COVID-19: The biopharmaceutical industry is leading the way in developing vaccines, treatments & diagnostics

As a science-driven industry that aims to address some of the world's biggest healthcare challenges, the biopharmaceutical industry is uniquely positioned to respond rapidly to COVID-19. It has deep scientific knowledge gained from decades of experience working on developing solutions for combating a range of infectious diseases such as MERS, SARS, Ebola and influenza, as well as experience working with health authorities and regulators to find a fast-tracked approach to bringing safe and effective medicines, vaccines and diagnostics to the market for patients.

The rapid spread of SARS-CoV-2 across the globe is a major public health threat for all, with profound health, social and economic impacts around the world. More than ever, we need effective international cooperation to ensure that no-one is left behind in the race to tackle the spread of COVID-19. This cooperation requires coordinated, multi-stakeholder action that includes the private sector as a critical partner. IFPMA members are fully committed to bringing their unique expertise in research, development and manufacturing of diagnostics, medicines and vaccines to the table.

*IFPMA members are also committed to work in close collaboration with national regulatory agencies, academia and global* 

**RELATED RESOURCES**

*Statements*

IFPMA Statement on the “Solidarity Call to Action to realize equitable global access to COVID-19 health technologies through pooling of knowledge, intellectual property and data”
health stakeholders to maintain access to existing medicines and vaccines for treatment and prevention of other conditions, while also continuing clinical research into new options and treatments for serious, life-threatening diseases (Read our Regulatory Guiding Principles here).

IFPMA has joined the global public-private partnership, ACT Accelerator, as founding partner, and it is bringing to this partnership its knowledge and expertise in the discovery and development of medicines and vaccines, as well as its experience in building manufacturing capacity and distribution networks. IFPMA has published the Vaccines policy principles that will guide its work going forwards with the ACT Accelerator Vaccines Partnership (CoVax).

**REPURPOSE EXISTING & TEST NEW TREATMENTS**

Rapidly screen the industry's vast libraries of medicines to identify potential treatments and undertake numerous clinical trials to test new and existing therapies.

As of 14 April 2020, the WHO’s landscape analysis of potential treatments for COVID-19 contains 133 therapeutics. Further, the WHO Solidarity Trial has brought together over 100 countries working together to find effective therapeutics for COVID-19 as fast as possible. IFPMA members have also been reviewing their drug portfolios, which involves scientists searching for potentially useful assets that could help with the development of new or repurposed treatments to fight against the novel coronavirus. On March 28, the US FDA approved Emergency Use Authorization (EUA) for chloroquine/hydroxychloroquine to facilitate the availability of these potential treatments during the COVID-19 pandemic.

**AbbVie** is partnering with global authorities to determine the effectiveness of HIV drugs lopinavir/ritonavir in treating COVID-19.

**Amgen** and Adaptive Biotechnologies (Seattle, USA) are partnering to combine expertise to discover and develop fully human neutralizing antibodies targeting SARS-CoV-2 to potentially prevent or treat COVID-19.

**Astellas** In Japan, Astellas is providing compounds in response to a request from the Ministry of Health, Labour and Welfare and National Institute of Infectious Diseases to cooperate in the “Basic Screening Plan for Drugs for Coronavirus Disease”. Astellas is also responding to requests from the European Federation of Pharmaceutical Industries Associations (EFPIA) and the Innovative Medicines Initiative (IMI) to cooperate in “Activities Aimed at Developing Drugs for the Novel Virus” and providing consultation on countermeasures.

**AstraZeneca** has mobilized its R&D expertise in infectious disease and antibody discovery technology to discover novel coronavirus-neutralising antibodies as a potential preventative treatment. AstraZeneca’s R&D teams have identified monoclonal antibodies to progress towards clinical trial evaluation as a treatment to prevent COVID-19.
**Boehringer Ingelheim** is searching for novel virus-neutralizing antibodies. It is also screening its entire molecule library for compounds that could target the virus. **Boehringer Ingelheim** is joining the COVID-19 Therapeutics Accelerator initiative, initiated by the Gates Foundation, Wellcome and Mastercard, to speed up the development of therapeutics, but also vaccines and diagnostics for COVID-19. **Boehringer Ingelheim** is contributing its ongoing COVID-19 projects and expertise to the Innovatie Medicines Initiative (IMI) of the European Union. **Bristol-Myers Squibb** is joining the COVID-19 Therapeutics Accelerator initiative, initiated by the Gates Foundation, Wellcome and Mastercard, to speed up the development of therapeutics, but also vaccines and diagnostics for COVID-19.

**Chugai** Pharmabody Research Pte. Ltd. and the Agency for Science, Technology and Research (A*STAR) in Singapore are jointly researching a therapeutic antibody to fight COVID-19 by applying Chugai's proprietary antibody engineering technologies. **Chugai** and Eli Lilly are collaborating regarding the development of COVID-19 therapeutic antibodies, using Chugai’s antibody engineering technologies.

**CSL Group/Seqirus** is collaborating with Takeda, Biotest AG, Bio Products Laboratory, LFB and Octapharma to accelerate development of an unbranded anti-SARS-CoV-2 polyclonal hyperimmune immunoglobulin medicine to treat COVID-19 patients with serious complications. **CSL Group** is evaluating potential treatment candidates with SAB Therapeutics as part of its previously announced collaboration to investigate new therapies to treat infectious diseases as well as immunological and neurological conditions.

**EFPIA**, through the Innovative Medicines Initiative (IMI), with IMI Associated Partners and other organisations has provided up to 45 million EUR to fund 8 COVID-19 R&D projects with 3 focusing on treatments.

**Eli Lilly** and AbCellera (Canadian biotech firm) have agreed to co-develop antibody products for the treatment and prevention of COVID-19. Following this partnership, patients have been dosed in the world’s first study of a potential antibody treatment designed to fight COVID-19. **Eli Lilly** and Junshi Biosciences have partnered to co-develop antibody therapies for the prevention and treatment of COVID-19. Lilly will receive an exclusive license to conduct clinical development, manufacturing and distribution of products outside of Greater China. Junshi Biosciences will maintain all rights in Greater China. **Eli Lilly** is joining the COVID-19 Therapeutics Accelerator initiative, initiated by the Gates Foundation, Wellcome and Mastercard, to speed up the development of therapeutics, but also vaccines and diagnostics for COVID-19. **Eli Lilly** will advance its investigational selective monoclonal antibody LY3127804 against Angiopoietin 2 (Ang2) to Phase 2 testing in pneumonia patients hospitalized with COVID-19 who are at a high risk of progressing to acute respiratory distress syndrome (ARDS). **Eli Lilly** is collaborating with Chugai on COVID-19 therapeutic antibodies, see Chugai for more details.

**Eisai** is joining the COVID-19 Therapeutics Accelerator initiative, initiated by the Gates Foundation, Wellcome and Mastercard, to speed up the development of therapeutics, but also vaccines and diagnostics for COVID-19.

**Gilead** is investigating the use of remdesivir (previously developed to treat Ebola, SARS and MERS). **Gilead** announced that positive data is emerging from the National Institute of Allergy and Infectious Diseases’ (NIAID) study of the investigational antiviral remdesivir for the treatment of COVID-19.
Gilead has received EUA from the FDA for its potential COVID-19 treatment remdesivir. Gilead received approval from the Japanese Ministry of Health, Labour and Welfare for Veklury® (remdesivir) for the treatment of adults and children with COVID-19.

GSK and Vir Biotechnology Inc are in a collaboration using GSK’s expertise in functional genomics and Vir’s proprietary monoclonal antibody platform technology to accelerate existing and identify new anti-viral antibodies for use in therapeutics or preventative treatments. GSK is starting trials of an experimental rheumatoid arthritis drug (otilimab) on patients suffering from severe pulmonary COVID-19 related disease by the end of May. GSK is joining the COVID-19 Therapeutics Accelerator initiative, initiated by the Gates Foundation, Wellcome and Mastercard, to speed up the development of therapeutics, but also vaccines and diagnostics for COVID-19.

Johnson & Johnson, in partnership with the Rega Institute for Medical Research, University of Leuven (Belgium), are working to identify existing or new compounds with antiviral activity against COVID-19. Johnson & Johnson is joining the COVID-19 Therapeutics Accelerator initiative, initiated by the Gates Foundation, Wellcome and Mastercard, to speed up the development of therapeutics, but also vaccines and diagnostics for COVID-19.

LEO Pharma is participating in a pharma industry initiative supported by the European Commission to identify active compounds and compile a sample library for testing with the potential of reducing lead time for treatment development for COVID-19.

MSD is joining the COVID-19 Therapeutics Accelerator initiative, initiated by the Gates Foundation, Wellcome and Mastercard, to speed up the development of therapeutics, but also vaccines and diagnostics for COVID-19. MSD and Ridgeback Biotherapeutics LP have entered into a collaboration agreement to develop EIDD-2801, an orally available antiviral candidate currently in early clinical development for the treatment of patients with COVID-19.

Merck is joining the COVID-19 Therapeutics Accelerator initiative, initiated by the Gates Foundation, Wellcome and Mastercard, to speed up the development of therapeutics, but also vaccines and diagnostics for COVID-19.

Novartis is rapidly evaluating existing products to see if any could be utilized beyond their approved indications in response to the pandemic. Novartis announced it would conduct a 450-person study in the US to determine if its malaria drug hydroxychloroquine can effectively treat COVID-19. Novartis announced plans to initiate a Phase III clinical trial to study canakinumab in patients with COVID-19 pneumonia. The company aims to rapidly enroll 450 patients at multiple medical centers across France, Germany, Italy, Spain, UK and the US. Novartis is co-chairing the COVID-19 Therapeutics Accelerator initiative, initiated by the Gates Foundation, Wellcome and Mastercard, to speed of the development of therapeutics, but also vaccines and diagnostics for COVID-19.

Pfizer finalised a preliminary assessment of certain antiviral compounds that were previously in development and that inhibited the replication of coronaviruses. Pfizer is working to revive a compound identified as potential treatment for the 2003 SARS-CoV-1 which inhibits a specific enzyme (a protease) produced by coronaviruses.
Pfizer is joining the COVID-19 Therapeutics Accelerator initiative, initiated by the Gates Foundation, Wellcome and Mastercard, to speed up the development of therapeutics, but also vaccines and diagnostics for COVID-19.

Roche's Actemra® was approved by China on March 5 to treat COVID-19 patients with lung complications. Actemra has been on the European market since 2010 for treatment of several kinds of arthritis. Roche initiates phase III clinical trial of Actemra/RoActemra plus remdesivir in hospitalised patients with severe COVID-19 pneumonia.

Sanofi has entered into a partnership with Regeneron Pharmaceuticals to start a clinical program evaluating Kevzara in patients hospitalized with severe COVID-19. Kevzara, a drug originally used to treat arthritis, is an interleukin-6 (IL-6) pathway inhibitor which might help in slowing the overactive inflammatory response in the lungs of COVID-19 patients. Sanofi is joining the COVID-19 Therapeutics Accelerator initiative, initiated by the Gates Foundation, Wellcome and Mastercard, to speed up the development of therapeutics, but also vaccines and diagnostics for COVID-19.

Shionogi and the Hokkaido University Research Center for Zoonosis Control are in early stages of identifying several promising lead compounds from internal in vitro studies. They are accelerating drug discovery efforts with the aim of starting clinical trials in FY2020.

Sumitomo Dainippon Pharma donated 10 million yen to the Kitasato Institute’s Project for COVID-19 to identify clinical candidates for the treatment of COVID-19 through a large-scale screening of approved pharmaceuticals. It is further providing drug substances to the “Basic Screening Plan for Drugs for Coronavirus Disease 2019” at the Japanese National Institute of Infectious Diseases.

Takeda and CSL Group formed the CoVlg-19 Plasma Alliance with other leading global plasma companies, including Biotest, BPL, LFB and Octapharma, to develop a potential plasma-derived therapy for treating COVID-19. The Alliance is developing a medicine made from the plasma of individuals who have recovered from COVID-19 with the potential to treat those at risk of serious conditions form COVID-19. The CoVlg-19 Plasma Alliance has since expanded to comprise 10 companies and attracted the support of major companies and organizations. It is expected that this will enhance both speed and scale.

Teva is actively looking through its range of products to determine if it can help provide any products that may be relevant in addressing acute and substantial need during the COVID-19 crisis.

SHARE REAL-TIME CLINICAL TRIAL DATA WITH GOVERNMENTS & OTHER COMPANIES

Share real-time clinical trial data with governments and other companies around the world to advance the development of additional therapies.

The rapid virus sequencing by the scientific community enabled researchers to characterize and begin to understand the new threat posed by COVID-19. "Open Access” data-sharing channels are the backbone to securing a response capacity and have proven their worth with influenza networks. The rapid pace with which researchers have been able to understand this novel strain...
of virus and get medicines into human clinical trials is a testament to the lessons learned from past public health emergencies. The Global Initiative on Sharing All Influenza Data or GISAID Initiative, an open access platform partly funded by the private sector, played a critical role in sharing the first genome sequences of the novel coronavirus and centralizing their collection. This has proven vital in speeding up the sharing of information among scientists as well as public health authorities. But there is still a lot to learn about the virus, both in terms of how it spreads as well as what existing treatments may be effective in helping patients who contract the disease. On March 28, the US FDA approved Emergency Use Authorization (EUA) for chloroquine/hydroxychloroquine to facilitate the availability of these potential treatments during the COVID-19 pandemic.

**Abbvie** is supporting clinical studies and basic research with lopinavir/ritonavir, working closely with European health authorities and the US FDA, Centres for Disease Control and Prevention, National Institutes of Health and the Biomedical Advanced Research and Development Authority to coordinate efforts.

**Amgen**'s subsidiary deCODE genetics and colleagues from Iceland’s Directorate of Health and the National University Hospital published in the *New England Journal of Medicine* a population-based study of the early spread of SARS-Cov-2 (causing COVID-19 disease) in Iceland’s population.

**AstraZeneca** will initiate a randomised, global clinical trial to assess the potential of Calquence (acalabrutinib) in the treatment of the exaggerated immune response (cytokine storm) associated with COVID-19 infection in severely ill patients. Calquence is approved for the treatment of adult patients with chronic lymphocytic leukaemia (CLL) in the US and a few other countries with an active global filing programme.

**Bayer** is supporting a French study conducted by medical experts to assess the effectiveness of a novel combination of molecules for the treatment of COVID-19 patients. Bayer, Canada will partner with the Population Health Research Institute (PHRI) to launch a major clinical research program with two studies that will evaluate the safety and efficacy of different combination therapies including Bayer’s chloroquine and interferon beta-1b. Bayer will make a financial commitment of CAD 1.5 million (approx. €1 million) towards the studies and will supply study drugs to support the research.

**Biogen**, Broad Institute of MIT and Harvard and Partners HealthCare announced a consortium that will build and share a COVID-19 biobank that will help scientists study a large collection of de-identified biological and medical data to advance knowledge and search for potential vaccines and treatments.

**Boehringer Ingelheim** supports scientists worldwide with its open innovation portal opnMe.com, which offers 6 anti-viral compounds out of 43 high quality pharmacological tool compounds at no cost for testing of research hypotheses.

**Bristol-Myers Squibb** (BMS) identified 1,000 compounds in its discovery library that they are making available to collaborators for screening for potential treatments for COVID-19. BMS is actively evaluating certain medicines in its portfolio that could be included in near-term clinical trials with a focus on agents impacting the inflammatory immune response associated with COVID-19.

**Eli Lilly** has entered into an agreement with the National Institute of Allergy and Infectious Diseases
NIAID, part of the National Institutes of Health (NIH), to study baricitinib as a potential treatment for hospitalized patients diagnosed with COVID-19. Baricitinib is approved in more than 65 countries as a treatment for adults with moderately to severely active rheumatoid arthritis.

Eli Lilly is participating in the Accelerating COVID-19 Therapeutic Interventions and Vaccines (ACTIV) partnership with the US National Institutes of Health (NIH) to speed up development of COVID-19 treatment options, streamline clinical trials, coordinate regulatory processes and/or leverage assets among all partners to rapidly respond to the COVID-19 and future pandemics.

Gilead initiated two Phase 3 clinical trials of remdesivir in countries with high prevalence of COVID-19. The company is also supporting two Phase 3 trials in China and a global Phase 2 trial led by the US National Institute of Allergy and Infectious Diseases.

Gilead reports on the New England Journal of Medicine (NEJM) publishing an analysis of the effects of their investigational medicine remdesivir on a small group of patients with severe COVID-19 symptoms.

Gilead announces topline results from Phase 3 SIMPLE trial, NIAID releases positive interim findings from the Adaptive COVID-19 Treatment Trial (ACTT), and The Lancet publishes data and commentary from severe 2019-nCoV remdesivir clinical trial in China.

Gilead announced that findings from the NIAID trial of remdesivir in hospitalized patients with advanced COVID-19 have been published The New England Journal of Medicine (NEJM). These findings support the use of remdesivir in this population, with the largest benefit observed among individuals who required oxygen supplementation but were not mechanically ventilated.

Gilead also anticipates for results from their Phase 3 SIMPLE-Severe study to be available in the near future. Beyond the ongoing studies of remdesivir, Gilead is looking forward to the initiation of combination studies of remdesivir to understand whether the addition of other drugs may enhance patient outcomes.

Gilead announced results from phase 3 trial of Remdesivir in patients with moderate COVID-19. Study demonstrates 5-day treatment course of Remdesivir resulted in significantly greater clinical improvement versus treatment with standard of care alone. Data add to body of evidence from prior studies demonstrating benefit of Remdesivir in hospitalized patients with COVID-19.

Ipsen donated financial resources to the Institut Pasteur that has devoted a portion of its research, since January, to understanding SARS-CoV-2 in terms of epidemiology, biological characteristics and pathogenicity.

Merck donated a supply of interferon beta-1a (Rebif®) to the French Institut National de la Santé et de la Recherche Médicale (INSERM) following a request for use in a clinical trial to investigate it as a potential therapeutic for COVID-19.

Merck is donating 290,000 units of its interferon beta-1a (Rebif®) to the WHO for use in their global SOLIDARITY trial which investigates several potential therapeutics for the treatment of COVID-19.

MSD and the US Institute for Systems Biology (ISB) are collaborating to investigate and define the molecular mechanisms of SARS-CoV-2 and COVID-19 and identify targets for medicines and vaccines, in partnership with US BARDA. Findings generated from the study will be made available to the worldwide scientific and biomedical community.

Novartis is contributing by making several compounds from its libraries available that are considered
suitable for in vitro antiviral testing.

**Novartis** plans to initiate a Phase III clinical trial in collaboration with Incyte to evaluate the use of Jakavi® (ruxolitinib) for treatment of a type of severe immune overreaction called a cytokine storm that can lead to life-threatening respiratory complications in COVID-19 patients. **Novartis** and Incyte will take Jakafi into a second phase 3 trial for COVID-19 patients with acute respiratory distress syndrome (ARDS)

**Pfizer** joins the Accelerating COVID-19 Therapeutic Interventions and Vaccines (ACTIV) initiative. **Pfizer** is committed to making the vital tools they develop available on an open source platform to the broader scientific community and to share data and learnings gained with other companies in real time to rapidly advance therapies and vaccines to patients. **Pfizer** is committed to share their clinical development and regulatory expertise to support the most promising candidates smaller biotech companies bring forward. **Pfizer** is reaching out to US federal agencies including NIH, NIAID and CDC to build a cross-industry rapid response team of scientists, clinicians and technicians able to move into action immediately when future epidemics surface. **Pfizer** followed up on its commitments by sharing safety data on the Azithromycin-Hydroxychloroquine Combination. **Pfizer** shared preliminary data confirming the anti-SARS-CoV-1 compound shows antiviral activity against SARS-CoV-2. Pfizer will perform pre-clinical confirmatory studies, including further anti-viral profiling and assessment of the suitability of the lead molecule for IV administration clinically. **Pfizer** and the Liverpool School of Tropical Medicine's Respiratory Infection Clinical Research Group are launching two new studies to provide insights on the interaction between S. pneumoniae and SARS-CoV-2.

**Roche** is working with the US FDA to initiate a Phase III clinical trial to evaluate the safety and efficacy of Actemra in hospitalised adult patients with severe COVID-19 pneumonia. This is the first global study of Actemra in this setting and is expected to begin enrolling in early April hoping to attract 330 patients globally, including the US. **Roche** (through its daughter company Chugai) announced it will initiate a randomized, double-blind, placebo-controlled Phase III clinical trial (COVACTA study) globally to evaluate the safety and efficacy of Actemra plus standard of care in hospitalized patients with severe COVID-19.

**Sanofi** is coordinating with the Coalition for Epidemic Preparedness Innovations (CEPI) and sharing its vaccine R&D experience and expertise to advance vaccine solutions. **Sanofi** committed to donating hydroxychloroquine (Plaquenil®) to governments worldwide if ongoing clinical trials demonstrate its safety and efficacy in COVID-19 patients. **Sanofi** and Regeneron shared preliminary results from the Phase 2 portion of an ongoing Phase 2/3 trial evaluating Kevzara® (sarilumab) for treating hospitalized patients with “severe” or “critical” respiratory illness caused by COVID-19. In the preliminary Phase 2 analysis, Kevzara had no notable benefit on clinical outcomes when combining the “severe” and “critical” groups, versus placebo. The trial will now be amended so that only “critical” patients continue to be enrolled to receive Kevzara 400 mg or placebo.

**Sumitomo Dainippon Pharma** also collaborates in the “COVID-19 Research Database” consortium to provide researchers with
Takeda partnered with IMI in Europe to leverage collective expertise in the hope to develop inhibitors to help prevent future outbreaks. Takeda and the CoVig-19 Plasma Alliance partnered with the US National Institute of Allergy and Infectious Diseases (NIAID) for a global study on the safety, tolerability and efficacy of the hyperimmune therapy in adult COVID-19 patients. The study is anticipated to start in the summer and will form the foundation for potential regulatory approval.

UCB is working with the US-based Seattle Structural Genomics Center for Infectious Disease to identify crystal structures of SARS-CoV-2 proteins. It is also partnering with UK-based Diamond Light Source and The University of Oxford to design inhibitors of SARS-CoV-2’s main protease for treatment of COVID-19 patients. It is also working with government agencies and the healthcare community to determine if any of their therapies could be used effectively against COVID-19.

As of 27 May 2020, the WHO reports there are currently 10 candidate vaccines in clinical evaluation and 123 candidate vaccines in preclinical evaluation. Several biopharmaceutical companies are researching vaccine candidates for the prevention of COVID-19 and collaborating in the sharing of existing technologies that can be leveraged to allow a rapid upscale of production once a vaccine candidate is identified. IFPMA members are also sharing technologies that act as an adjuvant which can boost the effectiveness of a potential vaccine.

Experts are hoping it will take as little as 12 to 18 months before there is a vaccine available. This is a best-case estimate that assumes one or two of the first few vaccines that enter development and complete three phases of clinical trials will be successful. Typically, only approximately one in ten experimental vaccines make it all the way through to regulatory approval. Therefore, the more companies taking different approaches to find a vaccine, the greater the chance of success.

IFPMA is a founding partner of Access to COVID-19 Tools (act) Accelerator, a global collaboration to accelerate the development, production and equitable access to new COVID-19 diagnostics, therapeutics and vaccines.

AstraZeneca and the University of Oxford are joining forces for the global development and distribution of the University’s potential recombinant adenovirus vaccine aimed at preventing COVID-19 infection from SARS-CoV-2. AstraZeneca received support of more than $1bn from the US Biomedical Advanced Research and Development
Authority (BARDA) for the development, production and delivery of the vaccine, starting in the fall. The development programme includes a Phase III clinical trial with 30,000 participants and a paediatric trial.

**AstraZeneca** – A Phase I/II clinical trial of AstraZeneca & Oxford University’s vaccine candidate began last month to assess safety, immunogenicity and efficacy in over 1,000 healthy volunteers aged 18 to 55 years across several trial centres in southern England. Data from the trial is expected shortly which, if positive, would lead to late-stage trials in a number of countries.

**CSL Group/ Seqirus** provides scientific and technical expertise together with its established MF59® adjuvant technology to the University of Queensland in Australia to fast-track R&D of their CEPI-funded COVID-19 vaccine candidate, which uses novel molecular-clamp technology. University of Queensland is now aiming to take the vaccine candidate in to a phase 1 clinical trial in July.

**Eli Lilly** is participating in the Accelerating COVID-19 Therapeutic Interventions and Vaccines (ACTIV) partnership with the US National Institutes of Health (NIH) to speed up development of COVID-19 vaccine options, streamline clinical trials, coordinate regulatory processes and/or leverage assets among all partners to rapidly respond to the COVID-19 and future pandemics.

**GSK** is collaborating with multiple companies and research groups on promising COVID-19 vaccine candidates through the use of its vaccine adjuvant technology, of particular importance in a pandemic situation since it may reduce the amount of vaccine protein required per dose, allowing more vaccine doses to be produced and therefore contributing to protecting more people.

GSK entered into a collaboration with Sanofi to develop an adjuvanted vaccine for COVID-19, using innovative technologies from both companies. The vaccine is expected to enter clinical trials in second half 2020.

GSK is also collaborating with the University of Queensland, Clover Biopharmaceuticals and Xiamen Innovax Biotech Co., Ltd. GSK believes that more than one vaccine will be needed and is hoping that there will be a number of successful vaccines developed with its pandemic adjuvant technology.

**Johnson & Johnson** expanded its collaboration with the Biomedical Advanced Research and Development Authority (BARDA) and established a new collaboration with Beth Israel Deaconess Medical Center (BIDMC).

Johnson & Johnson and partners announced the selection of a lead COVID-19 vaccine candidate from constructs it has been working on since January 2020. The Company has already begun preparations for clinical vaccine production at its facility in Leiden, the Netherlands, with the aim of initiating Phase 1 human clinical studies of its vaccine candidate in September 2020.

**MSD** and IAVI, a nonprofit scientific research organization dedicated to addressing urgent, unmet global health challenges, will work together to advance the development and global clinical evaluation of a SARS-CoV-2 vaccine candidate. This vaccine candidate will use the recombinant vesicular stomatitis virus (rVSV) technology that is the basis for MSD’s Ebola Zaire virus vaccine, ERVEBO®. The vaccine candidate is in preclinical development, and clinical studies are planned to start later in 2020.

MSD announced it will acquire Vienna-based biotech company Themis. The planned acquisition builds upon an ongoing collaboration between the two companies to develop vaccine candidates using the measles virus vector platform and is expected to accelerate the development of Themis’ COVID-19 vaccine candidate. The vaccine candidate is in pre-clinical development, and clinical studies are planned to start later in 2020.

**Novartis**’ AveXis division is partnering with Massachusetts Eye and Ear and Massachusetts General Hospital, members of Mass General Brigham, entering into a manufacturing agreement to produce their novel genetic vaccine.
AveXis will begin manufacturing the vaccine this month while AAVCOVID undergoes further safety and efficacy testing in preclinical studies taking place at academic medical institutions including Mass. Eye and Ear.

**Pfizer** and BioNTech have entered into a partnership to jointly develop BioNTech’s mRNA-based vaccine candidate BNT162 to prevent COVID-19 infection. The two companies plan to jointly conduct clinical trials initially in the United States and Europe across multiple sites by the end of April 2020. On April 22, the German regulatory authority, the Paul-Ehrlich-Institut, has approved the Phase 1/2 clinical trial for BioNTech’s BNT162 vaccine program to prevent COVID-19 infection. Pfizer and BioNTech announced that the first cohort of BioNTech’s Phase 1/2 clinical trial has been dosed. Twelve study participants were dosed with vaccine candidate BNT162 in Germany since dosing began on April 23, 2020. Pfizer and BioNTech announced that the first participants have been dosed in the U.S. in the Phase 1/2 clinical trial for the BNT162 vaccine program to prevent COVID-19. The Phase 1/2 trial in the U.S. will enroll up to 360 healthy subjects into two age cohorts (18-55 and 65-85 years of age).

**Sanofi** announced a collaboration with the Biomedical Advanced Research and Development Authority (BARDA) to advance a novel COVID-19 vaccine candidate. Work is underway to leverage previous development efforts of a SARS vaccine candidate using Sanofi’s recombinant DNA technology. Sanofi, and Translate Bio, a clinical-stage messenger RNA (mRNA) therapeutics company, will collaborate to develop a novel mRNA vaccine for COVID-19. This collaboration leverages an existing agreement from 2018 between the two companies to develop mRNA vaccines for infectious diseases. Sanofi joined forces with GSK, sharing innovative technologies from both companies. For more details see GSK.

**Shionogi**’s subsidiary UMN Pharma Inc. is pursuing the discovery and development of a recombinant protein vaccine in a project supported by the Japan Agency for Medical Research and Development (AMED). Shionogi made the decision to develop a prophylactic vaccine for COVID-19. The company is looking to offer the vaccine for 10 million people.

**UCB** is collaborating with The University of Oxford on a vaccine development.

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**DEVELOP DIAGNOSTIC TESTING & SECURE CONTINUOUS SUPPLY**

Develop and scale up the capacity of diagnostics testing for COVID-19 patients as much as possible and secure the continuous supply of diagnostic test kits to countries around the world.

Rolling out diagnostics to detect whether patients are genuinely infected with the new coronavirus is a key step in preventing or slowing its spread. However, the rapid spread of COVID-19 has drastically increased the demand for testing kits around the world and governments are trying to ramp up their testing capacities. The biopharmaceutical industry is therefore pushing the boundaries, uniting and collaborating to increase and secure the production and development of diagnostics for COVID-19.

**AstraZeneca** is accelerating the development of its diagnostic testing capabilities to scale-up
screening and is also working in partnership with governments on existing screening programmes to supplement testing. 

**AstraZeneca** is collaborating with GSK and Cambridge University by setting up a new testing laboratory at the University's facilities for high throughput screening for COVID-19 testing. It will also explore the use of alternative chemical reagents for test kits to help overcome current supply shortages.

**Bayer** is making more than 40 virus diagnostics devices available from its research operations to scale up Germany's COVID-19 analysis by several thousand tests daily. It is also freeing up specially trained personnel for this purpose.

**EFPIA** through the Innovative Medicines Initiative (IMI), with IMI Associated Partners and other organisations has provided up to 45 million EUR to fund 8 COVID-19 R&D projects with 5 focusing on diagnostics.

**GSK** is partnering with AstraZeneca and Cambridge University to create a state-of-the-art, high-throughput testing laboratory in Cambridge, which is introducing state-of-the-art robotics, automation and other diagnostic innovations to optimise COVID-19 testing. In the long-term, these innovations will inform and strengthen the UK’s diagnostics capability. For more details see AstraZeneca.

**GSK** is also conducting large-scale testing at its facility in Rixensart, Belgium.

**Johnson & Johnson** entered into a research collaboration with Alveo Technologies to advance Alveo’s be.well™ platform of analyzers, nasal swabs and cartridges for the detection of viral infectious diseases, including potentially SARS-CoV-2. J&J will provide Alveo with financial support as well as technical and regulatory counsel.

**Menarini** Diagnostics and Credo Diagnostics Biomedical have entered into an exclusive distribution agreement for the VitaPCR™ SARS-CoV-2 assay kit.

**Novo Nordisk** scientists are working in R&D laboratories to boost Denmark's COVID-19 testing capacity.

**Roche** received Emergency Use Authorization (EUA) from the US FDA for its diagnostic kit cobas® SARS-CoV-2 Test. Roche is committed to delivering as many tests as possible and is going to the limits of production capacity.

**Roche** announced the development and upcoming launch of its Elecsys® Anti-SARS-CoV-2 serology test to detect antibodies in people who have been exposed to SARS-CoV-2.

**Roche** received EUA from the US FDA for its COVID-19 antibody test. Roche has already started shipping the new antibody test to leading laboratories globally and will ramp up production capacity to high double-digit millions per month to serve healthcare systems in countries accepting the CE mark as well as the U.S.

**Roche** is doing everything possible to ensure an adequate supply of their tests. It calls upon
governments to work with the industry to keep global manufacturing and supplies running.

**Sanofi** Sanofi joined forces with Luminostics to develop a COVID-19 smartphone-based self-testing solution. Luminostics would contribute its proprietary technology for consumer-diagnostics for COVID-19 testing while Sanofi would bring its clinical research testing experience and capabilities.

**Shionogi** Shionogi and Micro Blood Science (MBS) entered into a partnership to develop COVID-19 antibody-test kits using MBS’ original technology, including unique trace-blood collection devices. Shionogi is currently undertaking performance testing to demonstrate its suitability for practical use in Japan and are collecting clinical data for regulatory approval. Shionogi entered a partnership with MBS and Vazyme Biotech to support delivery of their COVID-19 antibody-test kits to medical institutions, testing facilities, research laboratories, etc.

**Takeda** Takeda is partnering with public entities and other pharmaceutical companies through the Innovative Medicines Initiative (IMI) in Europe to leverage collective expertise in the hope of developing diagnostics for COVID-19.

**UCB** UCB is working closely with the Belgian government to scale up COVID-19 testing capabilities. It is looking at similar possibilities in the UK.

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**SECURE ESSENTIAL SUPPLIES FOR MEDICINES & VACCINES**

Work to secure continuity of supply for all essential medicines, and vaccines for patients with other life-threatening diseases, urging governments to implement policies and decisions that facilitate access for all those in need.

IFPMA and its member companies are monitoring the impact the SARS-CoV2 outbreak and measures put in place by governments to prevent the spread of the virus (e.g. restrictions on travel, movement, border closures or measures on supply chain). Member companies are committed to ensure the continued supply of essential supplies for medicines and vaccines, for patients that suffer from chronic illnesses or other health conditions. Member companies are not aware of any near-term impacts on the availability of medicines and vaccines. They are continuously monitoring and proactively handling the situation as it develops and do currently not expect any long-term impact on the availability of medicines and vaccines, unless any disruption caused by the pandemic is sustained over the next several months.

Biopharmaceutical companies are working to prevent and mitigate any shortages through close coordination with national regulatory authorities and other global stakeholders, including the World Health Organization.

There is an increase in the threat of falsified medicines, targeting existing products but also new potential treatment against COVID. On April 9, the WHO issued an alert warning that between 31 March and 2 April 2020, the WHO global surveillance and
monitoring system on substandard and falsified (SF) medical products received nine reports of confirmed falsified chloroquine products from three countries. IFPMA and its members continue their commitment to tackling the global public health threat that are falsified medical products. IFPMA, as a member of the Fight the Fakes campaign, supports the campaign’s activities (Statement).

AbbVie  AbbVie is not anticipating disruption to the medicine supply for HIV patients as a result of the investigation of the effectiveness of HIV medicines against COVID-19.

Almirall  Almirall will continue production of all its essential products and has increased production of specific medicines, such as paracetamol.

Astellas  At Astellas there are currently no problems with the supply of products as we have been able to maintain an adequate inventory level of raw materials and finished products, by closely cooperating with outsourcing manufacturers and suppliers of raw materials taking into account the continuation of business and the stable supply of products.

Bayer  Bayer is continuing the production of medicines and health care products at their plant in Garbagnate, Italy for both the Italian and global market.

Biogen  Biogen take the vital role they play in ensuring an uninterrupted supply of their medicines to patients very seriously. It does not anticipate any interruptions but cannot exclude the possibility that COVID-19 might have an impact on manufacturing capabilities in the future.

Boehringer Ingelheim  Boehringer Ingelheim ensures further discovery, development, production and supply of highly innovative medicines that are needed by patients around the globe.

Bristol-Myers Squibb  Clinical and commercial supply chain teams at Bristol Myers Squibb have proactively made sure raw materials and products reach their markets and clinical sites. It has not seen any disruption in its clinical or commercial supply chain due to the pandemic.

Chiesi  Chiesi Group will continue the production of all medicines without interruption at sites in Italy and abroad at the same high-quality standards. Currently, it is able to deliver medicines under normal production and distribution channels from all production plants in Italy, Brazil and France.

CSL Group/Seqirus  Seqirus has enacted its business continuity plans across the globe to minimise disruption to the manufacture and on-time supply of its influenza vaccines.

Daiichi-Sankyo  Daiichi-Sankyo announced it has not any shortage of its medicines. Its Supply Chain team is monitoring the evolving situation very carefully to maintain supply and delivery of these medicines.

Eisai  Eisai maintains necessary stocks for the stable supply of medicines in addition to the stable production of medicines.

Eli Lilly  Eli Lilly launched the Lilly Insulin Value Program in the US allowing anyone with commercial insurance and those without insurance to fill their monthly prescription of Lilly insulin for $35.

Gilead  Gilead has no manufacturing concerns or supply shortages with any Gilead products, including those in the HIV and hepatitis portfolios. Gilead’s global commercial supply chain is robust and resilient with the right processes in
place, geographic diversity in the supply chain and enough of the materials required to make medicines. Gilead does not anticipate shortages of Gilead marketed products, including HIV treatment or prevention medicines, in the foreseeable future. The supply network provides both flexibility and redundancy, and inventory levels are robust, with no immediate or foreseeable risk to our supply chain.

Grüenthal Grüenthal is not experiencing any significant supply shortages. If their team detects any severe supply shortages that might potentially disrupt the supply of their products, affected partners will be informed as soon as possible.

GSK GSK has increased production of high demand products (e.g. multi-vitamins, respiratory medicines and antibiotics) and have so far donated more than 660,000 GSK products to more than 24 countries in Asia, Americas and EU.

Ipsen Ipsen is closely working with national and international supplies to monitor the provision of goods and services, with the goal of continuing operations as seamlessly as possible. It does not anticipate any supply shortages.

LEO Pharma LEO Pharma has activated business continuity plans to uninterruptedly supply patients with the medicines they need. LEO Pharma is taking additional measures to avoid any shortages of medicines or raw materials and to mitigate any interruptions.

Lundbeck Lundbeck has been extremely busy with taking precautions to provide treatments to the millions of people relying on them. Its supply chain remains intact and it has not experienced any supply disruptions.

Merck Merck and The Jenner Institute announced they have laid the foundation for large-scale production of The Jenner Institute’s COVID-19 vaccine candidate, ChAdOx1 nCoV-19. Their joint team reduced process development time to two months from a year.

MSD Recognizing the changing needs of patients during the COVID-19 pandemic, MSD announced it is taking a number of new steps to support patients in the United States who may have lost their jobs and insurance coverage.

Novartis Sandoz, the Novartis generics and biosimilars division, is maintaining prices on a basket of essential medicines that may help in the treatment of COVID-19. Novartis encourages industry, governments and international institutions to work together to ensure adequate global access of medications to treat COVID-19 patients.

Novo Nordisk Novo Nordisk is ensuring the supply of their lifesaving medicines to people with serious chronic diseases across the globe. Novo Nordisk is applying its experience with Chinese lockdown measures around the globe to assure continuity of their supply chain.

Roche Roche is doing everything possible to ensure an adequate supply of their medicines. It calls upon governments to work with the industry to keep global manufacturing and supplies running by ensuring the free flow of vital goods across national borders, consider pragmatic temporary adjustments to regulations on packaging, reviews, customs etc. and to work together across governments internationally.

Sanofi Sanofi to provide hydroxychloroquine (Plaquenil®) wherever possible and will secure appropriate supply levels of current approved indications.

Servier Servier puts its best efforts forward to ensure the continuity of its production in order for its medicines to remain available to patients who rely on them. It therefore brings its expertise to the multi-stakeholder partnership “Health Innovation Coalition – Health Crisis” in France.
Sumitomo Dainippon Pharma is striving to ensure a stable supply of products and business continuity. Takeda is currently not experiencing any potential supply disruption due to the Coronavirus outbreak. The company is tracking the situation as it evolves and will take all necessary actions in an effort to ensure supply continuity for patients.

Teva is prepared for various scenarios and has inventory and redundancy plans in place to address potential shortfalls, if necessary. The supply chain for their key products, brand, generics and APIs remains largely uninterrupted with adequate inventory of products.

**INCREASE & SHARE MANUFACTURING CAPACITY FOR MEDICINES & VACCINES**

Increase our manufacturing capabilities and share available capacity to ramp up production once a successful vaccine or treatment is developed.

Biopharmaceutical companies are part of a wider research community which is collaborating to fast-track the development of therapeutics and new vaccines. Collaborating in this way could speed up development of resources to tackle this outbreak. It creates networks of centres of excellence that can deliver a real impact and a preparedness infrastructure which can be mobilized for future outbreaks. While there are still many unknowns about the virus, companies are entering in partnerships to scale-up production capacity.

IFPMA is a founding part of Access to COVID-19 Tools (act) Accelerator, a global collaboration to accelerate the development, production and equitable access to new COVID-19 diagnostics, therapeutics and vaccines.

AstraZeneca and the University of Oxford joined forces to be responsible for the development, worldwide manufacturing and distribution of the vaccine, developed by the Jenner Institute and Oxford Vaccine Group, at the University of Oxford, if clinical trials prove successful. AstraZeneca will make 30 million doses of coronavirus vaccine available to the U.K. by September and has committed to scale-up production to 100 million doses this year. AstraZeneca – The Company has concluded the first agreements for at least 400 million doses of its vaccine candidate (being developed in collaboration with the University of Oxford) and has secured total manufacturing capacity for one billion doses so far and will begin first deliveries in September 2020. AstraZeneca is also in discussions with governments around the world to increase access. Furthermore, AstraZeneca is in discussions with the Serum Institute of India and other potential partners to increase production and distribution. AstraZeneca reached a $750m agreement with CEPI and Gavi to support the manufacturing, procurement and distribution of 300 million doses of the vaccine, with delivery starting by the end of the year. In addition, AstraZeneca reached a licensing agreement with Serum Institute of India (SII) to supply one billion doses for low
and middle-income countries, with a commitment to provide 400 million before the end of 2020.

**Eli Lilly** and AbCellera collaborate on AbCellera’s rapid pandemic response platform, developed under the DARPA Pandemic Prevention Platform Program, and Lilly’s global capabilities for rapid development, manufacturing and distribution of therapeutic antibodies.

**GSK** and Sanofi vaccine development collaboration, both companies commit to create and supply sufficient quantities of vaccines that will help stop this virus. Both companies bring significant manufacturing capacity, and, if successful, they will be able to make hundreds of millions of doses annually by the end of next year. GSK confirmed its intention to manufacture 1 billion doses of its pandemic vaccine adjuvant system, in 2021, to support the development of multiple adjuvanted COVID-19 vaccine candidates. GSK will manufacture, fill and finish adjuvant for use in COVID-19 vaccines at sites in the UK, US, Canada and Europe.

**Gilead** has accelerated manufacturing of remdesivir at risk, in anticipation of potential future supply needs. Gilead has proactively scaled up manufacturing of remdesivir to increase available supply as rapidly as possible in anticipation of potential future supply needs. Gilead has increased supply nearly 30-fold since January and aims to produce more than 1 million treatment courses by year-end and several million in 2021, if required. These goals were based on a 10-day treatment course. The SIMPLE study results in patients with severe disease may enable significantly increasing the number of treatment courses using existing remdesivir supply. To further expand global supply, Gilead is in discussions with leading chemical and pharmaceutical manufacturing companies about their ability, under voluntary licenses, to produce remdesivir for Europe, Asia and the developing world at least through 2022. For the developing world, Gilead has negotiated long-term voluntary licenses with several generic drugmakers and is in active discussions with the Medicines Patent Pool to license remdesivir and with UNICEF to deliver the drug using its established distribution networks.

**Johnson & Johnson** announced a collaboration Emergent BioSolutions, Inc. to support the manufacturing of its lead investigational COVID-19 vaccine candidate. Johnson & Johnson has committed to rapidly produce and supply more than one billion doses of a safe and effective vaccine globally on a not-for-profit basis for emergency pandemic use. Johnson & Johnson signed a deal with Catalent to accelerate rapid scale-up of segregated manufacturing capacity over the coming months to support dedicated production of Johnson & Johnson's investigational vaccine candidate. Catalent plans to hire approximately 300 additional employees at the site for this program starting in July 2020 to meet operational readiness and 24×7 manufacturing schedules by January 2021.

**Pfizer** and BioNTech are jointly developing a COVID-19 vaccine, to be produced initially in the US and Europe. Manufacturing capacity will be scaled-up to support global supply. Pfizer will contribute its leading global vaccine clinical R&D, regulatory, manufacturing and distribution infrastructure and capabilities. Pfizer is committed to use any excess manufacturing capacity and to potentially shift production to support others in rapidly getting life-saving breakthroughs into the hands of patients as quickly as possible.

**Sanofi** increased production capacity of hydroxychloroquine (Plaquenil®) by 50% and is on track to further increase production over the coming months. Under Sanofi and GSK vaccine development collaboration, both companies commit to create and supply sufficient quantities of vaccines that will help stop this virus. See GSK for more details.

**Seqirus** – CSL partners with CEPI and the University of Queensland to advance the university's Covid-19 vaccine. If trials are successful, initial large-scale production of the vaccine will happen at CSL's biotech
manufacturing headquarters in Melbourne. The company estimates that the scale-up can help generate up to 100 million doses by the end of next year.

Teva is assessing additional production of hydroxychloroquine sulfate tablets with materials that are being sent to Teva from its ingredient supplier.

Teva's global manufacturing network has been working tirelessly on securing and scaling production of both API and finished doses for potential treatments that may prove essential in treating COVID-19 everywhere Teva does business.

UCB is assuring a reliable supply of medicines in every market it has a commercial presence in. It has not experienced shortages for any of its products due to this epidemic.

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**SUPPORT GLOBAL HEALTHCARE SYSTEMS**

Use our medical expertise to support global healthcare systems to manage the unprecedented increase in the pressure they are experiencing.

IFPMA member companies are committed to support healthcare system capacities and protect health care workers, particularly in the most hard-hit countries and vulnerable countries which are ill prepared to cope with an accelerating outbreak of COVID-19. When the novel coronavirus first emerged in Wuhan, China, IFPMA and its member companies started working with their teams on the ground, and with the Chinese authorities to ensure people can get access to necessary health care services.

Given the spread of the virus to other regions across the world, IFPMA member companies have stepped up these efforts and are donating personal protective equipment and financial resources to ease the burden on health care systems. Company employees are also volunteering in community efforts to relieve the burden on healthcare systems.

**Support to the most affected countries (on-going)**

**AbbVie** announced a donation of $35 million to support COVID-19 relief efforts. In the US, AbbVie's funds will be used to support healthcare capacity for hospitals as well as protect vulnerable populations by enabling access to food and essential supplies. In Europe, the donation will provide critical equipment and supplies to patients and front-line healthcare workers in the hardest-hit countries.

**AbbVie** announced donations to 26 nonprofit organizations totaling $5 million to support immediate COVID-19 relief efforts. Through support from the newly created AbbVie COVID-19 Community Resilience Fund, these organizations will help front-line healthcare workers and vulnerable populations in hard-hit communities.

**AFIDRO** (Colombian Association of Pharmaceutical Research and Development Laboratories), donated medical equipment to the Central Military Hospital of Bogota (Colombia) to strengthen its capacity to respond to patients
requiring high-level care as a result of the COVID-19 pandemic. Almirall has donated topical cream to healthcare professionals in Spain and the UK. It has also repurposed production facilities in Germany to manufacture antibacterial gels. It also donated protective equipment to healthcare workers in Spain.

Amgen and the Amgen Foundation announced an initial commitment of up to $12.5 million to support US and global relief efforts to address critical needs in communities impacted by COVID-19. The funds will be used to support emergency response efforts in Amgen’s US and international communities, patient-focused organizations that are mounting their own response efforts, and international relief efforts by Direct Relief and International Medical Corps.

To help support the cardiovascular community during this time, Amgen has donated $1 million to support the AHA’s COVID-19 rapid response efforts. Amgen’s donation will support a number of COVID-19-related initiatives, including the formation of the AHA COVID-19 patient registry which will help improve the scientific community’s understanding of how the virus impacts cardiovascular health and better manage patients for improved health outcomes.

APCRG (Association of Pharmaceutical Companies Representatives in Georgia) donated 35,000 Georgian lari to the STOPCOV fund (State Treasury Fund) created by the Government of Georgia to fight COVID-19.

APIFARMA (Portuguese Pharmaceutical Industry Association) and its associated pharmaceutical companies have implemented a series of measures to support the fight against the COVID-19 pandemic and have donated more than €3 million euros to various Portuguese organisations and institutions.

Astellas announced Astellas Pharma US, Inc. and the Astellas Global Health Foundation are each expanding support for global and local communities fighting COVID-19 by providing up to $2 million of new financial assistance, in aggregate, to meet the urgent demand for resources to help patients, health care workers, and first responders.

In Italy, Astellas Pharma S.p.A., has decided on a donation worth 150,000 euros for the necessary supply of goods to public medical institutions and NPOs.

In Spain, Astellas Pharma S.A., has decided on a donation worth 200,000 euros to its country’s health ministry for the necessary supply of goods to medical institutions.

Furthermore, to assist health care systems coping with increasing demands by government or non-profit organization presented by the escalation of COVID-19 around the world, Astellas will authorize a maximum of 4 weeks of paid leave (in accordance with each country’s provision) to employees who are medically qualified and wishes to contribute in volunteer activities within their community.

AstraZeneca is donating 9 million face masks to support healthcare workers around the world. It has partnered with the World Economic Forum’s COVID Action Platform, created with the support of the WHO, to identify countries in greatest need. Italy will receive the first shipments with other countries to follow. AstraZeneca and GSK are collaborating to provide process optimisation support to various UK national testing centres for COVID-19 to expand testing capacity.

Bayer made financial donations to an aid fund of the regional authorities in Lombardy, Italy to help procure urgently needed equipment for intensive care units in hospitals with the greatest needs. Bayer started producing hand sanitizers in Cimanggis, Indonesia based on their expertise from their plants in Wuppertal and Bergkamen, Germany. Bayer is also supplying German hospitals with ventilators from their
pharmacology labs and health care workers with masks. It also supports employees from the Pharmaceutical Division with a medical background to support the local health care system by offering them paid leave for 4 weeks. It is also providing the German Army with 600,000 chloroquine tablets.

**Bayer** made a donation of one million products to support the health of underserved US communities, including 3 million chloroquine tablets.

**Bayer** made a donation of €1 million (R$ 5.7 million) to combat COVID-19 in Brazil: €490,000 (R$ 2.8 million) is being contributed to the Brazilian government’s “Solidaric Fundraising” campaign, €350,000 (R$ 2 million) will go to UNICEF in Brazil to support children, youth projects and underprivileged communities and €160,000 (R$ 900,000) will enable the national health system to purchase personal protective equipment for hospitals (PPE).

**Bayer** made a donation of €1 million to France to support the “All united against the virus” alliance set up by the Fondation de France, the Assistance Publique – Hôpitaux de Paris (AP-HP) hospital network and the Pasteur Institute. Bayer already donated PPE, dermatological products and meals in the Lyon region.

**Bayer** is donating approximately one million chloroquine tablets for COVID-19 treatment in Italy.

**Biogen** employees have also donated more than $300,000 to non-profit organizations and are volunteering in their communities.

**Boehringer Ingelheim** contributes €5.8 million from their Global Support Program donations fund, provides paid leave for its 51,000 employees to volunteer for COVID-19 relief and established a €580,000 relief fund for social entrepreneurs and their communities in Kenya and India via its Making More Health program. Boehringer Ingelheim also made a number of financial contributions totaling over $1 million to protect health care professionals in the critical services they are providing to patients.

**Bristol-Myers Squibb** donated more than $22 million in financial support and necessary products (e.g. PPE and medical equipment) to relief efforts in 40 countries. Licensed healthcare professionals employed by BMS are supported to volunteer in local hospitals and will continue to receive pay. Through Skills2Give, an ongoing BMS volunteer program, colleagues in the US, UK and Australia have the option to select from virtual volunteer opportunities with thousands of nonprofit organizations. Over 3,000 employees are registered with the program.

The **BMS Foundation** has contributed to more than 40 patient advocacy groups and professional societies on the frontlines of patient care, and BMS is engaging with more than 250 patient and professional organizations to support research, education, patient psychosocial support and basic human needs. The BMS Foundation contributed a $7 million grant to Team Rubicon’s and Patient Advocate Foundation’s COVID-19 Emergency Food Assistance Program, which is providing assistance to immunocompromised patients whose ability to access or afford food and other nutritional needs is at risk. BMS also partnered with GRYT Health to develop the **COVID Advocacy Exchange**, a virtual platform to unite patient advocacy organizations, patients, policy makers, healthcare practitioners and industry in the exchange of information.

**Chiesi Group** commits €3 million for donations to support the ongoing emergency in Italy. It donated 50,000 units of sanitizing hand gel to public transport operators and personal protective equipment to hospitals. It collaborates with associations of general practitioners on advice and guidance, providing support for the purchase of respiratory equipment in hospitals that support COVID-19 patients.

**Chugai** announced that it decided to make a financial donation of JPY 50 million to support healthcare

Daiichi-Sankyo will make a donation of $1 million to the WHO’s COVID-19 Solidarity Response Fund through the Japan Center for International Exchange in support of relief efforts for countermeasures against COVID-19.

Eisai In the US, Eisai has provided $250,000 in funding to non-profit patient organizations, in addition to providing Personal Protection Equipment to local healthcare providers.

In Europe, Eisai has provided €945,000 in funding to professional organizations such as the WHO, as well as to support healthcare providers and vulnerable communities in the UK, Italy, Germany, Spain, Belgium, France, Portugal, and Slovakia.

In Asian countries outside of China, Eisai has donated 11.8 million rupees to federal emergency funding in India, and is planning donations of funding and supplies in Indonesia, Thailand, the Philippines, Malaysia, and Vietnam.

Eli Lilly is deploying its medical professionals to staff a free drive-through COVID-19 testing facility at its corporate headquarters in Indianapolis. The testing facility serves active frontline health care workers and first responders, as a service to the community and in an effort to protect people working on the front lines of this pandemic.

Eli Lilly and Company Foundation has contributed $500,000 to the Central Indiana COVID-19 Community Economic Relief Fund.

Farmindustria and its member companies have donated over €9.4 million worth of medicines to Italian hospitals; €21.8 million of financial and material donations, such as respiratory personal protective equipment, and disinfectant gels, and four companies have modified their production lines in order to meet health needs during this pandemic.

Gilead has provided remdesivir to physicians for compassionate use to treat several hundred severely ill patients with confirmed COVID-19.

Gilead announced that their existing supply, including finished product ready for distribution as well as materials in the final stages of production, amounts to 1.5 million individual doses of remdesivir. This presents 140,000 treatment courses based on a 10-day treatment duration, all of which Gilead has committed for donation.

Gilead announced a $20 Million Philanthropic Fund called Gilead CARES (COVID-19 Acute Relief and Emergency Support) Grantee Fund to support nonprofit organizations impacted by the COVID-19 Crisis. Organizations may be eligible to receive up to $100,000 in emergency assistance. Gilead will also make two significant community donations: $1 million to the San Mateo County Strong Fund and $1 million to the Mayor’s Fund for Los Angeles.

GSK is donating $10 million to the COVID-19 Solidarity Response Fund, created by the UN Foundation and WHO, to enable distribution of essential supplies such as personal protective equipment (PPE) to frontline health workers. GSK is donating lab equipment, instruments, and scientific kits to support government testing and has donated over 700,000 PPE units to protect frontline health workers in 29 countries.

GSK joined forces with AstraZeneca to help expand UK testing capabilities. For more info see AstraZeneca.

HKAPI (The Hong Kong Association of the Pharmaceutical Industry) delivered 17,000 surgical face masks to patient organizations together with the continued support of their member companies in sourcing PPE.

Johnson & Johnson announced a $50 million commitment to support frontline health workers, especially doctors, nurses, midwives and community health workers who are working tirelessly to treat COVID-19 patients around the world.
Johnson & Johnson is encouraging medically trained employees to donate their time and expertise by joining the local health workforce in combating COVID-19. Medically trained employees worldwide can take a paid leave for up to 14 weeks through March 31, 2021. Any Johnson & Johnson employee or retiree who donates to the Covid-19 Solidarity Response Fund or the CDC Foundation’s All of Us Campaign will be matched by the company, dollar for dollar, up to a total match of $1 million for each organization.

LEO Pharma has made donations to support local hospitals and communities in Northern Italy, Spain and the US states of New Jersey in their fight against COVID-19.

Lundbeck is supporting local communities and societies with for example monetary and medicine donations to Wuhan, fundraising activities in Italy, donations of protective equipment in France and in the US, together with support for local patient organizations. Lundbeck North America has committed $1 million in support of COVID-19 relief efforts and is donating to COVID Response Funds in regions where the company is present.

Medicines Australia joins forces with 15 healthcare organisations to highlight continuity of care. The Continuity of Care Collaboration (CCC) is an Australian-first national communication collaboration of 15 Peak Bodies, Industry and Healthcare Organisations coming together to stress the importance for people to continue monitoring their health and maintaining their regular medical care.

Menarini converted a topical pharmaceutical producing plant in Florence into a plant producing antibacterial gels, fully used for donations across Italy. Menarini has increased its production from 20 to 100 tonnes per month.

MSD has contributed or committed more than $30 million to COVID-19 relief efforts. Support includes donations of medicines, protective personal equipment (PPE) donations for health care providers and funding to relief organizations. A $10 million commitment will support COVID-19 relief efforts to help disparately impacted patients and communities in the U.S. and globally. A $3 million commitment, through MSD for Mothers, will help health systems better address critical maternal health needs during COVID-19. MSD also is enabling its medically trained employees to volunteer their time to aid their communities while maintaining their base pay.

Merck donated 150,000 liters of disinfectant to the German state of Hesse.

Novartis commits to donate up to 130 million doses of hydroxychloroquine to support the global COVID-19 pandemic response. The Novartis COVID-19 Response Fund will provide $20 million to support communities around the world most impacted by the coronavirus pandemic. Novartis and the Novartis US Foundation established a USD 5 million US COVID-19 Community Response Fund. Novartis Canada and Sandoz Canada announced a donation of $500,000 to community and patient groups as part of the companies’ newly created Community Strong COVID-19 response program. Novartis contributes $1 million to the International Rescue Committee to support the COVID-19 response in East Africa.

Novo Nordisk is donating essential equipment including masks and gloves and provided 20 tonnes of alcohol to replenish stocks of hand sanitiser in hospitals. Novo Nordisk Foundation also made a donation of more than $7 million to fight COVID-19 in Denmark.

Pfizer created a new Global COVID-19 Medical Service Program that empowers medical colleagues to provide diagnostic, treatment, and public health support. Pfizer and the Pfizer Foundation announced a $40 million commitment in medical and charitable cash grants to help combat the COVID-19 pandemic. The donation addresses the urgent needs of partners who are working to
slow the spread of the virus and strengthen vulnerable healthcare systems against future public health threats.

**Roche**  Roche's subsidiary, **Genentech** and the Genentech Foundation are announcing charitable commitments of $42 million to help address the devastating impact of the COVID-19 pandemic. This support includes emergency response grants as well as funds for longer-term recovery efforts to mitigate ongoing challenges posed by the breadth and depth of this global health crisis.

**Sanofi**  **Sanofi** announced it will make a charitable gift of 100 million euros to help tackle the coronavirus crisis in France, with the money going to hospitals, care homes and other initiatives. **Sanofi** will donate 100 million doses of hydroxychloroquine across 50 countries.

**Servier**  **Servier** actively contributes by providing personal protection equipment to hospitals in affected countries, as well as making donations to foundations and NGOs (e.g.: Chinese Red Cross and APHP Foundation). In addition, tens of healthcare professionals employed by Servier have volunteered and have been made available to French health authorities to join medical staff on the front line against SARS-CoV-2.

**Sumitomo Dainippon Pharma**  **Sumitomo Dainippon Pharma** has planned to manufacture 20,000 face shields and procure personal protective equipment through its Chinese subsidiary for use in the worst affected Japanese prefectures. North American subsidiary **Sunovion Pharmaceuticals** provided a monetary donation to the US Center for Disaster Philanthropy (CDP) COVID-19 Response Fund, donated medical protective equipment and provided food donations and further financial support to several organizations? In Canada it joined forces with Innovative Medicines Canada to set up a COVID-19 fund. In the UK, subsidiary **Sunovion Pharmaceuticals Europe** delivered food donations to a food bank and sent out volunteers to support the activities of the National Health Service (NHS).

**Takeda**  **Takeda** is in total donating $6.25 million to the American Red Cross, the city of Cambridge, and the town of Lexington to fight COVID-19. The Red Cross will receive $4 million to make sure the organization can maintain a sufficient blood supply during the health crisis. Takeda is donating $2 million to the Cambridge Mayor’s Relief Fund and $250,000 to the Lexington Emergency Assistance Fund to help families affected by the epidemic.

**Teva**  **Teva** donated more than 10 million hydroxychloroquine doses to hospitals and refocused their Mount Sinai partnership. In Israel, it donated 2 million hydroxychloroquine units to the Israeli Ministry of Health, supported government-led programs and supported the National Aid Society. In India, it provided personal protective equipment (PPE), kits and food to populations in need. To Spain, it donated hydroxychloroquine and PPE. In the UK, it employees are able to volunteer with the National Health Service (NHS) without having to use unpaid leave.

**UCB**  **UCB** is donating hydro-alcoholic solutions to the Belgian and Swiss authorities which it started producing at its own major manufacturing sites. It is further supporting healthcare professionals in its company that wish to volunteer in line with local government needs and guidance. It also donated masks and googles to Belgian healthcare authorities and local hospitals.

**Support to China during the start of the outbreak (Jan/Feb 2020)**

**AbbVie**  **AbbVie** donated older antiviral drugs upon request from the Chinese government as an experimental option to
Astellas Astellas Pharma China, Inc. donated one million yuan to the Red Cross Society of China for purchasing personal protective equipment (PPE) and procuring medical treatment equipment, next to a donation of 300,000 yuan worth of PPE, all for healthcare professionals serving at hospitals in Wuhan, China.

Bayer Bayer made substantial financial contributions as well as donations of several medicines to the Chinese Red Cross.

Boehringer Boehringer Ingelheim (BI) made financial donations to the Chinese Red Cross to purchase medical protective equipment and also made donations of medicines.

Bristol-Myers Squibb Bristol Myers Squibb Company and the Bristol Myers Squibb Foundation are committed to supporting communities deeply affected by COVID-19. More than $5 million in financial support and needed products (i.e., personal protection equipment) has been provided to relief efforts in affected areas around the world, including Wuhan city and Hubei province (China).

CSL Limited CSL Limited donation of 1 million RMB to the China Red Cross in support of efforts to combat the pandemic.

Eisai Eisai has donated 1 million yuan to the Wuhan Charity Federation NPO and provided local healthcare providers with medicines and medical relief supplies.

Johnson & Johnson Johnson & Johnson provided drug-screening for antiviral properties against the novel coronavirus to assist with laboratory-based investigations to the Chinese Centre for Disease and Prevention and donated 300 boxes of HIV medication to the Shanghai Public Health Clinical Centre and Zhongnan Hospital of Wuhan University.

Lilly China Lilly China made a cash donation of one million yuan (approximately $150,000) to the Red Cross, and the Lilly Foundation donated an additional $100,000 to Direct Relief, a US non-profit organization. In addition, the Lilly Foundation made a $150,000 donation to Project HOPE to help with their efforts in response to the Coronavirus.

MSD MSD compiled a 1 million RMB donation for the Chinese Red Cross Foundation and supported the construction of a second specialty hospital (Leishenshan Hospital) to treat COVID-19 patients in Wuhan. Their team in China also launched online campaigns to educate the public about respiratory disease and helped provide up-to-date articles on treatment guidelines for health care professionals.

Otsuka Otsuka China donated medical supplies to the Hubei Charity Federation. Supportive nutritional products were sent to support medical staff, the Tianjin Red Cross and designated hospitals in Beijing. ZOP donated 1 million RMB to Red Cross located in Jinnan Community Hangzhou Lin’an Area to buy medical supplies and personal protective equipment. LOP donated 500,000 RMB to the Sichuan Red Cross to support the local epidemic response.

Pfizer Pfizer has made cash contributions to its global NGO partners who have shipped supplies to hospitals in China. Pfizer Foundation has provided $500,000 in grants to support the provision of urgently needed aid and supplies to front-line healthcare workers. This grant funding supports urgent assistance by Direct Relief and Project HOPE, who are working with local partners on the ground to provide supplies and other support to healthcare workers and health systems in affected areas of China.

Roche Roche donated diagnostics tests, medical supplies and financial support. Genentech, a member of the Roche Group, is working with Chinese health authorities and the government to help provide screening and health care, including supporting local health officials and hospitals in the Hubei Province.
Roche donated nearly $2m-worth of Actemra to China to help manage the COVID-19 outbreak.

Sumitomo Dainippon Pharma's Chinese subsidiary Sumitomo Pharmaceuticals donated RMB 1 million (approximately JPY 15 million) to the Chinese Red Cross Foundation for prevention and containment efforts.

Teva donated 9,600 packs of azithromycin to 15 hospitals in Hubei.

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**KEY FACTS & FIGURES**

- **>20** companies involved in R&D for therapeutics, vaccines and diagnostics
- **35** clinical trials evaluating the effectiveness of therapeutics
- **350** people on average in clinical trials (except large-scale Gilead, Pfizer and Teva trials which have >1000 participants)

- **$700M**
- **$40M**
- **25M**
<table>
<thead>
<tr>
<th>IN MONETARY DONATIONS</th>
<th>NON-MONETARY DONATIONS</th>
<th>DONATED UNITS OF MEDICINES AND PERSONAL PROTECTIVE EQUIPMENT</th>
</tr>
</thead>
</table>

### WHO LINKS

- WHO - COVID-19 situation dashboard
- WHO - WHO R&D Blueprint
- WHO - Coronavirus Diseases (COVID-19) Outbreak
- WHO - Coronavirus Diseases (COVID-19) Situation Reports
- WHO - Q&A on the Coronavirus
- WHO - Global Research on Coronavirus Disease (COVID-19)
- WHO - Speeches of WHO DG Dr Tedros at daily media briefings
- WHO - Updated Country Preparedness and Response Status for COVID-19 as of 6 March 2020
- WHO COVID-19: WHO’s Global Research Roadmap
- WHO - A Coordinated Global Research Roadmap: 2019 Novel Coronavirus
- WHO - Draft landscape of COVID 19 candidate vaccines
- Access to COVID-19 Tools (act) Accelerator

### OTHER LINKS

- International Clinical Trials Registry Platform
- Policy Cures Research - COVID-19 R&D Tracker
- COVID-19 NMA - a living mapping of ongoing research.
- Global Coronavirus COVID-19 Clinical Trial Tracker
- FDA - Emergency Use Authorization (EUA) information, and list of all current EUAs