



Coronavirus (COVID-19) Executive Briefing

Understand the COVID-19 outbreak, its impact on the global economy, and initial implications for specific sectors

Last Updated: 11 May 2020

Sixteenth in the series

Key Developments and Changes Since Last Update



347,614 new cases since Thursday; total confirmed cases reach 4 million

- The virus has now spread to 189 countries/regions with 4 million confirmed cases and more than 280,000 deaths.

Slide 6

The US records the highest number of infections; ten countries have reported more cases than China

- US, Spain, Italy, UK, France, Germany, Russia, Turkey, Brazil and Iran surpassed China in terms of confirmed cases, although testing rates in China are low.
- The number of confirmed cases in the US crossed 1.3 million, with deaths nearing 80,000.

Slides 8 to 10

No therapeutic or preventative options are available, but the pipeline is crowded

- Currently there are 1,540 clinical trials for COVID-19 (+79 from the last update). Gilead's remdesivir's recent trial success makes it the new standard of care and the drug was approved in Japan for treatment of patients with severe COVID-19. The race is on to develop a vaccine and produce millions of doses by the end of 2020.

Slide 19

Upward trends in clinical trial disruption continue with at least 1,072 trials (+48 from the last update) and 430 Pharma/Biotech companies and CROs (+22 from the last update) associated with disrupted clinical trials

- Across the industry, ongoing trials, irrespective of indication, will likely be impacted not just in terms of trial enrollment and patient care but also data collection and analysis.

Slide 28

In the short-term, unemployment will rise in all major economies

- 20.5 million Americans lost their jobs in April with unemployment rate rising to 14.7%, highest since the great depression of 1930s.

Slide 34

Worldwide GDP forecast to contract

- Consensus forecasts for worldwide GDP growth in 2020 are (-)2.3%. The US economy contracted by 4.8% in Q1 2020; the EU economy predicted to contract 7.5% in 2020

Slide 35

GlobalData polls

- Concern over the virus are falling; business confidence is improving
- Hiring is on hold; marginal increase in layoffs announced
- Recovery not expected for 2-3 years

Slides 43 to 45

A large, detailed 3D rendering of a virus particle, likely SARS-CoV-2, shown in a teal/cyan color against a dark blue background. The surface is highly textured with numerous small, rounded protrusions. A vertical teal bar is positioned to the left of the 'Contents' header.

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- US records the highest number of infections
- Infection Trajectories

COVID-19 Testing and Management

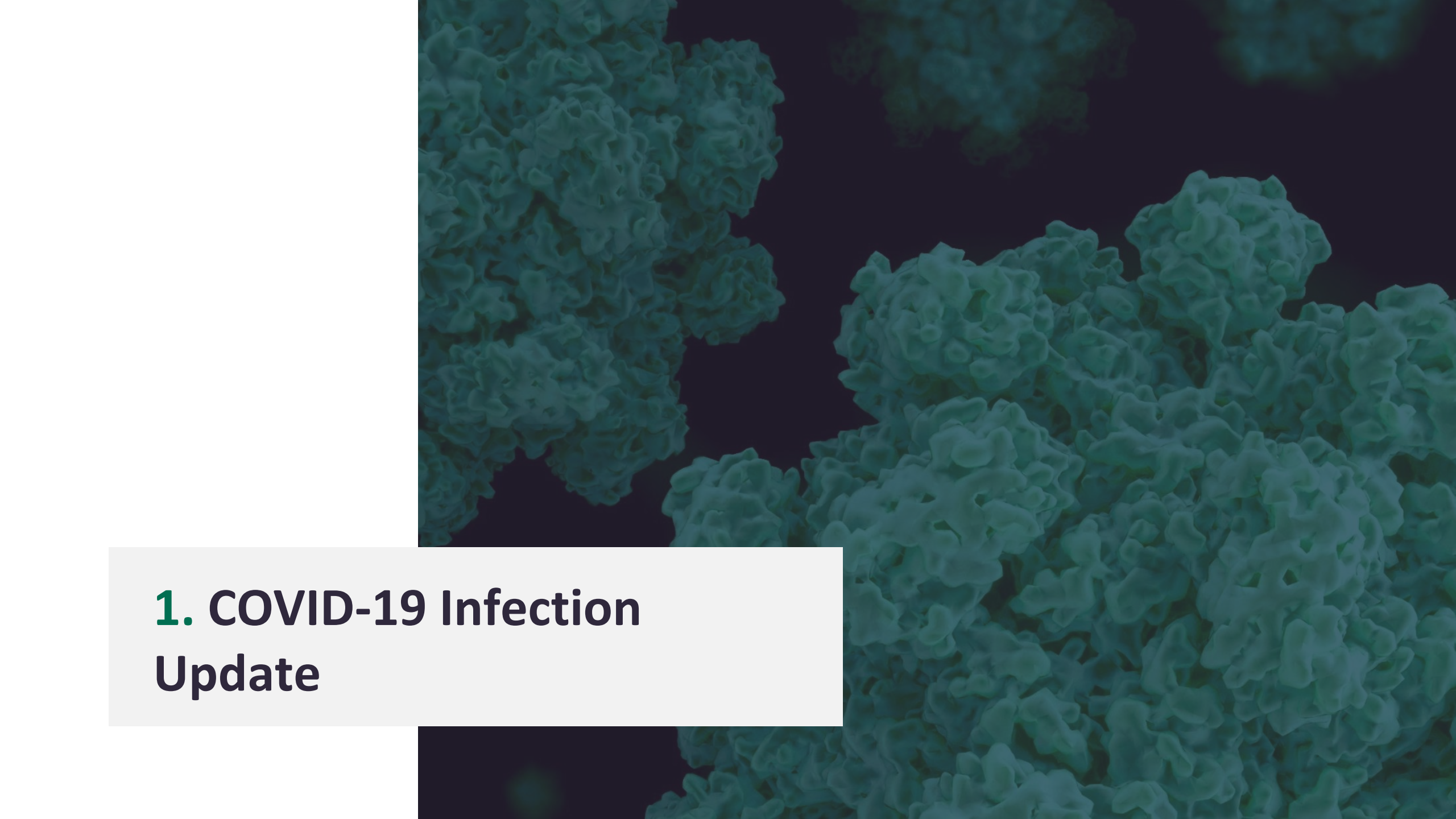
- Testing Statistics by Country

COVID-19 Vaccine and Therapeutic Development

Economic Impact

- Overview of Top Economies
- Stock Market Indices
- Unemployment
- GDP
- Policy Response
- Company Concerns

Sector Impact

A microscopic view of COVID-19 virus particles, showing their characteristic spherical shape and surface texture. The particles are rendered in a teal color against a dark background. The image is partially obscured by a white rectangular box on the left side, which contains the title text.

1. COVID-19 Infection Update



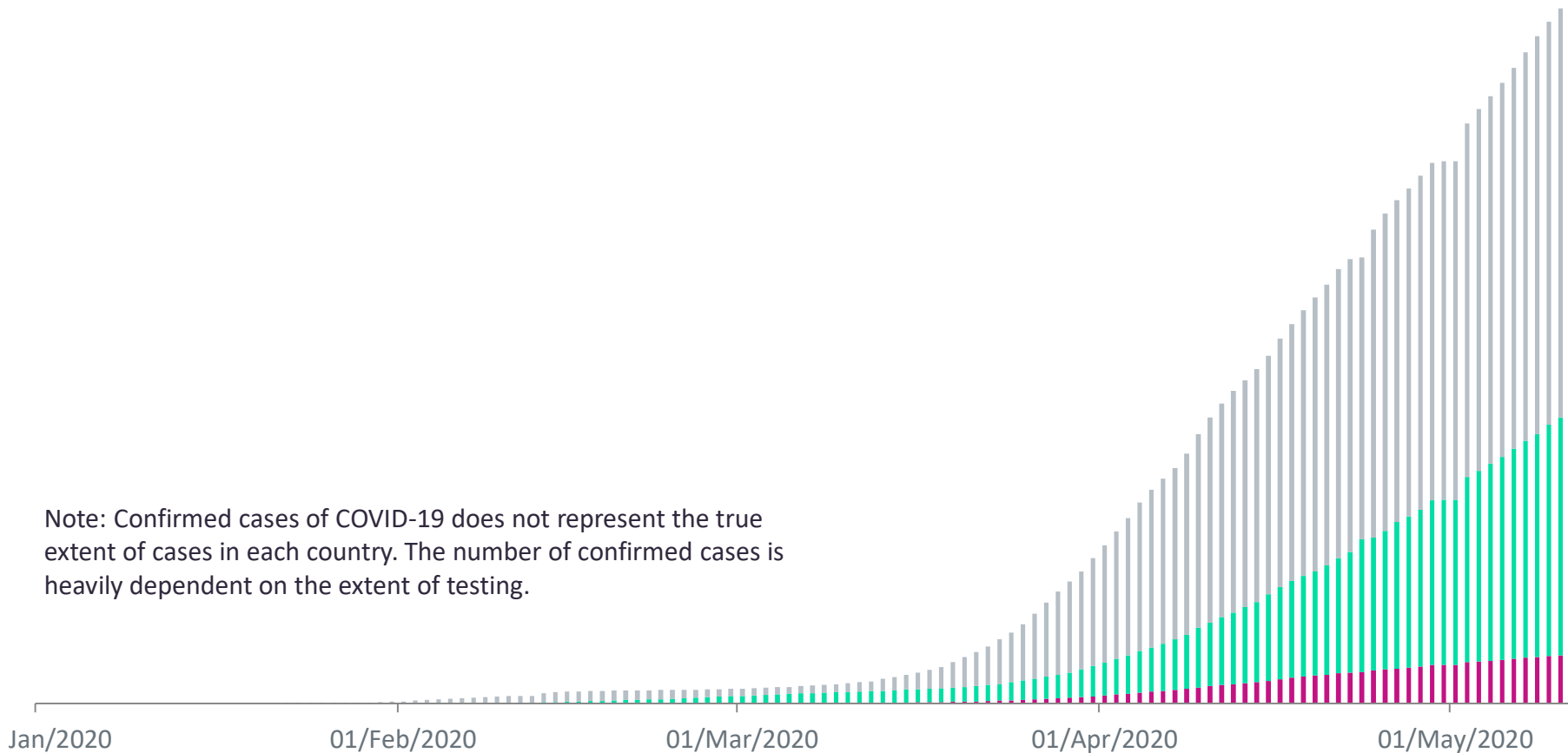
-
- The virus has spread to 189 countries, with 4 million confirmed cases
 - Case count in the US, Spain, Italy, UK, France, Germany, Russia, Turkey, Brazil and Iran exceeds China's
 - The number of confirmed cases in the US crossed 1.3 million
 - The US recorded the highest number of fatalities, which nears 80,000
 - US records the highest number of infections
 - Recorded deaths decline
 - Case fatality rates exceed 10% in Spain, Italy, France, and UK

Infection Rates Increase Exponentially



Impact of COVID-19 +/- change between 7 May 2020 and 11 May 2020
as of 11 May 2020

■ Deaths ■ Recovered ■ In Treatment



Note: Confirmed cases of COVID-19 does not represent the true extent of cases in each country. The number of confirmed cases is heavily dependent on the extent of testing.

347,614 new cases since Thursday's briefing

COUNTRIES/TERRITORIES AFFECTED
189

CONFIRMED CASES
4,102,955 +347,614

IN TREATMENT
2,408,617 +162,522

RECOVERED
1,411,619 +166,204

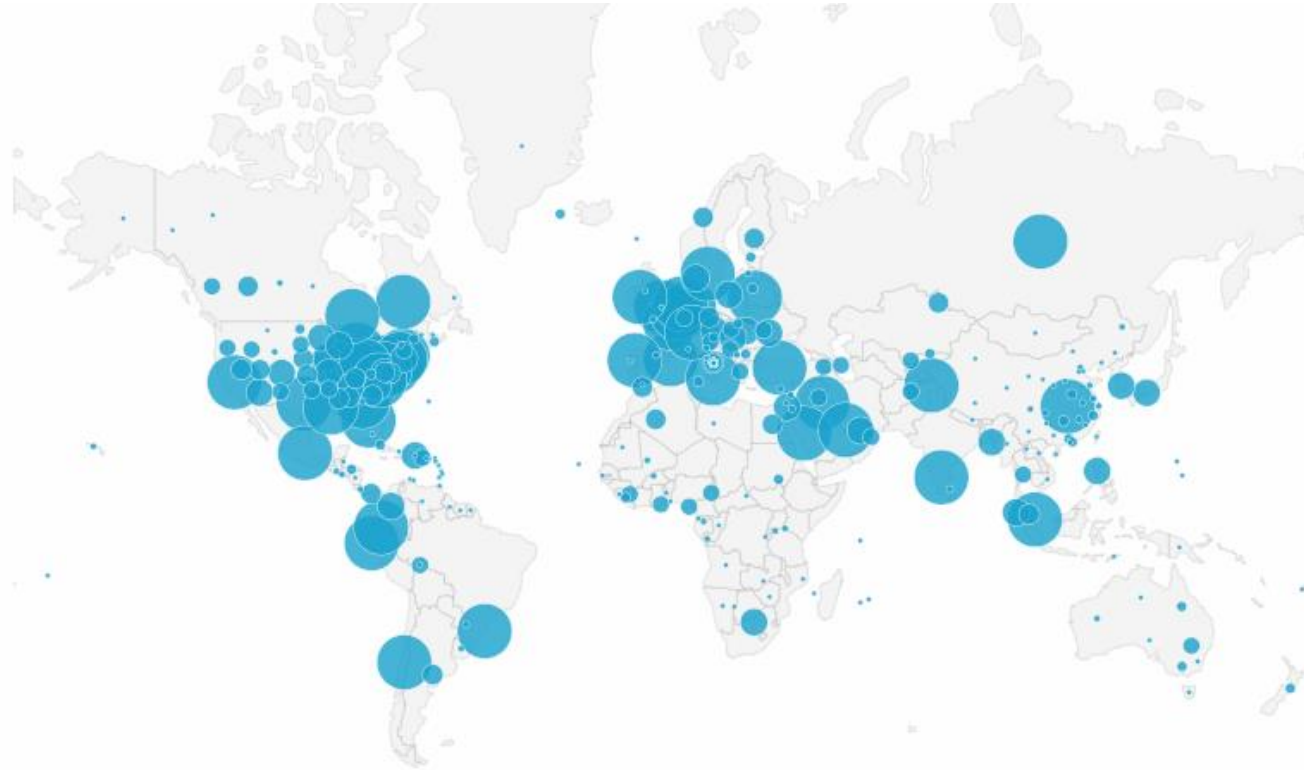
DEATHS
282,719 +18,888

COVID-19 is a Worldwide Problem



Affected Countries/Regions

as of 11 May 2020



Note:

Confirmed cases of COVID-19 do not represent the true extent of cases in each country. The number of confirmed cases is heavily dependent on the extent of testing.

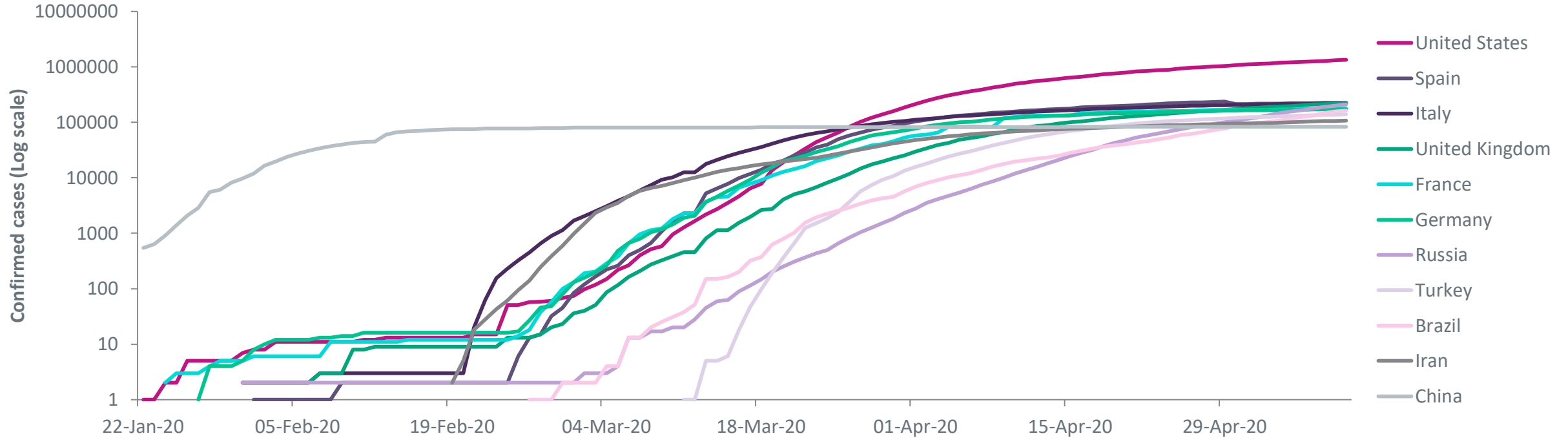
China case counts do not include counts from Hong Kong (1,047 confirmed cases | 982 recovered | 4 deaths), Macau (45 confirmed cases | 41 recovered | 0 deaths) and Taiwan (440 confirmed cases | 366 recovered | 6 deaths)

| | Confirmed Cases | Recovered | Deaths |
|----------------|-----------------------|--------------------|------------------|
| United States | 1,329,799 +101,196 | 216,169 +26,259 | 79,528 +6,097 |
| Spain | 224,350 +4,025 | 136,166 +10,164 | 26,621 +764 |
| United Kingdom | 220,449 +18,090 | 1,002 +68 | 31,930 +1,780 |
| Italy | 219,070 +4,613 | 105,186 +11,941 | 30,560 +876 |
| Russia | 209,688 +43,759 | 34,306 +12,979 | 1,915 +378 |
| France | 177,094 +2,870 | 56,327 +2,246 | 26,383 +571 |
| Germany | 171,879 +3,717 | 145,600 +5,700 | 7,569 +294 |
| Brazil | 162,699 +36,088 | 64,957 +13,587 | 11,123 +2,535 |
| Turkey | 138,657 +6,913 | 92,691 +14,489 | 3,786 +202 |
| Iran | 107,603 +5,953 | 86,143 +4,556 | 6,640 +222 |
| China | 82,918 +33 | 78,144 +187 | 4,633 |

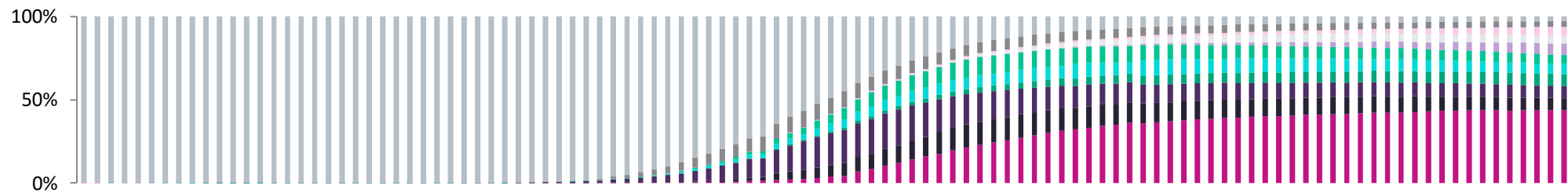
Case Count in Ten Countries Exceeds China's



COVID-19 Confirmed Cases by Country
as of 11 May 2020



Breakdown of new cases by countries



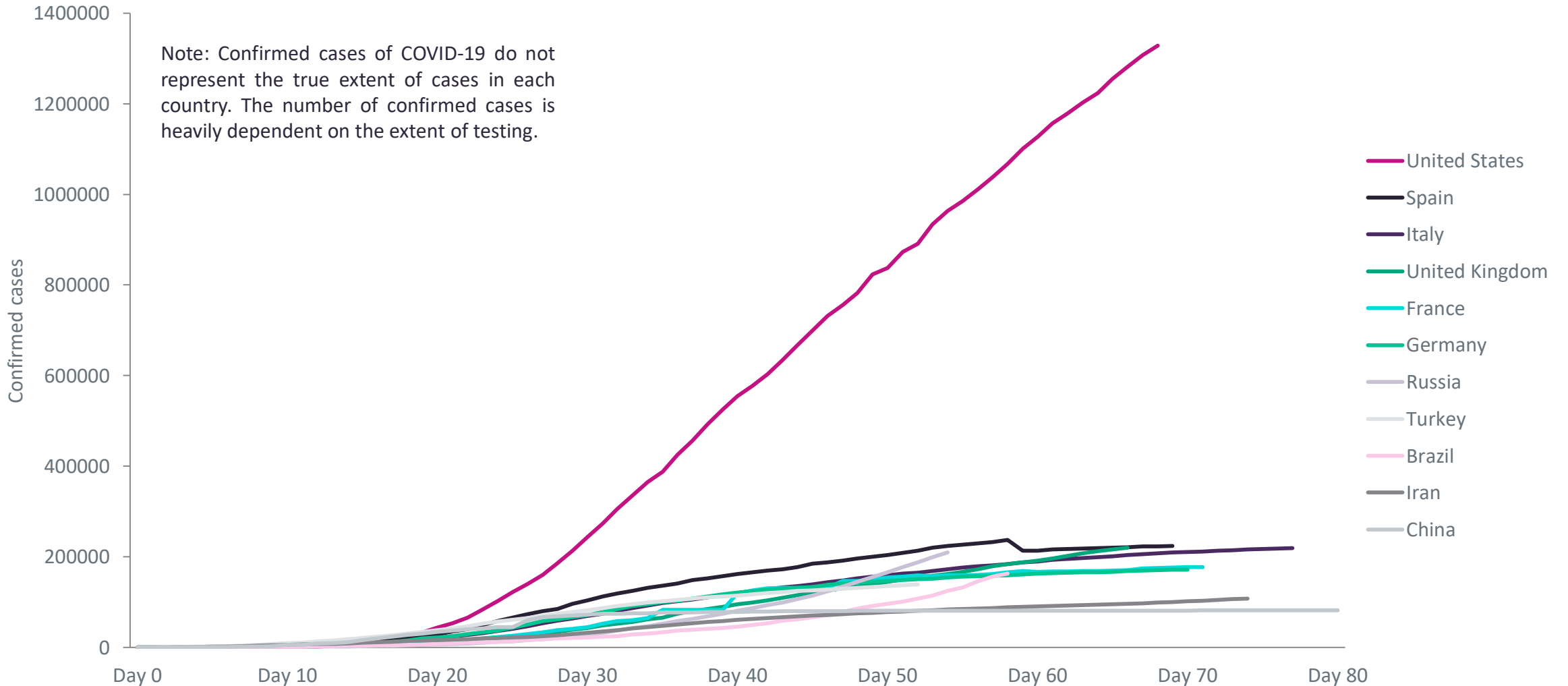
Source: GlobalData Analysis; 2019 Novel Coronavirus COVID-19 (2019-nCoV) Data Repository by Johns Hopkins CSSE

US Records the Highest Number of Infections



COVID-19 Confirmed Cases Trajectories for Select Countries

Cumulative confirmed cases, by days since 100th case for top 10 countries by confirmed cases till the 80th day, as of 11 May 2020

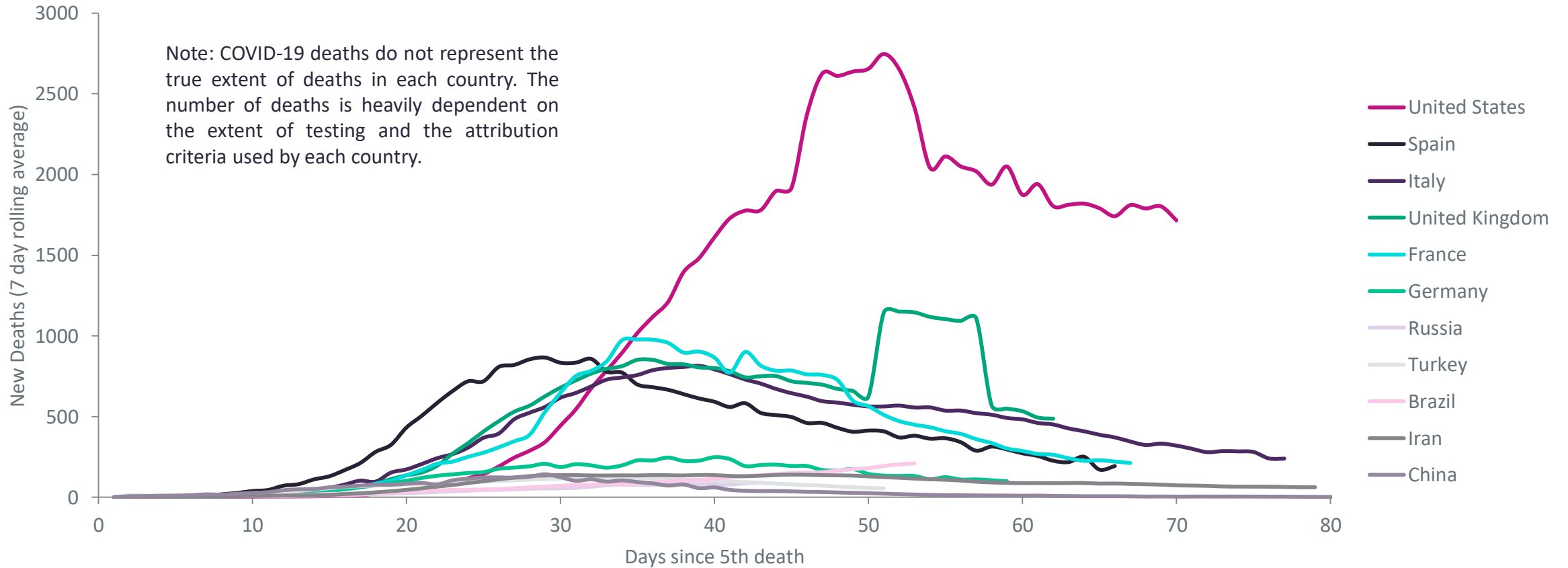


Recorded Deaths Decline



COVID-19 Death Trajectories for Select Countries

7 day rolling average of new deaths, by days since 5th death for top 10 countries by confirmed cases till the 80th day, as of 11 May 2020



Note: China's 7 day rolling average of new deaths continues to decline even after day 60 from day since 5th death

On 29 April, the UK changed its reporting policy to include COVID-19 deaths outside hospitals. The sudden spike is caused by the retrospective inclusion of all deaths prior to this date. The 7-day average figure used in this chart reflects this spike over a week-long period, before dropping to the long-term trend.

Infection Peak and Decline Forecasts for Select Countries



GlobalData Pharma Analysis

- Peak and recovery curves based on GD forecast models, details on next slide.
- Russia moves up 3 spots ahead of the UK. Brazil moves ahead of Turkey.
- US, UK, Italy, and Iran: trending better along the new model with slower decline, recovery estimates based on new model forecast recovery in July.
- Iran appears to have had a small surge of cases this past week.
- France and Germany: recovery is slower than expected, extended to mid-June.
- Russia and Brazil: yet to reach peak, expect to trend along new model with recovery timeline extended to end of July.

Estimated Peak Weeks and Decline to Zero New Cases Weeks for Top Infected Countries (Excluding China)

as of 11 May 2020

| Date (Weeks) | MAR | APR | | | | MAY | | | | JUN | | | | | July | | | | |
|--------------|------|------|------|------|------|------|------|----------|----------|----------|----------|----------|----------|----|------|----|----|----------|----------|
| | 30 | 6 | 13 | 20 | 27 | 4 | 11 | 18 | 25 | 1 | 8 | 15 | 22 | 29 | 6 | 13 | 20 | 27 | |
| US | | Peak | Peak | Peak | | | | | | | | | | | | | | Recovery | Recovery |
| Spain | Peak | Peak | | | | | | Recovery | Recovery | Recovery | | | | | | | | | |
| Italy | Peak | Peak | | | | | | | | | | | | | | | | Recovery | Recovery |
| Russia | | | | | | | Peak | Peak | Peak | Peak | | | | | | | | | Recovery |
| UK | | | Peak | Peak | Peak | | | | | | | | | | | | | Recovery | Recovery |
| France | | Peak | Peak | | | | | | | Recovery | Recovery | Recovery | | | | | | | |
| Germany | Peak | | | | | | | | | Recovery | Recovery | Recovery | | | | | | | |
| Brazil | | | | | | | Peak | Peak | Peak | | | | | | | | | | Recovery |
| Turkey | | | Peak | Peak | | | | | | Recovery | Recovery | Recovery | Recovery | | | | | | |
| Iran | | Peak | Peak | | | Peak | | | | | | | | | | | | Recovery | Recovery |
| Canada | | | | | | Peak | Peak | Peak | Peak | | | | | | | | | Recovery | Recovery |

Note: Trends from China showed a steep drop after reaching peak. However, recent trends from US, UK, Italy, Spain, and other markets showed slower declines after peak than China, and in some markets, a long extended plateau without obvious peak or decline. Recovery forecast will now be trended along the new running average model taking into account the more drawn out recovery observed in recent weeks unless data suggests otherwise. Additional surges after initial peak are also likely due to countries opening up.

Peak weeks in pink; recovery weeks with decline in daily new cases close to 0 in green. Lighter shaded squares represent more uncertain estimates.

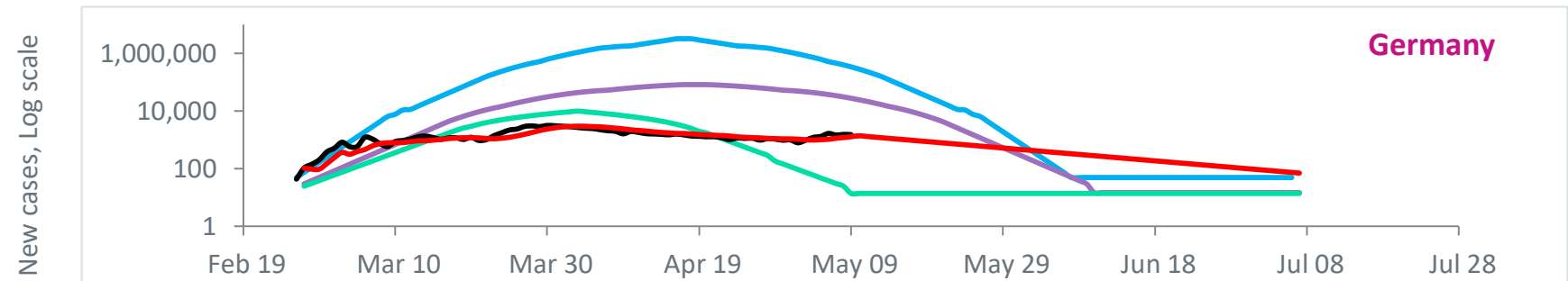
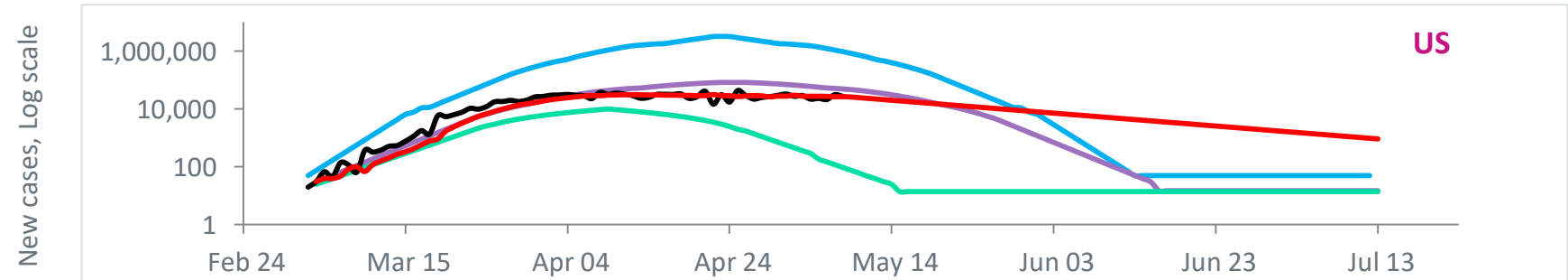
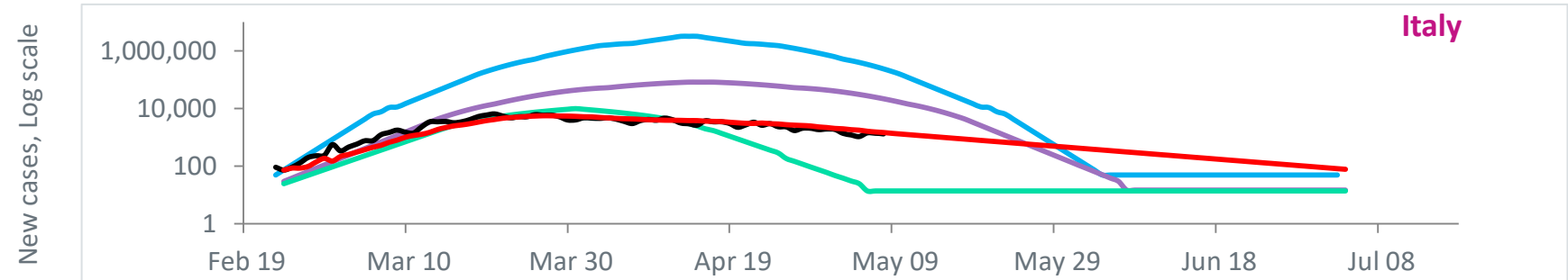


Infection Peak and Decline Forecasts for Select Countries

GlobalData Pharma Analysis

- Peak transmissions & potential dates for return to normal in the countries are limited by the testing and reporting capabilities.
- Trajectory dependent on continued implementation of social-distancing, testing and contact tracing, isolation of infected patients, and prevention of travel-related second-wave transmissions.
- GlobalData will monitor the situation for second, third, or seasonal outbreaks, which can be expected based on global trends.
- New model Running Average (red line): potential COVID-19 outlook with slower decline rate observed in several markets such as Canada and Italy.

Projections of Daily New Confirmed Cases for Select Countries, Since 100th Confirmed Case as of 11 May 2020



Source: GlobalData Analysis

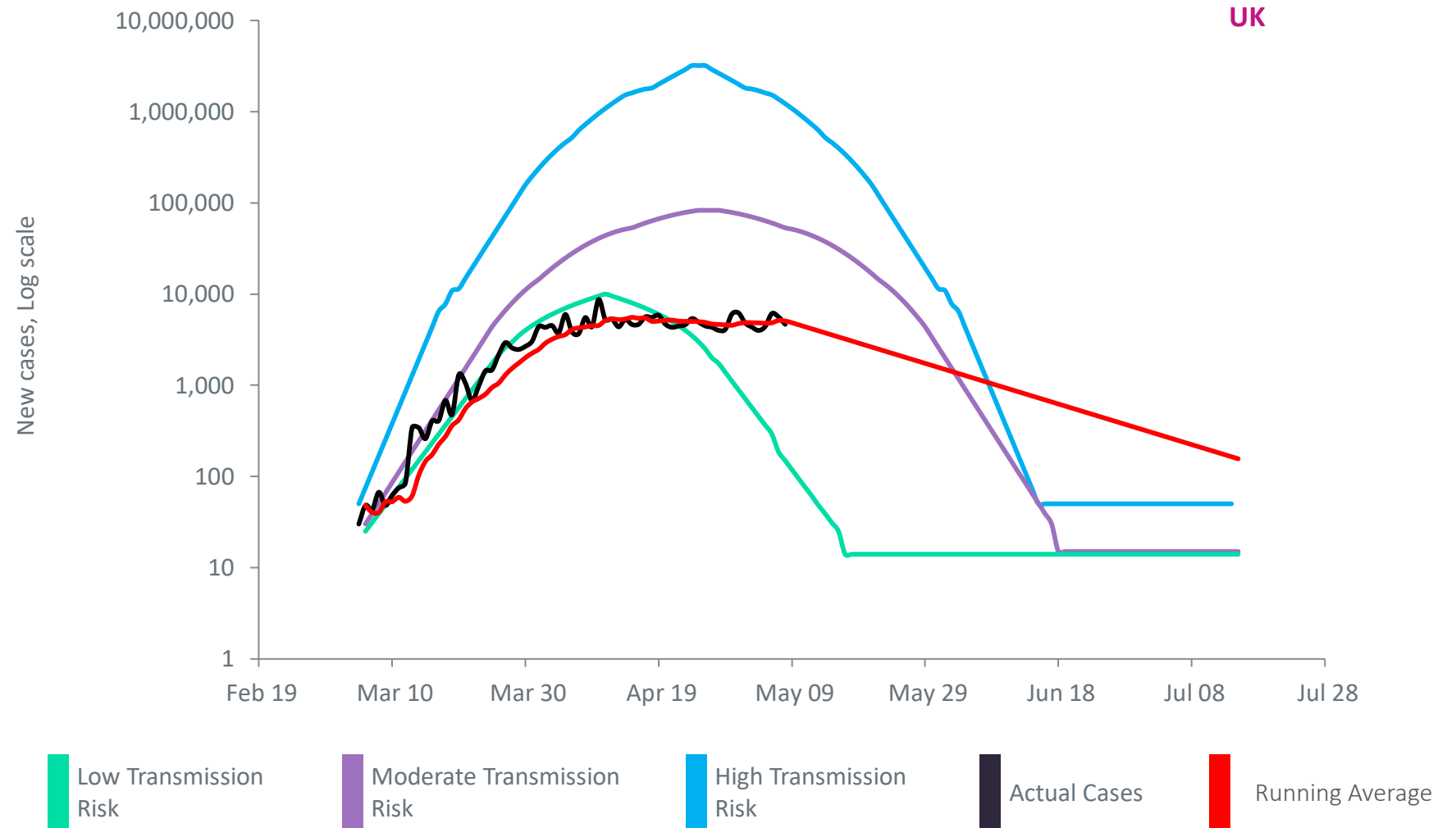
Country Highlight: UK Not Expected to Reach Full Recovery Until Mid-July at Earliest



GlobalData Pharma Analysis

- UK appeared to have reached the peak of its transmission curve in the second week of April.
- Average daily new cases in past week is around 500 cases lower than the April peak week.
- Despite increased testing, the number of new confirmed cases has not increased in the recent days.
- However, the UK appears to have been experiencing an extended plateau of new cases, recovery is slow.
- There is growing pressure on the UK government to lift its social distancing policy. If this happens too soon, a second wave of exponentially increasing cases could easily happen.

UK, Modeled Forecast of COVID-19 Trajectory of New Cases.
as of 11 May 2020



Source: GlobalData Analysis

A microscopic view of virus particles, likely coronaviruses, showing their characteristic spherical shape and surface structure. The particles are rendered in a teal/cyan color against a dark background. The image is partially obscured by a white rectangular box on the left side.

2. COVID-19 Testing and Management



Testing

- Rapid and Point of Care Testing now make up more than 50% and 30% of pipeline and marketed diagnostic tests, making the prospect of population level testing increasingly likely.
- Supply issues of test reagents continue to have an impact, particularly in countries reliant upon ad hoc test protocols that are dependent upon so-called home-brew reagents.
- Abbott's launch of the ID NOW molecular point of care test is a potential game changer, allowing a molecular test to detect the virus in as little as five minutes. Abbott is on track to initially provide 50,000 ID NOW COVID-19 tests per day, equating to less than 3 tests for each of the 18,000 ID NOW machines in use in the US.
- US PCR testing volumes appear to be plateauing at 140,000-150,000 tests per day.

Management

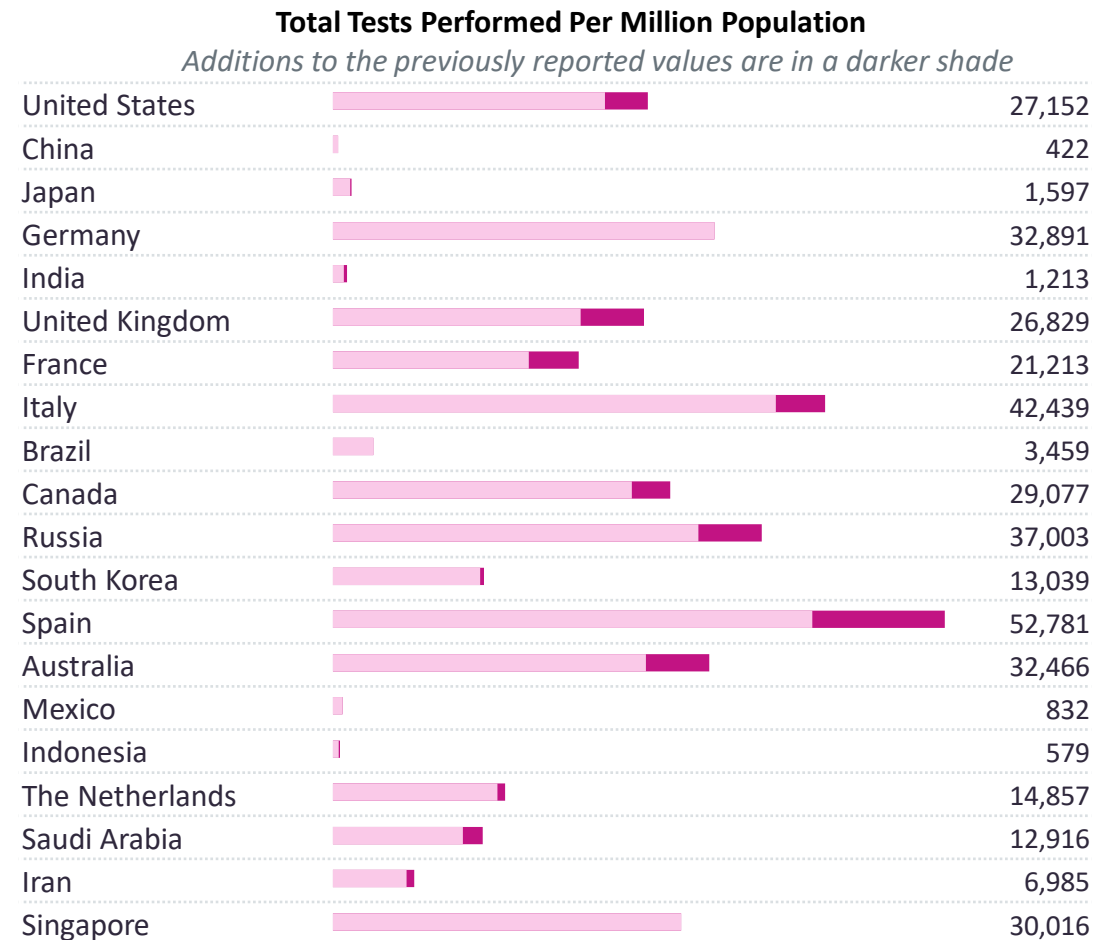
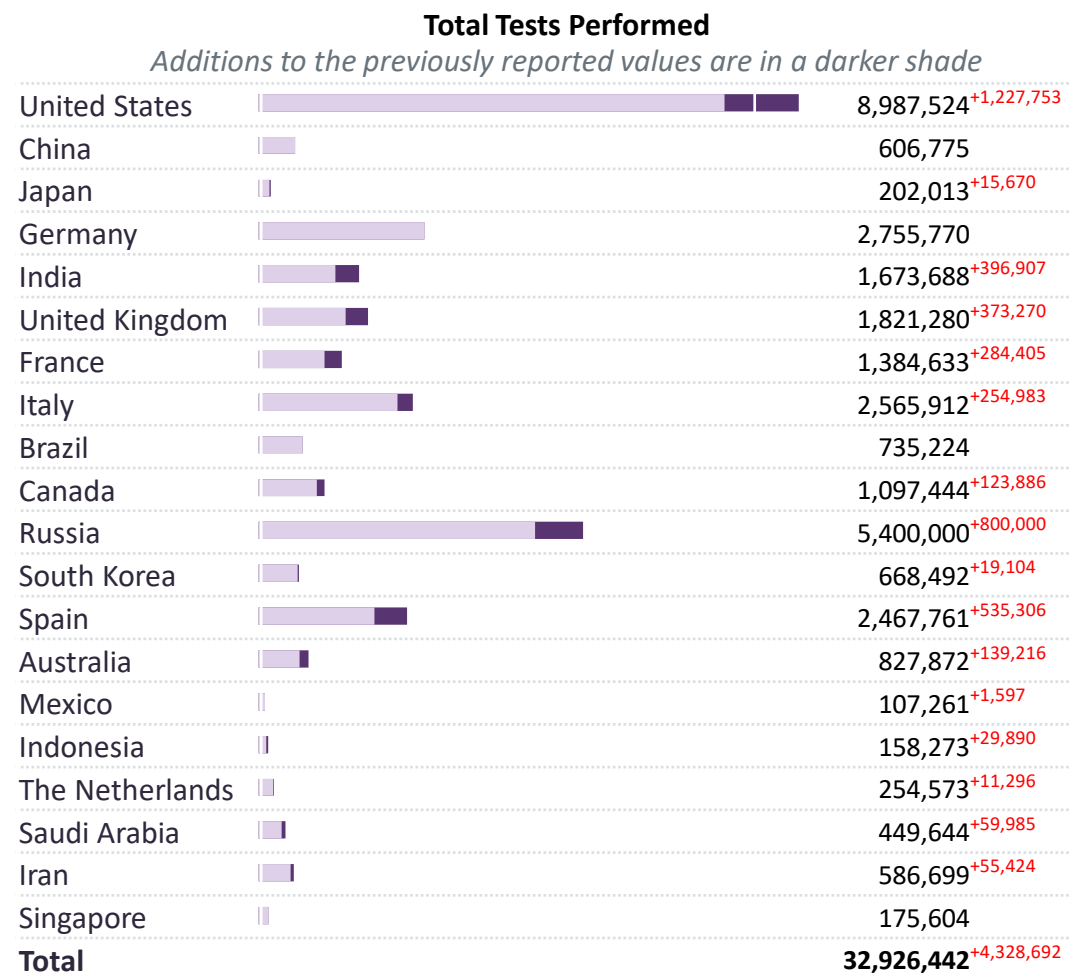
- Ventilator shortage became a critical issue after the COVID-19 outbreak, starting from China and Italy, now to the UK and US. According to GlobalData's analysis, approximately 880,000 more ventilators are in demand globally due to the COVID-19 outbreak.
- The Ventilator Challenge consortium, led by the High Value Manufacturing Catapult research group is best placed to deliver new ventilators soonest, as it is making use of spare production capacity to scale up production of Smiths Detection machines, that are already in use with the NHS, such as the Parapac transport ventilator.
- Non-medical companies globally are developing and building emergency ventilators, with rudimentary designs appearing in developing markets, as inventories of ventilators from established manufacturers are exhausted.
- Donald Trump has now invoked the Defense Production Act, a law stemming from the Korean War, to force General Motors to produce ventilators. GMs' deal with medical equipment maker Ventec Life is expected to result in shipments from next month.

Testing for COVID-19 is Gathering Pace In Many Countries



Total Tests and Per Million Population Tests for Top Economies

as of 11 May 2020



Note: The last known test counts taken for China (27-04-2020), Germany(07-05-2020), Brazil (04-05-2020) and Singapore(05-05-2020). Other figures updated between 08-05-2020 and 11-05-2020.

Source: GlobalData Analysis; Government/Ministry of Health websites; Factly.in; Ourworldindata.org



3. COVID-19 Vaccine and Therapeutic Development

No Therapeutic or Preventative Options are Available but the Pipeline is Crowded



Examples of Vaccines and Therapeutic Agents in Development for COVID-19

as of 11 May 2020

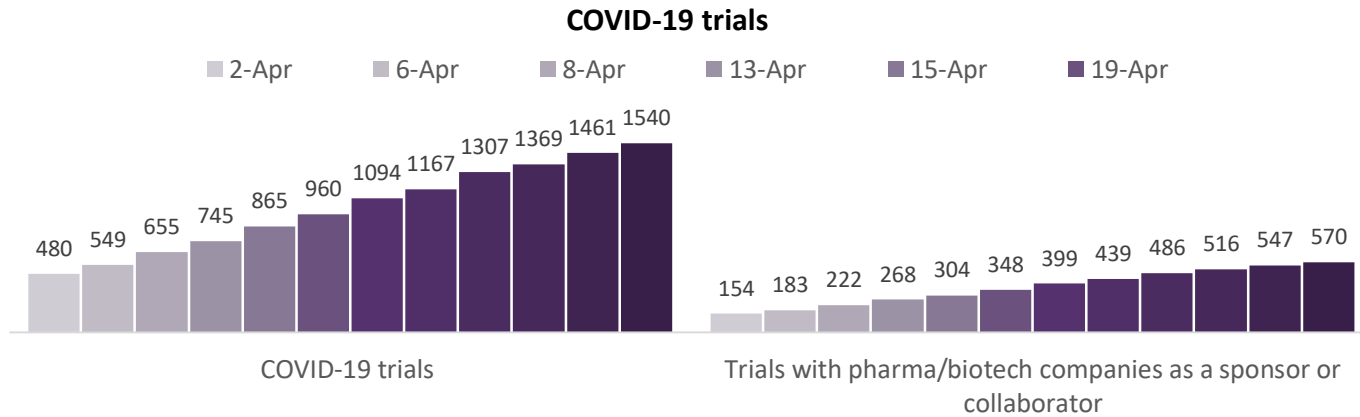
| Intervention Type | Drug in Trial | Trial Title and Phase | Trial Status |
|-------------------|---|---|-------------------------|
| Therapeutic | Pluristem Therapeutics' emiplacel | Clinical Study of Compassionate Use of Emiplacel (Phase I) | Ongoing, recruiting |
| | Cytodyn's leronlimab | Study to Evaluate the Efficacy and Safety of Leronlimab for Mild to Moderate COVID-19 (Phase II) | Ongoing, recruiting |
| | OncolImmune's CD24Fc | CD24Fc as a Non-antiviral Immunomodulator in COVID-19 Treatment (SAC-COVID) (Phase III) | Ongoing, recruiting |
| | Ascletis's ASC09 + ritonavir | A Randomized, Open, Controlled Clinical Study to Evaluate the Efficacy of ASC09F and Ritonavir for 2019-nCoV Pneumonia (Phase III) | Ongoing, recruiting |
| | Alexion's eculizumab (trial by Hudson Medical) | Eculizumab (Soliris) in COVID-19 Infected Patients (SOLID-C19) (Phase III) | Ongoing, recruiting |
| | Gilead's remdesivir | Study to Evaluate the Safety and Antiviral Activity of Remdesivir (GS-5734) in Participants With Severe Coronavirus Disease (COVID-19) (Phase III) | Ongoing, not recruiting |
| | Sanofi/Regeneron's sarilumab | Evaluation of the Efficacy and Safety of Sarilumab in Hospitalized Patients With COVID-19 (Phase II/III) | Ongoing, recruiting |
| | F. Hoffman-La Roche's tocilizumab | Early Intervention with Tocilizumab in Patients with COVID-19 and Hypoxia (Phase III) | Ongoing, recruiting |
| Vaccine | BioNTech's BNT-162a1, BNT-162b1, BNT-162b2, BNT-162c2 | A Multi-site Phase I/II, 2-Part, Dose-Escalation Trial Investigating the Safety and Immunogenicity of four Prophylactic SARS-CoV-2 RNA Vaccines Against COVID-2019 Using Different Dosing Regimens in Healthy Adults (Phase I/II) | Ongoing, recruiting |
| | Inovio Pharmaceuticals' INO-4800 | Safety, Tolerability and Immunogenicity of INO-4800 for COVID-19 in Healthy Volunteers (Phase I) | Ongoing, not recruiting |
| | Moderna's mRNA-1273 (trial by NIAID) | Safety and Immunogenicity Study of 2019-nCoV Vaccine (mRNA-1273) for Prophylaxis of SARS CoV-2 Infection (COVID-19) (Phase I) | Ongoing, recruiting |
| | University of Oxford's ChAdOx1 nCoV-19 | A Study of a Candidate COVID-19 Vaccine (COV001) (Phase I/II) | Ongoing, not recruiting |
| | Sinovac Biotech's Coronavirus Disease 2019 (COVID-19) vaccine, PiCoVacc | Safety and Immunogenicity Study of Inactivated Vaccine for Prophylaxis of SARS CoV-2 Infection (COVID-19) (Phase I/II) | Ongoing, recruiting |

...With Clinical Investigations of Novel and Existing Drugs Growing Exponentially



Clinical Investigations for Therapeutics and Vaccines for COVID-19 by Numbers

as of 10 May 2020

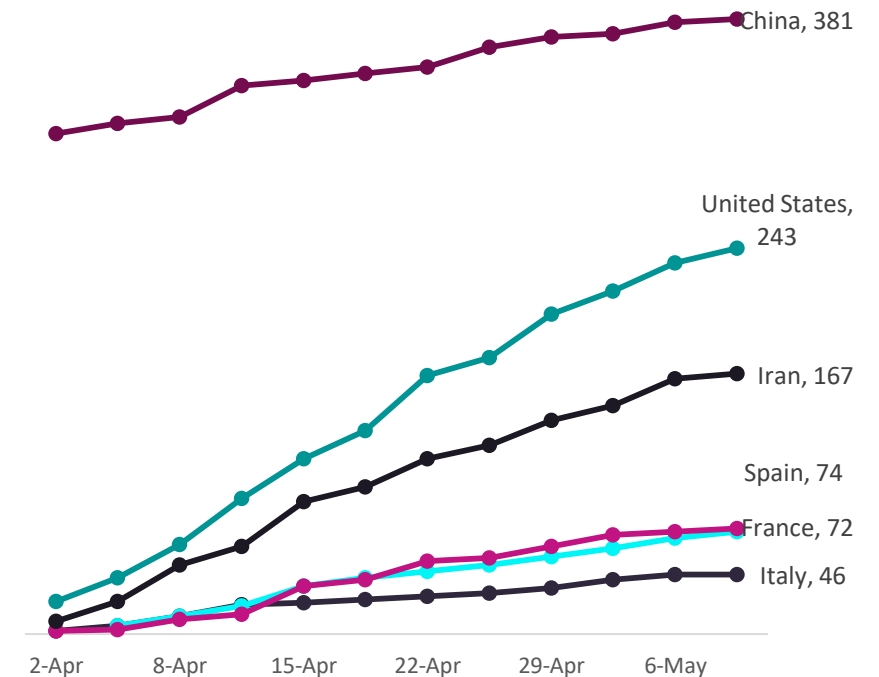


Where is the trials activity?

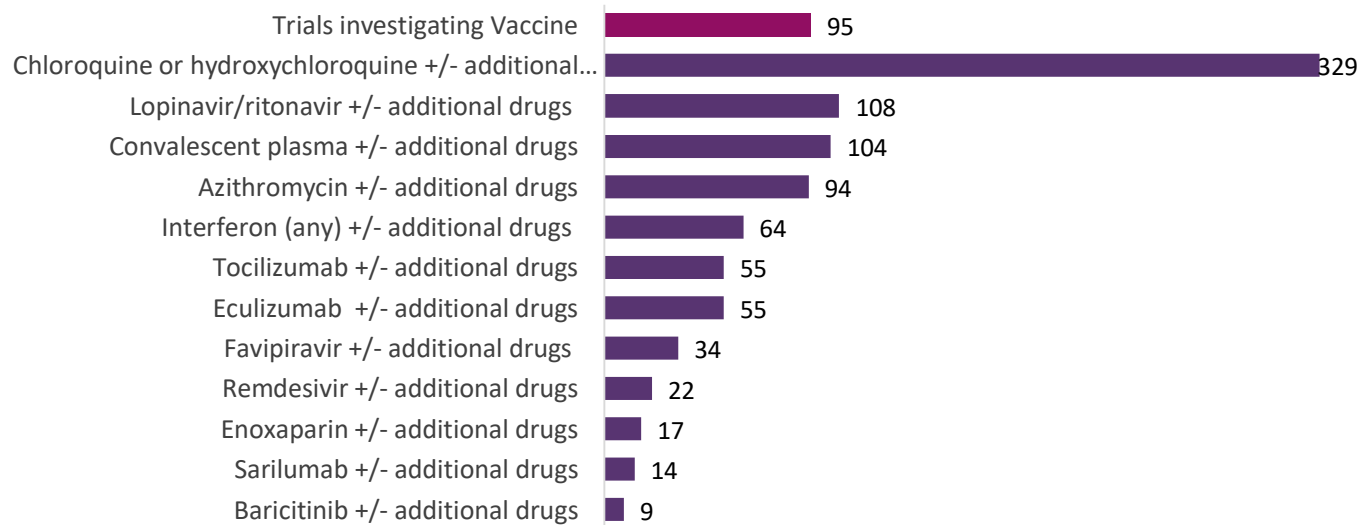
55 (-2) multinational trials, 1220 (+55) single country trials (remaining trials have not disclosed locations)

Countries with more than 40 COVID-19 trials

Number of trials in the US and Iran are growing at a much higher rate than other countries



Investigational drugs in COVID-19 trials



SARS-CoV-2 Antivirals & Vaccines Are Being Developed Independently...



Independently Developed Antivirals

as of 11 May 2020



- Gilead is developing remdesivir, an antiviral in Phase III trials in China/Asia and the US; received Emergency Use Authorization (EUA) from the FDA on May 1, 2020. The drug was approved in Japan on May 7th.



- Innovation Pharmaceuticals announced that it is evaluating Brilacidin, a defensin-mimetic drug candidate, as a potential treatment for coronavirus. Brilacidin has shown antibacterial, anti-inflammatory, and immunomodulatory properties in several clinical trials.



- Novartis announced plans to initiate a Phase III clinical trial to study canakinumab in patients with COVID-19 pneumonia. The CAN-COVID trial will examine the efficacy of utilizing canakinumab, an interleukin (IL)-1 β blocker, to treat a type of severe immune overreaction called cytokine release syndrome (CRS).

Independently Developed Vaccines

as of 14 April 2020



- An intranasal COVID-19 vaccine is being developed by US-based clinical-stage biopharmaceutical company, Altimune.



- Vaxart is developing an oral recombinant vaccine in a tablet formulation using its proprietary oral vaccine platform, VAAST.



- The MIGAL Research Institute is modifying an Infectious Bronchitis Virus (IBV) vaccine for COVID-19. The vaccine has demonstrated efficacy in pre-clinical trials conducted by the Volcani Institute.



- Clover Biopharmaceuticals is developing a recombinant subunit vaccine using its patented Trimer-Tag technology, based on the trimeric S protein (S-Trimer) of the COVID-19 coronavirus, which is responsible for binding with the host cell.

“The speed with which remdesivir has moved into clinical development for this coronavirus reflects the pressing need for treatment options and the shared commitment of industry, governments, global health organizations and healthcare providers to respond to this public health threat with the highest urgency.”

Merdad Parsey, MD, PhD, Chief Medical Officer, Gilead Sciences

“The results of our recently published influenza challenge study demonstrated that our oral tablet vaccine primarily protects through mucosal immunity, a potential key factor when targeting mucosal pathogens such as this new coronavirus.”

Sean Tucker, PhD, Chief Scientific Officer of Vaxart

...and Through Partnerships Between Public and Private Sectors



Example Partnership

as of 11 May 2020



Description of Partnership Activity

- Junshi Biosciences and Eli Lilly and Company announced have entered into an agreement to co-develop therapeutic antibodies for the potential prevention and treatment of COVID-19.
- At the beginning of the COVID-19 outbreak, Junshi Biosciences launched one of the industry's first R&D efforts aimed at discovering therapies to combat COVID-19. Multiple neutralizing antibodies have been engineered, with the lead asset poised to enter clinical testing in the second quarter.

Partner View

“

As the number of global cases continues to grow, there is an urgent need to study multiple complementary approaches to address this disease.

”

Daniel Skovronsky, Chief Science Officer, Eli Lilly



- Bavarian Nordic announced that it has entered into an exclusive head of terms agreement with AdaptVac, a joint venture established by ExpreS2ion Biotechnologies and NextGen Vaccines spun out of the University of Copenhagen, to license AdaptVac's proprietary capsid virus like particle (VLP) based SARS-CoV-2 subunit vaccine. The parties seek to enter into the final license agreement within the next two months.
- AdaptVac's technology has the potential to mimic a virus to the body's immune system, giving the optimal stimulus to generate a fast, long-lasting immune response that offers a highly efficacious protection.

“

We have been interested in the capsid VLP technology for some time and are pleased to support and rapidly advance this highly promising vaccine candidate against SARS-CoV-2.

”

Paul Chaplin, Chief Executive Officer and President, Bavarian Nordic

Note: The majority of deals for COVID-19 are partnerships, and these are focused in North America and Asia. There have been no associated M&A deals to date.

Source: GlobalData Analysis; Client & Subject Matter Expert Interviews; Press Articles; Company Announcements; Verdict Media

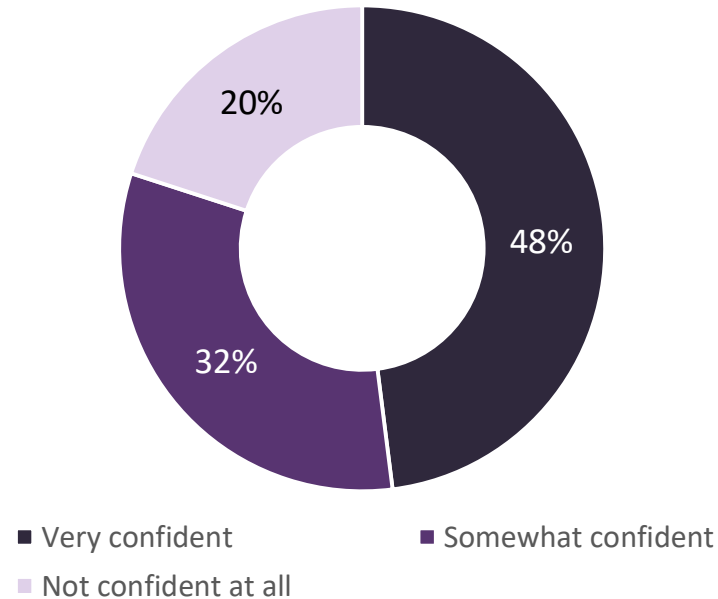
Industry is Confident that a Treatment or Vaccine will be Available Within a Year...



Summary of COVID-19 Clinical Trial Activity (changes since our last update)

as of 11 May 2020

Industry Perspective on Therapeutic Development

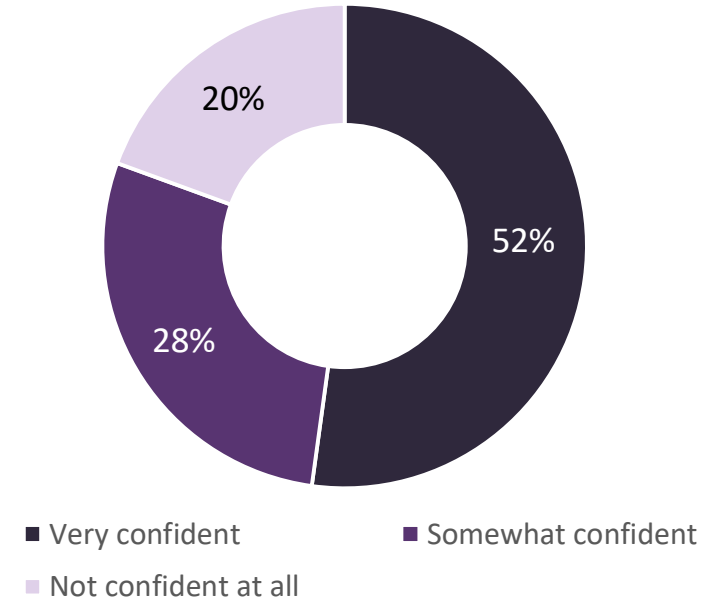


About 80% of respondents have some level of confidence that a therapeutic agent will be available within 12 months. Recent positive results for remdesivir over the past two weeks, put us one step closer to a treatment. Japan also approved remdesivir for COVID-19 treatment on May 7th making it the first approved drug for the disease.

Based on poll data collected from respondents who visited the Pharmaceutical Technology site between Mar 26-April 1, 2020 (n = 477)

Source: GlobalData Analysis

Industry Perspective on Vaccine Development



A similar level of confidence exists that a vaccine to protect against COVID-19 will be available within the next 12 months. This is a very aggressive timeline, but the US has launched “Operation Warp Speed” to fast track development and Moderna, Oxford University (partnered with AstraZeneca) and Pfizer have pledged to have millions of doses available by the end of 2020. Moderna also announced on May 7th that the company received FDA clearance to begin a 600 patient, Phase II trial for its mRNA vaccine candidate.

Based on poll data collected from respondents who visited the Pharmaceutical Technology site between Mar 26-April 1, 2020 (n = 1,561)

Remdesivir Emergency Use Authorization Triggers Fast-track Approval in Japan



Remdesivir is Now the first Drug Approved for COVID-19 Treatment

as of 11 May 2020

- On April 29, 2020 Dr. Fauci, Director of the NIAID reviewed the most powerful data supporting use of remdesivir in patients with COVID-19, even going so far as to say that it should become the new standard of care, as this demonstrates proof of concept that the virus could be blocked with an antiviral.
- Following this announcement, the FDA issued an Emergency Use Authorization (EUA) for emergency use of remdesivir for the treatment of hospitalized 2019 coronavirus disease (COVID-19) patients. This is the second such authorization after that for chloroquine phosphate; however, given that most data for chloroquine and its derivatives has been called into question, this EUA paves the way for remdesivir to become the standard of care for COVID-19 going forward. After receiving EUA, Gilead handed distribution rights for remdesivir to the US government. The distribution got off to a rocky start and many hospitals struggled to gain access to the drug. On May 8th, the White House announced that Dr Deborah Birx, the coronavirus response coordinator, will play a leading role in the remdesivir distribution effort.
- On May 7th, Japanese health minister announced that the government approved remdesivir (branded as Veklury) as a treatment for patients with severe COVID-19. Japan began a fast-track approval for remdesivir as a possible treatment for COVID-19 patients after the US FDA granted Emergency Use Authorization (EUA) for treatment of hospitalized COVID-19 patients. Gilead's distribution plan in Japan is unclear but this approval adds additional pressure for the company to quickly ramp up its manufacturing efforts in order to meet demand. Japan is also considering approval of Fujifilm Toyama's favipiravir for COVID-19; the drug is in Phase III globally.

“

Although a 31% improvement doesn't seem like a knockout 100%, it is very important proof of concept. What it has proven is that a drug can block this virus.

”

Anthony Fauci, MD, Director of National Institute of Allergy and Infectious Diseases

“

FDA's emergency authorization of remdesivir, two days after the National Institute of Health's clinical trial showed promising results, is a significant step forward in battling COVID-19.

”

Alex Azar, Secretary, US Health and Human Services

Gilead Ramps up Production and ICER Recommends a Price for Remdesivir



Institute for Clinical and Economic Review (ICER) recommended guidance

as of 7 May 2020

- Now that the FDA has issued an Emergency Use Authorization (EUA) for use of remdesivir for the treatment of hospitalized COVID-19 patients, the next question is how to make the drug accessible to patients worldwide. With this goal in mind, the World Health Organization announced plans to speak to the US Government and Gilead about how to make the drug more widely available as additional efficacy data emerges. For now, Gilead is donating remdesivir to the US government and the company plans to continue donating the drug until its current supply chain is depleted. No plans have been announced for donations outside of the US. In our daily newsletter, we mentioned concerns about Gilead being able to keep up with the manufacturing demand for remdesivir. Gilead has now ramped up its own production and announced that the company is in discussions with external partners to create parallel supply chains and further boost production.
- Pricing of remdesivir is another area of concern for stakeholders. Remdesivir is administered intravenously (IV) and historically IV drugs come with a large price tag. The Institute for Clinical and Economic Review (ICER) has now weighed in and estimated a price of \$4,460 per course of treatment based on the disease burden. At this estimate price, remdesivir could be a \$4-\$5 billion drug for Gilead if you consider the company's plan to have 500,000 treatment courses by October and a million by the end of the 2020. It is uncertain if Gilead will follow ICER's recommendation since in many cases, drug makers and ICER are at odds and there is no obligation to follow these guidelines. However, there will likely be considerable pressure to make the drug available at an affordable price.

“

We are releasing these estimates now, despite the fact that the evidence is highly uncertain and evolving, because now is the time when the public and policymakers should be actively debating how to link pricing to an overall platform to develop treatments for COVID-19.

”

Steven D. Pearson, MD, MSc, ICER's President

“

We deeply respect and appreciate the fact that, when we get into millions of doses, we have to have a sustainable economic model that works here and that achieves access to affordability to patients around the world

”

Daniel O'Day, Gilead CEO

Insights Exclusive Intel: COVID-19 Vaccine and Therapeutic Development



Exclusive COVID-19 Investigative Journalism Content from the Pharma Intelligence Center

as of 11 May 2020

| Date | Headline | Drugs Mentioned | Experts Interviewed |
|------------|---|--|---------------------|
| 8 May 2020 | French COVID-19 study of mesenchymal stromal cell approach has enrollment goal altered to keep in line with COVID-19 case trends; 13 patients recruited so far, source says | <ul style="list-style-type: none">mesenchymal stromal cells | 1 |
| 7 May 2020 | MediciNova files for a 40–60 patient Phase II safety trial investigating ibudilast for hospitalized COVID-19; FDA feedback within two weeks, source says | <ul style="list-style-type: none">ibudilast | 1 |
| 6 May 2020 | Fujifilm’s and Ansun’s efforts to repurpose their influenza therapies to treat COVID-19 draw efficacy skepticism due to many information gaps, experts say | <ul style="list-style-type: none">favipiravirDAS181 | 8 |
| 1 May 2020 | Gilead’s remdesivir use for COVID-19 could spill over beyond sweet spot of hospitalised patients yet to require mechanical ventilation, possibly straining supply, physicians say | <ul style="list-style-type: none">remdesivir | 6 |
| 1 May 2020 | Italian convalescent plasma trial site sees one critically ill COVID-19 patient moved from ICU and another discharged, investigator says | <ul style="list-style-type: none">convalescent plasma | 1 |



The Race Is On, but With Hurdles Along the Way

COVID-19 Impact Assessment

as of 4 May 2020

GlobalData Analyst View

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...solutions on the horizon are antivirals, with Gilead's remdesivir and Ascleptis's ASC09/ritonavir possibly reaching the market in late 2020 if the results of ongoing late-stage clinical trials are positive.

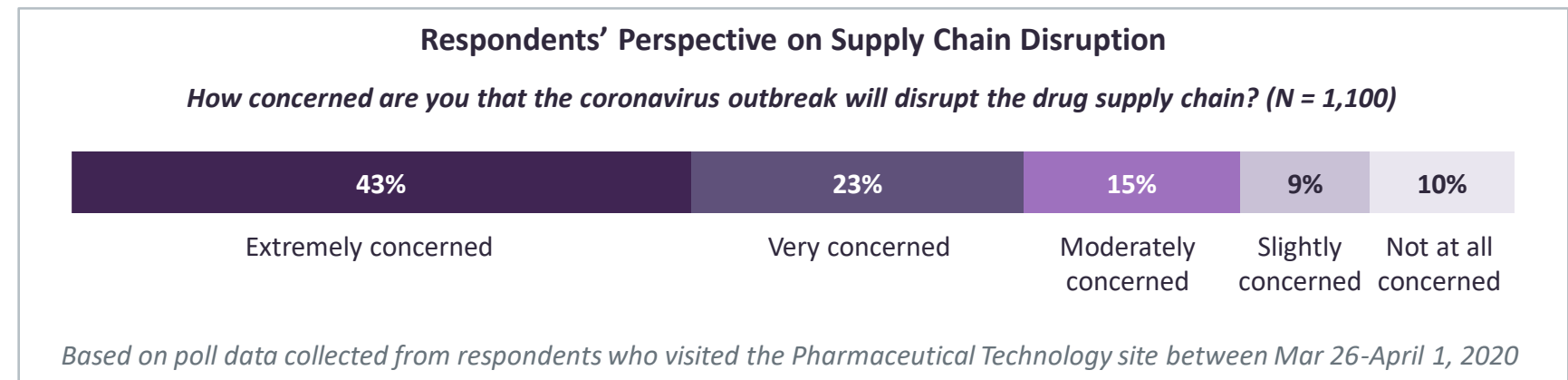
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The pharmaceutical industry race to develop both preventive and therapeutic interventions

- The nearest solutions are antivirals such as Gilead's remdesivir which got a much-needed boost last week after a series of mixed trial results. On May 1, 2020, the FDA issued an Emergency Use Authorization for use of remdesivir for the treatment of hospitalized COVID-19 patients, paving the way for remdesivir to become the standard of care for COVID-19 going forward.
- Even though a vaccine typically takes years to develop, the US has fast-tracked development with the goal to have as many as 300 million doses by early 2021. According to Dr. Anthony Fauci, it is “in the realm of possibility” to have a potential vaccine ready for wide distribution by January.

Restricted manufacturing resulted in drug supply shortfalls

- In a recent GlobalData poll, about 90% of respondents expressed some level of concern about supply chain disruption due to the coronavirus outbreak.





Supply Chains in Northern Italy Are Impacted

Drugs Manufactured in Italy

as of 10 May 2020

- As of 4 May, one of the worst COVID-19 outbreaks in Europe is located in Italy, with close to 212,000 confirmed cases and 29,000 deaths.
- On 8 March, the Italian government implemented a lockdown/quarantine of the Northern regions to prevent the spread of infection to the rest of the country.
- GlobalData's Contract Service Provider database shows the majority of CMOs with Italian facilities, are located in these same Northern regions of Italy and they were impacted by general manufacturing and export restrictions.

Impacted Biopharma Companies with Associated Products and CMOs

| Biopharma Company | Product | Contractor |
|-------------------------|----------|-------------------------|
| GlaxoSmithKline Plc | Ventolin | Cambrex Corp |
| Seattle Genetics Inc | Adcetris | Delpharm SAS |
| Seattle Genetics Inc | Adcetris | BSP Pharmaceuticals SpA |
| Amgen Inc | Nplate | Patheon NV |
| Bristol-Myers Squibb Co | Vidaza | BSP Pharmaceuticals SpA |

“

We have not closed our operations in Italy, but we have been operating at a lower capacity due to high levels of absence among staff. This has started to improve gradually over the last week or so, but we find it far too early to conclude that the crisis would be over.

”

Erik Haeffler, Vice President
Manufacturing Services &
Head of Sustainability
at Recipharm.



Clinical Trials and Regulatory Delays

COVID-19 Impact Assessment
as of 10 May 2020

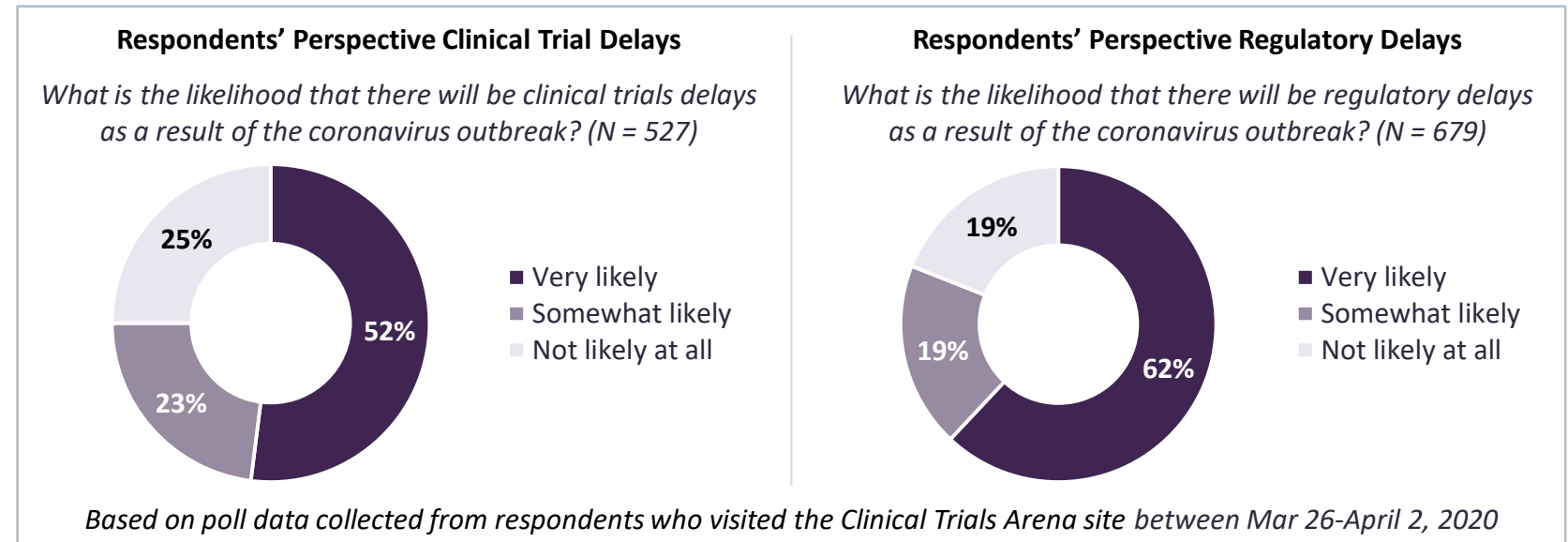
GlobalData Analyst View

“
...Clinical trials irrespective of indication will likely be impacted, not just in terms of recruitment and immediate patient care but also in terms of data collection and analysis in the months to come. Pharma could see an uptick in virtual trials during and after the pandemic.”

”

Clinical trials and regulatory delays could impact future approvals and revenues

- Upward trends in clinical trial disruption continue with at least 1,072 trials (+48 from the last update) and 430 Pharma/Biotech companies and CROs (+22 from the last update) are associated with disrupted clinical trials.
- The FDA has suspended inspection of foreign manufacturing plants and Advisory Committee Meetings have been cancelled or postponed.
- In a recent GlobalData poll, about 75% and 80% of respondents expressed some level of concern about clinical trial or regulatory delays respectively due to the coronavirus outbreak.





Ongoing Disruption of Clinical Trials

Examples of Disrupted Clinical Activities

as of 10 May 2020

“

Eli Lilly was the first large global pharmaceutical company to announce clinical trial delays.

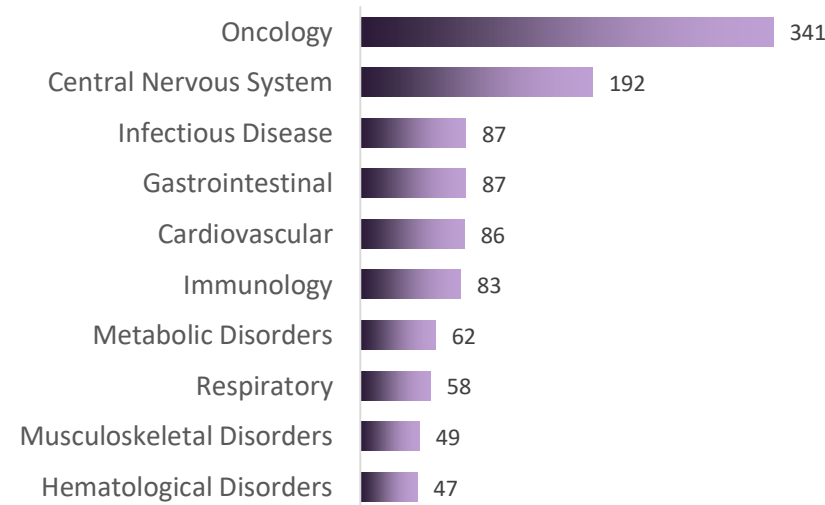
Additional large pharma companies, including Pfizer, Merck, Amgen and BMS, as well as smaller biotech companies, have followed suit in delaying start of planned trials and suspending recruitment of subjects in ongoing trials.

Oncology trials continue to suffer the most disruption followed by trials for CNS diseases due to the COVID-19 pandemic.

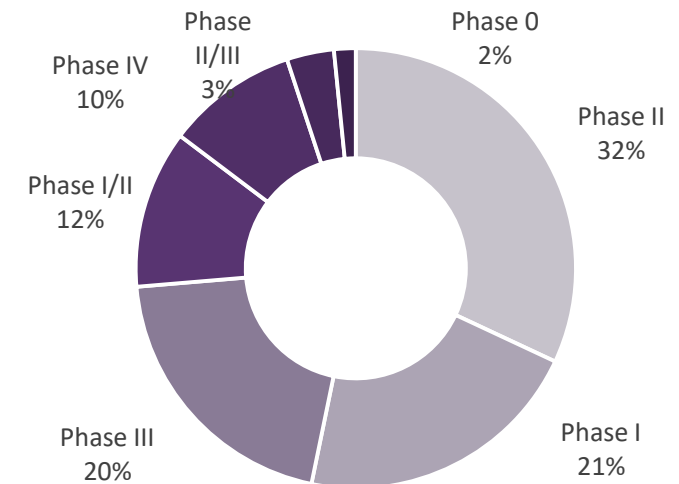
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| Trials disrupted due to COVID-19 | | Companies reporting trial disruption due to COVID-19 | |
|---|-------------------|--|------------------|
| Overall trials disrupted due to the COVID-19 pandemic | 1072 (+48) | All sponsor (Industry and non-industry) | 787 (+32) |
| Planned trials that have delayed initiation | 131 (+8) | Companies in a role as sponsor, collaborator or CRO | 430 (+22) |
| Ongoing trials impacted due to slower enrollment | 169 (+18) | | |
| Ongoing trials that have suspended enrollment (includes trials suspended before initiation) | 772 (+22) | Companies in a role only as sponsor or CRO | 313 (+22) |

Disrupted Clinical Trials by Therapy Area



Disrupted Clinical Trials by Trial Phases





4. Economic Impact



-
- The impact of COVID-19 on the world's top economies
 - Major market indices are improving
 - Oil price dips below zero but rebounds quickly
 - Many economists have cut their GDP forecasts; 2020 consensus forecast for GDP growth is currently -2.3%
 - Historic numbers of people apply for unemployment benefits in the US
 - Governments' response and fiscal stimulus plans
 - Concern over the spread of COVID-19 increases, but so does business optimism
 - Hiring is on hold, lays offs expected

COVID-19 has Impacted the World's Top Economies



| Countries | Confirmed Cases | Cases per Million Capita | Deaths | Case Fatality Rate | Stimulus (\$ Billion) | Stringency Index | Active Jobs (30 Day Change) | Market Index (YTD Change) | GDP Growth (2020 Estimate) |
|----------------|-----------------|--------------------------|--------|--------------------|-----------------------|------------------|-----------------------------|---------------------------|----------------------------|
| United States | 1,329,799 | 4,018 | 79,528 | 6.0% | 4,984 | 70 | -8.9% | -8.4% | -5.3% |
| China | 82,918 | 58 | 4,633 | 5.6% | 368 | 61.67 | -15.0% | -4.6% | 0.8% |
| Japan | 15,777 | 125 | 624 | 4.0% | 1,098 | 56.19 | -20.6% | -12.3% | -4.7% |
| Germany | 171,879 | 2,052 | 7,569 | 4.4% | 1,231 | 77.62 | -13.5% | -18.2% | -6.6% |
| India | 67,259 | 49 | 2,212 | 3.3% | 23 | 93.57 | -28.9% | -20.6% | 2.1% |
| United Kingdom | 220,449 | 3,247 | 31,930 | 14.5% | 446 | 80.95 | -14.6% | -21.8% | -7.6% |
| France | 177,094 | 2,713 | 26,383 | 14.9% | 455 | 92.38 | -12.2% | -22.9% | -8.3% |
| Italy | 219,070 | 3,623 | 30,560 | 13.9% | 861 | 94.29 | -24.8% | -27.6% | -9.4% |
| Brazil | 162,699 | 765 | 11,123 | 6.8% | 149 | 75.71 | -17.0% | -50.9% | -3.2% |
| Canada | 70,091 | 1,857 | 4,991 | 7.1% | 142 | 80 | -11.2% | -12.6% | -6.0% |

Note: Case Fatality Rate is the ratio of total death to total confirmed case. Market Index data is based on MSCI index of respective country. GDP growth estimates are based on consensus data from various analysts and firms.

Stringency index, created by Oxford COVID-19 Government Response Tracker (OxCGRT), is the aggregated score based on several different common policy responses governments have taken, such as school and workplace closures and restrictions on travel and gatherings etc.

Major Markets are Improving; Oil Price Dips Below Zero but Rebounds Quickly



Impact of COVID-19 on Asset Prices

Year-to-date performance, Indexed to 100 as of 8 May 2020



All indices rebased to 100 on 1 January 2020

Source: GlobalData Analysis; Yahoo Finance; Investing.com; Bloomberg

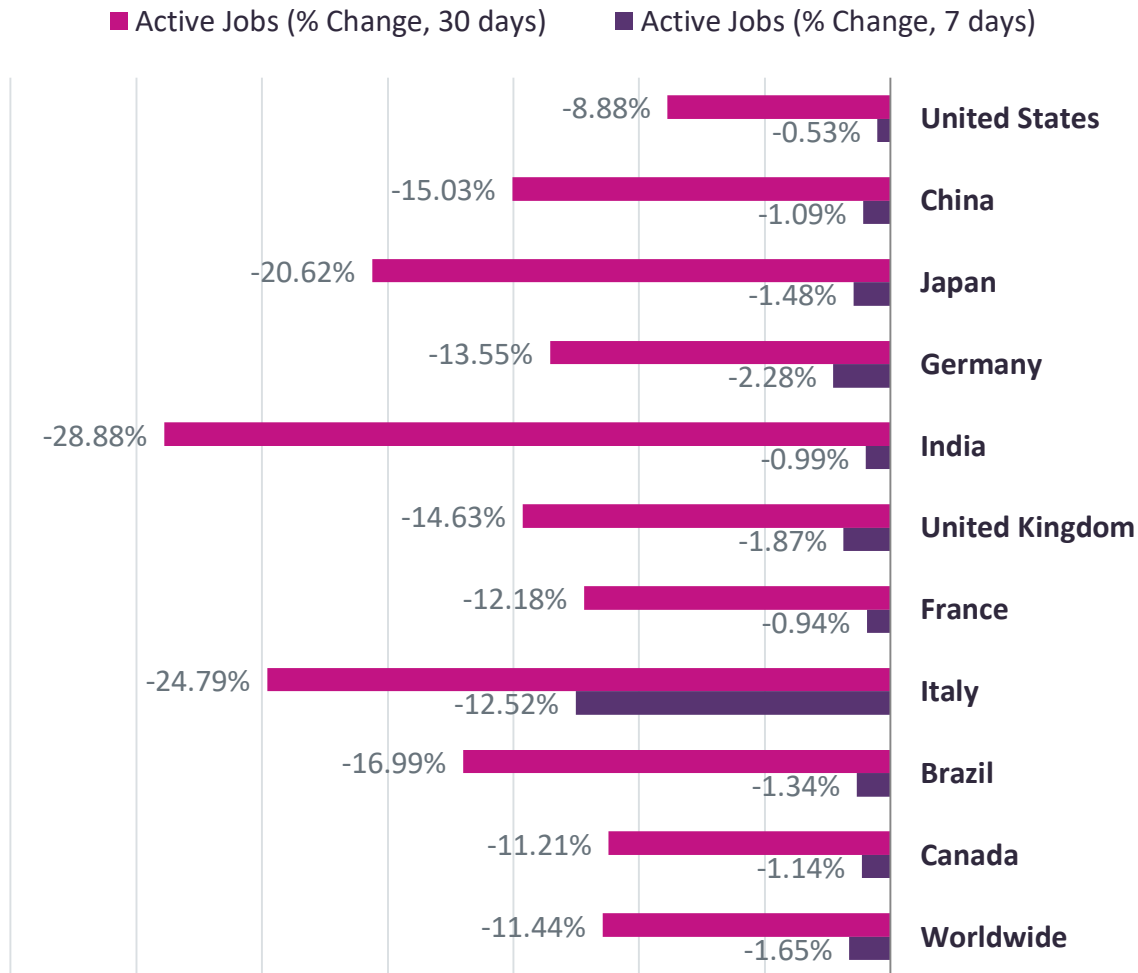
Active Job Vacancies Plummet, While Unemployment Rises



Job Trends

as of 11 May 2020

Change in Active Jobs by Country



Forecasters Sound the Alarm

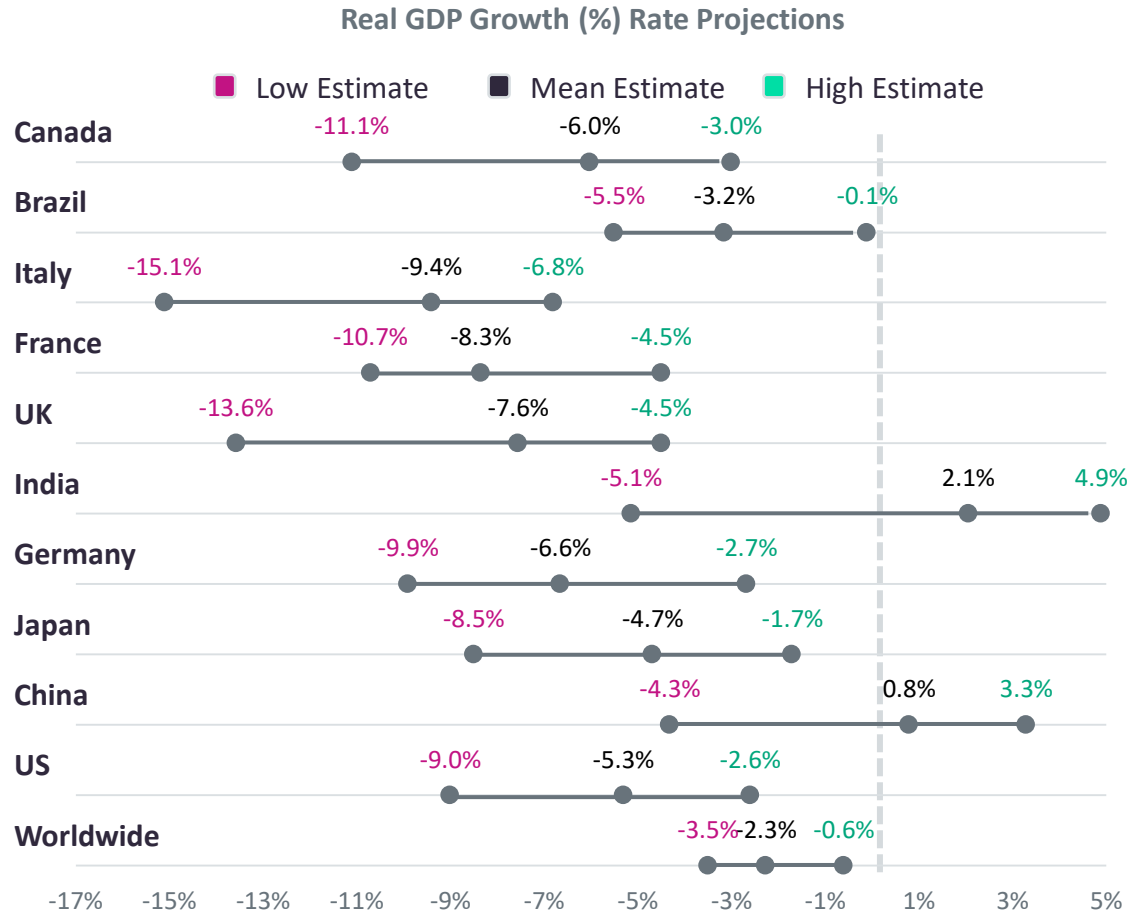
- According to the Bureau of Labour Statistics, 20.5 million Americans lost their jobs in April with unemployment rate rising to 14.7%, highest since the great depression of the 1930s. (May 8)
- According to Statistics Canada, around 2 million Canadians lost their jobs in April after 1 million lost theirs in March. Unemployment is now 13%. (May 8)
- India's unemployment rate increased to 27.1% in April 2020 from 8.7% in March 2020, according to CMIE. (May 6)
- According to National Statistical Office ISTAT, Italian unemployment was 9.3% and 8.4% in February and March 2020, respectively. (April 30)
- The ILO believes that 1.6 billion workers in the informal economy –nearly half of global workforce – are in immediate danger. (April 29)
- Spain's unemployment rate in Q1 2020 rose to 14.4%. The IMF forecasts Spain's unemployment rate will be 20.8% in 2020. (April 28, 2020)
- Japanese unemployment rose to 2.5% in March, its highest level this year; job availability stands at its lowest in three years. (April 26)
- The World Travel and Tourism Council (W TTC) estimates job losses of 100.8 million in the travel and tourism industry. (April 24)
- In France, 10 million people have been laid off during the lockdown. (April 22)
- The International Labour Organization (ILO) estimates 6.7% of worldwide working hours will disappear in Q2 2020, equivalent to 195 million workers. (April 8)

Consensus Expects a Global Recession



Estimated 2020 GDP Growth

as of 11 May 2020



Note: Estimates on 2020 GDP growth based on multiple broker projections

Source: GlobalData Analysis; National Statistics Office; The World Bank; Broker Estimates; BBC; Twitter; Reuters

Forecasters Sound the Alarm

- Moody's forecast India's economic growth to remain flat in FY21 and bounce back next year to register a growth rate of 6.6% in FY22. (May 8, 2020)
- The European Commission predicts the EU economy will contract by 7.5% in 2020 but expects a recovery in 2021 despite exceptional uncertainty. (May 6, 2020)
- The Spanish government forecasts GDP to contract by 9.2% in 2020 expects 6.8% GDP growth next year. (May 2, 2020)
- According to the National Statistical Office - INSEE, the French economy contracted by 5.8% in Q1 2020, its worst performance since 1949. Economists expect a slow and painful recovery. (April 30, 2020)
- According to Eurostat preliminary estimates, the Eurozone economies contracted by 3.8% in Q1 2020. It expects further deterioration in Q2. (April 30, 2020)
- According to the US Bureau of Economic Analysis (BEA), the US economy contracted by 4.8% in Q1 2020. (April 29, 2020)
- According to the National Bureau of Statistics of China, the Chinese economy contracted by 6.8% in Q1 2020. (April 17, 2020)
- The IMF forecasts the global economy to contract by 3% in 2020. Economic growth in the US and Europe is forecasted to plunge by 9.1% and 5.8% respectively during the year. (April 14, 2020)
- The World Bank projects South Asian nations will register a growth rate of 1.8%–2.8% in 2020, worst in over 40 years. (April 12, 2020)

Response to COVID-19: USA and China



United States

| | |
|-----------------|-----------|
| Confirmed cases | 1,329,799 |
| Deaths | 79,528 |
| Recovered | 216,169 |

Managing lockdown

- Trump administration to temporarily ban issuance of work-based visas due to high unemployment. (May 9)
- Announced closure of schools till the end of the academic year . (May 6, 2020)
- States started lifting lockdown orders amid unemployment claims. (April 27)
- Announced a 3-phase plan to lift the lockdown: re-open restaurants, theaters and places of worship followed by re-opening schools and resumption of non-essential travel, and finally lift all restrictions. (April 17)
- “Stay at Home” orders for 44 out of 50 states. (April 7)

Recovery measures

- A relief package worth \$484 billion was signed off (April 23)
- Trump announced a \$19 billion bailout package for ailing farmers. (April 17)
- Unveiled an additional stimulus measure worth \$2.3 trillion to be used for purchasing notes from states and countries and providing loans to mid-sized businesses. (April 9)
- Approved a US\$2.2 trillion fiscal stimulus package (cash payments to individuals, support to businesses , and strengthen public services). (March 27)



China

| | |
|-----------------|--------|
| Confirmed cases | 82,918 |
| Deaths | 4,633 |
| Recovered | 78,144 |

Managing lockdown

- Beijing eased travel restrictions on domestic travelers from April 30. (May 1, 2020)
- Promotes ‘civilized behavior’ by banning sneezing or coughing without covering nose or mouth, spitting in public, maintaining social distancing, and hygiene measures effective from June 1, 2020. (April 28, 2020)
- With re-emergence of new imported cases, the Chinese government, decided to tighten border controls and quarantine measures. (April 12)
- Lockdown lifted from the city of Wuhan, rail and road connectivity re-established. (April 7)
- Employees are back to work and Chinese factories started its operation. The country also re-opened 500+ cinemas, shops, bars and tourist spots. (March 23)

Recovery measures

- The People’s Bank of China announced it is to step up counter cyclical adjustments. (May 10)
- Approved fiscal measures worth \$368 billion.
- People’s Bank of China reduced its 7 days reverse repurchase rate to a record low of 2.2% and injected \$7 billion into the financial system . (March 30)

Response to COVID-19: Japan and Germany



Japan

| | |
|-----------------|--------|
| Confirmed cases | 15,777 |
| Deaths | 624 |
| Recovered | 8,127 |

Managing lockdown

- Considers easing 'state of emergency' in 17 prefectures with no new cases in the last seven days. (May 7)
- Extended nationwide 'State of Emergency' with non-relaxation of physical distancing measures till May 31, 2020. (May 4, 2020)
- Parks, museums, and other recreational buildings to open in the coming weeks. (May 3, 2020)
- Extends entry ban from 14 more nations, taking the total number of banned nations to 87. (April 27, 2020)
- Declares nationwide 'State of Emergency' with the rising number of COVID-19 cases. (April 16, 2020)
- Declares 'State of Emergency' in seven prefectures. (April 7, 2020)

Recovery measures

- Signals upcoming additional stimulus to support sinking economy. (May 8)
- Bank of Japan decides to buy unlimited bonds to keep borrowing costs low. (April 27, 2020)
- Total stimulus package worth \$1.09 trillion has been approved by the Japanese government to support health measures and fight COVID-19.



Germany

| | |
|-----------------|---------|
| Confirmed cases | 171,879 |
| Deaths | 7,569 |
| Recovered | 145,600 |

Managing lockdown

- Regional government of North Rhine-Westphalia postponed plan to reopen business and public venues that was scheduled for May 11, amid a spike in cases. (May 8)
- Allowed reopening of all shops. Schools for older children reopened. (May 6, 2020)
- Larger events such as football matches, festivals and concerts to be allowed after August 31. (May 5, 2020)
- German government reopens playgrounds, churches and museums from May 4. (April 30)
- Extends ban on tourists until mid-June. (April 29)
- The country gradually eases lockdown measures and reopens shops. It had made wearing of mask mandatory. (April 22)
- Allows foreign workers from Poland, Bulgaria and Romania in the country to harvest fruits and vegetables. (April 2)

Recovery measures

- Approved a stimulus package worth \$1.23 trillion. Tourism companies allowed to defer tax payments and workers sent home by the employers to be compensated under government subsidy scheme.

Response to COVID-19: India and UK



India

| | |
|-----------------|--------|
| Confirmed cases | 67,259 |
| Deaths | 2,212 |
| Recovered | 20,969 |

Managing lockdown

- Nationwide lockdown further extended till May 17, 2020, with suspension of international and domestic flights. (May 2, 2020)
- Allowed movement of stranded migrants through train services. (April 29, 2020)
- Relaxed measures for financial services, commercial services (print media, e-commerce companies, courier services, cold storage and others), agricultural activities, health services, cargo and essential services. (April 20, 2020)
- Lockdown extended till May 3. (April 20, 2020)
- Imposed nationwide lockdown for 21 days from March 25. (March 24, 2020)

Recovery measures

- Government to announce new stimulus with a focus on the micro, small and medium enterprises (MSMEs) along with reforms to attract investment. (May 10)
- The Reserve Bank of India (RBI) created a facility to help state governments' short-term liquidity needs, and relaxed export repatriation limits. (April 1, 2020)
- Announced a total stimulus package worth US\$23 billion.
- The RBI cut benchmark repo rate by 75 bps to 4.40% to improve market liquidity. (March 27, 2020)



United Kingdom

| | |
|-----------------|---------|
| Confirmed cases | 220,449 |
| Deaths | 31,930 |
| Recovered | 1,002 |

Managing lockdown

- Unveiled 'conditional plan' to ease lockdown and allow workers to return to work (who could not work from home) from May 13 onwards. Also plans to reopen primary schools and shops on June 1. (May 11)
- New COVID-19 Alert System launched, with a scale of one to five. (May 11, 2020)
- Government hints at plans to ease lockdown from May 11 onwards and to issue public statement on the strategy on May 10. (May 6, 2020)
- Extends lockdown by three more weeks. (April 16)
- PM Boris Johnson imposed a three-week lockdown to prevent the spread of coronavirus. British nationals were advised against all but essential international travel. Travelling citizens were advised to return to the UK. (March 23)
- The government directed people to stay at home throughout this period except for essential purchases, essential work travel or medical needs. (March 23)

Recovery measures

- Stimulus package worth \$446 billion (15.94% of GDP) has been approved by the government for tax cuts and business loan grants.
- Bank of England has slashed interest rates to all time low of 0.1% and increased holding of bonds (government and corporate) by £200 billion. (March 19)

Response to COVID-19: France and Italy



France

| | |
|-----------------|---------|
| Confirmed cases | 177,094 |
| Deaths | 26,383 |
| Recovered | 56,327 |

Managing lockdown

- Lockdown restrictions in Paris to stay as rest of France partially reopens on May 11. (May 7)
- Imposed a 'State of Health Emergency' for two months till July 24. (May 2)
- To start lifting lockdown measures from May 11 onwards. Schools and non-essential businesses to reopen. Masks made mandatory for schools and public transport. However, bars and restaurants were not permitted to open. (April 28)

Recovery measures

- The French government's stimulus package is worth \$455.1 billion (16.8% of GDP) to revive the economy.
- Three State aid scheme approved by the European Commission. (March 21)
 - Two schemes will enable public investment banks to provide State guarantees on commercial loans for companies having up to 5000 employees.
 - Scheme that will provide State guarantee to banks on new loans for all companies.
- Support from the State and the Banque de France (credit mediation) to negotiate with its bank to reschedule bank credits. (March 17)



Italy

| | |
|-----------------|---------|
| Confirmed cases | 219,070 |
| Deaths | 30,560 |
| Recovered | 105,186 |

Managing lockdown

- Resumption of construction and manufacturing work from May 4; retail shops and museums to reopen from May 18; restaurants and bars to reopen from June 1 and schools to remain shut till September. (May 5, 2020)
- The Italian government allowed a few shops and businesses to re-open from April 14 onwards as it seeks to ease restrictions. (April 14)
- The nationwide lockdown was extended until May 3. (April 10)
- All retail trade is suspended, save for essential goods, and banking, financial, and insurance services. All gatherings of people are forbidden, and the movement of people is restricted. Italy will allow a narrow range of businesses to resume operations this week. (March 11)

Recovery measures

- Italian government announced stimulus package worth \$860.5 billion to support small businesses and healthcare system.
- A moratorium on loan repayments for some households and SMEs, including mortgages and overdrafts; state guarantees on loans to SMEs; incentives for financial and non-financial companies in the form of Deferred Tax Activities. (March 10)

Response to COVID-19: Brazil and Canada



Brazil

| | |
|-----------------|---------|
| Confirmed cases | 162,699 |
| Deaths | 11,123 |
| Recovered | 64,957 |

Managing lockdown

- Malls and stores resumes activities in some cities and states in Brazil with the relaxation of quarantine measures. (April 24)
- Sao Paulo lockdown extended through May 10. (April 17)
- Sao Paulo lockdown extended through April 22. (April 6)
- Banned foreigners from entering Brazil until April 30. (March 30)
- Churches exempted from coronavirus-related lockdowns. (March 27)

Recovery measures

- Central bank policy rate (Selic) has been further reduced to 3% from its previous historic low of 3.75%. (May 6)
- Central excise tax and import duty reduced to zero until September 30 on transactions on medical products. Taxes on any financial transaction during April 3 to July 3 have been reduced to zero. (April 16)
- The central bank lowered the policy rate (SELIC) by 50bps to 3.75%. Reduced the reserve requirements and capital conservation buffers. (March 18)
- Announced stimulus package worth \$149.4 billion to support economy and fight COVID-19.



Canada

| | |
|-----------------|--------|
| Confirmed cases | 70,091 |
| Deaths | 4,991 |
| Recovered | 32,109 |

Managing lockdown

- 520 Ontario parks to reopen on May 11 and the remaining 115 to reopen on May 15 for limited day use. (May 9)
- Some provinces have reopened garden centers, nurseries, auto dealerships, service centers and lawn care & landscaping. (May 1, 2020)
- Announced gradual reopening of the economy from Monday, May 4 2020. Retail stores are reopened, with some provinces reopening restaurants. (April 27, 2020)
- Border closed with the US for non-essential travel—which was set to expire on April 21—has been extended for another 30 days. (April 18, 2020)
- Ordered a wide range of closures and other restrictions aimed at limiting the spread of virus. (March 17, 2020)

Recovery measures

- Announced total stimulus package worth \$142.3 billion (8.26% of GDP).
- Announced targeted support to local farmers and agri-food businesses by creating an emergency fund, launching national AgriRecovery initiatives and Surplus Food Purchase Program among others. (May 5, 2020)
- Introduced 75% wage-subsidy to employers for up to 12 weeks. (March 27, 2020)

Response to COVID-19: Russia and Spain



Russia

| | |
|-----------------|---------|
| Confirmed cases | 209,688 |
| Deaths | 1,915 |
| Recovered | 34,306 |

Managing lockdown

- Lockdown in Moscow extended till May 31 with the rise in COVID-19 cases. (May 7)
- As part of May 11 exit strategy, restriction on movement and certain industries to gradually ease. (May 6, 2020)
- Ban on foreigners entering Russia extended. (April 30)
- Announced a further extension of the 'non-working' period till May 11. (April 28)
- Citizens are allowed to leave home for work, medical care and facilities, nearest grocery store, and to take out their garbage. (April 25)
- Restriction on issuance of visas & work permits for all foreign citizens. (March 17)

Recovery measures

- Russian government adopted a stimulus package worth \$49.8 billion to fight the pandemic.
- Central Bank of Russia has cut its policy rate to 5.5% from 6.0%. (April 24)
- Parliament approved a law that guarantees the possibility for affected citizens and SMEs to receive deferrals of loan payments for up to six months.
- Tax holidays to provide relief to the country's aviation and tourism industries and a moratorium on tax audits until June 1 is provided. (April 2)



Spain

| | |
|-----------------|---------|
| Confirmed cases | 224,350 |
| Deaths | 26,621 |
| Recovered | 136,166 |

Managing lockdown

- Spain and Barcelona disallowed to move on to the next phase of lockdown exit. (May 9)
- State of emergency—which was due to expire on May 9—extended by two more weeks. (May 6, 2020)
- Four islands in Canaries and Balearics transit to phase one, lockdown easing from May 4 with lifting of restriction on movement. (May 3)
- Announced to lift lockdown in phases (Preparatory: 4-11 May, Phase 1: two weeks from May 11, Phase 2: two weeks from late May, Phase 3: end of June). (April 29)
- Children below 14 years of age were allowed to play (April 26). Relaxed measures that will allow outdoor exercise and walks from May 2 onwards. (April 25)
- Begun a gradual lift of the lockdown and allowed 300,000 non-essential workers to return to work. (April 14)

Recovery measures

- SMEs and the self-employed allowed to delay tax payment worth 30K over the next six months. (April 23)
- Announced a stimulus of \$220 billion which is approximately equivalent to one-fifth of the country's GDP. (March 18)

Response to COVID-19: Turkey



Turkey

| | |
|-----------------|---------|
| Confirmed cases | 138,657 |
| Deaths | 3,786 |
| Recovered | 92,691 |

Managing lockdown

- Two-day curfew imposed on 24 provinces beginning May 8 mid-night. (May 9)
- Announced relaxation of confinement rules for young and aged people. (May 5, 2020)
- To continue imposing curfews on weekends in 31 provinces until end of May. (May 3)
- Intended to relax lockdown measures by June if spike in the new COVID19 cases eases. (April 30)
- 31 cities have been placed under quarantine, including Istanbul from April 4 onwards. (April 3)
- Suspended all foreign flights and imposed travel restriction on 30 cities. (March 27)

Recovery measures

- \$28.7 billion stimulus package has been adopted by the Turkish government that will include working allowance, minimum wage support, tax postponement and preservation of commercial life among others. (April 26)
- Central Bank of Turkey lowered the policy rate by 100bps to 9.75% and a package of financial measures was introduced. (March 17)

Concern Over the Spread of COVID-19 Is Falling, Business Optimism Trends Upwards



Poll to Assess Business Sentiment

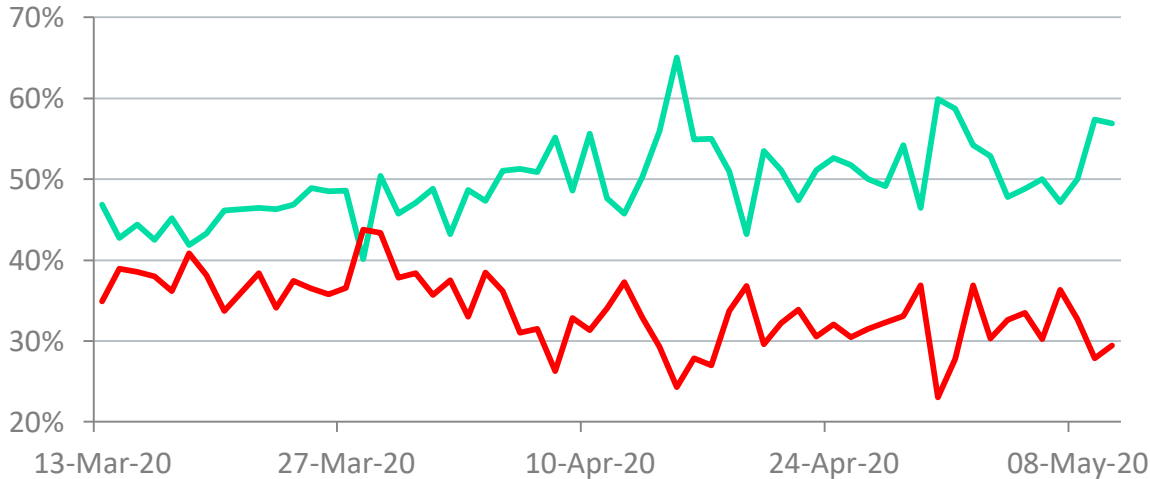
as of 10 May 2020

How optimistic are you about your company's growth prospects?

- Very optimistic
- Optimistic
- Neither optimistic or pessimistic
- Pessimistic
- Very pessimistic

Companies' View on Future Growth Prospects

— Optimistic — Pessimistic



Note: Optimistic includes respondents with response as “very optimistic” and “optimistic”. Pessimistic includes respondents with response as “pessimistic” and “very pessimistic”. Neutral respondents were discounted from the analysis. 20,045 responses were received.

Source: GlobalData Analysis

Poll to Assess Concern Related to Spread of COVID-19

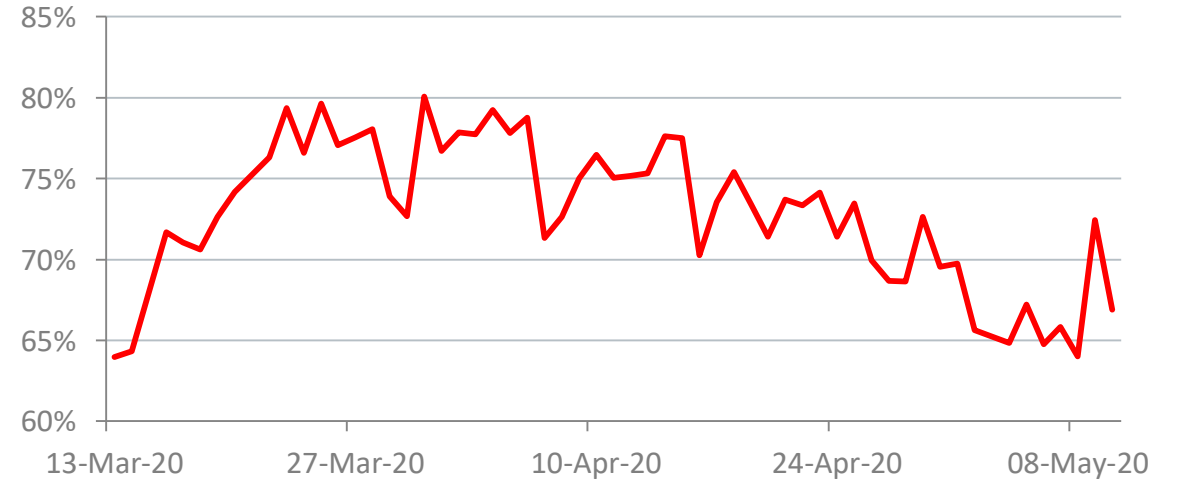
as of 10 May 2020

How concerned are you about the spread of coronavirus?

- Very concerned
- Slightly concerned
- Neither concerned nor unconcerned
- Not very concerned
- Not concerned

COVID-19 Concern Index

— Very Concerned

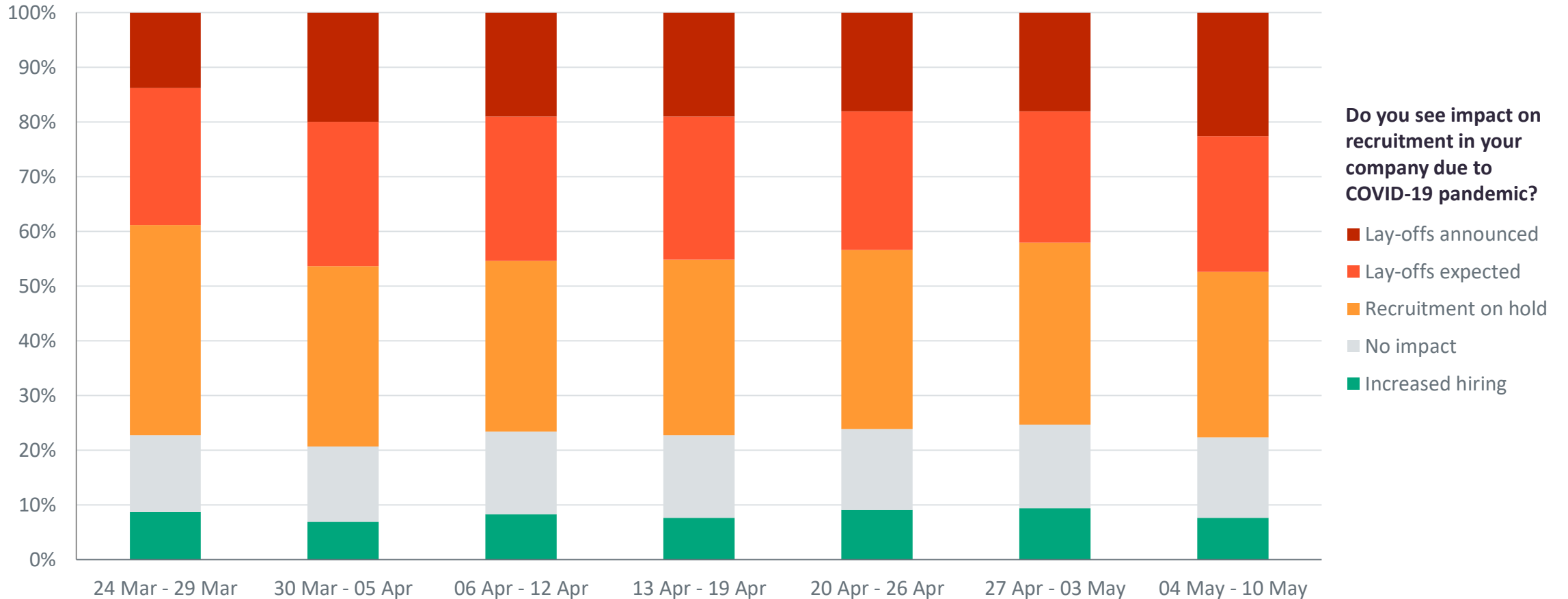


Note: Concern index is based on respondents who answered that they are “very concerned” about the spread of COVID-19. The index is based on a total of 130,409 responses.

Hiring Is On Hold; Marginal Increase in Lays Offs Announced



There has been 8.8 percentage points increase in lay offs announced during the week ended 04 May-10 May as compared to the week 24-29 Mar as of 10 May 2020



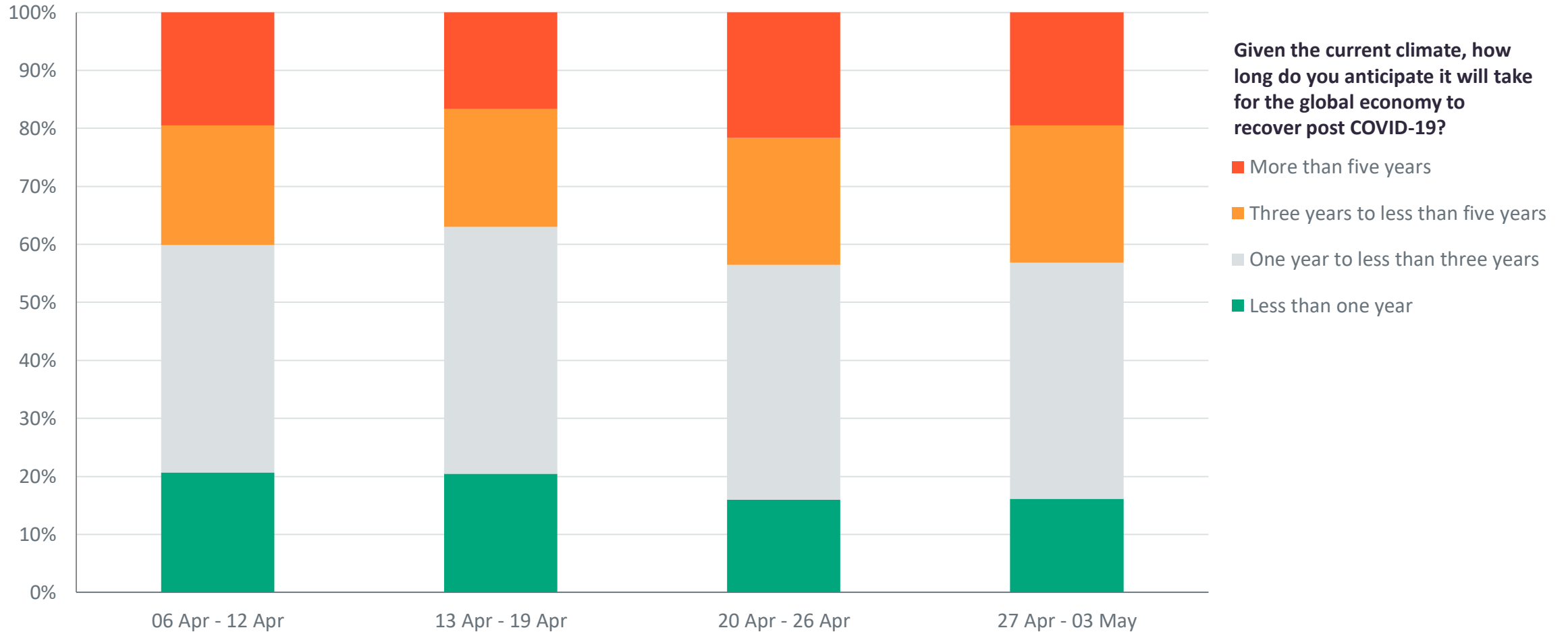
Note: Analysis based on 15,888 responses received till 10 May 2020. Data represents weekly average responses

Global Economic Recovery Post COVID-19



Globally, 42.4% of respondents report one year to less than three years for global economy to recover

as of 10 May 2020



Note: Analysis based on 32,000 responses received till 10 May 2020. Data represents weekly average responses.

Source: GlobalData Analysis



5. Sectoral Impact

Interdependent and complex relationship between Aerospace and Defense will spread the damage

Revenue Predictions

- Boeing & Airbus lost \$641 million and \$522 million in Q1 respectively. Both have cut output between 35 to 50%.
- IATA's estimate of lost airline revenue for 2020 now stands at \$315bn, a 55% reduction. Recently released figures for March show worldwide passenger numbers reduced 52% from last year.
- Defense prospects are relatively brighter but may be curtailed by medium term fiscal restraint as a result of measures to combat COVID-19, with differing impacts per subsector and per region. Defense is likely to be used as a stimulus in markets with large domestic capacity.

Unemployment

- Boeing announces plans to lay off 10% of its workforce following Q1 results, while Airbus furloughs thousands of workers in the UK. Reports suggest Rolls-Royce could shed upwards of 8,000 jobs, 15% of its global workforce.
- Defense has yet to be majorly impacted. Strategic capabilities will be protected, as they are extremely difficult to resurrect in short order once lost. A small number of pureplay defense primes, notably Lockheed Martin, have added to headcount recently.

Supply Chain & Demand Disruption

- The US DoD expects three-month delays on major defense acquisition programs (MDAPs). It also notes specific vulnerability within aerospace, shipbuilding and small space launch markets.
- Although South Korea & Thailand have both recently announced defense budget cuts to address COVID-19, these savings are currently attributed to deferred programs and payments, not cancellations.

Sector-specific Stimulus Programs

- Largest so far is the US CARES act, providing \$17bn in specific funding for businesses critical to national security, along with \$61bn in aviation and broader aerospace support.
- Governments are also implementing prompt payment measures to their defense supply chains with a particular focus on supporting SMEs and identifying weak points, specifically on civil aerospace exposure.

Being A Force For Good

- Along with the automotive sector, Aerospace & Defense are at the forefront of efforts to manufacture ventilators at pace using methods such as 3D Printing and leveraging experience with rapid acquisition.

Aerospace, Defense & Security COVID-19 value chain impact



Variation in impact across tiers and timeframes

| | Prime Contractors | Tier 1 & 2 Subcontractors | Tier 3 & 4 Components & Fabrication | Tier 5 Raw Materials |
|-------------------|---|---|---|---|
| Short-term impact | <p>Defense primes face production & supply issues but supported by programme assurance. Civil Aerospace in deep freeze.</p> | <p>High relative vulnerability to civil markets in key areas, risk of failure without state aid. Prompt prime payments crucial.</p> | <p>Disruption to supply chains, labor force and revenue from commercial markets.</p> | <p>Disruption to supply chains, labor force and revenue from commercial markets.</p> |
| Mid-term impact | <p>L or U-shaped aviation recovery defines medium term impact. Prospects for defense budgets also apparent in the mid-term.</p> | <p>Consolidation needs become acute. Debt financing for M&A now more feasible, however.</p> | <p>Diversification to mitigate supply chain and customer risk.</p> | <p>Global recession keeps civil demand checked.</p> |
| Long-term impact | <p>Rebalanced civil aerospace sector and no reversion to previous demand patterns, depressed defense budgets.</p> | <p>Landscape emerges after M&A. Greater supply chain scrutiny from governments throughout the tiers.</p> | <p>Reshoring of some capability to guarantee security of supply (PCB, cables, assemblies etc.).</p> | <p>Broader view of what counts as strategic industry may include some elements of raw material production/supply.</p> |

Automotive COVID-19 impact assessment



Nearly \$140 billion in lost revenue for North American and European industry alone

As production restarts and lockdowns are tentatively lifted, a truer picture of demand will emerge

Revenue Predictions

- The hit to the market will be greater than in the 2007/8 financial crisis.
- Our base COVID-19 light vehicle sales scenario forecasts a fall of 18.9% on 2019 to 72.8 million.
 - Declines heavily weighted to Q2; measures to suppress the virus allow for recovery from Q3 onwards.
- Plants in Europe and North America now starting to reopen with new safety protocols in place. Due to COVID-19 closures, 4.1 million light vehicles will have been removed from production.
- Revenue cost of \$139 billion to the OEMs here alone.
- For the aftermarket there will be some income loss from extended service intervals and lower annual distances travelled.

Unemployment

- Demand decimation and production stoppages damaging all parts of the value chain.
- Furloughing of staff is widespread: dealers, suppliers and OEMs all applying measures to try and conserve cash.

Supply Chain & Demand Disruption

- Complexity of supply chains revealed early on as production at FCA and Hyundai plants in Europe and Korea was disrupted due to Wuhan's shutdown.
- Concern now moved from supply chain disruption to the demand side. Suppliers contribute ~60% of a vehicle translating to \$83.4 billion in lost revenue in Europe and North America alone up until April. Profit hit at an average 3% margin is nearly \$2.5 billion.

Sector-specific Stimulus Programs

- The tools to stimulate demand, such as scrappage from the last crisis, are not viable just yet.
- Will be required once the public health risk subsides, with emphasis on green vehicles.
- German industry now beginning lobbying. Wants existing €6k subsidy for EVs increased to €10k for all car types.

Being A Force For Good

- Sector at forefront of manufacturing ventilators and masks. Vehicles have been donated and payments made to help communities.
- OEMs extending warranties and offering payment holidays to customers.

Automotive COVID-19 value chain impact



Difficult to see beyond a rebasing of the entire value chain at this point: structural imbalances finally addressed

But last pandemic did give way to the 'roaring twenties'...

| | Supplier Network | Auto Manufacturers | Sales & Marketing | End Market | Sale & Post-sale Activity |
|-------------------|---|--|---|---|--|
| Short-term impact | Devastating, unless can pivot to new markets or highly automated production. | Double whammy. Supply chain disruption mutates into demand decimation. | Day job disrupted, messaging shifts away from product to CSR. | Lockdowns limit vehicle need. Big ticket items move right to the back of the queue however much one digitalizes. | Goodwill initiatives abound; offer help to customers you do have. |
| Mid-term impact | M&A need accelerates. Technology and geographic portfolios reassessed. | Cash conservation is king, R&D checked. Back to basics. Capacity rationalization looked at. OEMs do right by society and don't wait to be impelled by legislation. | Sales and marketing function reset at OEMs. Messages focus on positive CSR aspects of the products. | Digital comms and virtual commuting take hold. Only vital journeys undertaken, demand becomes normalized to utility and not wealth. | More focus on 'cradle-to-grave' support that are the profit generating activities of any national sales company or dealership group. |
| Long-term impact | Leaner, more agile, supplier base results. Industry 4.0 fully implemented and industrial manufacturing repatriated. | Supply chains remapped. Single source risks mitigated. Industry rationalized, less need to foist upon consumers unwanted tech for unsustainable advantage. | Simplified but more oligopolistic marketing function emerges. Increased spend on advertising as non-price competition becomes more important. | Sector moves from push-to-pull. Industry no longer pushes product into people's hands who can ill-afford it. Damage to PCP market after macro damage. | Moves from footfall in the showroom being the mantra to traffic in service bay. Return to Jac Nasser-era vision for Ford. |

COVID-19 is creating conditions of acute economic stress and disruption worldwide

Retail banks will play a critical operational and strategic role in helping absorb the first-round adjustment costs

Revenue Predictions

- In the near-term, COVID-19 will be analogous to the credit crisis, creating a period of economic paralysis and leaving a massive hole in banks' balance sheets.
- Fee and interest income will fall, driven by reduced use of cards (interchange fees), and the obligation to provide payment holidays and waive interest and overdraft charges.
- Non-performing loan (NPL) ratios will increase, particularly across SMEs in sectors such as retail, travel, tourism, and entertainment.
- New mortgage lending will freeze. Net interest margins will remain low and/or be compressed further by rate changes.
- Short-term costs will increase amid lost productivity from increased work from home, and scenario analysis and stress testing of possible COVID-19 impacts.

Unemployment

- The International Labour Organization (ILO) estimates job losses of around 25 million worldwide.

Supply Chain & Demand Disruption

- Massive increases in digital activity, both from employees working from home and customers using mobile apps/websites, will drive increased risk of performance disruption.
- Much longer than normal lead times for infrastructure components (such as, servers, storage, parts and networking gear).

Sector-specific Stimulus Programs

- Various measures are being implemented including fiscal stimulus steps, rate decreases, liquidity measures, and a relaxation of capital rules.
- Operational challenges and lack of policy clarity have left some banks fearful of “writing blank cheques” when providing emergency finance.

Being A Force For Good

- By taking various counter-cyclical measures, banks will play a critical role in protecting employees, customers and the wider economy.

Banking COVID-19 value chain impact



Significant negative impact across the entire value chain but ultimately “forcing” through necessary business model change

| | Channels | Products | Operations | Infrastructure |
|-------------------|--|---|--|---|
| Short-term impact | Rapid change in channel usage, diverting primarily to call centres. | Loss of income, “forced” lending to vulnerable segments, and waived fees and charges. | Operational workarounds to affect process changes quickly at expense of long-term process simplification. | Legacy systems creak amid increased volume and velocity of data processing and new time-to-market imperatives. |
| Mid-term impact | Banks that built out mobile as a full sales and service channel reap benefits. | Cautious resumption of lending but with non-traditional credit risk metrics. | Growing reliance on open banking partnerships to refine credit assessment and remote on-boarding. | Cloud migration, software-as-a-service partnerships, and data consolidation to enable more personalized digital interactions. |
| Long-term impact | Accelerated decline in branch usage and conversion of digital holdouts. | More flexible product options, greater personalization and hybridization of features. | Increased process automation to improve business resilience and re-on-shoring of business-critical activities. | Cloud-native, mobile-native, micro-services architectures to optimize agility and flexibility. |



Global construction output to fall 2.2% in 2020

Sharp declines in activity expected in Europe and North America

Output predictions

- The construction industry will be subdued beyond the immediate period of lockdowns and other containment measures despite huge government stimulus packages.
- GlobalData predicts that global construction output will contract by 2.2% in 2020, a sharp downward revision compared to the forecast increase of 3.1% pre-COVID-19.
 - Western Europe output will contract by 5.2%.
 - North America output is expected to drop by 6.6%.
 - North-East Asia output will grow by just 1.0%.
- There is still an assumption that the outbreak will be contained across most major markets by the end of the second quarter, following which, conditions would allow for a steady return to normalcy in terms of economic activity and freedom of movement in the second half of the year.
- In the event that the spread of the virus continues into the second half of 2020, further downward revisions to the growth outlook are likely.

Sector specific stimulus

- Governments and public authorities will advance spending on infrastructure projects as soon as normality returns to reinvigorate the industry.
- This will be spread across all areas of transport infrastructure and energy and utilities.

Supply chain & demand disruption

- The construction industry will be heavily affected by the economic downturn. Planned projects are at a high risk of being delayed or cancelled.
- In the short term there is a high risk of projects in execution being halted because of lockdowns, a lack of materials, and other supply chain disruption.
- Projects at pre-construction stages will be severely delayed, given disruption processing building permits, tendering, and awarding contracts.

Unemployment

- While European governments are still permitting construction sites to remain open, contractors have laid off workers and used government support programs.

Construction COVID-19 Sub-sector impact. We do not preform analysis of the construction value chain. Sub-sector impact presented instead



All sectors to experience short term disruption, with commercial and industrial hit hard

Infrastructure investment will be a focus for efforts to boost the recovery

| | |
|-------------------------------|--|
| Commercial | Commercial construction is likely to be the hardest hit in the early part of 2020, with sectors such as retail, leisure and hospitality already suffering from the knock-on effects of the decline in trade, travel, and consumer and business confidence. |
| Energy & Utilities | Spending on energy and utility projects will be severely impacted by global supply chain disruptions and plunging oil prices. However governments and public authorities will likely advance spending on power and utilities projects as soon as normality returns. |
| Industrial | The industrial sector is most at risk from the severe drop in economic activity. Immediate priorities for manufacturers will be to stay afloat and rebuild core operations, rather than expand and invest in new premises or capacity. |
| Infrastructure | Infrastructure projects will be a priority for government investment as soon as normality returns, to reinvigorate the industry. With interest rates at record lows, borrowing costs will be at a minimum, but success will depend in part on the financial standing of governments post COVID-19. |
| Institutional | Governments across the world are preparing to fight the virus outbreak by strengthening their healthcare infrastructure, and building of new hospitals is rising sharply. This investment helping to support the expansion in institutional buildings. |
| Residential | The residential sector will struggle as unemployment rises, despite low interest rates and direct government support. There is a high risk that a considerable proportion of the early stage projects in the sector will be cancelled or pushed back, and few new projects will start in Q2 2020. |





Furloughs, lay-offs and job insecurity continues to affect consumers' willingness to spend, with the greatest impact on high-end or 'non-essential' products

Unemployment

- Unemployment and job insecurity will lead to consumers continuing to focus spend on essential goods, with premiums and non-essentials falling by the wayside.

Revenue predictions

- Though lockdown restrictions have started to ease, consumers are still likely to limit visits to supermarkets to buy food and ingredients for meal preparation. This will continue to drive demand for meal kits, which are seeing a strong boost. Hello Fresh in the UK estimates full-year turnover to grow by as much as 55%.
- US meat plants are shutting down operations, due to the growing number of COVID-19 cases among workers. Concern have been raised of constrained supplies in the coming weeks.
- Consumers' choices will be guided by their trust in brands and hence while shopping they will prefer only the brands that are known/familiar and are easily available.

Supply chain & demand disruption

- Demand for online delivery is high during lockdowns. Retailers are adapting to accommodate this through click and collect as well as increased home delivery services.
- Several supermarkets have unveiled new ways to shop in-store, using their own proprietary apps. These apps use the smartphone's camera to scan barcodes so customers can scan and pack as they pick up their shopping. This reduces the potential for infection from fomites.
- Kraft Heinz released Q1 results with 6.2% organic growth, gaining from its shelf-stable products like baked beans and tomato ketchup, but experiencing a decline in the foodservice channel as restaurants remain closed. Foodservice declines will impact Q2 earnings as all innovation plans have also been postponed to the end of the year.

Being a force for good

- While Corporate Social Responsibility continues to be in the spotlight, some local organizations, such as Feed Britain are taking it one step further and developing social business models. These companies run at-cost distributing meals and ingredients from local suppliers, and profits go to charity to ensure key workers get hot meals.

Consumer COVID-19 value chain impact



COVID-19 could change longer-term consumer behavior, the most successful companies will alter their strategies to accommodate this

| | Supplier Network | Manufacturers | Logistics and distribution | Channels | Consumers |
|-------------------|--|--|---|---|---|
| Short-term impact | Consumer Goods companies will experience short term delays from suppliers, especially those from further afield. | Manufacturing will experience minor short term disruption from ill staff and supplier disruption. Focus will shift away from smaller convenience products. | Delays in distribution networks may prevent revenue maximization. | Online orders and convenience stores are become more popular. | Major shifts in consumption behaviour are occurring rapidly making it difficult to react. |
| Mid-term impact | Consumer Goods companies are likely to be forced to analyse their sourcing strategies. | Product development will be hampered by COVID-19 disruption. The sales mix is likely to change—favourable for some, though others will struggle. | Longer-term effects might persist for some time, causing on-going difficulties. | Online retailers will become increasingly important for consumer goods manufacturers. | A global recession will increase demand for value products. |
| Long-term impact | New supplier networks might be created with the aim of building more resilience into overall arrangements. | While weaker businesses and brands might fail, those left should be well placed to fill any voids. | “New normal” patterns will bed in. | Overall channel mix will likely be altered for some time, requiring greater operational complexity to be managed. | Long-lasting impacts force CPG companies to alter pricing and promotion strategies. |



The global slowdown in foodservice will result in a net loss of market value of US\$834.9bn

Revenue predictions

- GlobalData's latest forecasts (which are currently updated weekly), show a decline of 22% in profit sector operator sales for 2020 relative to 2019, equivalent to \$834 billion in lost revenue.
- The West Europe market is set for the fastest decline in percentage terms, with a -25.7% loss vs 2019, based on current slowdown estimates.
- The North American market is set to decline by -23.8% and the Asian Market will decline by -23.7%.

Unemployment

- A survey has found that the US restaurant industry has lost eight million employees, approximately two-thirds of the total workforce, due to COVID-19.
- The ONS reported that the accommodation and foodservice sector in the UK had the second-highest closure of all sectors, with 82% of respondents claiming that they had temporarily closed.
- Companies are likely to experience staffing shortages as the recovery begins.

Supply chain & demand disruption

- Manufacturers are forced to close production do you to increased infection of employees.
- GlobalData's week six consumer survey found that 31% of respondents are ordering food-deliveries/takeaways from restaurants more often.
- Foodservice is expected to become more automated with the use of robotics and automated systems. Furthermore, contactless delivery operations will become the norm as consumers continue to self-isolate and perform social distancing.
- Even as lockdown restrictions are eased, food chains are opening only for take-aways and deliveries as they will have to adopt new measures for in-house dining services.
- Suppliers who have lost their primary market are turning to direct-to-consumer models.

Being a force for good

- Starbucks has announced that it will be providing all its employees with catastrophe pay. Employees choosing to work will receive an additional \$3 per hour.
- Sodexo is establishing a €30 million relief fund, funded by the company and senior executives.

Foodservice COVID-19 value chain impact



COVID-19 could change longer-term consumer behavior, the most successful companies will alter their strategies to accommodate this

| | Equipment Suppliers | Food & Beverage Suppliers | Catering Service Providers | Channels & operators | Food Delivery Specialists |
|-------------------|---|--|---|---|--|
| Short-term impact | Short term sales will be negatively impacted by companies cutting costs. | Restaurant closures will be damaging for food and beverage suppliers. | The contract/cost-sector is likely to experience a revenue reduction of 15%. | Those that remain open will have to rely on drive-through and to-go models. | COVID-19 has sparked increased demand for food delivery; however supply is limited by closing restaurants. |
| Mid-term impact | The slow, drawn out recovery of restaurants will be passed on to equipment suppliers. | As restaurants begin to open with social distancing measures demand will increase but lower than previous years. | As events, schools and Companies begin to get ack to normal, catering service providers revenues will increase. | Social distancing measures will decrease restaurant capacity, negatively impacting revenue. | Likely increased uptake of online delivery. |
| Long-term impact | Delayed or cancelled restaurant openings will negatively impact equipment suppliers. | The slow, drawn out recovery of restaurants will be passed on to food & beverage suppliers. | Cost-sector/contract arrangements will require restructuring. | All channels will undergo a slow and painful recovery from the deep-seated effect on consumer behaviour and household spending. | Alternative methods of delivery will be explored, e.g. drones. |



Economic instability will have the longest impact on the industry

Premium impacts

- The Chinese insurance industry is expected to generate ¥4,467.06bn (\$629.8bn) in gross written premiums (GWP) in 2020. This forecast was revised down from an initial estimate of ¥4,754.22bn (\$670.29bn) before COVID-19, representing a decline of 6.0%.
- The reliance on health insurance in the US could cause premiums to surge by up to 40% as the insurers face an unprecedented number of claims.
- According to Secured Retirement Institute, the sale of fixed-rate deferred annuity products in the US registered a growth of 57% in March 2020, when compared to the previous month.

Changing claims landscape

- Expected death benefit claims linked to COVID-19 are estimated to reach \$160bn in the US, according to Moody's.
- Underwriting losses for general insurers may reach \$140bn in an extreme scenario, according to Willis Towers Watson.
- Underwriting losses attributed to the impact of COVID-19 have been reported. With Q1 losses for Swiss Re, Munich Re and AIG to be \$476m, \$864m, and \$272m respectively.

Economic instability

- A global recession would initially be felt in commercial lines with business closures reducing demand. This will trickle through to personal lines as consumers' disposable incomes fall.
- Volatility in financial markets has raised the pressure on insurers' balance sheets as exposure to corporate bonds has increased in recent years in search of better returns.
- Insurtech funding in Q1 2020 declined in excess of 50%, yet the volume of deals has increased. The participation of reinsurers has fallen as they focus on ensuring business continuity.

Being a force for good

- Some motor insurance providers in the US are refunding premiums to policyholders who are unable to use their vehicles during the lockdown due to considerable fall in claims.
- Insurance regulators are extending the premium payment grace period, policy term periods and expiry dates in markets impacted by the pandemic.
- Sri Lanka Corp has donated 10,000 litres of surface disinfectants and 10,400 sanitizers and face masks.

Insurance COVID-19 value chain impact



Long term benefits are possible across the value chain despite short term pain

| | Product development | Marketing & distribution | Underwriting & risk profiling | Claims management | Customer service |
|-------------------|---|---|--|---|--|
| Short-term impact | <p>There will be little capacity for new product development as the industry responds to the crisis.</p> | <p>The sale of new policies has been paused in some lines of business as insurers limit their exposure.</p> | <p>Policy terms must be reviewed in order to understand potential hidden exposures.</p> | <p>The surge of claims will put increasing strain on claims management. With social distancing measurers making it challenging to effectively process claims.</p> | <p>With many businesses being uninsured due to policy wordings policyholders will feel the level of customer service received is sub-standard.</p> |
| Mid-term impact | <p>The cost of claims will result in a lack of funds for innovation as core product lines are protected.</p> | <p>The industry will need to engage with customers and highlight the changes which have occurred to policies.</p> | <p>The impact on reinsurance will become evident as natural catastrophes occur.</p> | <p>In the medium term claims will begin to stabilize after the peak of the virus is reached.</p> | <p>The impact of customer service on market share will become evident as renewal dates are approached.</p> |
| Long-term impact | <p>Changes in consumer habits which occurred as a result of lockdown measures will create demands for new policies to be developed.</p> | <p>New policies will have a reliance on technology particularly those which are usage-based, resulting in the need for new distribution channels.</p> | <p>The industry will benefit from the wealth of data which will become available allowing for improved underwriting accuracy relating to future pandemics.</p> | <p>The need for a contactless claims process will result in significant investment in technology which enables virtual claims processing.</p> | <p>The high demand for clear communication of policy terms will lead to a change in industry practice.</p> |

Medical COVID-19 impact assessment



Governments around the world are approving stimulus packages to ensure hospitals can continue to operate during the crisis

With hospitals focusing on COVID – 19 patients, the more lucrative procedures are taking a back seat

Revenue predictions

- GlobalData expects the current spend for disposable hospital supplies to increase \$8B worldwide based on worst-case scenario assumptions, mostly based on a surge in demand for PPE and growth in areas such as medical solutions.
- IVD companies and services such as Myriad Genetics and Quest Diagnostics have seen 40-75% reductions in test volumes in the US following lockdown in March. Abbott Laboratories reported diagnostic sales declining by 0.8% due to lower demand for routine testing.
- Most elective surgeries have been cancelled, but countries are looking at how to restart these, with the approach likely to vary according to the type of healthcare system.

Unemployment

- Medical manufacturers' available jobs fell 22% in the last month.
- Thermo Fisher, despite recent COVID-19 product releases, posted a 51% decline in jobs between March and April, echoing the overall decline in IVD demand, as surgeries were cancelled.

Supply chain & demand disruption

- The initial surge in demand for ventilators is now subsiding as UK and US reveal much less demand for ventilators during the first wave than anticipated. The UK reduced its demand from 30,000 additional machines to 18,000.
- Shortages of N95 masks force end users to use disinfectants in order to reuse masks.
- Up to 30% of hospitalized COVID-19 patients suffer from kidney failure, putting pressure on dialysis machine availability.

Sector-specific stimulus programs

- US Congress approved a \$100B stimulus package for US hospitals to help address the pandemic.
- US government actions to simplify CPT coding and improve reimbursement increase patient access to telemedicine.
- US Government "Opening up America Again" envisages 3 phases. The Phase 3 stimulus bill that passed Congress in March paired coverage guarantees for coronavirus tests with an obligation that healthcare providers publish prices for tests.

Medical COVID-19 value chain impact



Disruption in medical markets is expected to continue through the end of 2020

Companies with minimal supply chain disruption are better equipped to perform well over the long term

| | Supplier Network | Manufacturers | Sales & Marketing | End Users (Patients, Physicians, Hospitals) |
|-------------------|--|--|---|---|
| Short-term impact | <p>Logistics and dearth of device components supplies will be major issues for all.</p> | <p>Most Medical companies will show a decline in revenues in Q1 and Q2 due to the limited number of procedures being done.</p> | <p>With disruptions in face-to-face meetings, sales forces will lower effectiveness using virtual and electronic marketing tools.</p> | <p>Physicians are currently overworked, understaffed, and have inadequate supplies to handle large influxes of patients with severe disease.</p> |
| Mid-term impact | <p>As concerns over availability of materials subside, manufacturing process will begin to resume, though will initially lag relative to regular operations.</p> | <p>Developers of COVID-19 interventions could thrive; the bulk of the industry will be challenged with supply chain interruptions, and limited procedures.</p> | <p>Sales will begin to recover once supply chains and procedures are not disrupted.</p> | <p>Healthcare providers will continue to struggle with provided adequate patient care as long as a shortage in any aspect of patient care is deficient.</p> |
| Long-term impact | <p>Growth will be derived from opportunities to manufacture and support distribution of COVID-19 tests and test capabilities.</p> | <p>The need for devices will grow above pre-COVID-19 levels due to the increased number of procedures to catch up the delay. In some cases, not all missed procedures will be caught up.</p> | <p>Sales volumes will increase as devices are sold to make up for the lack of procedures in early 2020.</p> | <p>The healthcare system will remain overburdened by the number of procedures that are required post COVID-19, but providers will not be overburdened.</p> |

Mining COVID-19 impact assessment



COVID-19 is impacting both the demand and supply side of the mining sector

Demand side

- The latest forecast for global construction output growth is a decline of 2.2%, versus initial expectations of 3.1% for 2020.
- A slowdown in construction has impacted copper and steel demand, with copper demand forecast to be down by 3% in 2020.
- Lower automotive manufacturing will also impact demand for steel, aluminium, platinum and palladium. Platinum demand is forecast to decline by 7% in 2020.

Capital expenditure

- Original guidance for 20 leading miners' capex growth was 11% in 2020. However, capex is being cut. April's announcements include:
- Rio Tinto advised capex for the full year would be between US\$5-6 billion, down from the previous guidance of \$7 billion.
- Anglo American is cutting its 2020 capex by US\$1bn to US\$4-4.5bn
- First Quantum advised on a reduction from US\$850m to US\$675m.
- Freeport-McMoRan announced a cut in capex from US\$2.8bn to US\$2.0bn.
- Vale announced a reduction from US\$5bn to US\$4.6bn as expenditure will be delayed until 2021.

Supply side

- Suspensions of mining have now been ended in Argentina, South Africa, India, Zimbabwe, Peru and Bolivia. Governments in both Peru and Bolivia have allowed mines to return to operation from 2 May, provided they implement strict protocols to avoid the spread of COVID-19.

Operations

- Mining companies are undertaking a range of measures to minimize the potential for infections and the impact of the virus on mining operations.
- With concerns over infections being brought in by FIFO workers, Rio Tinto is trialing a rapid blood-testing system for FIFO workers before they board their flights to its Western Australian mines. The test screens for viral-related antibodies and should anyone test positive, they self-isolate and seeks out a COVID-19 test. Workers also complete a questionnaire the day before travel and are assessed at the airport by medical personnel.

Mining COVID-19 value chain impact



The speed of recovery will also vary by commodity

| | Prospecting & Exploration | Mine Development | Extraction & Processing | Marketing |
|-------------------|---|---|---|--|
| Short-term impact | <p>Much prospecting and exploration has been deferred due to financial consolidation by mining companies.</p> | <p>Construction activities have been slowed by lockdowns, whilst investment decisions have stalled pending market improvements.</p> | <p>Large numbers of mines have been temporarily closed in several markets, except where considered an essential service. Interruptions to supply chains will affect production.</p> | <p>Demand for many commodities, such as base metals and PGMs has dropped significantly with the slowdown of the global economy.</p> |
| Mid-term impact | <p>Continued closure of borders and travel restrictions will hinder explorers, whilst investor sentiment will impact capital raising.</p> | <p>Investments will depend on the recovery of commodity prices and ability to source the required workforce to develop each site.</p> | <p>Delay to recovery of equipment and consumables suppliers could impact supply chains. However, miners will attempt to redress production deficits.</p> | <p>Recovery in China and public sector investments will support demand for commodities for industrial production and infrastructure construction. However, lower luxury purchases affects PGMs, diamonds, etc.</p> |
| Long-term impact | <p>Exploration budgets may be constrained in many commodities whilst markets recover.</p> | <p>Recovery in commodity demand will spur an increase in mine development activity to meet future demand requirements.</p> | <p>Improvements to emergency response plans and investments in worker health. Increased investment in technology and potentially an increase in automation.</p> | <p>As the global economy returns to growth, demand growth for commodities will return to pre-COVID expectations.</p> |

Oil & Gas COVID-19 impact assessment



The oil & gas industry is heavily impacted on all fronts as falling demand and geopolitical ambitions are greatly impacting company finances

Upstream sector will bear the brunt of the COVID-19 outbreak as the falling oil prices will impact production economics.

Revenue predictions

- Lockdown measures have brought a sharp drop in global oil and gas demand, with the IEA estimating that global oil demand could fall by approximately 26 percent in May 2020.
- The crash in prices - aggravated by a rapid build in liquids storage that caused lower utilization at the production end - will significantly impact revenue and profit margins.

Capex realignment

- IOCs, NOCs, and independents are cutting capex and opex in tune with low oil prices.
- Announced cuts to capex guidance for 2020 now amount to around US\$120 billion as of 10th May 2020, considering 170 companies.
- Capex cuts are primarily being felt in drilling in the US shale plays, in postponement of project FIDs, and reductions to exploration budgets.
- Major FID postponements to date include Woodfibre LNG, Rovuma LNG, and the Scarborough gas field and Pluto LNG expansion.

Supply chain disruption

- Production shutdowns in China have disrupted raw material and equipment supply chains across all industries, especially those that are heavily dependent on China.
- Restrictions aimed at limiting the spread of COVID-19 are hampering progress for some ongoing projects, with a major example being the Tortue LNG project in Mauritania and Senegal, delayed for around 1 year.

Government policy responses

- OPEC and other major producers collectively agreed over 9.7 million bpd of oil production cuts in order to offset reduced demand.
- Norway announced oil production cuts of 250,000 bpd for June 2020 and 134,000 bpd for the rest of the year to stabilize the markets
- Canada and Ghana are among the first countries that are planning a fiscal stimulus to support the country's ailing oil and gas industry from the downturn.

Unemployment

- Shrinking E&P activity and closing oil and gas plants are leading to layoffs in the services industry.
 - Halliburton announced job cuts in Texas and Oklahoma.

Oil & Gas COVID-19 value chain impact



Low prices coupled with a prospect of low demand does not bode well, and forces to rethink on project timelines and cost cutting across value chain

Projects with high capital intensity are at a high risk of cancellation or FID delay

| | Upstream | Midstream | Downstream | Petrochemicals | Equipment & Services |
|-------------------|---|--|---|---|--|
| Short-term impact | <p>Production cut. Projects put on hold. Drilling suspension.</p> | <p>Project delays. Production cuts. Product surplus at storage facilities. Volatility in tariff.</p> | <p>Reduced utilization. Suspension/closures of refinery operations. Delay in critical maintenance activities.</p> | <p>Lower utilization due to temporary closures. Projects delays. Delay in maintenance.</p> | <p>Supply chain disruption. Shortage of labour. Delay in project execution. Cost escalation.</p> |
| Mid-term impact | <p>Review of asset portfolio. Reassessment of capital allocation based on prevalent pricing and demand.</p> | <p>Opex reduction. Re-evaluation of new and active projects. Possible consolidation in the industry.</p> | <p>Possible consolidation in the industry. Refineries to assess margins and configurations in light of crude oil abundance.</p> | <p>Opex reduction. Re-evaluation of new projects.</p> | <p>Re-look of risk clauses. Project backlogs to be handled. Margins under stress.</p> |
| Long-term impact | <p>Companies to restructure with focus shifting to cleaner options - gas, light oil, renewables etc.</p> | <p>Review of supply chain infrastructure for oil and gas. Reassessment of risk clauses for supplier and contractors.</p> | <p>Focus on large integrated refineries to continue. Demand for cleaner fuel will increase further.</p> | <p>No perceptible impact on demand. Focus shift to large integrated complexes for better profitability.</p> | <p>Consolidation on E&S is expected. Diversification of sector, geography and service.</p> |



Pockets of the packaging sector are experiencing growth, fueled by customer demands

Revenue predictions

- E-commerce packaging providers are scaling up production and benefitting from the increased demand for online retail - corrugated cardboard is performing well.
- There is a heightened demand for food packaging, more specifically shelf-stable packaging for the grocery industry.
- Demand for luxury goods packaging expected to fall significantly as discretionary spending is reduced.
- Diversified product portfolios will offer some mitigation.
- Industrial and transportation packaging which is closely related to GDP will fall.
- Demand for healthcare packaging materials continues to increase globally.

Unemployment

- Packaging factories largely remain open during the outbreak.
- However, some companies are being heavily affected; Berry Global has furloughed 600 members of staff.

Supply chain & demand disruption

- Consumers prefer larger pack sizes. Lockdowns have reduced demand for smaller packaging for on-the-go lifestyles. Consumers also want to restrict visits to shops during the pandemic.
- In North America, packaging company Sonoco has announced a minimum 5.5% price raise for all rigid paper containers and closures, in line with the increasing costs of recycled paperboard.
- As crude-oil prices have fallen, the cost of oil-based raw materials, such as plastic resins for the packaging industry, is likely to fall.

Being a force for good

- Chipotle Mexican Grill, a restaurant chain, has adopted tamper-proof packaging in order to prevent food contamination amid the COVID-19 outbreak.
- Private-label paper products manufacturer AJM Packaging is offering up to \$1,000 in bonus to eligible Detroit-area manufacturing employees to appreciate their presence during these tough times.

Sector Specific Stimulus

- Governments have deemed the packaging sector as essential, allowing companies in the sector to continue operations, green lanes are aiding smooth transportation.

Packaging COVID-19 value chain impact



COVID-19 could change longer-term consumer behavior, the most successful companies will alter their strategies to accommodate this

| | Packaging materials production | Packaging converters | Wholesale, distribution & logistics | Retailers | Consumers |
|-------------------|---|--|--|--|---|
| Short-term impact | <p>Social distancing measures will slow down production rates, companies will benefit from falling oil prices.</p> | <p>The short-term focus will be on tamperproof and aseptic packaging.</p> | <p>Delays in distribution networks may prevent revenue maximization.</p> | <p>Closure of foodservice outlets will increase demand for food packaging.</p> | <p>Online orders by quarantined customers will increase demand for corrugated cardboard packaging.</p> |
| Mid-term impact | <p>With it being uncertain how long social distancing measures will persist, production will be slow to get back to 100%.</p> | <p>E-commerce and food packaging will be in high demand.</p> | <p>Longer-term effects might persist for some time, causing on-going difficulties.</p> | <p>Online retailers will become increasingly important.</p> | <p>A global recession will increase demand for value products, non-food premium packaging will suffer.</p> |
| Long-term impact | <p>Production of plastics will reduce; glass and cardboard packaging will increase.</p> | <p>Sustainability will come back to the forefront, alternatives for plastics will be increasingly important.</p> | <p>“New normal” patterns will bed in.</p> | <p>Recovery will depend on packaging type; fast food will have a quick rebound; high-end luxury goods will struggle.</p> | <p>Downturn in economic activity and poor performance of companies are likely to reduce end use demand.</p> |

Payments COVID-19 impact assessment



The long-term prospects for payments look bright as consumers shift to electronic tools over cash

COVID-19 may be the trigger that finally heralds the long-awaited “cashless society”

Revenue Predictions

- Decline in electronic payments growth to at least 2023 will hit projected electronic payments revenue.
- Long-term revenue will grow as consumers move away from cash.
- Regulators will take aim at card fees once the dust settles – if merchants take less cash they will resume interchange challenges.
- E-commerce revenue growth will sharply accelerate worldwide.

Unemployment

- Payments will be less affected than other sectors.
- Working remotely is feasible for almost all payments companies.
- Banks will see furloughs and layoffs as the recession bites.

Cash On A Sharp Decline

- Cash is shunned as a disease vector. Central banks, card schemes and other industry players rush to push consumers away from it.
- Contactless limits rise, account fees drop to push digital payments.
- ATM network operators will see their business shrink rapidly.

Growth Prospects

- E-commerce is already performing more strongly than forecast and will continue to do well as consumers move from physical to online.
- Mobile payments have a major growth opportunity at the POS.
- P2P and instant payments also have major growth opportunities.

Being A Force For Good

- Banks offering repayment holidays on credit card debt to support those hit financially.
- Card schemes roll out increases to contactless payment limits to reduce consumer exposure to disease vectors.

Supply Chain Impact

- Many payments companies are software based – lower impact.
- Terminal manufacturers, card manufacturers and ATM manufacturers will all see a hit as trade slows.

Fraud On the Rise

- The influx of inexperienced new e-commerce, mobile, and contactless users, are ripe targets for fraudsters.
- The industry may not be ready for fraud surge.

Payments COVID-19 value chain impact



Long-term economic depression will impact consumer spending strongly, hitting payments revenue

Cash is on the way out, though, which will buoy electronic payment spending specifically.

| | Banks/Issuers | Acquirers and Processors | Schemes | Card and terminal manufacturers | Alternative Payment Providers |
|-------------------|--|---|---|---|---|
| Short-term impact | Revenue will be hit hard by reduced consumer spending under lockdown. | Consumer spending reduction hits revenues hard. E-commerce specialists will see growth as consumers shun physical stores. | Schemes are less exposed to changes in transaction numbers – their networks will remain necessary and funded. | Supply chains impacted by lockdowns. In-store payments greatly reduced and stores close, cutting down demand. | Specialists in e-com, mobile, and real-time payments benefit immediately from consumers turning to remote channels and low-contact tools. |
| Mid-term impact | Electronic payments overall will go up, but growth will be lower than pre-COVID forecasts as economic downturn bites. | As lockdowns lift, physical stores will see increased traffic, though merchant partners may struggle with lower overall spending. | Schemes will gain from greater electronic payments usage as cash falls off. | Spending reductions will bite hardest in face-to-face commerce, and merchants may struggle. Banks may shift to virtual card issuing. | With strong enough marketing and a good enough initial user impression, alternative tools can funnel ex-cash users to their platforms. |
| Long-term impact | More instant card issuing and remote card issuing – lower cost base will offset revenue losses as regulators target card fees. | Ramping up of e-commerce demand puts the big, merged processors and e-com specialists in strong positions. | Schemes' positions are not guaranteed – vulnerable to disruption from real-time payment systems which have a big opportunity to grow. | In-store payments will recover, but remote digital spending will gain a lot of ground. Growth prospects overall lower than pre-COVID. | Strong, sustained growth as consumers who adopted tools during the crisis maintain usage habits. |

Pharma COVID-19 impact assessment



The COVID-19 pandemic has propelled the pharmaceutical industry into action to develop both preventive and therapeutic interventions

The industry is in a period of uncertainty but companies that are investing in R&D for COVID-19 drugs and vaccines are likely to fare better than their counterparts...

Product Development

- The pharmaceutical industry is racing to develop both preventive and therapeutic interventions.
 - There are currently 1540 clinical trials for COVID-19.

Clinical Trials and Regulatory

- Upward trends in clinical trial delays continue.
 - At least 1,072 trials and 430 Pharma/Biotech companies and CROs are associated with disrupted trials.
 - Newly approved drugs are also experiencing delayed launches; the most recent is Neurocrine's Ongentys (opicapone) for Parkinson's Disease, which received FDA approval on April 28th but will not launch until later this year.

Supply Chain

- Companies with facilities in China closed manufacturing plants at the height of the outbreak.
- Operations are resuming in areas such as Wuhan so supply chains are being restored.

Finance and Business Development & Licensing

- Drop in completed venture capital (VC deals) in Feb 2020 vs Feb 2019 (54% in value, 90% in volume); followed in increase in March.
- Infectious Diseases VC deals are 2nd most funded vs. 5th position in 2019.
- \$63B takeover of Allergan by Abbvie shifted from Q1 to Q2.

Marketing and Commercial Activities

- Cancellation of clinical events and restricted physician detailing have limited face time with physicians.
- Sales of antidepressants, anti-anxiety and anti-insomnia drugs increased ~20% post-COVID-19 (Express Scripts, *America's State of Mind report*).
- Q1 2020 sales of Roche's Actemra (tocilizumab) jumped 30% amid testing in severe COVID-19 patients.

Patient Access to Services

- Telemedicine is becoming a critical tool for patient management as patient office visits declined.
- Hospitals are also seeing a significant drop in visits for illnesses such as heart attacks, severe abdominal pain and strokes; likely due to patient fears of contracting COVID-19.

Pharma COVID-19 value chain impact



In the short-term, impact will overall be negative, slowly recuperating over time

Adverse impacts to sales, drug development, and patient care will resolve as the outbreak is addressed by containment measures and the anticipated launches of interventions

| | Drug Development | Supply Chain & Manufacturing | Sales & Marketing | End Users (Patients, Physicians, Hospitals) |
|-------------------|---|---|--|--|
| Short-term impact | Developers of COVID-19 interventions could thrive; the bulk of the industry will be challenged running trials and supply chain interruptions. | Logistic and supplies of APIs and intermediates will be a major issue for all players involved in the manufacture and marketing of finished dose forms. | With disruptions in face-to-face meetings, sales forces will lower effectiveness using virtual and electronic marketing tools. | Physicians are currently overworked, understaffed, and have inadequate supplies to handle large influxes of patients with severe disease. |
| Mid-term impact | Developers will have to cut losses and terminate COVID-19 programs if they do not appear promising. | As concerns over availability of APIs subside, manufacturing process will begin to resume, though will initially lag relative to regular operations. | Sales will begin to recover once supply chains and sales forces are not disrupted by COVID-19 and associated safety measures. | Healthcare providers will continue to struggle with provided adequate patient care as long as a shortage in any aspect of patient care is deficient. |
| Long-term impact | Experience in developing COVID-19 agents could be leveraged for other investigational programs. | Growth will be derived from opportunities to manufacture and support distribution of COVID-19 interventions. | The approval of an effective therapeutic or vaccine for COVID-19 could drive blockbuster revenues for a developer. | The availability of a vaccine or therapeutic will significantly improve public health, reducing stress on the healthcare system. |

New capacity auctions and contract awards are deferred

Several under-construction projects are experiencing delays due to supply-chain disruption and manpower shortage

Revenue predictions

- Electricity demand is growing across Europe as lockdown restrictions are being eased.
- Essential industries and facilities are becoming operational, worldwide. This will lead to slightly increased demand and electricity prices will slowly and steadily rise in the future.
- Eurelectric estimates new utility investments will fall by 10-15%.
- The IEA expects global renewable generation to grow by nearly 5% in 2020, despite supply chain and construction delays.

Unemployment

- In March, US clean energy sector job losses are estimated at 106k.
- Wind: AWEA reports coronavirus threatens 35k jobs in US.

Sector-specific stimulus programs

- In 14 European countries a temporary moratorium has been announced on energy bills.
- The Trump administration has agreed to change rules for renewable energy tax credits, providing more time to claim the subsidies.

Supply chain & demand disruption

- Thermal power plants in India are likely to be cash-strapped as power demand continues to fall while surplus coal lies unused at their sites.
- Wind sector supply chains will continue to be impacted in the months ahead, so some project milestones will be deferred.
- State-run auctions in Europe have been altered and implementation deadlines have been extended to help both authorities and bidders.
- The impact of COVID-19 on the Indian wind gearbox supply chain is expected not only on the home market, but also on the US market.
- Production at some wind turbine assemblies and component production facilities, for example in Spain, Italy, the UK and India, have been suspended to stem the spread of coronavirus.

Being a force for good

- Innogy is supporting the communities that neighbour its renewable projects through its community funding program.
- Iberdrola has made available to the Ministry of Interior about a million masks, 20,000 protective goggles and 5,390 medical gowns.
- Ørsted has pledged to donate £165,000 to support the UK's National Health System (NHS) and local food banks.

Power COVID-19 value chain impact



Distribution utilities to face cash flow issues due to payment delays.

Investments in RE sector looks promising in medium-to-long run, despite the short term impact

| | OEMs & Equipment Vendors | Power Producers | Transmission | Distribution & Retail Sales | Services – EPCs, PMCs |
|-------------------|--|---|---|---|---|
| Short-term impact | <p>Shutdowns cause delays in supply.</p> <p>Facing severe pressure from customers.</p> | <p>Fall in electricity prices and low demand to impact 2020 revenue. Operating at low PLFs. Working with reduced staff.</p> | <p>Staff under pressure; constant surveillance & response to generation/consumption imbalances.</p> | <p>As governments announce moratoriums, losses will increase.</p> <p>Reduced consumption affects sales.</p> | <p>Most construction halted.</p> |
| Mid-term impact | <p>Focus on strict deadlines to deliver order-backlogs.</p> | <p>Projects will be delayed or cancelled.</p> <p>New auctions/contracts to be deferred.</p> | <p>New large projects could be announced to boost sector.</p> | <p>Non-collectible write-offs will increase.</p> <p>Increased spend in employee HSE.</p> | <p>Legal complexities to arise due to COVID-induced delays.</p> |
| Long-term impact | <p>Project owners try to mitigate risks by local sourcing.</p> | <p>Slow change in generation, new-capacity mix; RE & gas to replace coal.</p> | <p>Safety & surveillance technology adoption to increase.</p> | <p>Increased competition from distributed energy resources.</p> | <p>New business from construction starts to meet capacity addition targets.</p> |



Impact on retail will be devastating, increasing the shift online and shaking out weaker operators even faster

Global recession will limit the bounce-back in spend in some sectors

Industry predictions

- Retailers must accommodate fast-changing shifts in behaviour, away from experience and indulgence to convenience, safety and necessities.
- As countries start to lift restrictions and non-essential stores re-open, implementing social distancing and employee safety measures, become critical. Footfall is down, but basket sizes are much higher and, in apparel, childrenswear, leisurewear and nightwear are in demand – all necessities for the current lifestyle.
- Retailers must make the physical shopping experience safe and easy to navigate – and use new merchandising methods to encourage higher volumes.
- They also need to speed up online capacity.
- As even more department stores collapse (Neiman Marcus, JC Penney, Lord & Taylor among the latest) shopping centres must reconsider anchor store status with food retailers taking more prominence.
- High unemployment and a global recession will hit household budgets over the next couple of years and a recovery in retail to 2019 spending levels is likely to take at least two years.

Supply chain & demand disruption

- The shift online in grocery is challenging supermarkets – Tesco has increased its weekly delivery slots from 590,000 at the start of the crisis to over a million by employing more staff to pick and more drivers to deliver.
- Others are all increasing capacity – but also increasing costs as well and this is the major problem to solve: how to make a profit with online food deliveries. Few retailers have scaled their online grocery platforms effectively.
- The cancellation of fashion orders in the wake of store closures is putting severe strain on suppliers, and the huge quantities of unsold stock will flood the market pushing prices down further and increasing the strain for surviving businesses.

Sector-specific stimulus programs

- Retail is a major employer, so any government stimulus programs tend to have a major impact – however there is a limit to how long governments can support furloughed workers and many businesses with high debt levels will not survive.

Being a force for good

- Brands are diverting production to aid health workers and supporting local communities. As they have a direct connection with the public, retailers are keen to be seen to playing their part in the community.

Retail COVID-19 value chain impact



The shift online and acceleration of store closures will shake out weaker non-food operators faster, placing strain on the supply chain

Fewer non-food retailers will mean fewer suppliers and prices will rise

| | Suppliers | Manufacturers | Distribution | Point of Sale |
|-------------------|--|---|--|---|
| Short-term impact | <p>Food suppliers are finding it difficult to meet demand. Non-food suppliers are suffering from cancelled orders.</p> | <p>Food manufacturers and processors restricting ranges to meet demand. Non-food manufacturers left with unsold stock and cancelled orders will collapse.</p> | <p>Warehouses and distribution struggling with demand in food and online, and unsold stockpiling up as non-essential stores close.</p> | <p>Store closures cutting off major part of retailers' revenue. Food stores struggling to meet demand and not sufficient capacity online.</p> |
| Mid-term impact | <p>Prices will rise in food. The non-food suppliers will begin to suffer and many may have to close.</p> | <p>Stockpiling in food lessens and the chain starts to return to normal. Non-food manufacturers hit hard and more business failures.</p> | <p>As COVID-19 takes hold across populations there are fewer resources to support distribution.</p> | <p>Heavy discounting in non-food to raise cash, negotiations with landlords to reduce rents. Food retailers cutting promotions.</p> |
| Long-term impact | <p>Higher food prices will remain until supply returns to normal and non-food prices will rise as fewer suppliers.</p> | <p>Higher prices in non-food as fewer manufacturers to choose from and negotiate. Loyalty and support will be rewarded.</p> | <p>Businesses will step up digital and technology investment to improve online capabilities and the ability to flex demand.</p> | <p>Faster shakeout of weaker players in non-food – which will be beneficial to the survivors – less competition. Fewer stores, more online.</p> |

Sports COVID-19 impact assessment



Over \$100 billion in lost revenue for North American and European industry alone

That's assuming a return to production by May. No guarantees that's the cap on losses...

Revenue Predictions

- The hit to the sports market will likely be greater than in the 2007/8 financial crisis.
- Premier League stands to lose \$1.2 billion if 2019-20 season left unfinished.
- Esports global gambling revenue is set to double to \$14 billion in 2020 following news Nevada has relented and is accepting bets on esports events.
- The hosting fee for the Formula One Chinese Grand Prix is estimated to be \$33.1 million, while a further \$5.1 million was spent on corporate hospitality ticket sales.
- Local economies for the European Championships stand to miss out. In 2016, this equated to \$1.445 billion.
- Cancellation of The Open Golf Championship will cost the competition and the local Kent economy an estimated \$185.4 million.

Unemployment

- The restrictions on international travel will present organisational challenges for global sports such as Tennis and Golf.
- Furloughing of staff is widespread: sponsors, teams and leagues all introducing cost-cutting solutions.

Supply Chain & Demand Disruption

- Cancellation of the Championships at Wimbledon will see sellers of 'strawberries and cream' event miss out on \$556,235.
- Bookmakers hit hard by the cancellation of horse racing events. Expected losses of \$392 million from the UK's Grand National.
- City of Nice, France, to miss out on potential \$120 million economic boost from cancellation of the Tour de Frances' Grand Depart.
- COVID-19 will see an acceleration in the trend of more pay-for performance deals, which was marked by Nike's agreement with Liverpool.

Sector-specific Stimulus Programs

- Sport England has made \$240.2 million of funding available to help the sport and physical activity sector.
- The Lawn Tennis Association (LTA) has introduced a \$24.6 million relief fund for British players and coaches.

Being A Force For Good

- Brooks Koepka donated \$100,000 to a relief fund in his hometown.
- Spanish athletes donated \$260,000 to the Red Cross of Spain.
- NBA star Zion Williamson has announced plans to cover the salaries of staff at the Smoothie King Center.

Sport COVID-19 value chain impact



Difficult to see beyond a rebasing of the entire value chain at this point: structural imbalances finally addressed

But last pandemic did give way to the 'roaring twenties'...

| | Media Rights | Broadcasters | Sponsorship Sector | Event Hosting | Agencies |
|-------------------|---|--|---|--|---|
| Short-term impact | <p>Significant hit to revenue. Broadcasters refuse to pay right instalments. Confusion regarding length of current deals.</p> | <p>Substantial hit from loss of subscriptions caused by widespread live sport cancellation.</p> | <p>Marketplace has been completely disrupted. An unessential area for brands and an easy cost to cut from budget.</p> | <p>Huge financial drain on those committed to hosting postponed events.</p> | <p>Significant budget cuts.</p> |
| Mid-term impact | <p>Lower revenues as the sector struggles to attract interest in a struggling economy.</p> | <p>Depending on the length of postponements, will continue to struggle. Greater competition for audiences upon backlog of live events.</p> | <p>A re-evaluation expected on the value of sponsorship rights in sport. Tightened purse strings will lower expectations.</p> | <p>Falling interest in large scale event hosting. Money reallocated to other domestic areas.</p> | <p>Pursue opportunities in new viable areas. Increased interest in esports.</p> |
| Long-term impact | <p>High demand returns. Becomes a sellers' market, as businesses flock back for biggest rights on offer.</p> | <p>Demand for sports content remains high in the long-term. No qualms, proving sports continue.</p> | <p>Sport will continue to offer prime marketing opportunities. Millions of fans will attract millions of dollars.</p> | <p>Renewed interest in sustainability. Focus remains on legacy of an event, which is key to reinvigorate host economies.</p> | <p>Increasingly creative development of brand impact.</p> |

The UK will impose quarantine on people entering the country by air

Although Prime Minister Boris Johnson provided few details, this may serve as something of a blueprint for future air travel

Revenue Predictions

- American Airlines posted a \$2.2 billion net loss. Even excluding special items, the loss was \$1.1bn, worse than the \$808m loss forecast by analysts. Like Delta, American warned that Q2 will be worse, predicting it will lose \$70m a day over that period.
- Accor's Q1 results paint a similar picture. Consolidated revenue totalled €768m (US\$829.3m), which was down 17% as reported and 15.8% like-for-like. Revenue per available room fell 25.4%. IHG's results provided no reassurance. RevPAR was down 24.9% for Q1, with occupancy down 14.4% and ADR 3% lower than Q1 2019.
- GlobalData predicts international travel to France, the most-visited country in the world, will fall by 41% and the US will see arrivals fall by 47%. Similar falls in visitation are forecast in many countries.

Unemployment

- British Airways was the first major player to warn of permanent job losses, with 12,000 jobs at risk. Unions have vowed to fight any cuts. Ryanair followed on May 1, saying that 3,000 jobs could be at risk and Qatar Airways has warned of substantial job losses.
- In the lodging space, Airbnb has set out plans to make 1,900 staff redundant, approximately 25% of its global workforce.

Demand Disruption

- The UK's announcement that it will impose quarantine on people entering the country by air shows that even as some travel becomes possible, a certain level of disruption will remain. It will be quite some time until things 'get back to normal.'
- Carnival Cruise Line has extended its sailing suspension to June 27, Royal Caribbean until June 11, Norwegian and Viking until June 30 and MSC until July 10.
- Demand disruption has markedly increased the threat of business failure. Virgin Australia has offered voluntary redundancy as it seeks a buyer and Avianca has filed for bankruptcy protection in a US court as it wrestles with high fixed costs and a severe drop in revenues.

Sector-specific Stimulus Programs

- Air France-KLM has secured at least €9bn (\$9.7bn) from the Dutch and French governments.
- In the UK, companies are accessing the Covid Corporate Financing Facility (CCFF). easyJet has borrowed £600m and IHG has issued £600m in commercial paper under this facility.

Being A Force For Good

- Some hotels and cruise ships have been used to house essential workers. 79

Travel & Tourism COVID-19 value chain impact



Demand for travel will return, but a new normal will emerge

Airline CEOs predict their businesses will be smaller, leaner and more agile for the next two to three years

| | Planning & Booking | Transport | Lodging | Excursions |
|-------------------|--|---|---|---|
| Short-term impact | <p>Devastating. Depend on people booking travel in large numbers and that is not occurring at present.</p> | <p>Demand has plummeted. Immediate focus is on survival.</p> | <p>A plunge in transport demand has severely weakened demand for lodging.</p> | <p>Failures likely as many small businesses populate this stage of the chain.</p> |
| Mid-term impact | <p>Uncertainty over the length of travel restrictions and indication is that measures will be in place even when travel opens back up.</p> | <p>Demand will return in waves as restrictions are lifted at different times in different countries. A new norm will emerge with quarantine measures a feature.</p> | <p>Demand will return in waves as restrictions are lifted at different times in different markets. Maintaining price discipline will be crucial.</p> | <p>Once leisure travel resumes, demand will return. May be used by tour operators to entice people to book but a return to 'normal' levels will take some time.</p> |
| Long-term impact | <p>Travel will return. Intermediaries are seen by many as a necessary aid when booking so demand will return.</p> | <p>Consolidation is a possibility, but airlines likely to be smaller companies for the next two to three years.</p> | <p>Accommodation sharing sites will suffer due to loss of hosts and increased hygiene concerns. Hotels will need to work hard to reassure travellers.</p> | <p>Some demand will return but much hinges on economic situation. Excursions are something travelers can forgo.</p> |

Enterprise Technology & Services COVID-19 impact assessment



The hyper-digital imperative of COVID-19 has put the spotlight on the telecom and tech sectors

The response of the industry has been swift and largely effective, but the sector will not be immune from longer-term economic impact

Revenue impact

- False positivity abounds in the industry. A wake-up call is imminent.
- Collaboration and other cloud services are growing exponentially.
- But many other IT infrastructure and services projects are stalled.
- IT services hardest hit as projects delayed or cancelled.
- Shift to homeworking sparks demand in collaboration tools. However, there are associated risks with cybersecurity, which are starting to come to light.

Unemployment

- Technology companies are not yet reporting job cuts but hiring programmes have been cut back significantly.
- Expect redundancies to follow.
- Cisco and other leading tech companies are, conversely, proactively stating a no job-cut policy, and advocating that position.
- But many IT services projects are on hold, which will likely impact the industry.
- Less well-funded start-ups are reporting job losses.

Supply chain & demand disruption

- Apple, Samsung and many others have experienced significant supply chain disruption. Expect significant supply chain diversification in the medium-term.
- Enterprise IT saw a rapid and intense demand spike for networking and capacity services, collaboration software and cybersecurity.
- Many IT projects are delayed or cancelled.
- Enterprise digitization plans could be delayed by 2 to 3 years.

Being a force for good

- IT companies—normally keen competitors—are working together with governments by providing AI, compute and other resources.
- Cloud service providers are prioritizing capacity for healthcare, emergency and education requirements.
- Enterprise technology and IT services providers are adjusting pricing and offering free services and more flexible financing terms to help alleviate economic pressure.
- However, the industry's penchant for hype has led to unfounded claims of using unapproved AI to cure COVID-19.

Enterprise Technology & Services COVID-19 value chain impact



The Enterprise IT market will experience a significant slowdown. Many 'disruptive' start-ups will run out of funding. Demand softens in long-term

| | Component Supply Chain | Product Development | Sales & Marketing | Customer Demand | Customer Experience |
|-------------------|--|--|---|---|---|
| Short-term impact | <p>Painful slowdown as demand shrinks. Supply chain disruption affects ability to meet what demand exists.</p> | <p>Digitization projects put on hold or cancelled. Expect significant increase in start-up failures.</p> | <p>Tech industry well-equipped for remote working, but demand will be low.</p> | <p>Short-term demand spikes offset by delivery and engineering issues; IT services will be hardest hit.</p> | <p>Customer service personnel shortfalls significantly affect CX.</p> |
| Mid-term impact | <p>Challenging market for 2020 and into 2021. Supply chain diversification to reduce reliance on China.</p> | <p>Competition between enterprises and IT firms to acquire the IP of failed start-ups.</p> | <p>Modest bounce-back can be expected as projects on hold begin to restart.</p> | <p>Assuming some economic bounce back, on-hold projects should resume.</p> | <p>Customer engagement will return to full service but enhanced by better digital awareness.</p> |
| Long-term impact | <p>Will bounce back when confidence returns. Biosensors up to 10% of sensor market by 2025.</p> | <p>Demand for new products may be tempered. Expect an uplift in cloud demand, robust home working solutions, and automation.</p> | <p>The IT industry may well need to reinvent its go to market strategy. The impetus behind digitization may be reduced.</p> | <p>In industries with many company failures, competitive pressure will lighten, slackening demand for new IT.</p> | <p>Weaker demand for enterprise IT will force the industry to focus on servicing existing clients better.</p> |

Telecom: Consumer Services & Technology COVID-19 impact assessment



The hyper-digital imperative of COVID-19 has put the spotlight on the telecom sector

The response of the industry has been swift and largely effective, but the sector will not be immune from longer-term economic impact

Revenue impact

- Early Q1 2020 results indicate an offset between losses in consumer hardware, mobile service and premium VAS sales, and gains elsewhere.
- Widespread retail channel closures and 5G handset delays have challenged short-term 5G revenue expectations in some markets.
- Telecom infrastructure is moderately impacted.
- Many operators face near-term slowdown due to installation challenges which will dampen CapEx.
- An exponential rise of video streaming and cloud service traffic has created network EBITDA challenges.

Unemployment

- Telecom operators are not yet reporting job cuts or furloughs.
- Similarly, technology companies are not yet reporting job cuts.
- However, in many companies, all new hiring is on hold.
- Less well-funded start-ups are reporting job losses.

Supply chain & demand disruption

- Apple, Samsung and other OEMs have confirmed supply chain disruption.
- This will impact near and mid-term 5G device delivery capability.
- There has been measurable impact on the infrastructure supply chain for some vendors.
- Residential telecom services traffic is at an all-time high, with optimism for positive demand pattern continuation into mid-term.
- Significant change in mobile voice demand patterns: reductions in wide-area usage compensated by increased VoWiFi in the home.

Being a force for good

- The tech sector has been at the forefront of humanitarian efforts.
- Many broadband service providers are waiving late bills and providing affordable connectivity to financially vulnerable homes.
- Telcos indicate willingness to provide anonymized location data to support epidemic infection spread control initiatives.
- Some OTT video suppliers have voluntarily reduced quality to alleviate network traffic congestion.

Telecom: Consumer Services & Technology COVID-19 value chain impact



In many ways the telecom sector is built for the demands of COVID-19

Mid-term and long-term outlooks will depend on how well businesses learn lessons and put them to work to create future opportunities

| | Component Supply Chain | Product Development | Sales & Marketing | Customer Demand | Customer Experience |
|-------------------|--|--|---|--|---|
| Short-term impact | <p>Painful slowdown as consumer market stalls. Biosensors a bright spot.</p> | <p>Digital innovation now more important than ever and can be done remotely.</p> | <p>Consumer retail channel closures and call centre staffing disruption creates significant sales challenges during lockdown.</p> | <p>Short-term demand spikes offset by delivery and engineering issues; demand for 5G service upgrades likely dampened.</p> | <p>Customer service personnel and retail shortfalls offset by existing digital e-care and self-service channels.</p> |
| Mid-term impact | <p>Challenging market for rest of 2020 and into 2021. Multi-sourcing strategies will grow.</p> | <p>Telecom and tech companies need to anticipate a change in consumer requirements. Enhanced security becoming table stakes.</p> | <p>Modest bounce-back can be expected as projects on hold, particularly on 5G, begin to restart.</p> | <p>Assuming some economic bounce back, on-hold projects should resume. Likely continued protective measures will keep network demand high.</p> | <p>Customer engagement will return to normal levels as lockdown restrictions loosen, with gains in digital channel support.</p> |
| Long-term impact | <p>Will bounce back when consumer confidence returns. Biosensors up to 10% of sensor market by 2025.</p> | <p>Broader acceptance of advanced technologies such as AI and analytics will drive product and CX innovation.</p> | <p>The industry and customers will be digitally transformed, including both internal and retail sales.</p> | <p>Many enterprises will embrace at least partial work-at-home as the new normal. Schools/universities likely to adopt more online engagement.</p> | <p>The COVID-19 era will be viewed as a milestone for consumer digital self-service acceptance.</p> |

Wealth management COVID-19 impact assessment



Wealth managers are adapting to remote working while managing clients at a key moment of truth: portfolio losses

Though profits will be down across the board, wealth management will fare better than other banking sectors more exposed to credit risk

Revenue predictions

- Execution-only revenue will increase as clients reposition portfolios out of equities benefiting those with large brokerage operations.
- AUM levels will be down massively leading to a short-term reduction in recurring stable revenue.
- Past experience with the GFC suggests the second half of 2020 will be more challenging than the immediate crisis period.
- Revenue is expected to decline, though no wealth manager should be sent into a loss as commissions and bonuses similarly fall.
- On average, we expect a 15% reduction in revenue over the course of 2020 compared to the strong results of 2019. Much of the red ink in reserving for credit losses seen at retail banks will be avoided.

Unemployment

- Wealth managers and banks are pledging not to reduce headcount, adding to running costs during crisis.
- Hiring of new advisers, the key method for expansion in private wealth will be disrupted, negatively impacting net inflows.
- Retail investors are likely to run down savings as unemployment bites into cash flow.

Supply chain & demand disruption

- Markets, after their initial drops, have proven volatile with wild swings that make timing investments difficult.
- Advisers formerly dependent on face-to-face meetings must adapt to home working and managing concerned clients remotely. TD Ameritrade has launched a series of webinars to help its advisers adapt.
- Adviser efficiency, previously rising, will decline. Training in newly rolled-out digital tools like BNP Paribas Wealth Management's new Client Experience program is key to mitigating this decline.

Sector-specific stimulus programs

- Quantitative easing will boost asset prices long term as per the global financial crisis.
- The flood of 0% or near 0% cash is forcing a rethink of leverage.
- Emergency early withdrawals from pension/superannuation are draining assets from the sector at bad valuations.

Being a force for good

- Sector helping high profile donations, notably Jack Dorsey's \$1bn gift.
- Independent financial advisers and major brands like Raymond James are at the forefront of local fundraising for hospitals and community services.

Wealth management COVID-19 value chain impact



Churn in the portfolio will benefit those earning off of investor buying and selling in the short term

Longer term investors will transition to providers with better digital offerings

| | Brokerages/ custodians | Asset managers | Private banks (HNW segment) | Financial Advisors (retail segment) | Robo-advisors |
|----------------------|---|--|--|---|--|
| Short-term impact | Higher volatility increases trading income though asset values will be down. | AUM/NAV declines will result in revenue hit. | AUM decline will hit revenue as net inflows decline. | AUM decline will hit revenue as net inflows decline. | Net inflows as investors take up low cost options, flat-rate fees unaffected by market losses. |
| Mid-term impact | Depending on the length and severity of the recession, trading volume could drop significantly. | Uncertainty and recession will push clients into low fee earning products. | Global recession will negatively impact wealth creation, on-boarding will be a challenge for remote working. | Financial stress will reduce capacity for saving and investing by target. | Fee-conscious investors will turn to low cost digital options such as robo-advisors. |
| Long-term impact | Financial markets are leading indicators and once recovery takes hold prices will rise. | Rising markets will boost AUM/NAV boosting revenue. | Recovery will see a return to previous volumes. | Recovery will see a return to previous volumes. | Use of digital wealth managers will be extended. |

For any questions or further enquiries please contact us at:
covid@globaldata.com

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