access Pool (C-TAP), sharing its COVID-19 vaccine knowledge, intellectual property, data and know-how to boost supply, reduce price and enhance equity. In fact, AstraZeneca's CEO, Pascal Soriot, has been vocally opposed, arguing that intellectual property is "a fundamental part of our industry and if you don't protect IP, then essentially, there is no incentive for anybody to innovate. What is important is for companies to volunteer to provide their products at no profit, like we're doing right now in case of a pandemic or crisis, when it's needed."[49]

More recently, AstraZeneca's CEO publicly opposed a World Trade Organization initiative which would temporarily waive certain categories of COVID vaccine-related IP rights under the Agreement of Trade-Related Intellectual Property Rights (TRIPS) until the majority of the world population receives effective vaccines and develops immunity to COVID-19.[50]

Fair distribution between countries

Many nations have deals with varying terms with AstraZeneca and its sublicensees. The vaccine has been supplied to around 140 countries through global, regional, and bilateral supply agreements as well as government to government donations.[51] Amongst high-income countries, the UK has purchased 100 million doses,[52] and the US has purchased 300 million doses.[53] The European Commission purchased up to 400 million doses for EU member states.[54,55] Australia

agreed to terms for 53.8 million doses, with nearly all the doses produced and supplied inside their own borders.[56] Japan has purchased 120 million doses.[57] The companies have also made an agreement with Canada to supply 20 million doses,[58] and Hong Kong 7.5 million.[59] Several other high-income countries have also entered into similar deals – resulting in rich countries securing roughly one billion doses of the AstraZeneca/Oxford vaccine.

COVAX has purchased 170 million doses from AstraZeneca.[60] COVAX and SII also have an agreement for 100 million doses (with options for up to 900 million doses more of either the AstraZeneca/Oxford or Novavax candidates). At the time of publishing, AstraZeneca confirmed to Oxfam that neither they nor their partners have deals with the African Union. Many poorer countries have entered into bilateral supply deals with AstraZeneca and/or its partners. All together including COVAX and bilateral deals, low- and middle-income countries have secured roughly 1.6 billion doses.[61] including the 450 million optional doses for the COVAX AMC countries, poorer countries have secured roughly 2 billion doses.[62]

CEO pay (AstraZeneca)[63]

FY 2020: $21,089,782
FY 2019: $20,272,830
FY 2018: $16,400,505

Political lobby spend on US federal government (AstraZeneca)[64]

Q1 2020: $1,560,000
Q2 2020: $780,000
Q3 2020: $450,000
Q4 2020: $680,000
Total 2020: $3,470,000 USD

Recent shareholder payouts (AstraZeneca)[65]

FY 2020: $3.6 billion in dividends
FY 2019: $3.6 billion in dividends

Johnson & Johnson (Ad26COVS1)

Research & development

Like the AstraZeneca/Oxford vaccine, Johnson & Johnson (JNJ)'s vaccine utilizes viral vector technology, which involves using a harmless adenovirus to carry the COVID-19 spike protein and to introduce the spike to the immune system, which then prompts the immune system to recognize COVID-19 and protect against the virus.[66] Against severe disease, across all countries and regions, the one-dose vaccine was 85% effective 28 days after vaccination. Furthermore, there were no hospitalizations or deaths amongst those clinical trial participants that received the vaccine after the 28-day period in which immunity developed.[67] The vaccine appears to be

effective against the B.1.351 variant as well (82% against severe disease and 64% against moderate disease).[68]

In late February, the US Food and Drug Administration approved the single-shot vaccine for an emergency use authorization.[69] In March, JNJ was granted a conditional marketing approval by the European Medicines Agency,[70] and the World Health Organization (WHO) listed JNJ's vaccine for emergency use.[71]

Public funding

BARDA awarded JNJ $456 million to be invested in development of the company's COVID-19 vaccine.[72] Additionally, the US government announced another $1 billion deal to expand manufacturing capacity.[73] This brings the US taxpayer investment into this vaccine to almost $1.5 billion.

Further, the spike protein used by Johnson and Johnson to develop its COVID-19 vaccine is based in part on a 'freezing technology' developed by the National Institutes of Health and academic researchers[74] (also used by at least four other vaccine companies) that maintains a spike protein in its prefusion shape,[75] and without which the rapid development of an effective coronavirus vaccine that relies on lab-manufactured spike proteins would not have been possible. The financial benefit of this public innovation is undisclosed.

Notably, the aforementioned funding does not reflect the hundreds of millions of taxpayer dollars the US government has given to the company in the past unrelated to COVID-19 vaccine research and development that may have indirectly contributed to the advancement of its coronavirus vaccine,[76] including substantial public funding provided to the company by the US government as well as other public funders, such as the European Union and the Coalition for Epidemic Preparedness Innovations (CEPI) for the development of its now-approved Ebola vaccine,[77] which uses the same platform that the company is using for its coronavirus vaccine.[78]

Transparency

JNJ has not committed to disclosing the terms and conditions of any contracts for development or procurement with public entities, nor to being transparent about the true cost of R&D and manufacturing of its vaccine candidate. The $1 billion agreement between the US government and Johnson and Johnson signed as a part of Operation Warp Speed was released by the Trump Administration in November 2020, but with several key parts of the contract redacted.[79]

Pricing, revenue and profits

JNJ stated in public hearings that the vaccine should be free to the public, because it is useless if people cannot afford it.[80] The company also stated that the vaccine development and production effort will be not-for-profit and will be accessible globally,[81] stating in particular that the vaccine would cost $10 per vaccine dose/regimen, during the course of the pandemic.[82] This $10 pandemic price per course is at the core of the original $1 billion, 100 million dose contract between the company and the US government.[83] In December 2020, it was disclosed that the European Union has negotiated a price of $8.50 per dose with the company.[84]

Outside the US and Europe, the African Union is reported to have agreed to pay the $10 price as well.[85] Johnson and Johnson and COVAX signed a communique in December 2020 for the company to supply its vaccine to low-income countries;[86] however, to date neither party has released terms and conditions of the contract nor the price agreed for the vaccine.

While the $10 pandemic price is likely to remain though 2021, the company clarified at an investor conference that "as we move to 2022, we are looking at [the vac cine] as more of a business opportunity."[87]

It is unknown at present how much revenue JNJ will receive in 2021 from its COVID-19 vaccine. In terms of profit, in the absence of transparency on the true costs of development and manufacturing, it is impossible to verify how close to the cost of production the vaccine will be.

Production levels

In 2020, JNJ announced it would manufacture 600 to 900 million vaccine doses by the first quarter of 2021 and increase the number of available doses to 1 billion over the year.[88] This production estimate was reaffirmed by the company in January 2021.[89]

According to UNICEF, JNJ made a limited technology transfer agreement with one company in India. In March 2021, a group of governments self-defined as the Quad (the governments of the United States, Australia, Japan, and India) announced a joint initiative to invest in the ongoing production of the vaccine in India so that at least one billion doses would be manufactured and distributed to countries in the Indo-Pacific region by the end of 2022. This would include both financial investments by the US and Japan for the manufacturing of the vaccine by JNJ's existing Indian partner, and a commitment by Australia, Japan, and the US to assist with procurement and vaccination in targeted countries.[90] Alongside this, JNJ has contract manufacturing agreements with eight companies in the US, Germany, South Africa, Spain and France.[91]

In March 2021, JNJ announced a partnership agreement with Merck and Co., its ninth manufacturing partner, to produce the company's COVID-19 vaccine.[92] To finance its production of the JNJ vaccine, the US government (via BARDA) will provide Merck with funding of up to $268.8 million to "adapt and make available a number of existing manufacturing facilities for the production of COVID-19 vaccines and medicines."[93] This includes $105 million from BARDA under the Defense Production Act to convert, upgrade and equip its facilities to produce the JNJ vaccine.[94] These funds would be in addition to Merck's investment in its global vaccines manufacturing network of more than $20 billion through the end of 2024, according to the company.[95]

Sharing intellectual property, technologies and know-how

Beyond the limited technology transfer agreement described above, JNJ has not made a public commitment in support of C-TAP, and to sharing its COVID-19 vaccine knowledge, technology, intellectual property, data, and know-how to boost supply, reduce price and enhance equity.

JNJ also publicly opposed a World Trade Organization initiative which would temporarily waive certain categories of COVID vaccine-related IP rights under the Agreement of Trade-Related

Intellectual Property Rights (TRIPS) until the majority of the world population receives effective vaccines and develops immunity to COVID-19.[96]

The US government, under its $1 billion contract signed with the company, seemingly has 'march-in rights' for the intellectual property underlying the vaccine. However, under the contract signed between the US government and JNJ, the US government has limited the grounds under which it normally can exercise march-in rights, and in particular the US government eliminated its ability to apply march-in rights if the US government deems the price is not offered on reasonable terms. Furthermore, the US government's other rights to 'march-in' were reportedly rewritten to authorize the use of such rights only in cases of formal declarations of public health emergencies, whereas march-in rights normally grant use of the intellectual property for several reasons, including to alleviate health and safety needs or failure to substantially manufacture the product in the United States.[97]

Fair distribution between countries

The US originally ordered 100 million doses of the vaccine, paying $1 billion for the supply through BARDA,[98] and the right to purchase an additional 200 million doses.[99] In March 2020, the US announced an intention to purchase 100 million more doses of the JNJ vaccine, though that procurement agreement has not been finalized.[100] The UK purchased 30 million doses,[101] and has an option of purchasing an additional 22 million doses.[102] The EU secured 200 million doses from JNJ with potential to expand to double that amount.[103] New Zealand has agreed to purchase two million doses of the vaccine with an option to purchase an additional three million doses.[104] Canada also signed a deal for up to 38 million doses.[105] South Korea has signed an agreement with the company for six million doses of the vaccine.[106]

The company has also signed several bilateral agreements with LMICs. For example, Chile signed an agreement for four million doses of the vaccine,[107] Mexico for at least 22 million doses,[108] Brazil 38 million doses,[109] and Colombia for nine million doses of the vaccine.[110] South Africa has agreed to a 11 million dose deal, with the option of purchasing 20 million more. Beyond these bilateral deals, the African Union signed a supply agreement with JNJ for 120 million doses to be provided in 2021.[111] This was followed by a second deal with the AU for 220 million doses, with an option for 180 million doses through 2022.[112] In December 2020, JNJ and COVAX agreed to a supply agreement for 100 million doses in 2021 and the right for COVAX to purchase an additional 100 million doses in 2021. The agreement also provides COVAX with an opportunity to purchase an additional 300 million doses, though not until 2022, for a combined total of up to 500 million doses through 2022.[113]

At present, then, 901 million doses are currently secured by rich nations, should these countries exercise their options. Including options and COVAX doses, LMICs have so far secured 1.2 billion doses.

CEO pay

Total calculated compensation[114]

FY 2020: $29,575,974

FY 2019: $25,365,777
FY 2018: $20,097,572

Pandemic stock sales

Since the pandemic began, JNJ's CEO Alex Gorsky has not cashed out any JNJ stock.[115]

Recent investor payouts[116]

2020: $13.7 billion ($10.5 billion in dividends; $3.2 billion in share buybacks)
2019: $16.66 billion ($9.9 billion in dividends; $6.8 billion in share buybacks)

Political lobby spend on US federal government[117]

Full year 2020: $5,570,000
Q1 2020: $1,500,000
Q2 2020: $1,760,000
Q3 2020: $860,000
Q4 2020: $1,450,000

Moderna / NIH (mRNA-1273)

Research and development

The mRNA-1273 vaccine was co-developed with scientists from the National Institute of Allergy and Infectious Diseases (NIAID), part of the National Institutes of Health (NIH).[118] Moderna published interim safety and primary efficacy results from a Phase III clinical trial conducted on 30,000 volunteers in December 2020.[119] The two-dose regimen had a demonstrated vaccine efficacy of 94.1% against COVID-19.[120] According to WHO Strategic Advisory Group of Experts (SAGE), the demonstrated vaccine efficacy is approximately 92% starting 14 days after administration of the first dose.[121] According to SAGE, based on evidence received, the vaccine appears to work against both the B.1.1.7 and B.1.351 variants of COVID-19,[122] though it may be slightly less effective against the B.1.351 variant.[123] The company has announced it is testing two booster shots to address the variants – one targeting the B.1.351 variant, and a second booster shot that could broadly address new mutations.[124]

The company received emergency use authorization for the two-dose vaccine regimen from the USFDA,[125] Health Canada,[126] the United Kingdom Medicines and Healthcare products Regulatory Authority,[127] a conditional marketing authorization from the European Medicines Agency[128] and several others. A decision date for an emergency use license may be issued by the WHO Prequalification Program by the earliest in April 2021.[129] The company expects to publish results of a study of the safety and efficacy of the vaccine for children as young as 12 by September 2021 but does not expect to have clinical trial data for young children until 2022.[130]

Public funding

Moderna is so far set to receive $955 million from the US federal government to develop and manufacture its vaccine candidate ($483 million in first contract with BARDA[131] and an additional $472 million in a second contract).[132] Under the terms of its contract with BARDA, Moderna has stated in a company press release that 'BARDA is reimbursing Moderna for 100 percent of the allowable costs incurred by the Company for conducting the program described in the BARDA contract.'[133]

In addition, the company has received commitments from the US government to provide an estimated $3.2 billion for purchase of the vaccine, bringing the total federal investment in Moderna's vaccine development, clinical trials, manufacturing, and purchase if certain milestones are met, to approximately $5.75 billion in US taxpayer's money.[134] Alongside this significant public investment, Moderna raised approximately $1.34 billion from private investors to invest in its technology.[135]

This $5.75 billion in public funding does not reflect the more than $100 million the US government has invested in the company to develop the Zika vaccine, which helped the company refine and further develop the mRNA technology that is being used for the coronavirus vaccine.[136]

As mentioned above, the Moderna / NIH COVID-19 vaccine was co-developed with the US National Institutes of Health, a taxpayer-funded research institution.[137] The government scientists at the NIH also assisted with the clinical trials that led to its authorization from several regulatory agencies.[138] Further, the spike protein used in the Moderna vaccine is based in part on a 'freezing technology' developed by the National Institutes of Health and academic researchers[139] that maintains a spike protein in its prefusion shape,[140] and without which the rapid development of effective coronavirus vaccine that rely on lab-manufactured spike proteins would not have been possible.[141] This same technology has also been used by at least four other pharmaceutical corporations. The Coalition for Epidemic Preparedness Innovations (CEPI) and the musician Dolly Parton have also provided funding for development of the company's vaccine. Ms. Parton provided $1 million,[142] while the exact amount awarded by CEPI is unknown.[143]

Transparency

Moderna disclosed three contracts previously signed in its third-quarter filings before the Securities and Exchange Commission.[144] These include: (a) a contract between the United States Department of Health and Human Services (HHS) and Moderna for the development of its vaccine candidate, through to licensure by the USFDA[145]; (b) an agreement between Moderna and Lonza, a Swiss-based company, which is providing large-scale manufacturing of the vaccine candidate[146]; and (c) a supply agreement between the United States Army and Moderna in which the United States is purchasing 100 million doses of the vaccine for US$ 1.5 billion.[147]

Moderna has not disclosed the terms and conditions of other contracts for development or procurement with public entities, nor committed to being transparent about the true cost of R&D and manufacturing of its vaccine candidate.

Moderna's access policy states that the company will commit to an 'annual independent third-party audit' of its commitment to provide Gavi-eligible countries with its lowest prices[148] but has not indicated whether it will publish such an audit either fully or partially.

Pricing, revenues and profits

While Moderna's CEO, Stéphane Bancel, stated, "There is no world I think where we would contemplate to price this higher than other respiratory virus vaccines,"[149] the company has also said it intends to make a profit from its vaccine. According to Moderna's access policy, it only states that: (a) Moderna will price its products through differential pricing frameworks, and (b) Gavi-eligible countries will get Moderna's lowest prices.[150]

The company has sold its vaccines to the US government at prices that range from $12-16.50 per dose, or $24-33 per two-dose regimen.[151] Prices in other countries have not yet been publicly disclosed by the company, although the price to the European Union, disclosed by a Belgian government official, for its first supply contract was $18 per dose, or $36 per regimen.[152] Reportedly, negotiations stalled with the EU in January for a second purchasing agreement because Moderna is seeking to double the price per dose.[153] The EU deal eventually did go through, but the price has not been disclosed. Elsewhere, the price of the vaccine could range from between $32 to $37 per dose, or $64-74 per two-dose regimen.[154] Moderna reportedly offered South Africa a price of $30 to $42 per dose in July 2020.[155] The company considers this "pandemic pricing", so this price could very well increase once the pandemic is officially over.[156]

The price of Moderna's vaccine paid for by the US government is the second-highest price of the other advanced vaccine candidates described in this brief. The price per unit also does not include the additional costs that countries—especially poorer countries—may have to incur to build additional cold chain capacity at -20°C for transportation, and the cost of thirty-day storage of the mRNA vaccine between 2°C and 8°C,[157] as well as the need for careful management of the vaccine at the point of care to avoid vaccine wastage. The burden of vaccine management (and avoiding wastage) for all countries may increase substantially if Moderna successfully petitions regulatory agencies to increase the number of doses it can sell per vial to 15 from the current 10: a potential 50 percent increase.[158]

In a February investor call, Moderna shared that it expects to earn $18.2 billion in revenue from its COVID-19 vaccine in 2021.[159] This would make the Moderna/NIH vaccine the world's second biggest selling pharmaceutical product in 2021, just below the anti-inflammatory drug Humira, and just above Pfizer/BioNTech's $15 billion in sales from its COVID-19 vaccine.[160]

In terms of profits, Moderna has not directly disclosed the profit margins it is receiving from its COVID-19 vaccine. It has however disclosed that in 2021 the expected cost of sales is approximately 20% of product sales.[161] Given the significant influx of public money for the R&D expenses for this vaccine and the likely very low marketing costs both reducing the 'below the line' expenses for this vaccine, it is a reasonably conservative estimate that Moderna, like Pfizer, is benefitting from a 25-30% net profit margin from this vaccine.[162] With an approximate profit

margin of 27.5% on $18.5 billion in sales, the company would make an estimated $5 billion in profits this year from its COVID-19 vaccine.

Meanwhile, experts have estimated that the cost of manufacturing of mRNA vaccines like Moderna's to be approximately $2 per dose.[163]

Manufacturing and production

Moderna has stated that it will have an expected capacity by the end of 2021 of between 700 million and one billion doses for 2021.[164] This will be accomplished through manufacturing sites in the US, Spain and Switzerland, as described below.[165]

As noted above, Moderna has petitioned the USFDA to increase the number of doses per vial to 15 from the current 10 doses per vial. While this may increase the number of doses the company supplies, it could observers say lead to more wasted doses.[166]

According to UNICEF, Moderna has made no technology transfer agreements to date. News reports indicate Moderna has held discussions with the Government of India and several private manufacturers in India to produce the vaccine, though there are insufficient details available.[167] The company has contract manufacturing agreements with companies in the US, France, Switzerland, and Spain.[168] No technology transfer nor any manufacturing agreements have been made in poorer countries to date.

Sharing intellectual property, technologies, and know-how

On October 9, 2020, Moderna made a public commitment, during the pandemic, to forgo enforcing its COVID-19 related patents against those making vaccines intended to combat the pandemic. It also confirmed that it is willing to license the intellectual property for COVID-19 vaccines to others for the post-pandemic period.[169] While this was a step forward,[170] the company has not committed to license its intellectual property (including patents) to the World Health Organization's C-TAP for worldwide use, nor to share its manufacturing know-how and provide deep technology transfer to additional manufacturers.

Moderna's access policy does not include any commitments related to the licensing of intellectual property to expand supply or access.[171] Moderna did not sign a letter opposing a World Trade Organization initiative which would temporarily waive certain categories of COVID vaccine-related IP rights under the Agreement of Trade-Related Intellectual Property Rights (TRIPS) until the majority of the world population receives effective vaccines and develops immunity to COVID-19.[172]

Notably, the NIH may jointly own the Moderna/NIH coronavirus vaccine, including through the filing of patent applications on the underlying technology, as well as pursuant to contracts signed between the NIH and Moderna which indicate the US government may own a joint stake in the vaccine.[173] If there are no other patent barriers, the US government may be able to make, use, or sell technologies for the vaccine without Moderna's consent, or license such technology to third parties, including other vaccine manufacturers or through the WHO COVID-19 Technology Access Pool.[174] The US government, pursuant to its funding contract with Moderna via BARDA,

also has 'march in rights' to the vaccine that would allow the US government to use the intellectual property under certain circumstances, such as if Moderna was charging excessive prices for the vaccine.[175]

In March 2021, several organizations wrote to senior US government officials noting that a soon to be issued patent – to the US government for the prefusion spike protein – has not yet been licensed to Moderna, even though it is a critical ingredient for its COVID-19 vaccine. As such, the organizations requested that the US government should require Moderna to sign a license agreement to use the issued patent, and in such a license agreement should require the company to, amongst other obligations: (a) empower the US government to authorize manufacturing of mRNA-1273, including by US government owned production facilities; (b) require technology sharing with the WHO to help ramp up global production; (c) introduce accessible pricing worldwide.[176]

Fair distribution between countries

To date, Moderna has sold the options for nearly all its supply to rich nations. The US has agreed to a deal for 200 million doses, and has since agreed to purchase an additional 100 million doses for a total of 300 million doses,[177] with an option to buy 300 million more.[178] The European Union has acquired 310 million doses of the vaccine, with the option for an additional 150 million doses in 2022.[179] Canada has purchased 44 million doses of the vaccine and has an option to purchase 16 million more doses.[180] Switzerland has purchased 13.5 million doses of the vaccine for itself,[181] Japan 50 million doses,[182] the United Kingdom has purchased 17 million doses[183], Israel 6 million doses,[184] Taiwan 5 million doses,[185] and South Korea has purchased 40 million doses.[186] Singapore[187] and Qatar[188] have also signed agreements with Moderna for the vaccine for an undisclosed number of doses.

Only three low- and middle-income countries to date have signed agreements for the vaccine. The Philippines has purchased 20 million doses of the vaccine,[189] of which 7 million have been purchased for the private market.[190] Colombia has signed an agreement for 10 million doses of the vaccine.[191] Indonesia meanwhile secured 5.2 million doses for use in the private market.[192] Moderna has not entered into any agreements with other LMICs or COVAX to supply poorer countries, although there are reports that Moderna is in active negotiations with COVAX for potentially hundreds of millions of doses with an unstipulated timeline.[193]

Low and middle-income countries all together have secured only 35.2 million doses of the vaccine. Meanwhile, 785.5 million doses of Moderna's supply is already guaranteed to go to a small group of rich countries. If the USG, the EU and Canada agree to exercise their respective supply options, a full 1.25 billion doses would be captured by just a small group of rich countries, with the US by itself cornering 60% of total supply in 2021 if it chose to exercise its options and if Moderna does not expand production beyond one billion doses.

CEO Pay[194]

Total calculated compensation[195]

FY 2020: $12,855,275

FY 2019: $8,948,207
FY 2018: $58,608,484

Pandemic stock sales[196]

Since the pandemic began, Moderna CEO Stephane Bancel has cashed out over $142 million in Moderna stock in rapid-fire fashion.[197]

Political lobby spend in US[198]

Q1 2020: $10,000
Q2 2020: $70,000
Q3 2020: $100,000
Q4 2020: $100,000
Total 2020: $280,000 USD

Novavax (NVX-CoV2373)

Research and development

The Novavax vaccine candidate is a protein subunit vaccine, which is comprised of a lab-manufactured coronavirus spike protein and an adjuvant (an immune boosting compound).[199] The spike protein is based in part on a 'freezing technology' developed by the National Institutes of Health and academic researchers that maintains a spike protein in its prefusion shape,[200] and without which the rapid development of effective coronavirus vaccine that rely on lab-manufactured spike proteins would not have been possible.[201] This technology has also been licensed to at least four other vaccine companies. The company's development of its COVID-19 vaccine is based in part on its prior experience in attempting to develop vaccines, in partnership with the University of Maryland and other entities, to protect against the MERS and SARS virus.[202] The company's SARS-CoV2 candidate, which is a two-dose vaccine that can be stored at normal fridge temperatures (2C to 8C), if approved, would be the first vaccine the company successfully brings to market.

In March 2021, the company announced results from a Phase III trial conducted in the UK, indicating that the vaccine was 96% effective in reducing mild, moderate, or severe disease against the original SARS-CoV2 virus, while 86% effective in protecting against disease if people were infected with the B.1.1.7 variant of the virus. The company is also conducting a Phase II trial of the vaccine in South Africa and has until now found that the vaccine is 55% effective in protecting against COVID-19 symptoms for the B.1.351 variant.[203]

Novavax has initiated a rolling review process for authorization of its COVID-19 vaccine with several regulatory agencies even as it completes Phase III clinical trials. The rolling review process has been initiated with at least the European Medicines Agency, the UK Medicines and Healthcare products Regulatory Agency, and Health Canada.[204]

Public funding

The company has received approximately $2 billion in public funding for its vaccine. This includes a $1.6 billion investment through Operation Warp Speed, which is its single largest investment, and includes the provision of 100 million doses to the US government.[205] Prior to that funding announcement, Novavax had also signed a $60 million contract with the United States Department of Defense to manufacture components of the vaccine in the United States as well as 10 million doses for clinical trials or use under an emergency use authorization.[206] Prior to its agreement with Operation Warp Speed, Novavax signed a $384 million agreement with CEPI (itself funded mostly by governments). This is CEPI's single largest investment.[207] That agreement is intended to scale up production of vaccine components and the vaccine in multiple locations, alongside provisions with respect to supply, intellectual property, and pricing (see below). The large funding grant from CEPI was preceded by an earlier $4 million funding agreement between CEPI and Novavax for clinical development of its vaccine candidate,[208] bringing total CEPI investments to $388 million. Finally, the company received a $15 million grant from the Bill and Melinda Gates Foundation for a co-funded trial "to evaluate the safety, immunogenicity, and potential efficacy of a candidate vaccine to prevent COVID-19 infection and/or disease in the South African population."[209]

After these funding agreements, the company has also signed several advance purchase agreements with various governments, and is negotiating other such agreements, which are described below.

Transparency

The terms and conditions of the $388 million contract between Novavax and CEPI has been disclosed in SEC filings by Novavax,[210] and analyzed independently after publication.[211] Novavax also disclosed its contract with the US government under Operation Warp Speed through SEC filings.[212] An agreement between Novavax and the United States Department of Defense was released following a Freedom of Information Act Request filed by Knowledge Ecology International.[213]

None of the other contracts signed between Novavax and R&D funders, third party manufacturers, suppliers, or governments and entities that have signed advanced purchase agreements, have been released for public review and scrutiny. Novavax has not publicly committed to being transparent about its own contribution to the cost of R&D for its vaccine candidate (and the overall cost of R&D) as well as its contribution to the manufacturing of the vaccine. The company has also not committed publicly to disclosing the cost of manufacturing each dose of the vaccine.

Under the terms and conditions of its funding agreement with CEPI, Novavax is required to "provide reasonable information about its COGs (cost of goods), production, supply, pricing, and sales of (its vaccine) sufficient to evaluate whether such activities meet the Equitable Access Policy (CEPI policy to ensure an 'affordable' price)."[214] However, it is not clear if CEPI and Novavax will agree to disclose such information publicly. Furthermore, CEPI has the right, under its funding agreement, to review or designate an external auditor to audit its cost of goods.[215] Novavax has not otherwise committed to publicly disclosing the price of its vaccine to different government and third-party buyers such as COVAX, nor have such funders or buyers required Novavax to disclose the price charged.

Pricing, revenue and profits

Novavax has not disclosed the actual prices that may be charged by the company or its manufacturing partners for its vaccine candidate, if approved. In 2020, the company stated that it is "in the process of developing a thoughtful pricing strategy", and that the company pricing will be aimed at ensuring "equitable access throughout the globe."[216]

Under the terms of Novavax's agreement with CEPI, the company has agreed to a 'reasonable pricing' clause, which states the following: "Awardee (Novavax) agrees that its pricing shall be reasonable to achieve Equitable Access for populations in need of a Project Vaccine as well as an appropriate return on investment for vaccine manufacturers that make on-going supply commercially available. For clarity, the purchase of Project Vaccine by the Global Allocation Body (e.g., COVAX) or by any other purchasing agent(s) designated by CEPI shall be considered to have satisfied the pricing requirements for Equitable Access."[217] Under the terms of the Agreement, CEPI has a worldwide, royalty-free license to manufacture the Novavax vaccine if the company does not meet certain commitments, including its commitment to 'reasonable pricing'.[218]

Under the contract of Novavax with Operation Warp Speed, the budget for manufacturing 100 million doses of the vaccines is $418 million, which would approximate a per dose cost of $4.18.[219] The actual per dose cost of goods may be lower if the original budget outlay under the US government contract included one-time fixed costs.[220] Additionally, under the terms of the contract signed between Novavax and the United States Department of Defense, the company committed to providing the US government with a best price commitment (for the US government) for sale of the 10 million doses included under the Agreement.[221] The actual price paid for the 10 million doses, and whether such doses have already been transferred to the US government, is not known.

Novavax has also signed agreements with several third parties to manufacture the vaccine for sales within specified jurisdictions (see below). While specific prices for vaccines sold under these manufacturing and distribution agreements have not been disclosed publicly, the Serum Institute of India, which may manufacture up to 1 billion doses of the Novavax vaccine in 2021,[222] has committed to not charging more than $3 per dose for sales to the 92 countries included in the COVAX advanced market commitment. This commitment is only for up to 200 million doses of the Novavax vaccine or for a different vaccine (the vaccine developed by AstraZeneca and Oxford) and required an investment of $300 million by the Gates Foundation with the Serum Institute.[223] Thus, the price commitment of no more than $3 per dose (for 200 million doses) can be applied by the Serum Institute to either the Novavax vaccine or to a vaccine developed by Oxford University and AstraZeneca.[224]

Ultimately, the Serum Institute could potentially charge more than $3 per dose to all buyers of the Novavax vaccine (for potentially all one billion doses) though the price targets or any

requirements for such sales depends on the contract between Novavax and the Serum Institute, which has not been disclosed, and the pricing strategy adopted by the Serum Institute.

As for revenue and profits made from the Novavax COVID-19 vaccine, no information is available.

Manufacturing and production

Novavax has partnered with multiple producers worldwide to manufacture the vaccine at scale. According to Novavax, it is aiming to produce up to two billion doses of its vaccine in 2021.[225] Separately, Novavax has stated it could reach 'full capacity' as early as mid-year 2021, which would translate into producing 150 million doses monthly.[226]

Alongside its manufacturing agreement with the Serum Institute, which should produce up to one billion doses of the vaccine in 2021, the company acquired a Czech manufacturing facility for $167 million, using funding provided to the company by CEPI. This facility could produce up to one billion doses per year.[227] Novavax also established at least ten other manufacturing partnerships, including technology transfer agreements in Japan, Poland and India, as well as contract manufacturing deals in Spain, the United States, South Korea, and Germany.[228] In January 2021 the company announced a new partnership with the Canadian government to produce 'millions of doses' in Canada.[229] One of these partnerships includes an undisclosed amount of funding from the government of Japan to one of Novavax's partners for up to 250 million doses per year.[230]

Sharing intellectual property, technologies, and know-how

Novavax has disclosed in its contract with Operation Warp Speed that it has rights to intellectual property for its vaccine candidate, though the actual patents are not listed in the contract included in its SEC filing. The contract does state that the company's own IP (its so-called Background IP) includes the following: manufacturing know-how, including, without limitation, the NVAX-Cov2373 manufacturing process, data, proprietary manufacturing materials, and critical reagents.[231]

The company has signed manufacturing and licensing agreements with several manufacturers noted above, although the scope of these agreements, including the terms and conditions related to licensing of intellectual property and know-how, as well as technology transfer, are not disclosed. Under the terms of its funding agreements with CEPI, CEPI has a worldwide, royalty-free license to intellectual property required to produce the vaccine that can be exercised if the vaccine has been authorized by one regulatory agency, and one of several conditions has occurred, such as the company breaching the Equitable Access Plan or declining to expand its work with CEPI upon request.[232]

The US government also has 'march-in' rights under the terms of its Agreement with Novavax through Operation Warp Speed, which can be exercised if the company does not meet certain commitments for public use, including if the US government needs to 'alleviate health or safety needs which are not reasonably satisfied' by Novavax.[233] The US government can also exercise its use of the intellectual property if the company does not fulfil the original supply commitment of 100 million doses (and the vaccine has been approved for use).[234] The company has not indicated

any intent to share its intellectual property and know-how with the COVID-19 Technology Access Pool.

Fair distribution between countries

Novavax has signed several vaccine deals for its product through advanced purchase agreements in rich and poorer countries alike. Among wealthy nations, the US government secured 100 million doses through Operation Warp Speed,[235] with an option to order an additional 560 million doses although the timing of such a purchase and manufacturing timetable is not clear.[236] This is in addition to the commitment of 10 million doses to the US Department of Defense discussed above. The UK has signed an advanced purchase agreement for 60 million doses,[237] and Canada has signed a deal for 52 million doses,[238] with an option to acquire 24 million doses. Australia has signed an agreement for 51 million doses,[239] while New Zealand has signed an agreement for 10.7 million doses.[240] South Korea purchased 40 million doses of the vaccine as well,[241] as did Switzerland for 6 million doses.[242] Beyond these confirmed agreements, the European Union has held preliminary talks to purchase up to 200 million doses of the vaccine.[243]

In low and middle-income countries, via the Serum Institute, Novavax agreed to supply the Philippines with 30 million doses,[244] the Government of Indonesia 50 million doses,[245] 15 million for Ukraine,[246] and 100 million doses for COVAX, with an option of 450 million more.[247]

Thus, if including all the options and assuming all COVAX doses go to poorer countries, roughly 914 million Novavax doses have been acquired by high-income countries through advanced commitments, while 645 million doses have been acquired by low- or middle-income countries.

As noted above, the Serum Institute has committed to supply COVAX advanced market commitment countries with up to 200 million doses of either the Novavax vaccine or AstraZeneca/Oxford vaccine at a price that does not exceed $3 per dose.[248] COVAX also indicated that it has an option for up to 900 million doses more of either the AstraZeneca/Oxford or Novavax vaccine candidates, presumably from production lines managed by the Serum Institute, though such contracts between COVAX and the Serum Institute have not been published.[249] Finally, a Japanese company, with support of the Japanese government, will produce up to 250 million doses of the vaccine per year,[250] although the intended destination (e.g., whether the product can be sold outside of Japan) is unclear. It is not clear either if any of the other manufacturing agreements, or its own production from its manufacturing facility in the Czech Republic, will be provided to LMICs.

CEO pay

Total calculated compensation[251]

FY 2020: [Not yet disclosed]
FY 2019: $2.4 million
FY 2018: $4.2 million

Pandemic stock sales[252]

Since the pandemic began, Novavax CEO Stanley C. Erck has cashed out over $9.2 million in Novavax stock.[253]

Political lobby spend on US federal government[254]

Q1 2020: $10,000
Q2 2020: $50,000
Q3 2020: $90,000
Q4 2020: $60,000
Total 2020: $210,000

Recent shareholder payouts[255]

2020: $39 million in share buybacks
2019: 0

Pfizer / BioNTech (BNT-162)

Research and development

Pfizer and BioNTech jointly conducted clinical trials for their COVID-19 vaccine,[256] based on BioNTech's proprietary mRNA technology. The companies published results from their Phase 3 trials in December 2020, which indicated that the vaccine had a 95% efficacy in preventing COVID-19 in those without prior infection seven days or more after administration of the second dose (the vaccine requires two doses).[257] Studies have indicated the antibodies generated by the vaccine are still effective against both the B.1.1 and B.1.351 variants.[258,259] Pfizer has indicated it will initiate studies of a booster shot of its existing vaccine as well the development of a customized booster against new strains, which would be given six months to a year after the two doses.[260]

The two-dose vaccine was issued emergency authorization by the USFDA in December 2020.[261] Prior to the USFDA emergency authorization, emergency authorization had also been issued by Britain, Bahrain, Canada, Saudi Arabia, and Mexico.[262] Since the USFDA emergency authorization, the vaccine obtained a conditional marketing authorization by the European Medicines Agency and has also obtained an emergency use listing at the World Health Organization, which both facilitates regulatory approval in many countries and also enables the purchase of the vaccine by procurement agencies such as UNICEF and the Pan American Health Organization.[263] In total, the companies have obtained emergency authorization or conditional regulatory approval from at least fifty countries.[264]

Public funding

Pfizer has stated that it would not itself rely on government funding, saying that it could move faster on its own.[265] Pfizer announced it was willing to spend $1 billion in 2020 to develop and manufacture the vaccine before seeing positive results, [266] but the company has not publicly disclosed (or committed to disclose) the true cost of the R&D and manufacturing, nor other details on whether or how precisely it may spend this budget. Furthermore, during clinical development of the vaccine, Pfizer signed a contract with the federal government, in which the US agreed to spend nearly $1.9 billion to secure 100 million doses of the company's vaccine—significantly de-risking the project by securing an early purchaser and guaranteeing a market for the vaccine. The European Union also struck an early 200 million dose deal with Pfizer at an undisclosed per dose price. After these initial supply agreements, Pfizer also signed additional supply agreements throughout 2020 that are described below.

For its part, BioNTech—the owner of the intellectual property for BNT-162—received a $117 million (€100m) debt financing agreement with the European Investment Bank, a publicly owned international financial institution whose shareholders are the EU member states, for the development of its vaccine.[267] BioNTech also received a $439 million (€375m) grant from the German Federal Ministry of Education and Research to support scale-up of manufacturing and development process.[268] Summing these early European, German and US public investments, the BNT-162 vaccine received approximately $2.5 billion in taxpayer money before emergency use authorization.

The spike protein used by BioNTech to develop the vaccine is based in part on a 'freezing technology' developed by the National Institutes of Health and academic researchers[269] that maintains a spike protein in its prefusion shape,[270] and without which the rapid development of an effective coronavirus vaccine that relies on lab-manufactured spike proteins would not have been possible.[271] This technology has also been used by at least four other vaccine companies.[272] The financial benefit of this public innovation remains undisclosed.

Transparency

Pfizer and BioNTech have not yet committed to disclosing the terms and conditions of any contracts for development or procurement with public entities, nor to being transparent about the true cost of R&D and manufacturing of their vaccine candidate. Several contracts signed by Pfizer and BioNTech have been released as a result of public pressure, including the following: (a) the loan agreement between the European Investment Bank and BioNTech;[273] (b) the heavily-redacted $1.9 billion purchase agreement between Pfizer and the US government[274]; and (c) a data sharing agreement between Pfizer and the Government of Israel, which obtained early access to the Pfizer vaccine in exchange for sharing medical data with Pfizer collected from its COVID-19 immunization program.[275]

Pricing, revenue and profits

Last year, Pfizer's CEO, Albert Bourla, stated, "If we were to implement free, open-market principles in pricing the product, we could go to huge prices and sell everything we can manufacture. But it would be unethical, I think. We will not do it, because that's really taking advantage of a situation, and people will not forget if you do that."[276] However, he also stated

that the vaccine is a "huge commercial opportunity,"[277] and that the company will not take a not-for-profit approach to the COVID-19 vaccine, as other companies have.[278] Bourla also indicated that a booster shot could be a source of sustained revenues for the company into the future.[279]

In the US, the companies priced the vaccine at $19.50 per a dose, or approximately $40 per two-dose regimen, for its 100 million dose order.[280] Subsequent orders by the US in December 2020 and February 2021 priced the doses the same.[281] Pricing is based on a number of factors, according to the company's communication with investors, including volume purchased, advanced purchase time, equity and value from health savings.[282]

Outside the US, price points for other countries remain murky. According to a disclosure by a Belgian government official, the European Union is paying 12 Euros per dose for the vaccine,[283] or approximately $28 per course. According to a leaked document, Pfizer will charge the African Union $6.75 each, or $13.50 per course.[284] Pfizer and BioNTech also announced an agreement with COVAX to offer the vaccine at a 'not-for-profit' price for the 91 low and low-middle income countries included in COVAX's Advanced Market Commitment – however, the not-for-profit price has not been disclosed publicly.[285] The terms and prices for other contracts signed between the companies and multiple governments and procurement agencies have not been disclosed either.

Pfizer is developing boosters for emerging variants to COVID-19, as mentioned above. While the company has not disclosed the price it will charge for these booster shots, the market for boosters could be substantial. On a February 2, 2021 investor call, company executives for Pfizer indicated that it would seek a higher price for a booster shot, especially if such booster shots were required after the pandemic was over.[286] Post-pandemic, according to the company, "Obviously, we're going to get more on price. And clearly… there's a significant opportunity for those margins to improve once we get beyond the pandemic environment." The company cited the typical price it receives for vaccines at $150, $175 per dose.[287]

Pfizer/BioNTech's vaccine has, so far, the highest publicly disclosed price of the vaccine candidates explored in this brief.

Pfizer and BioNTech expect to sell $15 billion worth of COVID-19 vaccines in 2021, evenly split between both companies.[288] That's nearly as much as Pfizer's three best-selling products combined and would make the BNT-162 vaccine the third biggest seller amongst all pharmaceutical products worldwide,[289] just behind the anti-inflammatory drug Humira, and the Moderna/NIH vaccine discussed elsewhere in this brief.

Pfizer expects to earn a 25-30% profit margin on the vaccine in 2021.[290] Pfizer and BioNTech together then are expected to earn between $3.75 billion and $4.5 billion (or roughly $2 billion) from its COVID-19 vaccine in 2021. And as mentioned above, the companies will look to increase the profits from this vaccine post-pandemic. Meanwhile, an industry financial analyst estimates that cost of goods sold for each dose is in the single digits.[291] Experts have estimated that the cost of manufacturing of mRNA vaccines like Pfizer's to be approximately $2 per dose.[292]

Manufacturing and production

Pfizer and BioNTech announced that they intend to produce 2 billion doses of the vaccine in 2021, which is an increase from earlier projections of 1.3 billion doses this year.[293] One reason for the increased estimate is that the companies lobbied regulators in the United States to expand the number of doses that can be drawn from each vial of the vaccine to six doses (from the previously approved five doses).[294] This allowed the company to provide more doses at least for supply to the United States with fewer vaccine vials.[295]

To meet manufacturing demand, Pfizer outsourced production of its current drug portfolio to its current 200 contractors to make way for its COVID-19 vaccine manufacturing operations.[296] Pfizer has designated three US sites (Kalamazoo, Michigan, Andover, Massachusetts, and St. Louis, Missouri) and one Belgian site (Puurs, Belgium) for its vaccine rollout.[297] BioNTech is producing the mRNA for the COVID-19 vaccine candidates for clinical trials in house at two of its existing facilities, and has subsequently announced additional acquisitions as well as manufacturing partnerships. In total the company now has thirteen partners or manufacturing sites.[298] For example, BioNTech acquired a GMP certified manufacturing facility in Marburg, Germany, which has a production capacity of up to 750 million doses per year, has obtained a manufacturing license and planned to start production for validation by the European Medicines Agency in February 2021.[299] Looking ahead, the company indicated that with an additional 'state aid' of 400 million Euros from the European Union it could expand production to 3 billion doses in 2022.[300]

Altogether, BioNTech has made two technology transfer agreements with Pfizer in the US and a company in China. The BNT-162 vaccine also benefits from contract manufacturing agreements with companies in the Germany and Switzerland.[301] No technology transfer nor any manufacturing agreements have been made in other low- and middle-income countries.

Pfizer also announced it would not manufacture the vaccine in India during the pandemic, but did indicate it would consider doing so only 'if it got faster regulatory clearance and freedom on pricing and exports.' While the company did indicate it would look at possibilities of manufacturing the vaccine outside the US and Europe after the pandemic was 'over', a company spokesman stated: "Pfizer has created two dedicated supply lines with established vaccine capabilities – one each in the US and Europe – to exclusively manufacture this vaccine for use across the world. This will continue to be the company's strategy for the time being. At this time, we are not in discussions for any additional local manufacturing for this vaccine."[302]

Sharing intellectual property, technologies and know-how

The German biotech company BioNTech owns the intellectual property for BNT-162.[303] Neither Pfizer nor BioNTech has made a public commitment in support of sharing its COVID-19 vaccine knowledge, technology, intellectual property, data and know-how to boost supply, reduce price and enhance equity.

Pfizer did however publicly oppose a World Trade Organization initiative which would temporarily waive certain categories of COVID vaccine-related IP rights under the Agreement of Trade-Related Intellectual Property Rights (TRIPS) until the majority of the world population receives effective vaccines and develops immunity to COVID-19.[304] BioNTech did not sign the letter.

Previously, when asked about the possibility of a voluntary mechanism under the WHO – through what is now known as the COVID-19 Technology Access Pool, the CEO of Pfizer, Albert Bourla, stated: “At this point in time, I think it’s nonsense, and...it’s also dangerous.”[305]

Fair distribution between countries

Pfizer and BioNTech, as of March 2021, have signed multiple supply agreements with numerous countries, most of the supply of which has been allocated to high-income countries and upper-middle income countries.

In July 2020, the UK pre-ordered 30 million doses of the vaccine,[306] and subsequently expanded its order to a total of 40 million doses.[307] Since the initial agreement of 100 million doses, [308] the US signed an agreement for another 200 million doses,[309] with the option of purchasing at least 400 million more doses.[310] Canada ordered 40 million doses with an option to buy 36 million more.[311] The Canadian government and Pfizer have not agreed if this should be based upon drawing five or six doses from each vaccine vial.[312] Japan also secured 144 million doses.[313] The European Union signed agreements for 500 million doses, with an option to buy 100 million more.[314] Australia has purchased 20 million,[315] Germany 30 million,[316] Kuwait 1 million, Taiwan 30 million, Israel 8 million, Switzerland 6 million, and New Zealand 10 million.[317]

Pfizer and BioNTech have made numerous supply agreements with upper-middle income countries as well. This includes Peru, Chile and Costa Rica, which each have secured individual deals with the companies, for 9.9 million,[318] 10.1 million[319], and 3 million doses,[320] respectively. Other supply agreements that have been signed include Malaysia, South Africa, Uruguay, Panama, Brazil, Mexico, and Lebanon, amongst several other countries.[321]

Pfizer and BioNTech signed a supply agreement with COVAX to supply 40 million doses of the vaccine for the 91 low- and low-middle income countries in the advanced market commitment for COVAX.[322] The companies also signed an agreement with the African Union to provide 50 million doses of the vaccine.[323]

In total, then high-income countries have secured an estimated 1.67 billion doses of the vaccine, when including options. Low and-middle income countries have secured approximately 290 million doses of the vaccine. Thus, out of a total of 2 billion doses that are expected to be sold in 2021, poorer countries will comprise 15% percent of total supply. Rich countries meanwhile have captured 83% of the supply of BNT-162.

Unallocated doses may either be based on sales to be completed or may only materialize if Pfizer and BioNTech convince existing purchasers to draw six doses from each five-dose vaccine vial.

CEO pay (Pfizer)

Total calculated compensation[324]

FY 2020: $21,033,570
FY 2019: $17,928,963
FY 2018: $9,854,557

Pandemic stock sales[325]

Since the pandemic began, Pfizer's CEO Albert Bourla has cashed out over $5.6 million in Pfizer stock.[326]

Recent investor payouts (Pfizer)[327]

2020: $8.44 billion ($8.44 billion in dividends; $0 in share buybacks)
2019: $16.9 billion ($8 billion in dividends; $8.9 billion in share buybacks)

Political lobby spend in US federal government (Pfizer)[328]

Q1 2020: $4,090,000
Q2 2020: $2,470,000
Q3 2020: $1,930,000
Q4 2020: $2,380,000
Total 2020: $10,870,000 USD

Recommendations

We have multiple safe and effective vaccines that could help us win against COVID-19, but we lack the political will to increase their supply and facilitate distribution everywhere. COVID-19 anywhere is COVID-19 everywhere. That's why we are calling on pharmaceutical corporations and the US government to back a People's Vaccine.

We urge pharmaceutical corporations developing COVID-19 vaccines to:

Become fully transparent about all public subsidies and tax incentives received, the true costs of producing treatments and vaccines, and all lobbying activities here and around the world.

Contribute to making COVID-19 vaccines free of charge to the public by setting the price of vaccines as close to the true cost of manufacturing as possible.

Forgo monopoly control over all COVID-19 vaccines to allow for worldwide, low-cost production to meet the unprecedented demand. This will require sharing of intellectual property, data, know-how and to engage in deep technology transfer where appropriate.

Commit to support fair global and domestic distribution based on need, not price or nationality.

Contribute their fair share of tax to support public health systems—by publicly committing to pay tax on profits where economic activity takes place, stop shifting profits to low-tax jurisdictions, and committing to begin reporting to the Global Reporting Initiative's new Tax Standard.

We urge the President of the United States of America to:

Lead the way to an internationally agreed roadmap to global herd immunity, with at least 60% of people across all countries offered a vaccine by the end of 2021.

Push for full transparency over US funding for development and purchase of COVID-19 vaccines, including by publishing contracts (and all of the terms and conditions of agreements signed) with companies and manufacturers so that the public can know what access terms have been negotiated, as well as determining the contributions to R&D provided for by the US government.

Guarantee that COVID-19 vaccines are made available free of charge to everyone, everywhere, with priority toward those most in need and/or at-risk. To make this fiscally responsible for the US and other governments, this will require including meaningful affordability conditions in government contracts with drug companies.

Immediately engage with world leaders to negotiate a fair global and equitable rapid manufacturing and distribution plan for the vaccines and all COVID-19 products and technologies that guarantees transparent 'at true cost-prices' and supplies according to need. The US should align itself, as much as possible, with the WHO's equitable allocation framework, and ensure sharing of new vaccines with - at a minimum - at risk populations and front-line workers around the world.[329]

Commit to take all possible steps to expand supply of the vaccines by ensuring that the vaccine developers share the technology and know-how, engage in open licensing of intellectual property so that vaccines can be manufactured around the world, free of monopoly control, and thereby available through a robust and affordable supply globally. This should be done through the existing global COVID-19 Technology Access Pool (C-TAP), so that COVID-19 vaccine licenses are freely available to all countries. In principle, Dr. Fauci seems to support this path.330 Likewise, both BARDA and the NIH can attach or invoke technology-transfer and reasonable-pricing conditions to contracts, while government agencies can also overcome patent barriers and authorize competition through the government use of patents (28 USC 1498). Furthermore, the US government can license such technologies and related knowledge to qualified manufacturers, to partner governments, to the World Health Organization and other entities, to both advance research and expand supply of a new vaccine.[331]

Support the temporary, emergency COVID-19 WTO waiver of certain TRIPS provisions being proposed by over 100 countries worldwide. This step would significantly facilitate governments and manufacturers worldwide to invest in making COVID vaccines and treatments as rapidly as possible, in as many places as possible, for the billions of people who still need them.

Announce an ambitious global vaccine manufacturing program, along with requisite funding lines, to end the pandemic and build vaccine infrastructure, especially in developing countries, for the future, helping to produce billions of additional vaccine doses within approximately one year. [332]Should the private sector be unable to produce at scale, as is the case today, **invoke the Defense Production Act and the All-Hazards Preparedness Act to ensure mass manufacturing of the vaccines**. The US can activate several existing manufacturing facilities

for this purpose and build more, much as other governments, such as the United Kingdom and Canada, have done in recent months.

Secure a significant global investment in health services to achieve universal health coverage, including the training and recruitment of millions of new health workers needed to deliver the vaccine roll out and deliver health care for all. The legacy of this terrible pandemic should be a global united effort to ensure every human being realizes their right to health.

Company engagement

Oxfam reached out to all the vaccine developers named in this briefing to ensure accuracy and fairness of the research findings. J&J, Novavax, Merck and AstraZeneca each responded with constructive feedback that has been incorporated into this analysis.

Endnotes

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[3] See: https://www.citizen.org/news/66-health-and-development-orgs-biden-must-launch-a-global-vaccine-manufacturing-program-to-end-the-pandemic/
[4] For CEO pay, Oxfam uses the indicator using Total Calculated Compensation, which is equivalent to Total Annual Cash Compensation + Option Awards, sourced from the financial database Capital IQ, which is itself based on company filings. For shareholder payouts, Oxfam includes Total Dividends Paid and Share Repurchases, also sourced from the financial database Capital IQ.
[5] Transparency in public funding is lacking across all the COVID-19 vaccine developers, making firm figures difficult. Oxfam has arrived at these estimates by analyzing the research and development, manufacturing and advanced purchase deals made between the companies and some governments, notably the US. While Oxfam attempted to include all sources of public funding across these 3 areas (research and development, manufacturing and procurement), we were not able to be comprehensive due to contract opacity. Note also that these sums do not include the public investments in years of early research, which preceded COVID but was essential to these vaccines succeeding. These amounts also do not include purely philanthropic contributions. As a result, these estimates are conservative, and likely much less than the total public investments.
[6] Course here is defined as the entire regimen of doses needed to provide protection. Two doses are required for each vaccine in this breif, with the exception of the Johnson & Johnson vaccine.
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[18] See: https://www.sciencemag.org/news/2021/02/south-africa-suspends-use-astrazenecas-covid-19-vaccine-after-it-fails-clearly-stop
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[25] See: https://www.citizen.org/article/the-peoples-vaccine/
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[30] See: https://www.publicmeds4covid.org/; https://mrc.ukri.org/news/browse/covid-19-vaccine-therapy-research-boosted-by-six-new-projects-in-rapid-response/; https://www.ukri.org/research/coronavirus/covid-19-research-and-

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[91] See: https://www.unicef.org/supply/covid-19-vaccine-market-dashboard
[92] See: https://www.jnj.com/johnson-johnson-statement-on-collaboration-with-merck
[93] See: https://www.merck.com/news/merck-to-help-produce-johnson-barda-to-provide-merck-with-funding-to-expand-mercks-manufacturing-capacity-for-covid-19-vaccines-and-medicines/
[94] See: https://www.fiercepharma.com/manufacturing/merck-snares-268m-barda-funding-to-boost-capacity-for-j-j-covid-19-vaccine#:~:text=Manufacturing-,Merck%20snares%20%24269M%20in%20US%20funding%20to%20prep,Johnson%20%26%20Johnson's%20COVID%2D19%20vaccine&text=Merck%20is%20using%20BARDA%20funding,COVID%2D19%20vaccines%20and%20drugs
[95] See: https://www.merck.com/news/merck-to-help-produce-johnson-barda-to-provide-merck-with-funding-to-expand-mercks-manufacturing-capacity-for-covid-19-vaccines-and-medicines/
[96] See: https://patentdocs.typepad.com/files/2021-03-05-phrma-letter.pdf
[97] See: https://www.keionline.org/34478
[98] See: https://www.cnbc.com/2020/08/05/jj-reaches-deal-with-us-for-100-million-doses-of-coronavirus-vaccine-at-more-than-1-billion.html.
[99] See: https://www.hhs.gov/sites/default/files/janssen-corp-covid-19-vaccine-contract.pdf
[100] See: https://www.voanews.com/covid-19-pandemic/us-buy-100-million-added-johnson-johnson-vaccine-doses
[101] See: https://www.bbc.com/news/health-53772650
[102] See: https://www.jnj.com/our-company/johnson-johnson-announces-collaboration-in-principle-with-the-united-kingdom-on-additional-phase-3-study-and-agreement-to-supply-its-covid-19-vaccine-candidate
[103] See: https://www.bloomberg.com/news/articles/2020-08-13/europe-seeks-200-million-vaccine-doses-from-johnson-johnson?srnd=coronavirus
[104] See: https://www.tvnz.co.nz/one-news/new-zealand/govt-agrees-purchase-5-million-doses-johnson-johnsons-covid-19-vaccine
[105] See: https://uk.reuters.com/article/us-health-coronavirus-novavax-canada/canada-wants-to-be-at-front-of-line-for-coronavirus-vaccines-signs-deals-with-novavax-and-johnson-johnson-idUKKBN25R1SX
[106] See: https://world.kbs.co.kr/service/news_view.htm?lang=e&Seq_Code=158497
[107] See: https://www.reuters.com/article/health-coronavirus-chile-vaccine-idINKBN2A31Z2
[108] See: https://www.reuters.com/article/health-coronavirus-mexico-janssen/mexico-says-could-order-22-mln-more-vaccine-doses-from-jj-idINL1N2IP055
[109] See: https://www.gov.br/saude/pt-br/assuntos/noticias/ministerio-da-saude-fecha-acordo-com-pfizer-e-janssen-para-mais-138-milhoes-de-doses-de-vacinas-covid-19
[110] See: https://www.reuters.com/article/us-health-coronavirus-colombia-vaccine-idUSKBN29500W
[111] See: https://www.swissinfo.ch/eng/exclusive--covid-19-shots-to-cost--3-to--10-under-african-union-vaccine-plan/46301804
[112] See: http://newsfile.refinitiv.com/getnewsfile/v1/story?guid=urn:newsml:reuters.com:20210329:nCNWXsBD5a&default-theme=true
[113] See: https://www.jnj.com/our-company/johnson-johnson-announces-agreement-in-principle-with-gavi-to-supply-janssens-covid-19-vaccine-candidate-to-lower-income-countries-in-2021
[114] Capital IQ, using Total Calculated Compensation = Total Annual Cash Compensation + Option Awards
[115] Oxfam analysis of SEC Form 4 filings, See: https://www.secform4.com
[116] Oxfam analysis of Total Dividends Paid and Repurchase of Shares, using Capital IQ database. See: https://www.oxfam.org/en/research/power-profits-and-pandemic
[117] See: https://www.opensecrets.org/federal-lobbying/clients/summary?cycle=2020&id=D000000386
[118] See: https://www.hhs.gov/about/news/2021/02/11/biden-administration-purchases-additional-doses-covid-19-vaccines-from-pfizer-and-moderna.html
[119] See: https://investors.modernatx.com/news-releases/news-release-details/moderna-announces-publication-results-pivotal-phase-3-trial
[120] See: https://investors.modernatx.com/news-releases/news-release-details/moderna-announces-publication-results-pivotal-phase-3-trial

[121] See: https://www.who.int/news-room/feature-stories/detail/the-moderna-covid-19-mrna-1273-vaccine-what-you-need-to-know
[122] See: https://www.who.int/news-room/feature-stories/detail/the-moderna-covid-19-mrna-1273-vaccine-what-you-need-to-know
[123] See: https://www.nytimes.com/2021/01/25/health/coronavirus-moderna-vaccine-variant.html
[124] See: https://www.politico.com/news/2021/01/25/moderna-booster-shot-vaccine-covid-variant-462131
[125] See: https://www.fda.gov/emergency-preparedness-and-response/coronavirus-disease-2019-covid-19/moderna-covid-19-vaccine#:~:text=On%20December%2018%2C%202020%2C%20the,SARS%2DCoV%2D2).
[126] See: https://www.canada.ca/en/health-canada/news/2020/12/health-canada-authorizes-moderna-covid-19-vaccine.html
[127] See: https://www.gov.uk/government/news/moderna-vaccine-becomes-third-covid-19-vaccine-approved-by-uk-regulator
[128] See: https://www.ema.europa.eu/en/news/ema-recommends-covid-19-vaccine-moderna-authorisation-eu
[129] See: https://extranet.who.int/pqweb/sites/default/files/documents/Status_COVID_VAX_23March2021_0.pdf
[130] See: https://www.cnbc.com/2021/01/11/covid-vaccine-moderna-doesnt-expect-data-for-young-children-this-year.html
[131] Zain Rizvi, The People's Vaccine, Public Citizen, pg 7, June 4, 2020.
[132] See: https://www.biopharmadive.com/news/coronavirus-moderna-phase-3-start-vaccine-trial/582330/.
[133] See: https://www.nasdaq.com/press-release/moderna-provides-US-covid-19-vaccine-supply-update-2021-01-26
[134] See: https://www.hhs.gov/about/news/2021/02/11/biden-administration-purchases-additional-doses-covid-19-vaccines-from-pfizer-and-moderna.html
[135] See: https://www.businesswire.com/news/home/20200518005788/en/Moderna-Announces-Pricing-of-Public-Offering-of-Shares-of-Common-Stock
[136] Zain Rizvi, The People's Vaccine, Public Citizen, pg 7, June 4, 2020; Also see: https://www.patientsforaffordabledrugs.org/2020/05/10/covid-blog-moderna/.
[137] See: https://www.patientsforaffordabledrugs.org/2020/05/10/covid-blog-moderna/.
[138] See: https://www.thenation.com/article/society/peoples-vaccine-covid-funding/
[139] See: https://www.documentcloud.org/documents/6956323-NIH-Statement-to-Axios.html
[140] See: https://www.citizen.org/article/leading-covid-19-vaccines-depend-on-nih-technology/?eType=EmailBlastContent&eId=3dbde9f7-8f59-48e0-99d8-78b49ea5e77e
[141] See: https://www.thisamericanlife.org/727/boulder-v-hill; https://www.citizen.org/article/leading-covid-19-vaccines-depend-on-nih-technology/
[142] See: https://www.nytimes.com/2020/11/18/world/dolly-parton-donated-1-million-to-help-develop-a-coronavirus-vaccine.html
[143] See: https://www.fiercepharma.com/vaccines/novavax-scores-cepi-s-largest-award-up-to-384m-to-support-covid-19-vaccine-work; https://www.cnn.com/2020/11/18/entertainment/dolly-parton-moderna-covid-vaccine-reaction-trnd/index.html
[144] See: https://www.keionline.org/34386
[145] See: https://www.sec.gov/Archives/edgar/data/1682852/000168285220000023/exhibit101.htm
[146] See: https://www.sec.gov/Archives/edgar/data/1682852/000168285220000023/lonzamodernagltafullye.htm
[147] See: https://www.sec.gov/Archives/edgar/data/1682852/000168285220000023/exhibit103.htm
[148] See: https://investors.modernatx.com/news-releases/news-release-details/modernas-commitment-vaccines-and-therapeutics-access
[149] For comparison, Pfizer's Prevnar 13, which treats pneumococcal pneumonia, costs $200 for each of its four doses in a full-course. See: https://www.businessinsider.com/how-much-will-coronavirus-vaccine-cost-2020-5. See also CDC Vaccine Price List, https://www.cdc.gov/vaccines/programs/vfc/awardees/vaccine-management/price-list/index.html.
[150] See: https://investors.modernatx.com/news-releases/news-release-details/modernas-commitment-vaccines-and-therapeutics-access
[151] Moderna, Inc. Form 8-K, US SEC, https://investors.modernatx.com/static-files/5ca1f25d-3452-4a63-b292-cfaf56ba49e0
[152] See: https://www.theguardian.com/world/2020/dec/18/belgian-minister-accidentally-tweets-eus-covid-vaccine-price-list
[153] See: https://www.reuters.com/article/health-coronavirus-eu-vaccines-idUSL1N2JM1U2
[154] See: https://www.cnbc.com/2020/08/05/moderna-is-pricing-coronavirus-vaccine-at-32-to-37-per-dose-for-some-customers.html
[155] See: https://news.bloomberglaw.com/health-law-and-business/moderna-offers-south-africa-vaccines-at-30-to-42-a-dose

[156] See: https://www.cnbc.com/2020/08/05/moderna-is-pricing-coronavirus-vaccine-at-32-to-37-per-dose-for-some-customers.html
[157] See: https://investors.modernatx.com/static-files/fc81a52b-3608-4977-b7a0-daa4f3f4107f
[158] See: https://www.nytimes.com/live/2021/02/01/world/covid-19-coronavirus/moderna-wants-to-increase-the-number-of-vaccine-doses-in-each-vial-so-it-can-deliver-vaccine-faster
[159] See: https://investors.modernatx.com/events/event-details/moderna-4q-2020-earnings-call
[160] See: https://qz.com/1967638/pfizer-will-make-15-billion-from-covid-19-vaccine-sales/
[161] See: https://investors.modernatx.com/static-files/527316b2-da06-4b48-af9c-c3d3a3baa48a
[162] Author estimate, based on financial statements reported by Moderna.
[163] See: https://www.nytimes.com/2021/01/12/opinion/world-covid-vaccines.html; https://www.mdpi.com/2076-393X/9/1/3/htm
[164] See: https://investors.modernatx.com/news-releases/news-release-details/us-government-purchases-additional-100-million-doses-modernas
[165] See: https://investors.modernatx.com/news-releases/news-release-details/moderna-and-lonza-announce-worldwide-strategic-collaboration;
https://www.sec.gov/ix?doc=/Archives/edgar/data/1682852/000168285220000019/mrna-20200918.htm
[166] See: https://www.nytimes.com/live/2021/02/01/world/covid-19-coronavirus/moderna-wants-to-increase-the-number-of-vaccine-doses-in-each-vial-so-it-can-deliver-vaccine-faster
[167] See: https://theprint.in/health/csir-in-talks-to-bring-modernas-covid-vaccine-to-india-says-its-chief-shekhar-mande/594668/
[168] See: https://www.unicef.org/supply/covid-19-vaccine-market-dashboard
[169] See: https://investors.modernatx.com/news-releases/news-release-details/statement-moderna-intellectual-property-matters-during-covid-19
[170] See: https://www.oxfamamerica.org/press/oxfam-response-moderna-covid-19-patent-announcement/
[171] See: https://investors.modernatx.com/news-releases/news-release-details/modernas-commitment-vaccines-and-therapeutics-access
[172] See: https://patentdocs.typepad.com/files/2021-03-05-phrma-letter.pdf
[173] See: https://www.citizen.org/article/the-nih-vaccine/
[174] See: https://www.citizen.org/article/the-nih-vaccine/
[175] See: https://www.npr.org/sections/health-shots/2020/10/24/927474041/a-federal-coronavirus-vaccine-contract-released-at-last-but-redactions-obscure-t
[176] See: https://www.prep4all.org/news/nih-letter
[177] See: https://www.hhs.gov/about/news/2021/02/11/biden-administration-purchases-additional-doses-covid-19-vaccines-from-pfizer-and-moderna.html
[178] See: https://www.unicef.org/supply/covid-19-vaccine-market-dashboard
[179] See: https://investors.modernatx.com/events/event-details/moderna-4q-2020-earnings-call
[180] See: https://investors.modernatx.com/news-releases/news-release-details/canada-exercises-increased-option-total-40-million-doses-mrna
[181] See: https://investors.modernatx.com/events/event-details/moderna-4q-2020-earnings-call/
[182] See: https://www.reuters.com/article/health-coronavirus-japan-moderna-idUSL4N2JI1L7
[183] See: https://www.gov.uk/government/news/moderna-covid-19-vaccine-authorised-by-uk-medicines-regulator
[184] See: https://www.reuters.com/article/idUSKBN28E1ZM
[185] See: https://www.reuters.com/article/idUSKBN2A9362
[186] See: https://www.reuters.com/article/us-health-coronavirus-southkorea-vaccine-idUSKBN2951BH
[187] See: https://www.straitstimes.com/singapore/health/how-singapore-picked-its-covid-19-vaccines
[188] See: https://www.reuters.com/article/health-coronavirus-qatar-moderna-int-idUSKBN27A0M3
[189] See: https://www.reuters.com/article/us-health-coronavirus-philippines-modern/philippines-to-buy-20-million-moderna-vaccine-doses-as-covid-19-cases-rise-idUSKBN29O1AW
[190] See: https://newsinfo.inquirer.net/1408846/ph-govt-private-sector-sign-deal-for-20-million-doses-of-moderna-vaccines
[191] See: https://www.reuters.com/article/us-health-coronavirus-colombia-vaccine/colombia-reaches-covid-19-vaccine-agreements-with-moderna-sinovac-idUSKBN29Z01X
[192] See: https://www.reuters.com/article/us-health-coronavirus-indonesia-vaccine/indonesia-orders-20-million-covid-19-vaccine-doses-for-private-inoculations-idUSKBN2B70LV
[193] See: https://medicalxpress.com/news/2020-12-pfizer-moderna-covid-vaccine-access.html
[194] Capital IQ, using Total Calculated Compensation = Total Annual Cash Compensation + Option Awards
[195] Capital IQ, using Total Calculated Compensation = Total Annual Cash Compensation + Option Awards
[196] Oxfam analysis of SEC Form 4 filings, https://www.secform4.com

[197] This included the following stock sales and transaction dates: $233,857 on 3/13/2020; $733,930 on 3/20/2020; $313,375 on 3/27/2020; $401,348 on 4/1/2020; $362,419 on 4/3/2020; $755,232 on 4/13/2020; $1,280,356 on 4/17/2020; $520,819 on 4/24/2020; $1,385,125 on 5/1/2020; $1,428,758 on 5/8/2020; $724,200 on 5/15/2020; $879,060 on 5/20/2020; $761,250 on 5/22/2020; $946,591 on 5/29/2020; $639,056 on 6/5/2020; $201,978 on 6/10/2020; $680,849 on 6/12/2020; $713,715 on 6/19/2020; $298,024 on 6/22/2020; $569,250 on 6/24/2020; $670,000 on 6/25/2020; $669,892 on 6/26/2020; $657,576 on 7/1/2020; $1,154,204 on 7/1/2020; $599,400 on 7/2/2020; $620,400 on 7/8/2020; $1,294,972 on 7/10/2020; $1,594,460 on 7/15/2020; $1,502,402 on 7/17/2020; $1,538,690 on 7/22/2020; $790,461 on 7/24/2020; $1,517,800 on 7/29/2020; $1,438,545 on 7/31/2020; $1,455,610 on 8/5/2020; $1,421,031 on 8/7/2020; $1,372,160 on 8/12/2020; $1,372,160 on 8/12/2020; $761,991 on 8/14/2020; $1,876,927 on 8/19/2020; $736,640 on 8/21/2020; $1,306,150 on 8/26/2020; $736,640 on 8/28/2020; $1,153,564 on 9/1/2020; $656,500 on 9/3/2020; $1,472,319 on 9/9/2020; $645,259 on 9/11/2020; $1,293,810 on 9/16/2020; $1,336,626 on 9/18/2020; $1,266,910 on 9/23/2020; $756,519 on 9/25/2020; $1,940,203 on 9/30/2020; $780,251 on 10/2/2020; $1,376,070 on 10/7/2020; $1,411,259 on 10/9/2020; $1,473,090 on 10/14/2020; $828,618 on 10/16/2020; $609,183 on 10/20/2020; $773,358 on 10/23/2020; $1,302,650 on 10/28/2020; $755,133 on 10/30/2020; $604,902 on 11/2/2020; $1,331,630 on 11/4/2020; $789,789 on 11/6/2020; $1,310,890 on 11/10/2020; $1,810,902 on 11/12/2020; $1,742,830 on 11/18/2020; $1,665,581 on 11/20/2020; $892,800 on 11/25/2020; $2,509,220 on 11/27/2020; $1,946,492 on 12/1/2020; $3,117,093 on 12/3/2020; $3,608,950 on 12/9/2020; $1,758,291 on 12/11/2020; $2,617,590 on 12/16/2020; $2,209,422 on 12/18/2020; $2,340,000 on 12/23/2020; $1,286,190 on 12/28/2020; $1,064,430 on 12/30/2020; $1,105,500 on 12/31/2020; $1,207,964 on 1/4/2021; $2,198,640 on 1/6/2021; $1,259,500 on 1/8/2021; $2,341,600 on 1/13/2021; $1,441,839 on 1/15/2021; $2,373,390 on 1/20/2021; $2,902,530 on 1/27/2021; $1,913,687 on 1/29/2021; $3,072,790 on 2/3/2021; $1,928,751 on 2/5/2021; $1,644,660 on 2/9/2021; $1,782,900 on 2/11/2021; $2,010,106 on 2/12/2021; $3,286,520 on 2/17/2021; $1,930,893 on 2/19/2021; $2,862,590 on 2/24/2021; $1,708,845 on 2/26/2021; $2,596,200 on 3/3/2021; $1,415,858 on 3/5/2021; $2,532,060 on 3/10/2021; $1,499,289 on 3/12/2021; $2,791,920 on 3/17/2021; $1,575,547 on 3/19/2021.

[198] See: https://www.opensecrets.org/federal-lobbying/clients/summary?id=F318256

[199] See: https://www.sciencemag.org/news/2020/11/will-small-long-shot-us-company-end-producing-best-coronavirus-vaccine

[200] See: https://www.citizen.org/article/leading-covid-19-vaccines-depend-on-nih-technology/?eType=EmailBlastContent&eId=3dbde9f7-8f59-48e0-99d8-78b49ea5e77e

[201] See: https://www.thisamericanlife.org/727/boulder-v-hill; https://www.citizen.org/article/leading-covid-19-vaccines-depend-on-nih-technology/

[202] See: Begum, Jubeda & Mir, Nasir & Dev, Kapil & Buyamayum, Bidyarani & Wani, Mohd & Raza, Meesam. (2020). Challenges and prospects of COVID-19 vaccine development based on the progress made in SARS and MERS vaccine development. 10.22541/au.159008098.82988208.

[203] See: https://time.com/5946225/novavax-covid-19-phase-3-results/

[204] See: https://www.globenewswire.com/news-release/2021/02/04/2170335/0/en/Novavax-Announces-Start-of-Rolling-Review-by-Multiple-Regulatory-Authorities-for-COVID-19-Vaccine-Authorization.html

[205] See: https://www.hhs.gov/about/news/2020/07/07/hhs-dod-collaborate-novavax-produce-millions-covid-19-investigational-vaccine-doses-commercial-scale-manufacturing-demonstration-projects.html

[206] See: https://ir.novavax.com/news-releases/news-release-details/novavax-awarded-department-defense-contract-covid-19-vaccine

[207] See: https://ir.novavax.com/news-releases/news-release-details/novavax-receive-388-million-funding-cepi-covid-19-vaccine

[208] Id.

[209] See: https://www.gatesfoundation.org/How-We-Work/Quick-Links/Grants-Database/Grants/2020/07/INV-021500

[210] See: Novavax 10-Q, US SEC, https://ir.novavax.com/node/14936/html

[211] See: https://www.citizen.org/article/covaxs-choices/#_ftn60

[212] See: https://www.npr.org/sections/health-shots/2020/11/11/933864908/novavax-posts-coronavirus-vaccine-contract-that-government-didnt-disclose

[213] See: https://www.keionline.org/35185

[214] Id.

[215] Id.

[216] See: https://www.fiercepharma.com/pharma/where-do-covid-19-vaccine-players-stand-pricing-no-profit-slight-profit-or-discussions

[217] See : https://www.citizen.org/article/covaxs-choices/#_ftn60

[218] Id.

[219] Novavax, in its response to Oxfam, stated that “We would disagree with drawing a straight line between the reimbursable costs that the government will cover and the cost per dose to manufacture. The manufacturing budget reflects only those costs that were mutually agreed upon between Novavax and the US Government to be reimbursed under the terms of the award and within the bounds of US Government contracting cost principles. As such, any manufacturing expenses that are funded by other means (internally or through other sponsors) or costs that are not typically allowable under US Government contracting would not be captured in the budget.” The company did not however provide an alternative price.
[220] See: https://www.sec.gov/Archives/edgar/data/1000694/000155837020013462/nvax-20200930xex10d1.htm
[221] See: https://www.keionline.org/35185
[222] See: https://ir.novavax.com/news-releases/news-release-details/novavax-announces-covid-19-vaccine-manufacturing-agreement-serum
[223] See: https://www.seruminstitute.com/news_sii_gavi_bmgf.php
[224] See: https://www.seruminstitute.com/news_sii_gavi_bmgf.php
[225] See: https://www.statnews.com/2021/01/28/novavax-says-its-covid-19-vaccine-is-90-effective-but-far-less-so-against-one-variant/
[226] See: https://www.reuters.com/article/us-health-coronavirus-vaccine-novavax/novavax-expects-to-produce-150-million-vaccine-doses-per-month-as-early-as-may-ceo-idUSKBN29Y2WP
[227] See: https://www.biopharma-reporter.com/Article/2020/06/02/Novavax-acquires-Praha-Vaccines
[228] See: https://www.unicef.org/supply/covid-19-vaccine-market-dashboard
[229] See: https://www.cbc.ca/news/politics/vaccines-canada-production-trudeau-1.5897343
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