COVID-19: Briefing materials

Global health and crisis response

Updated: April 13, 2020

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COVID-19 is, first and foremost, a global humanitarian challenge.

Thousands of health professionals are heroically battling the virus, putting their own lives at risk. Governments and industry are working together to understand and address the challenge, support victims and their families and communities, and search for treatments and a vaccine.

Companies around the world need to act promptly.

This document is meant to help senior leaders understand the COVID-19 situation and how it may unfold, and take steps to protect their employees, customers, supply chains, and financial results.

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Executive summary

The situation now

At the time of writing, COVID-19 cases have exceeded 1.5 million and are increasing quickly around the world, with concerns that a 15% hospitalization rate could drive hospital system overload.

To reduce growth in cases, governments have moved to stricter social distancing, with “shelter in place” orders in many areas in the U.S., Europe, India, and other countries. This has driven rapid demand declines and fears of recessions, which governments are trying to meet through bailouts and other fiscal measures.

Some Asian countries, e.g. China, have kept incremental cases low, and are restarting economies. So far, there is little evidence of a resurgence in infections, though reinfection from abroad is being reported.

How the situation may evolve

There is a limited window for governments to drive adequate public-health responses and meet demand drawdowns with proportionate economic interventions. Without this, the possibility of a deeper effect on lives and livelihoods is more likely.

Scaled-up testing will soon clarify the extent and distribution of spread in the U.S., and Europe. There continues to be concern about the extent of spread and its consequences in countries with large populations and higher population densities.

Learnings from other countries and recent innovations (strict social distancing rules, drive through testing, off-the-shelf drugs that can address mild cases, telemedicine enabled home care) could provide basis for a restart.

Actions that institutions can take

Having invested in setting up a basic structure to drive basic Resolve and Resilience planning, public and private sector institutions around the world are engaged in continuing protection of people (incl. workforce and customers), stabilizing supply chain (esp. PPE), as well as ensuring adequate cash and liquidity on hand.

In addition to this focus, some governments and companies are also starting to shift focus to what a Return to work may look like.

An effective Return depends on a number of factors – from ensuring that the local region has adequate readiness for a restart from a public health standpoint, to estimating timing for a return of demand, and other factors.

Ensuring that the Nerve Center, has adequate strategic focus in the form of Plan Ahead team, continues to be an important organizing principle for many institutions.
01
COVID-19: The situation now

02
Scenarios and path forward

03
Planning and managing COVID-19 responses

04
Sector-specific impact
The global spread is accelerating with more reports of local transmission

Latest as of April 12, 2020

Impact to date

<table>
<thead>
<tr>
<th>&gt;1.91M</th>
<th>&gt;119,500</th>
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<tbody>
<tr>
<td>Reported confirmed cases</td>
<td>Deaths</td>
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<tr>
<th>&gt;212</th>
<th>&gt;180</th>
<th>70</th>
</tr>
</thead>
<tbody>
<tr>
<td>Countries or territories with reported cases(^1)</td>
<td>Countries or territories with evidence of local transmission(^2)</td>
<td>Countries or territories with more than 1000 reported cases(^1)</td>
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</table>

<table>
<thead>
<tr>
<th>~0.1%</th>
<th>~38%</th>
<th>~46%</th>
<th>3</th>
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<tbody>
<tr>
<td>China share of new reported cases April 7 – April 13</td>
<td>US share of new reported cases April 7 – April 13</td>
<td>Europe share of new reported cases April 7 – April 13</td>
<td>New countries or territories with cases April 7 – April 13</td>
</tr>
</tbody>
</table>

Sources: World Health Organization, John Hopkins University (Observed at 2100 ET), CDC, news reports

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1. Previously counted only countries; now aligned with WHO reports to include territories and dependencies; excluding cruise ship
2. Previously noted as community transmission in McKinsey documents; now aligned with WHO definition

Current as of April 13, 2020
The virus has spread worldwide despite containment efforts

Source: World Health Organization, Johns Hopkins University, McKinsey analysis
The greatest share of cases come from Europe and the U.S.

Cumulative number of cases since March 1\textsuperscript{st} – April 13\textsuperscript{th}
Thousands

Asia
Incremental cases for China and South Korea are now <100 per day with continued focus on disease surveillance and management of imported cases and localized transmission

Europe
The effects of lockdowns policies are beginning to show across multiple countries. While the absolute number of new cases remains high, daily totals have plateaued or are declining in a number of countries

United States
The U.S. consistently has the highest number of new cases in the world, but there is early evidence of plateauing in new infections – each of the first 12 days in April has seen between 25K and 35K new cases

1. U.S. data from Johns Hopkins University CSSE (Observed at 2100ET), all other data from WHO Situation Reports

Sources: WHO situation reports, Johns Hopkins University, press search
Countries begin with similar trajectories but curves diverge based on demographics and measures taken

Cumulative number of cases

- **Europe**: Multiple European countries (including Italy, Spain, Germany) have seen their curves bend downward as the rate of new infections plateaus or declines.

- **South Korea**: Aggressive testing, contact tracing and surveillance, and mandatory quarantines are helping isolate virus clusters and dramatically slow spread of outbreak.

- **United States**: Steepest rate of growth but the curve has bent over the last 10 days.

Sources: WHO situation reports; Johns Hopkins University, press search
Countries with the widest testing tend to have the fewest cases per 1,000 people

Total confirmed COVID cases and conducted tests

3 Archetypes of testing approaches

1. **Countries with limited testing**
   - Low volumes of testing lead to few confirmed positive cases

2. **Countries with moderate testing approach**
   - Some countries test only (or predominantly) those with significant symptoms. Since milder cases are more likely to be missed, the Case Fatality Rate appears higher

3. **Countries with broad testing approach**
   - Countries that have taken broad testing strategies tend to be those that have had success in limiting the number of new cases

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1. Number of deaths / confirmed cases
2. Significantly more testing recently occurred

Sources: WHO situation reports, John Hopkins University, Our World In Data, The Government of the Hong Kong Special Administrative Region, The Singapore Government; Current as of 4/12 (South Korea, Japan, Canada, Austria), 4/11 (Italy, U.S., India, United Kingdom, Vietnam), 4/10 (Thailand), 4/7 (Netherlands, France), 4/6 (Singapore), 4/5 (Germany), 3/31 (Hong Kong)
### State of the Science: Latest evidence on COVID-19

**A**

**How is COVID-19 transmitted, and how long can it persist in different settings?**

We are learning more over time about how long the virus remains in the air and about survival on surfaces. According to one study[^1], droplets can hang in the air for 0.5-3 hours. Durability on surfaces ranges from hours to days, with the virus surviving for longer on harder, less porous surfaces. More work is needed to understand the impact of these findings on transmission.


**B**

**What portion of patients are asymptomatic, and what is the fatality rate?**

WHO and the US CDC estimate that between 20-50% of all infected individuals are asymptomatic. The same sources project a case fatality ratio (CFR) of all infected individuals of 1.4-5.7%.

[^2]: CDC

**C**

**What therapies and vaccines are in development for COVID-19?**

To date, there is no approved specific therapy or vaccine available for COVID-19. There are over 130 therapeutic candidates and 80 vaccine candidates being considered across a range of modalities and use cases. Among therapeutics, some small molecules are repurposed from other indications (e.g., antivirals, antimalarials); some showed efficacy in isolated cases under compassionate use.

[^3]: CDC

**D**

**Do masks help reduce transmission of COVID-19?**

Surgical masks catch both large and small droplets (coughed, sneezed, or exhaled by an infected individual). Several countries have recommended public use of masks to various extents (e.g., fines in Vietnam for not using masks, Japan delivering cloth masks to each household).

[^1]: CDC

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2. CDC

A. Viral viability varies among setting and surfaces, but impact on transmission is unclear

<table>
<thead>
<tr>
<th>Mode of transmission</th>
<th>Viability/ survival duration of virus</th>
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<tbody>
<tr>
<td>Air</td>
<td>Droplets can hang in the air for 0.5-3 hrs as aerosol$^{2,3}$</td>
</tr>
<tr>
<td><strong>Surfaces</strong></td>
<td></td>
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<tr>
<td>Cardboard</td>
<td>Approximately 8hrs on cardboard$^1$</td>
</tr>
<tr>
<td>Paper</td>
<td>4-5 days on paper$^4$</td>
</tr>
<tr>
<td>Glass</td>
<td>Up to 4 days$^4$</td>
</tr>
<tr>
<td>Metals</td>
<td>Up-to 48 hrs on stainless steel$^1$, and for up-to 4 hrs on copper$^2$</td>
</tr>
<tr>
<td>Wood</td>
<td>Up to 4 days$^4$</td>
</tr>
<tr>
<td>Plastic</td>
<td>6-9 days$^4$</td>
</tr>
<tr>
<td>Ceramics</td>
<td>Up to 5 days$^4$</td>
</tr>
<tr>
<td>Stone</td>
<td>2-12 days$^4$</td>
</tr>
<tr>
<td><strong>Polypropylene (incl. packaging, textiles)$^7$</strong></td>
<td>Virus can be found on materials containing polypropylene for ~16hrs$^5$</td>
</tr>
</tbody>
</table>

5. https://www.medrxiv.org/content/10.1101/2020.03.09.20033217v1.full.pdf

Current as of April 13, 2020
B. Estimates of the number of asymptomatic patients, case fatality ratio, and infection window continue to evolve

**Metric** | **Expert estimate range** | **WHO / CDC estimate**
---|---|---
Asymptomatic patients | It has been estimated that between 20-50\(^\circ\) of all infected individuals were asymptomatic | ![WHO estimate: 25\%](25\%) |

Case Fatality ratio | The case fatality ratio (CFR) of all infected individuals is estimated to be between 1.4-5.7\%\(^2\) | ![WHO estimate: 2-3\%, 3.8\%](2-3\%, 3.8\%) |

Infection window (viral shedding) | Viral shedding of infected individuals has been estimated to last between 10-20 days\(^3\) | ![CDC estimate: 12-20 days](12-20 days), [Severe cases: 20](20) |

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1. Bloomberg, IJID Online, ECDC, Eurosurveillance, The Hill
3. CDC, ECDC, The Lancet, JAMA, Medrxiv

Source: Expert interviews and McKinsey Analysis

Document intended to provide insight based on currently available information for consideration and not specific advice

![WHO / CDC estimate](25\%), [2-3\%, 3.8\%](2-3\%, 3.8\%), [12-20 days](12-20 days), [20](20)
C. There are over 80 vaccine candidates and 130 therapeutics candidates in development for COVID-19

<table>
<thead>
<tr>
<th># Candidates</th>
<th>Mechanism</th>
<th>Description</th>
<th>Earliest US target approval date (publicly announced)</th>
</tr>
</thead>
<tbody>
<tr>
<td>~80</td>
<td>RNA/DNA-based</td>
<td>RNA packaged in a vector / direct introduction of plasmid DNA encoding antigen against which immune response is sought</td>
<td>Fall 2020 for select population (e.g. health workers) with emergency approval^6</td>
</tr>
<tr>
<td>~130</td>
<td>Viral vectors / viral-like particles</td>
<td>Chemically weakened virus or molecules that closely resemble viruses</td>
<td>Early 2021 for emergency use authorization^6</td>
</tr>
<tr>
<td></td>
<td>Protein-based</td>
<td>Purified or recombinant antigens from a pathogen</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Small molecules</td>
<td>Largely repurposed compounds, including antivirals, antimalarials, steroids, and more</td>
<td>N/A</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Compound</th>
<th>Initial clinical evidence</th>
<th>Efficacy in isolated use?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remdesivir</td>
<td>N/A</td>
<td>Improvement in compassionate use cases in US and other countries^1</td>
</tr>
<tr>
<td>Hydroxy-chloroquine</td>
<td>Directionally positive result</td>
<td>Improvement in Japanese patient and patients in Australia^2,^3</td>
</tr>
<tr>
<td>Remdesivir</td>
<td>Directionally negative result</td>
<td>Improvement in compassionate use cases in US and other countries^1</td>
</tr>
<tr>
<td>Favipiravir</td>
<td>Directionally positive result</td>
<td>Improvement in Japanese patient and patients in Australia^2,^3</td>
</tr>
<tr>
<td>Kaletra (lopinavir, ritonavir)</td>
<td>Directionally positive result</td>
<td>Improvement in Thai patient and patients in Australia^3</td>
</tr>
</tbody>
</table>

Candidates with early evidence available

Additional detail on following page

Directionally positive result

Directionally negative result

^1 CDC; ^2 Pharma Japan; ^3 The Scientist, Tech Times; ^4 GenEng News 5 Fierce Biotech 6 J&J website 7 Preprint publication 8 Science Direct article 9 International Journal of Antimicrobial Agents (study retracted: https://retractionwatch.com/2020/04/06/hydroxychlorine-covid-19-study-did-not-meet-publishing-society’s-expected-standard/ 10 Mediterrane Infection 11 Zhejiang University Hospital English Abstract 12 Preprint publication 13 NEJM article 14 Engineering journal 15 Preprint publication

McKinsey & Company
D. At scale use of masks can have a role in reducing transmission of COVID-19, as reflected in recent policy changes

**Surgical face masks can prevent transmission of coronaviruses**

There are two main modes of coronavirus transmission...

- Spread through contact and large droplets, such as from a cough or sneeze
- Spread through small droplets diffusing through the air over both short and long distances

...and surgical masks can catch both large and small droplets\(^1\) as it’s coughed, sneezed, or exhaled

**Many governments are facilitating the use of face masks, but with divergent approaches**

- **South Korea\(^2\)**
  - Government banned export of medical masks; mandated 50% of mask production to be directed to centralized governmental supply
  - Government started rationing medical grade masks
  - Government published guidelines on re-using medical grade masks

- **Japan\(^3\)**
  - It is a standard practice in Japan to wear masks in public while healthy
  - Japanese government plans to deliver 2 cloth masks per household

- **United States\(^5\)**
  - CDC initially recommended against general public wearing masks
  - CDC updated its guideline, recommending wearing cloths masks (but is not recommending the use of surgical masks)
  - Some state/local governments implemented compulsory mask wearing (e.g., LA)

- **Vietnam\(^4\)**
  - Banned export of face masks
  - Wearing mask is required in public places
  - Imposed hefty fines for going ‘mask-less’

However, cloth masks may not be effective against airborne aerosols

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1. [https://www.nature.com/articles/s41591-020-0843-2](https://www.nature.com/articles/s41591-020-0843-2)
5. CDC
Countries will decide which measures to implement based on local situations and disease progression

<table>
<thead>
<tr>
<th>New daily cases</th>
<th>Localized clusters</th>
<th>Uncontrolled acceleration</th>
<th>Spread deceleration</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnitude</td>
<td>Majority of cases can be linked to known chains of transmission (i.e., cases can be managed individually)</td>
<td>Majority of cases involve an unknown source of infection and infection rate is accelerating</td>
<td>Number of new cases has peaked, and infection rate is decreasing</td>
<td>Limited number of new cases, and systems in place to control spread of infection (e.g., track and manage cases individually)</td>
</tr>
<tr>
<td>Growth</td>
<td>Handful of new cases per day</td>
<td>Significant number of new cases per day</td>
<td>Decline in the number of new cases over time (with potential day-to-day variation)</td>
<td>Handful of new cases per day, with no significant spikes</td>
</tr>
</tbody>
</table>

**Lead indicators to identify which phase of disease progression is applicable**

<table>
<thead>
<tr>
<th>Likely interventions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detect and trace all cases without losing control of chains of transmission (contain acceleration)</td>
</tr>
<tr>
<td>Apply distancing measures</td>
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<tr>
<td>Expand healthcare capacity</td>
</tr>
<tr>
<td>Build testing capacity</td>
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<tr>
<td>Maintain distancing measures; prepare to release when feasible</td>
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<tr>
<td>Prepare systems for individual case mgmt.</td>
</tr>
<tr>
<td>Detect and trace all cases without losing control of chains of transmission while restarting activity</td>
</tr>
</tbody>
</table>

**Predominant measures**

<table>
<thead>
<tr>
<th>Source: Empirical observation from WHO data of pandemic epidemiologic characteristics of populations in each phase</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Physical distancing / quarantine</td>
</tr>
<tr>
<td>B. Travel restriction</td>
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<tr>
<td>C. Effective use of Personal Protective Equipment</td>
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<tr>
<td>D. Testing and tracing</td>
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<tr>
<td>E. Healthcare capacity surge</td>
</tr>
</tbody>
</table>

| Country: McKinsey & Company | 15 |
Countries with the widest early testing show the fewest cases per 1,000 people

Total confirmed COVID cases and conducted tests

<table>
<thead>
<tr>
<th>Country</th>
<th># Total Cases</th>
<th># Total Tests Conducted</th>
</tr>
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<tbody>
<tr>
<td>US</td>
<td>25%</td>
<td>15%</td>
</tr>
<tr>
<td>Italy²</td>
<td>5%</td>
<td>2.5% Fatality Rate</td>
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<td>Austria</td>
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   Low volumes of testing lead to few confirmed positive cases

2. Countries with moderate testing approach
   Some countries test only (or predominantly) those with significant symptoms. Since milder cases are more likely to be missed, the Case Fatality Rate appears higher

3. Countries with broad testing approach
   Countries that have taken broad testing strategies tend to be those that have had success in limiting the number of new cases

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1. Number of deaths / confirmed cases, metric depends on confirmed cases
2. Significantly more testing recently occurred
3. Confirmed cases are dependent on breadth of testing

Sources: WHO situation reports, Johns Hopkins University, Our World In Data, The Government of the Hong Kong Special Administrative Region, The Singapore Government; Current as of 4/12 (South Korea, Japan, Canada, Austria), 4/11 (Italy, U.S., India, United Kingdom, Vietnam), 4/10 (Thailand), 4/7 (Netherlands, France), 4/6 (Singapore), 4/5 (Germany), 3/31 (Hong Kong)
South Korea quickly built the infrastructure required to conduct wide-scale testing and contact tracing

Daily Incremental cases in South Korea

<table>
<thead>
<tr>
<th>Month</th>
<th>Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>750</td>
</tr>
<tr>
<td>February</td>
<td>1,000</td>
</tr>
<tr>
<td>March</td>
<td>1,200</td>
</tr>
<tr>
<td>April</td>
<td>0</td>
</tr>
</tbody>
</table>

I: Local clusters
- Began daily government communication that created high public awareness of the importance of social distancing
- Shut down schools
- Recommended no mass gatherings, remote-work measures, staggered commuting hours, and avoidance of crowded spaces

II: Uncontrolled acceleration
- Required arrivals from Europe and US to take diagnostic test and self-quarantine for 2 weeks; enforced through check-ins by officials
- Required all overseas arrivals to self-quarantine for 2 weeks

III: Spread deceleration
- Developed effective system for triaging patients and supplemented already strong hospital network with private sector support (e.g., repurposing of corporate facilities)

IV: Prevention of recurrence
- Imposed entry ban on all foreign nationals who had traveled to Wuhan, Hubei China in the past two weeks
- Required arrivals from Europe and US to take diagnostic test and self-quarantine for 2 weeks; enforced through check-ins by officials

A: Physical distancing / quarantine
- Began daily government communication that created high public awareness of the importance of social distancing
- Shut down schools
- Recommended no mass gatherings, remote-work measures, staggered commuting hours, and avoidance of crowded spaces

B: Travel restriction
- Imposed entry ban on all foreign nationals who had traveled to Wuhan, Hubei China in the past two weeks
- Required arrivals from Europe and US to take diagnostic test and self-quarantine for 2 weeks; enforced through check-ins by officials
- Required all overseas arrivals to self-quarantine for 2 weeks

C: Effective Use of PPE
- Distributed ~4.5 million face masks via public organizations and restricted mask exports
- Launched a government-administered mask distribution system (managed distribution and tracking to avoid crowding)
- Requested private mobile apps and web services to include the location and volume of masks left in pharmacies

D: Testing and tracing
- Approved first RT-PCR test kit for emergency use
- Built infrastructure to support rapid contact tracing of confirmed cases and close contacts by KCDC
- Rolled out testing sites across the country, including drive thru and walk-in sites (600 collection centers)
- Began sharing real-time info with the public
- Launched integrated data platform connecting 28 agencies and companies to accelerate contact tracing

E: Healthcare capacity surge
- Developed effective system for triaging patients and supplemented already strong hospital network with private sector support (e.g., repurposing of corporate facilities)

Source: WHO data, Korea CDC, CNN, New York Times
Wuhan, China reopened sectors over a multi-week period only after new cases counts were dramatically reduced

**Daily incremental cases in Hubei, China**

<table>
<thead>
<tr>
<th>January</th>
<th>February</th>
<th>March</th>
<th>April</th>
<th>Easing of restriction</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>II</td>
<td>III</td>
<td>IV</td>
<td></td>
</tr>
<tr>
<td>23</td>
<td>01</td>
<td>01</td>
<td>01</td>
<td></td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1,000</td>
<td>3,000</td>
<td>15,000</td>
<td>6,000</td>
<td>0.12</td>
</tr>
<tr>
<td>2,000</td>
<td>5,000</td>
<td></td>
<td>1,000</td>
<td>0.08</td>
</tr>
<tr>
<td>3,000</td>
<td>7,000</td>
<td></td>
<td>2,000</td>
<td>0.04</td>
</tr>
<tr>
<td>4,000</td>
<td>9,000</td>
<td></td>
<td>3,000</td>
<td>0.02</td>
</tr>
<tr>
<td>5,000</td>
<td>11,000</td>
<td></td>
<td>4,000</td>
<td>0.02</td>
</tr>
<tr>
<td>6,000</td>
<td>13,000</td>
<td></td>
<td>5,000</td>
<td>0.06</td>
</tr>
</tbody>
</table>
Austria has released plans to gradually reopen businesses and ease physical distancing restrictions over the next month

Daily incremental cases in Austria

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feb 26</td>
<td>Open federal gardens, shops &lt;400 sq m, hardware and garden centers</td>
</tr>
<tr>
<td></td>
<td>irrespective of sales area</td>
</tr>
<tr>
<td>Mar 1</td>
<td>Open all schools</td>
</tr>
<tr>
<td>Mar 1</td>
<td>Apr 14: Open federal gardens, shops &lt;400 sq m, hardware and garden</td>
</tr>
<tr>
<td></td>
<td>centers irrespective of sales area</td>
</tr>
<tr>
<td>Apr 14</td>
<td>Expected future openings, if there is no pickup in infections</td>
</tr>
<tr>
<td></td>
<td>End of Apr: May reopen swimming pools, fitness centers, and sports</td>
</tr>
<tr>
<td></td>
<td>facilities</td>
</tr>
<tr>
<td>Mid-May</td>
<td>Open all hotels, restaurants, and schools</td>
</tr>
<tr>
<td>End of June</td>
<td>Allow public events to resume, open cinemas and theaters</td>
</tr>
</tbody>
</table>

Local clusters / uncontrolled acceleration

- Ordered full lockdown, including prohibition of large public events
- Closed all schools

Spread deceleration

- Restricted cross-border travel from neighboring EU countries
- Suspended external air and train traffic, limited public transport
- Isolated multiple regions with high case loads

Prevention of recurrence

- Apr 14: Open federal gardens, shops <400 sq m, hardware and garden centers irrespective of sales area
- Expected future openings, if there is no pickup in infections
- End of Apr: May reopen swimming pools, fitness centers, and sports facilities
- May 1: Open all shops and hairdressers
- Mid-May: Open all hotels, restaurants, and schools
- End of June: Allow public events to resume, open cinemas and theaters

Travel restriction

- End of April: May lift restriction on leaving home (currently allowed for work, groceries, and select other situations)

Effective Use of PPE

- Distributed masks at no cost
- Required covering of nose and mouth in supermarkets + public transit
- Required regular disinfection of open stores

Healthcare capacity surge

- Provided government funding for hospital equipment
- Set up additional capacity for mobile and stationary care
- Deployed additional healthcare staff, including military physicians and former civil servants

Testing and tracing

- Easing of restrictions

Japan limited the number of cases early, but cases have grown significantly in the past several weeks

Daily incremental cases in Japan

<table>
<thead>
<tr>
<th>Month</th>
<th>Events</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>0 cases</td>
</tr>
<tr>
<td>February</td>
<td>0 cases</td>
</tr>
<tr>
<td>March</td>
<td>800 cases</td>
</tr>
<tr>
<td>April</td>
<td>0 cases</td>
</tr>
</tbody>
</table>

Local clusters

A: Physical distancing / quarantine
- Feb 27: Prime Minister ordered closure of schools
- Mar 24: Tokyo Olympics and Paralympics postponed

B: Travel restriction
- Mar 5: Required 2-week quarantine for individuals entering from China and South Korea
- Mar 18: Required 2-week quarantine for individuals entering from 28 countries including EU
- Mar 23: Required 2-week quarantine for individuals entering from US

C: Effective Use of PPE
- Government banned the reselling of face masks online as a result of price gouging; mask wearing is typical in Japan during hay fever season (regardless of COVID)

D: Testing and tracing
- Early Feb: Began coronavirus testing for individuals with symptoms; initiated a specialized team to trace infection clusters

E: Healthcare capacity surge
- Mar 20: Prime Minister’s Office announced that they would continue to focus on infection cluster countermeasures and preparing health care infrastructure to treat the seriously ill

Uncontrolled acceleration

Apr 1: A government panel of experts called for drastic measures, but Prime Minister said declaration of a state of emergency was not needed

Apr 7: Prime Minister declared a month-long state of emergency (not lockdown) for Tokyo and six other prefectures, encouraging residents to stay home

April 11: Prime Minister calls for 70% reduction in workers commuting to offices in Tokyo and the 6 prefectures affected

Apr 2: Announced distribution 2 cloth masks per household

Cities of Niigata and Nagoya began offering drive-thru testing services

Apr 7: Upon declaring state of emergency, Prime Minister committed to ramping up testing capacity to 20K tests/day

Source: WHO Sitrep, Japan Times, Kyodo News, Nippon, Reuters

Current as of April 13, 2020
## Emerging economies face unique challenges across public health measures and have adopted interventions to address them

### Categories

<table>
<thead>
<tr>
<th>A: Physical distancing / quarantine</th>
<th>Challenges</th>
<th>Key lessons from specific regions</th>
</tr>
</thead>
<tbody>
<tr>
<td>High population density and communal living hinders physical dancing</td>
<td><strong>Quarantine early and aggressively</strong></td>
<td></td>
</tr>
<tr>
<td>High percentage of vulnerable population (migrants)</td>
<td><strong>Vietnam.</strong> Proactive and early quarantine measures to isolate and contain COVID-19 infection (2/13 Lockdown of part of Vinh Phuc province, later lifted)</td>
<td></td>
</tr>
<tr>
<td><strong>Colombia.</strong> Rapid national-wide lockdown measures (first in Latin America)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| B: Travel restriction | Lengthened domestic travel restriction can be especially costly for countries dependent on primary and secondary industry |
| Access to goods may be harder in developing countries | **Aggressive border control** |
| **Vietnam.** Suspension of international arrivals including ex-pat Vietnam nationals while providing case-by-case exceptions to key industry stakeholders (e.g., Samsung Electronics) |
| **India.** Suspension of all international commercial passenger flights (3/22) |
| **Colombia.** Aggressive border closure (13 days post first case) |

| C: Effective Use of PPE | Cost of medical-grade PPE is burdensome |
| Communication of PPE importance may be lagging in developing countries | **Raise COVID-19 awareness** |
| Hygienic practices (e.g., washing with clean water) can be difficult especially in rural areas | **Vietnam.** Media running frequent messaging on COVID including PPE usage; Hefty fines for sharing “fake news” about COVID-19 |

| D: Testing and tracing | Large-scale commercial testing is often out of reach in developing countries especially in rural areas |
| Lower digital technology penetration (e.g., smartphones) hinders app-based tracing methods | **Supplement with low-cost/high-volume testing** |
| **Bangladesh.** Approved the production of low-cost antibody detection test kits |
| **Vietnam.** Imported 200,000 lower-cost rapid test kits to complement RT-PCR based tests |

| **Leverage previous pandemic infrastructure** |
| **Nigeria.** Using capabilities built during Ebola crisis (e.g., National Reference Laboratory for molecular testing, Emergency Operations Center) to track and isolate second-hand contacts of infected individual |
| **Colombia.** Using capabilities built during Measles outbreak to conduct initial contact tracings |

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Contents

01
COVID-19: The situation now

02
Scenarios and path forward

03
Planning and managing COVID-19 responses

04
Sector-specific impact
The Imperative of our Time

1

Safeguard our lives
1a. Suppress the virus as fast as possible
1b. Expand treatment and testing capacity
1c. Find “cures”; treatment, drugs, vaccines

2

Safeguard our livelihoods
2a. Support people and businesses affected by lockdowns
2b. Prepare to get back to work safely when the virus abates
2c. Prepare to scale the recovery away from a -8 to -13% trough

“Timeboxing” the Virus and the Economic Shock

Source: McKinsey analysis, in partnership with Oxford Economics
Scenarios for the economic impact of the COVID-19 crisis
GDP impact of COVID-19 spread, public health response, and economic policies

Virus spread and public health response
Effective response, but (regional) virus resurgence
Public health response initially succeeds but measures are not sufficient to prevent viral resurgence so social distancing continues (regionally) for several months

Broad failure of public health interventions
Public health response fails to control the spread of the virus for an extended period of time (e.g., until vaccines are available)

Ineffective interventions
Self-reinforcing recession dynamics kick-in; widespread bankruptcies and credit defaults; potential banking crisis

Partially effective interventions
Policy responses partially offset economic damage; banking crisis is avoided; recovery levels muted

Highly effective interventions
Strong policy responses prevent structural damage; recovery to pre-crisis fundamentals and momentum

COVID-19 U.S. impact could exceed anything since the end of WWII

United States real GDP
% total draw-down from previous peak

Source: Historical Statistics of the United States Vol 3, Bureau of economic analysis; McKinsey team analysis, in partnership with Oxford Economics
Scenario A3: Virus Contained

The virus continues to spread across the Middle East, Europe and the U.S. until mid Q2, when virus seasonality combined with a stronger public health response drives case load reduction.

Epidemiological scenario

China and East Asian countries continue their current recovery and control the virus by early Q2 2020.

Virus in Europe and the United States would be controlled effectively with between two to three months of economic shutdown; new case counts peak by end April and declines by June with stronger public health response and seasonality of virus.

Economic impacts

China will undergo a sharp but brief slowdown and relatively quickly rebound to pre-crisis levels of activity. China’s annual GDP growth for 2020 would end up roughly flat.

In Europe and the U.S., monetary and fiscal policy would mitigate some of the economic damage with some delays in transmission, so that a strong rebound could begin after the virus was contained at the end of Q2 2020.

Most countries are expected to experience sharp GDP declines in Q2, which would be unprecedented in the post WWII era.
## Scenario A3: Virus Contained

**Real GDP growth**
Local currency units indexed, 2019 Q4=100

<table>
<thead>
<tr>
<th></th>
<th>2019 Q4</th>
<th>2020 Q4</th>
<th>2020 Q3</th>
<th>2020 Q2</th>
<th>2020 Q1</th>
<th>2021 Q1</th>
</tr>
</thead>
<tbody>
<tr>
<td>World</td>
<td>100</td>
<td>110</td>
<td>105</td>
<td>110</td>
<td>115</td>
<td>115</td>
</tr>
<tr>
<td>United States</td>
<td>85</td>
<td>85</td>
<td>90</td>
<td>90</td>
<td>95</td>
<td>95</td>
</tr>
<tr>
<td>Eurozone</td>
<td>105</td>
<td>110</td>
<td>115</td>
<td>115</td>
<td>115</td>
<td>115</td>
</tr>
<tr>
<td>China¹</td>
<td>90</td>
<td>95</td>
<td>95</td>
<td>95</td>
<td>95</td>
<td>95</td>
</tr>
</tbody>
</table>

1. Seasonally adjusted by Oxford Economics

Source: McKinsey analysis, in partnership with Oxford Economics

<table>
<thead>
<tr>
<th></th>
<th>Real GDP drop 2019 Q4–2020 Q2</th>
<th>2020 GDP growth % change</th>
<th>Time to return to pre-crisis Quarter</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>-3.3%</td>
<td>-0.4%</td>
<td>2020 Q3</td>
</tr>
<tr>
<td>USA</td>
<td>-8.0%</td>
<td>-2.4%</td>
<td>2020 Q4</td>
</tr>
<tr>
<td>World</td>
<td>-4.9%</td>
<td>-1.5%</td>
<td>2020 Q4</td>
</tr>
<tr>
<td>Eurozone</td>
<td>-9.5%</td>
<td>-4.4%</td>
<td>2021 Q1</td>
</tr>
</tbody>
</table>
Scenario A1: Muted World Recovery

The virus spreads globally without a seasonal decline. Health systems are overwhelmed in many countries, especially the poorest, with large-scale human and economic impact.

**Epidemiological scenario**

China would need to clamp down on regional recurrences of the virus.

The United States and Europe would fail to contain the virus within one quarter and be forced to implement some form of physical distancing and quarantines throughout the summer.

**Economic impacts**

China would recover more slowly and would also be hurt by falling exports to the rest of the world. Its economy could face a potentially unprecedented contraction.

The United States and Europe would face a GDP decline of 35 to 40 percent at an annualized rate in Q2, with major economies in Europe registering similar performance. Economic policy would fail to prevent a huge spike in unemployment and business closures, creating a far slower recovery even after the virus is contained.

Most countries would take more than two years to recover to pre-virus levels of GDP.
**Scenario A1: Muted World Recovery**

**Real GDP growth**
Local currency units indexed, 2019 Q4=100

- **World**
- **United states**
- **Eurozone**
- **China**

<table>
<thead>
<tr>
<th></th>
<th>2019 Q4</th>
<th>2020 Q1</th>
<th>2020 Q2</th>
<th>2020 Q3</th>
<th>2020 Q4</th>
<th>2021 Q1</th>
<th>2021 Q2</th>
</tr>
</thead>
<tbody>
<tr>
<td>World</td>
<td>100</td>
<td>95</td>
<td>90</td>
<td>95</td>
<td>100</td>
<td>105</td>
<td>110</td>
</tr>
<tr>
<td>USA</td>
<td>95</td>
<td>90</td>
<td>85</td>
<td>90</td>
<td>95</td>
<td>100</td>
<td>105</td>
</tr>
<tr>
<td>China</td>
<td>90</td>
<td>85</td>
<td>80</td>
<td>85</td>
<td>90</td>
<td>95</td>
<td>100</td>
</tr>
<tr>
<td>Eurozone</td>
<td>85</td>
<td>80</td>
<td>75</td>
<td>80</td>
<td>85</td>
<td>90</td>
<td>95</td>
</tr>
</tbody>
</table>

1. Seasonally adjusted by Oxford Economics

Source: McKinsey analysis, in partnership with Oxford Economics

---

**Real GDP drop 2019 Q4–2020 Q2**

- **World**: -6.2%
- **United states**: -10.6%
- **Eurozone**: -12.2%
- **China**: -3.9%

**2020 GDP growth**

- **World**: -4.7%
- **United states**: -8.4%
- **Eurozone**: -9.7%
- **China**: -2.7%

**Time to return to pre-crisis Quarter**

- **World**: 2022 Q3
- **United states**: 2023 Q1
- **Eurozone**: 2023 Q3
- **China**: 2021 Q2
What business leaders should look for in coming weeks

There are three questions business leaders are asking, and a small number of indicators that can give clues

**Depth of disruption**

- How deep are the demand reductions?

**Length of disruption**

- How long could the disruption last?

**Shape of recovery**

- What shape could recovery take?

---

### Depth of disruption

- Time to implement social distancing after community transmission confirmed
- Number of cases – absolute (expect surge as testing expands)
- Geographic distribution of cases relative to economic contribution

### Length of disruption

- Rate of change of cases
- Evidence of virus seasonality
- Test count per million people
- % of cases treated at home
- % utilization of hospital beds (overstretched system recovers slower)
- Availability of therapies
- Case fatality ratio vs. other countries

### Shape of recovery

- Effective integration of public health measures with economic activity (e.g. rapid testing as pre-requisite for flying)
- Potential for different disease characteristics over time (e.g. mutation, reinfection)

---

### Epidemiological Indicators

- Bounce-back in economic activity in countries that were exposed early in pandemic
- Early private and public sector actions during the pandemic to ensure economic restart

### Economic Indicators

- Cuts in spending on durable goods (e.g., cars, appliances)
- Extent of behavior shift (e.g., restaurant spend, gym activity)
- Extent of travel reduction (% flight cancellations, travel bans)
- Late payments/credit defaults
- Stock market & volatility indexes
- Purchasing managers index
- Initial claims for unemployment
<table>
<thead>
<tr>
<th>Section</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>COVID-19: The situation now</td>
</tr>
<tr>
<td>02</td>
<td>Scenarios and path forward</td>
</tr>
<tr>
<td>03</td>
<td>Planning and managing COVID-19 responses</td>
</tr>
<tr>
<td>04</td>
<td>Sector-specific impact</td>
</tr>
</tbody>
</table>
Leaders need to think and act across 5 horizons

1. **Resolve**
   Address the immediate challenges that COVID-19 represents to the institution’s workforce, customers, technology, and business partners.

2. **Resilience**
   Address near-term cash management challenges, and broader resiliency issues during virus-related shutdowns and economic knock-on effects.

3. **Return**
   Create a detailed plan to return the business back to scale quickly, as the virus evolves and knock on effects become clearer.

4. **Reimagination**
   Re-imagine the “next normal”—what a discontinuous shift looks like, and implications for how the institution should reinvent.

5. **Reform**
   Be clear about how the regulatory and competitive environment in your industry may shift.

**Nerve center**
Managing across the 5Rs requires a new architecture based on a team-of-teams approach.
3 Return

Create a detailed plan to return the business back to scale quickly
There are 3 distinct actors with different responsibilities in the Return from COVID-19

National governments
- Contain the domestic virus spread
- Fasttrack testing, treatment and vaccine approval and production
- Protect and restart the economy

State / Local governments
- Administer virus treatment
- Enforce protection policies
- Safeguard vulnerable populations

Companies
- Resume sustainable operations
- Protect employees in the workplace

National governments, State and Local governments, and companies each play different roles in achieving a full Return - and stakeholders in different geographies can coordinate to define roles and responsibilities.
National Governments
The extent of the healthcare system’s ability to handle virus transmission is one key indicator for a national government’s readiness for reactivation.

Each region's readiness can be assessed along two dimensions:

- **Virus spread**
  - Low virus spread
  - Medium virus spread
  - High virus spread

- **Public-health system readiness**
  - Low
  - Medium
  - High

### Public-health system readiness

<table>
<thead>
<tr>
<th>Low system readiness and low virus spread</th>
<th>Medium system readiness and low virus spread</th>
<th>High system readiness and low virus spread</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low system readiness and medium virus spread</td>
<td>Medium system readiness and medium virus spread</td>
<td>High system readiness and medium virus spread</td>
</tr>
<tr>
<td>Low system readiness and high virus spread</td>
<td>Medium system readiness and high virus spread</td>
<td>High system readiness and high virus spread</td>
</tr>
</tbody>
</table>

### Virus spread

- New daily infections
- Virus transmission rate (Rt), i.e., the number of people that catch the disease from a single infected person
- New people requiring hospitalization and ICU care daily

### Public-health system readiness

- **Medical capacity**, especially ICUs (e.g., ICU beds, ECMOs)
- Adequate medical resources (e.g., trained doctors, beds, personal protective equipment)
- Ability to rapidly test infections
- Effectiveness in tracking and isolating cases and contacts, including digital tools for real-time sharing of critical data

Source: McKinsey analysis, Press search
Governments could prioritize reopening of sectors based on risks of virus transmission and their economic relevance

An illustration of how countries might prioritize reopening of sectors along two dimensions

**Illustrative Example**

<table>
<thead>
<tr>
<th>Risk of transmission</th>
<th>Economic relevance (varies by country)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>High</td>
<td>High</td>
</tr>
</tbody>
</table>

**Group 1:** Examples of sectors with high economic relevance and low risk of transmission
- Agriculture
- Manufacturing
- Logistics
- Essential goods (e.g., food, medicine)
- Other essential services (e.g., utilities, waste management, public defense)
- Healthcare and services relating to prevention and control of outbreak (e.g., testing)

**Group 2:** Examples of sectors with some economic relevance and low or medium risk of transmission
- Real Estate
- Other professional services (e.g., accounting, marketing)

**Group 3:** Examples of sectors with low economic relevance and high risk of transmission
- Food and accommodation (e.g., hotels, restaurants)
- Educational institutions
- Recreational businesses (e.g., Gyms and fitness centers)

Source: McKinsey analysis, OECD
## China example: Containment measures can be adapted based on assessed readiness for reactivation

Example of stages of reactivation China’s regions went through

<table>
<thead>
<tr>
<th>Stage 1</th>
<th>Stage 2</th>
<th>Stage 3</th>
<th>Stage 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Geography</td>
<td>Hubei</td>
<td>Other provinces</td>
<td>National government</td>
</tr>
<tr>
<td>Readiness to reactivate economy</td>
<td>Readiness to reactivate economy</td>
<td>Readiness to reactivate economy</td>
<td>Readiness to reactivate economy</td>
</tr>
<tr>
<td>Essential sectors</td>
<td>All sectors are allowed to operate and key supply chains operate on market basis</td>
<td>Government begins to prepare the management of key supply chains in partnership with the private sector</td>
<td>Government partially manages essential supply chains</td>
</tr>
<tr>
<td>Non-essential sectors</td>
<td>All sectors are allowed to operate while being cautious of health and safety measures</td>
<td>Most sectors are allowed to operate but must comply with specific physical distancing and health protocols (e.g., in restaurants)</td>
<td>Few sectors are allowed to operate after they have received approval and comply with physical distancing and safety protocols (e.g., manufacturing factories)</td>
</tr>
<tr>
<td>Transport</td>
<td>Hubei</td>
<td>Other provinces</td>
<td>National government</td>
</tr>
<tr>
<td>Lockdown lifted, all transportation resumes in all Hubei cities including Wuhan. Residents who travel have to show “green” health code. People from other provinces can travel in and out of Hubei with green code</td>
<td>All transportation within city, inter-city and inter-province resumes. People who travel have to show “green code”</td>
<td>Intra-city movement restricted</td>
<td>Intra-city movement restricted</td>
</tr>
<tr>
<td>Transport</td>
<td>Hubei</td>
<td>Other provinces</td>
<td>National government</td>
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<td>All transportation within city, inter-city and inter-province resumes. People who travel have to show “green code”</td>
<td>Limited inter-city movements with strict screening at traffic control points</td>
<td>Limited inter-city movements with strict screening at traffic control points</td>
</tr>
<tr>
<td>Assembly</td>
<td>Large events and gatherings that draw crowds are banned (e.g., concerts, tourist events)</td>
<td>Gathering limited to medium-sized groups. Workplace events encouraged to be cancelled or postponed.</td>
<td>Gatherings limited to small groups in private and public places</td>
</tr>
</tbody>
</table>

Source: Press search

McKinsey & Company
China example: Targeted demand and supply interventions can accelerate the recovery of sectors

Examples of interventions used by the Chinese government

**Demand: Restore consumer confidence**
- Boost consumers’ willingness to spend:
  - Rolled out digital coupons via Alipay and WeChat pay to use for dining, shopping and travel for short period of time
  - Reduce import tariffs on consumer goods
- Communicate frequently across multiple channels:
  - Establish centralized reporting and communication channels to keep citizens informed
  - Created an online epidemic control website to publish disease indicators and provide real-time updates
  - Create health QR codes on leading platform Alipay to track mobility, and alert on risks

**Supply: Accelerate business recovery**
- Guarantee transportation logistics and coordinate supply channels:
  - Coordinate local raw material and accessory resources, and promote cross-city collaboration as needed
- Assist enterprises in epidemic prevention:
  - Advised companies to formulate prevention and control measures (employee inspections, facilities, adequate medical supplies)
  - Investigation and research teams sent by central government to inspect work resumption progress
- Promulgate trade emergency measures:
  - Registration fees exempted for specific drugs and medical devices
  - Manufacturers of essential supplies and products will benefit from a one-time tax deduction for equipment purchases
  - Import/export of technology by local companies is to be prioritized and receive special assistance from local departments

**Solve labor shortage and difficulties in work resumption and recruiting:**
- Arranged chartered transport and offered allowances to bring migrant workers from provinces with labour surplus to needed cities
- Subsidise “point-to-point” pickup and drop off of migrant workers
- Offer subsidies for couples returning to work and companies hiring more workers
- Receive money for every new hire by local firm and hiring a minimum of workers from outside provinces

**Alleviate pressure on cash flow and operating costs:**
- Tax declaration extension
- Exemption of social insurance payments and housing provident funds for corporates
- Reduce electricity cost
- Subsidise loans, issue low cost loans, postpone loan repayment, reduce SSC, VAT reduction or exemption, and reduce rent for SMEs
China example: Sectors recover at different rates, with large industrial firms recovering the earliest and SMEs and services taking longer

Industrial enterprises
- 99% of China's major industrial enterprises have resumed production as of March 28
- In Hubei, 95% of major industrial enterprises have resumed operations, and 70% of employees have returned

Automotive
- Returned to 97% operating rate, 82% of employees have returned to work as of March 28

Steel & electronics
- 90% of employees have returned to work as of March 28

Textile, machinery, light industries
- 70-90% of employees have resumed work as of March 28

Construction & infrastructure
- 11,000 key projects outside of Hubei province have resumed, at a rate of 89.1% as of March 23
- Major highway and water transportation work has resumption rate of 97%. Airport and major water projects respectively reported a rate of 87% & 86%

Restaurants
- Estimated 40% of restaurants reopened and only 20% of workers returned as of mid-March

Work resumption rate for large enterprises outside Hubei as of March 28: 99%
Work resumption rate for all government-owned firms as of early March: 92%
Work resumption rate for small and medium enterprises outside Hubei as of March 29: 77%

Source: Press releases
China example: Continued, targeted stimulus can support populations & businesses that struggle during reactivation periods
Examples of economic measures to support the most vulnerable segments in China

Efforts and measures to help unemployed and impoverished people

- Wanning city government in Hainan created 1,327 temporary public welfare posts for epidemic prevention, including disinfecting and guarding for impoverished people
- In addition to offering jobs for low-income families, many places in China arranged shuttle buses, trains and flights to transport impoverished workers from their rural hometowns back to work in big cities
- Local governments sought and dispatched workers, majority of whom were rural migrant workers in poverty, to fill vacancies of enterprises that were facing shortages of labour
- In the city of Huai'an in northern Jiangsu, the local government has announced measures including the introduction of jobs and employment subsidies to encourage migrants to work in their hometown

Financial aid provided to highly impacted SMEs and micro-businesses

- Offer subsidized loans to agricultural firms and SMEs
- Postponement of principal and interest loan repayment for payments from Jan 25 to June 30 2020
- From March 1 to May 31, 2020, small taxpayers in Hubei province will be exempted from VAT if their tax rate is set at 3%. Small taxpayers in other regions will pay rate of 1% on taxable sales revenue if their VAT rate is set at 3%.
- Reduce and postpone social security contributions, reduce contributions for endowment insurance, unemployment insurance and work injury insurance
- Guide banks to issue low cost loans to individual businesses
- Trim electricity charges by 5% for companies not from high energy consuming industries
- Encourage local governments to cut land use tax as incentives for property owners to reduce rent for business tenants

COVID-19 poses a grim market for new graduates

- College graduates in China reaches a record high of 8.74 million while job recruitment has dwindled or been postponed due to the COVID-19 outbreak
- The Ministry of Education has announced measures to ease the pressure, including launching an online campus recruitment service and expanding the enrolment of master's degree students
- To provide more job opportunities, the country will expand recruitment in basic education, primary-level medical care and community services
- Government encouragement of new graduates to work in grass-root institutions in remote areas of the country

Source: Press releases
State / Local governments
Local leaders can combat COVID-19 across six domains

<table>
<thead>
<tr>
<th>Domain</th>
<th>Example objective</th>
<th>Potential metrics</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Foundational Public Health</td>
<td>Mitigate contagion by protecting healthcare workers, scaling testing capabilities, establishing contact tracing, setting effective quarantines, and adopting public use of PPE, and other &quot;low regret&quot; approaches</td>
</tr>
<tr>
<td>II</td>
<td>Societal Compliance</td>
<td>Achieving compliance with public health strategies among people and institutions, using communication, influencers, segmentation, penalties, enforcement, and support</td>
</tr>
<tr>
<td>III</td>
<td>Health System Capacity</td>
<td>Expand health system capacity including staff, supplies, and physical infrastructure likely through coordination, direct support (National Guard), funding, and directives</td>
</tr>
<tr>
<td>IV</td>
<td>Industry Safeguarding</td>
<td>Protecting the public at work, in stores, and at school by erecting safeguards to human interaction, helping businesses secure their operations, and creating safe environments for people to work</td>
</tr>
<tr>
<td>V</td>
<td>Vulnerable Populations</td>
<td>Ensuring public support for individuals who are recently unemployed or homeless, or have chronic physical or mental health conditions that can be exacerbated by the epidemic</td>
</tr>
<tr>
<td>VI</td>
<td>Economic Health</td>
<td>Minimize the economic impact and accelerate recovery by distributing federal stimulus, crafting local programs to supporting business, and incentivizing consumer spending</td>
</tr>
</tbody>
</table>

23 public health interventions identified and assessed across 4 dimensions (epidemic, economic, social and implementation)

<table>
<thead>
<tr>
<th>Categories</th>
<th>Interventions to stop contagion</th>
<th>Evidence of impact on epidemic</th>
<th>Unfavorable economic impact</th>
<th>Unfavorable social impact</th>
<th>Implementation difficulty</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection</td>
<td>Protection of essential health workers-adequate PPE and protocols</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Systematic testing</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>Sign and symptom screens (temperature checks, self-screening)</td>
<td>Medium</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>Contact tracing</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>Time limited quarantine of infected patient</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>Time limited quarantine of those in contact with infected patient</td>
<td>Medium</td>
<td>Low</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>Extended quarantine of high-risk population</td>
<td>Medium</td>
<td>Low</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>Personal behavior</td>
<td>Personal/home hygiene e.g., hand washing, surfaces</td>
<td>Medium</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>Targeted use of masks</td>
<td>Medium</td>
<td>Low</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>Voluntary physical distancing</td>
<td>Medium</td>
<td>Low</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td>Economic activity</td>
<td>Migrate to remote working where possible</td>
<td>Medium</td>
<td>Medium</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>Workplace safeguards (e.g., masks, physical distancing)</td>
<td>Medium</td>
<td>Medium</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>Prohibiting selective activity/sectors (e.g., retail, manufacturing)</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>Full shelter-in-place</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Travel/ movement</td>
<td>Stop large gatherings (e.g., church, sports)</td>
<td>Medium</td>
<td>Low</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Stop small gatherings (e.g., church, sports)</td>
<td>Medium</td>
<td>Low</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Restricting movement in/out of state/city</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td>Mass transportation shutdown</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>Cleaning/protocols of mass transportation</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td>Education</td>
<td>Shift primary education to remote</td>
<td>Medium</td>
<td>High</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>Shift secondary education to remote</td>
<td>Medium</td>
<td>Medium</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>Shift higher education to remote</td>
<td>Medium</td>
<td>Medium</td>
<td>Low</td>
<td>Medium</td>
</tr>
<tr>
<td></td>
<td>Require education safeguards</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
</tr>
</tbody>
</table>

Interventions can be categorized by effectiveness and level of pain, with 5 fundamental interventions identified.

<table>
<thead>
<tr>
<th>Evidence of effectiveness</th>
<th>The Fundamentals</th>
<th>Most painful, highly effective</th>
<th>Close to no-regret</th>
<th>Effective, but painful</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongest evidence of high efficacy</td>
<td>Execute at scale</td>
<td>Drive compliance</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 Protection of essential health workers</td>
<td>14 Full shelter-in-place</td>
<td>6 Time limited quarantine of those in contact with infected patient</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 Systematic testing</td>
<td>17 Restricting movement in/out of state/city</td>
<td>7 Extended quarantine of high-risk population</td>
<td></td>
</tr>
<tr>
<td></td>
<td>4 Contact tracing</td>
<td>18 Mass transportation shutdown</td>
<td>13 Prohibiting selective activity/sectors (e.g., retail, manufacturing)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5 Time limited quarantine of infected patients</td>
<td></td>
<td>16 Stop small gatherings (e.g., church, sports)</td>
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</tr>
<tr>
<td></td>
<td>9 Targeted use of masks</td>
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<td>20 Shift primary education to remote</td>
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</tr>
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<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>22 Shift higher education to remote</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some evidence of effectiveness</td>
<td>Operating through pandemic, maintain readiness</td>
<td>Apply only as needed; mitigate risk/downside</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 Sign and symptom screens (temperature checks, self-screening)</td>
<td></td>
<td>8 Personal/home hygiene</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8 Personal/home hygiene</td>
<td></td>
<td>10 Voluntary physical distancing</td>
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</tr>
<tr>
<td></td>
<td>11 Migrate to remote working where possible</td>
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<td>11 Workplace safe guards</td>
<td></td>
</tr>
<tr>
<td></td>
<td>12 Workplace safe guards</td>
<td></td>
<td>15 Stop large gatherings</td>
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<tr>
<td></td>
<td>19 Cleaning/protocols of mass transportation</td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>23 Require education safeguards</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Level of pain, economically, socially

COVID-19 exacerbates challenges across a variety of universal basic needs (1/2)

Potential COVID-19 related challenges

<table>
<thead>
<tr>
<th>Health-related basic need</th>
<th>Employment</th>
<th>Housing</th>
<th>Food security</th>
<th>Transportation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic downturn threatening small businesses</td>
<td>Spike in unemployment due to businesses closing as a result of physical distancing</td>
<td>Ability to quarantine compromised by living arrangements (e.g., shelters, group homes)</td>
<td>Destabilization of food safety net as a result of illness and physical distancing policies (e.g., school closures, staff shortage at food agencies)</td>
<td>Public transportation systems reducing frequency of routes</td>
</tr>
</tbody>
</table>

COVID-19 exacerbates challenges across a variety of universal basic needs (2/2)

**Potential COVID-19 related challenges**

**Social support**
- Elimination/reduction of in-person social support services and socialization opportunities due to physical distancing

**Education and language/ literacy**
- Lack of educational support for students with special education or language needs during school closures
- Limited access to technology to continue with online learning during shut down
- Rapid flow of information about COVID-19 may not be provided in appropriate languages or channels to meet needs of hard-to-reach populations

**Safety (including racism/discrimination)**
- Increasing discrimination against certain racial/ethnic groups
- Exacerbation of existing racial/ethnic tensions and economic disparities
- Physical distancing/isolation and economic stress may trigger domestic abuse
- Economic stress may increase rate of crime

Measures can be taken across levers to support people and businesses at the local level

<table>
<thead>
<tr>
<th>Lever</th>
<th>Example specific measures</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>People</strong></td>
<td></td>
</tr>
<tr>
<td>Protect current employment</td>
<td>• Support continued employment through targeted wage subsidies</td>
</tr>
<tr>
<td>Enable rapid returns to the workforce</td>
<td>• Reduce barriers to accessing work (e.g., loosen licensing requirements) • Create COVID-19 response job portals to connect the unemployed or underemployed with companies seeing spikes in demand</td>
</tr>
<tr>
<td>Support critical needs</td>
<td>• Ease critical expenses through residential loan forbearance measures or eviction freezes • Identify and communicate to beneficiaries of any stimulus funding measures to ensure appropriate enrollment</td>
</tr>
<tr>
<td>Businesses</td>
<td></td>
</tr>
<tr>
<td>Improve liquidity/cash flow</td>
<td>• Ease financial obligations, e.g., postpone/waive taxes or fees for SMBs or hardest hit sectors, commercial mortgage loan forbearance measures • Accelerate state’s payment of outstanding AP to state vendors • Facilitate process for SBA loans/grants, e.g., portal to support application prep</td>
</tr>
<tr>
<td>Invigorate demand</td>
<td>• Target affected sectors and SMBs with dedicated state purchasing/procurement programs • Shift attention to demand spikes and essential needs</td>
</tr>
<tr>
<td>Re-start/continue operations</td>
<td>• Support shift to remote operations, e.g., expanded WiFi coverage, targeted loans for remote work equipment</td>
</tr>
</tbody>
</table>

## COVID-19 readiness dashboard structure for state/local governments

<table>
<thead>
<tr>
<th>Foundational public health</th>
<th>Societal compliance</th>
<th>Health system capacity</th>
<th>Industry safeguarding</th>
<th>Vulnerable populations</th>
<th>Economic health</th>
<th>Composite index</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Score</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>11</strong></td>
</tr>
<tr>
<td><strong>Domain performance metrics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Mortality</td>
<td>• Compliance by high risk, medium risk, and low risk</td>
<td>• Ventilators</td>
<td>• Ability to consume safely</td>
<td>• Eviction rates</td>
<td>• Unemployment</td>
<td></td>
</tr>
<tr>
<td>• Hospitalized patients, healthcare workers</td>
<td>• Intensive care beds</td>
<td>• Beds</td>
<td>• Portion safeguarded of essential services, non-essential services, schools</td>
<td>• SNAP enrollment</td>
<td>• Bankruptcies</td>
<td></td>
</tr>
<tr>
<td>• Active cases</td>
<td>• Clinical workforce</td>
<td>• Testing rate</td>
<td>• Depression, anxiety RXs</td>
<td>• Suicide rates</td>
<td>• Sales tax</td>
<td></td>
</tr>
<tr>
<td>• Testing rate</td>
<td>• Mask availability</td>
<td>• Mask availability</td>
<td>• Hate crimes</td>
<td>• New business formation</td>
<td>• State programs</td>
<td></td>
</tr>
<tr>
<td>• EVICTION rates</td>
<td>• Social sector</td>
<td>• Economic health</td>
<td>• Solvency</td>
<td>• Federal programs</td>
<td>• State benefits</td>
<td></td>
</tr>
<tr>
<td>• Unemployment</td>
<td>• Federal programs</td>
<td>• Economic health</td>
<td>• Workforce availability</td>
<td>• Federal programs</td>
<td>• State benefits</td>
<td></td>
</tr>
<tr>
<td>• Bankruptcies</td>
<td></td>
<td>• Economic health</td>
<td></td>
<td>• Federal programs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Sales tax</td>
<td>• State programs</td>
<td>• Economic health</td>
<td></td>
<td>• Federal programs</td>
<td></td>
<td></td>
</tr>
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<td>• New business formation</td>
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<td></td>
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<td></td>
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</tr>
<tr>
<td>• Hate crimes</td>
<td>• State programs</td>
<td>• Economic health</td>
<td></td>
<td>• Federal programs</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Epidemiological**
- Starting context
- Rate of new cases
- Immunity

**The science**
- Treatment
- Vaccine

**Domain performance**
- Public health
- Societal compliance
- Health system capacity
- Industry safeguarding

### Domain performance metrics
- **Public health**
  - Mortality
  - Hospitalized patients, healthcare workers
  - Active cases
  - Testing rate
  - Mask availability
- **Societal compliance**
  - Compliance by high risk, medium risk, and low risk
- **Health system capacity**
  - Ventilators
  - Beds
  - Intensive care beds
  - Clinical workforce
- **Industry safeguarding**
  - Ability to consume safely
  - Portion safeguarded of essential services, non-essential services, schools

### Tactics
- **PPE/worker safety**
  - PPE/worker safety
  - Testing
  - Contact testing
  - Quarantines
  - Masks
  - Low-regret tactics
  - Activity restrictions
- **Public outreach**
  - Public outreach
  - Enforcement
  - Support
- **Supplies (vents)**
  - Supplies (vents)
  - Physical space
  - Clinical workforce
  - Direct intervention
- **Essential services**
  - Essential services
  - Non-essential sectors
  - Education
  - Standards
  - Monitoring/compliance
- **Social sector**
  - Social sector
  - Private sector
  - State programs
  - Federal programs
  - Monitoring
- **Federal programs**
  - Federal programs
  - State programs
  - State benefits

Companies
Many uncertainties are causing lack of clarity on return planning for corporations

<table>
<thead>
<tr>
<th>Future of work</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Will COVID-19 driven changes (e.g., in remote work) accelerate other changes (e.g., greater percentage of jobs done through gig-style contracts) that affects current plans on hiring &amp; talent management</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Workforce safety</th>
</tr>
</thead>
<tbody>
<tr>
<td>• What leading indicators could precede a lifting of shelter at home provisions?</td>
</tr>
<tr>
<td>• Will less impacted regions restart sooner than more impacted regions?</td>
</tr>
<tr>
<td>• Will companies be liable if they return employees to work and they fall ill?</td>
</tr>
<tr>
<td>• How much advance warning will federal, local, state governments give before shelter at home provisions are lifted?</td>
</tr>
<tr>
<td>• Will there be restrictions mandated by the government at the time of a restart/return to work?</td>
</tr>
<tr>
<td>• Are there any employee segments that would like current remote work arrangements to continue, and can still be productive?</td>
</tr>
<tr>
<td>• What new norms need to be defined and followed to ensure no spread in our facilities?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Strategic shift to ‘next normal’</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Will COVID-19 driven changes (in the market, consumers, competitive landscape, other) result in fundamental strategic shifts for the company soon after COVID-19, and will that drive the need for a new set of skills that are not currently assumed in the workforce plan?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Financial impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>• What will the extent of demand drawdown be?</td>
</tr>
<tr>
<td>• What are the chances of an economic recession (in spite of bailout packages and other measures)?</td>
</tr>
<tr>
<td>• What implications would a potential downturn have on the business (revenue hit, liquidity issues, other)</td>
</tr>
<tr>
<td>• What do these implications mean for the workforce?</td>
</tr>
<tr>
<td>• Will the bailout package (or post COVID reform measures) include provisions that affect the organization in a fundamental way?</td>
</tr>
</tbody>
</table>
A basic framework for return to work planning

**Who to transition**
- Workforce criticality
- Extent of Remote Work Possible
- Extent of RW advisable long-term

<table>
<thead>
<tr>
<th>Onsite critical</th>
<th>Onsite flexible</th>
<th>Virtual</th>
<th>Other</th>
</tr>
</thead>
</table>

**When to transition**
- Shelter-at-home provisions
- Local Public Health Readiness
- Return of demand locally
- Readiness to travel

<table>
<thead>
<tr>
<th>&lt;1 month</th>
<th>1-3 months</th>
<th>&gt;3 months</th>
</tr>
</thead>
</table>

**How to transition**
- Policies for at-risk vs. general employees
- Communications & outreach
- Pre-return capability building (new norms)
- Facility preparedness
- Post-transition norms & preparedness

<table>
<thead>
<tr>
<th>High Restriction Operations</th>
<th>Partial Restriction Operations</th>
<th>Next Normal Operations</th>
</tr>
</thead>
</table>
Who to transition: Four categories of workforce for the immediate post-shelter-at-home environment

**Maintain remote work, while increasing flexibility**
- Focus on remote support, productivity, connectivity, health
- Shift contracts where needed & possible towards flexible arrangements

**Define plan for staged return based on local context**
- Identify milestones for starting a safe return to work process (e.g., local public health system readiness, government return to work guidelines)
- Develop detailed plan for return to work based on key considerations: virus spread, guidance from public health authorities, workforce readiness to return to work, legal liability

**Return to work with increased work flexibility**
- Define plan for return to work, including staggered shifts and slower ramp-ups
- Re-train to move to more flexible skill sets
- Shift contracts where needed & towards flexible arrangements

**Transparency, reskilling, preserve company’s future**
- Provide transparency into reality of situation facing company
- Re-train or seek opportunities to shift focus
- Other actions to preserve future of company
When to transition

Charting the path toward returning to work and planning for economic recovery

What you have to believe before returning your workforce back to sustainable operations

- Shelter at home provisions are removed
- Local public health situation indicates recovery
- Demand within region is starting to return (in case the region is a market)
When to transition: Leaders must monitor key milestones to chart path toward recovery

Businesses can anticipate return to work and plan for economic recovery by monitoring readiness indicators

Example Return to work readiness milestones

Health system capacity
- >5 ICU beds per 10,000 adults
- >45 hospital (Med/Sur) beds per 10,000 adults

Case progression
- Rate of new cases falls below <8%
- <.02% of the population is currently sick

Testing and Tracing
- Positive tests represent <20% of total tests administered
- Availability of rapid testing
- Contact tracing at scale infrastructure in place
- Progress toward 70% of population immune (via vaccine, recovery, or tested immunity)

Example Economic recovery readiness milestones

Economic stimulus
- Degree of distribution of government stimulus

Social distancing behavior
- Traffic congestion returns to within 30% of 2019

Corporate confidence
- Unemployment rate is going down
- Purchasing Managers Index is over 50

Consumer confidence
- Consumer Confidence Index rises from prior month
- Discretionary credit card increases for two weeks
- Retail foot-traffic returns to within 20% of pre-crisis
When to transition: An effective leading indicator dashboard can help determine timing of recovery

**Indicators of recovery:** Regions do not need to meet desired thresholds of all indicators to be “ready”

<table>
<thead>
<tr>
<th>Prerequisite</th>
<th>Priority region 1</th>
<th>Priority region 2</th>
<th>Priority region 3</th>
<th>Priority region 4</th>
<th>Priority region 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shelter-in-place</td>
<td>• All shelter-in-place orders have been rescinded</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Health system capacity</td>
<td>• &gt;5 ICU beds per 10,000 adults</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Case progression</td>
<td>• Rate of new cases falls below &lt;8%</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Testing and tracing</td>
<td>• Positive tests represent &lt;20% of total tests given</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
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**Indicates recovery**

Shelter-in-place

• All shelter-in-place orders have been rescinded

Health system capacity

• >5 ICU beds per 10,000 adults
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Case progression

• Rate of new cases falls below <8%
• <.02% of the population is currently sick

Testing and tracing

• Positive tests represent <20% of total tests given
• Availability of rapid testing
• Sophistication of contact tracing infrastructure
• Progress toward 70% of population immune (via vaccine, recovery, or tested immunity)

Economic Stimulus

• Degree of distribution of government stimulus

Social distancing

• Traffic congestion returns to within 30% of 2019

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• Retail foot-traffic returns to within 20% of pre-crisis
How to transition: “Return to workplace” should be executed with care

Sample employer interventions

Healthy human interactions
- Ensure employees and customers stay > 6 ft apart
- Sanitize high-contact surfaces
- Separate customers and employees from potentially ill individuals
- Ensure hygienic handling of items that come in contact with the broader population (e.g., materials handling)
- Mandate temperature checks upon entry

Seamless business operations
- Flexible sick leave so workers can stay home when ill
- Support function flexibility (e.g. backup supply chains, contractors)
- Manage absenteeism and enable remote work, rotating days/weeks
- Operate multiple locations without travel
- Structurally limit physical contact between employees (e.g., barriers between workstations)
- Improve building conditions and airflow (e.g., ventilation, no-touch bathrooms)
- Educate on good hygiene habits (e.g., handwashing, sanitizer)
- Routine and targeted deep cleaning (e.g., if an employee tests positive)
- Provide personal protective equipment where needed (e.g., facemasks, gloves)

Safe work environment

Interventions should be assessed and evaluated across key dimensions including:
- Effectiveness of dealing with the pandemic
- Implementation difficulty
- Disruptions to business

1. Any steps on safety should be taken in accordance with CDC / local Department of Health guidelines

Source: CDC, OSHA
China example: Protocols specifically tailored by sector can also help lower transmission (1/2)

Examples of protocols in manufacturing sector in China

**Factory worker safety**
Staggered working shifts, arrival times and lunch breaks; temperature screening and sanitizers; physical distancing seating arrangements; worker space decontamination; required to issue personal protective equipment to all workers; wear masks at all times

**Maximize worker availability**
Cover costs for travel/relocation for dislocated workers returning to work (with 14-day quarantine for those returning from high risk provinces); flexible work hours; proactive assessment of worker health codes (green/yellow/red)

**Inbound supply**
Suppliers, manufacturers, and customers have shared resources proactively, given mutual dependence including PPE (masks, disinfectants), idle transportation asset, and personnel; manufacturers have simplified offerings to high running items, shifting focus to locally supplied SKUs, and key input suppliers are more closely tracked

**Logistics**
Change in operating model, including running multiple drivers per truck asset with staggered timings to fully utilize asset; segregation of drivers, transfer points, and rest/cleaning checkpoints; drivers wearing full protective equipment; ensure distribution center safety measures

**Non-manufacturing function**
Implemented work-from-home accommodations to roles that are able to; flexible work schedules and teleworking; staggered work times to ensure availability of research spaces while maintaining physical distancing

**Large Electronic Manufacturer**
A large electronics manufacturer has introduced frequent temperature testing and plans to give tens of thousands of coronavirus tests to workers along with an equally large number of chest x-rays. Workers with elevated temperature are immediately taken to a hospital, and those around them are closely watched.

**Car manufacturer**
After shutdown was lifted, a car manufacturing facility gradually resumed operations and has now returned to full activities. Among other measures, employees are also prohibited from sharing apartments and provided isolated accommodations instead.

Source: Interviews with plant managers in China on March 21-24, 2020
Singapore example: Protocols specifically tailored by sector can also help lower transmission (2/2)
Examples of protocols in food and restaurants businesses in Singapore

Pre-lockdown, food & restaurants across the country rolled out several health safety measures to prevent contagion

One restaurant moved out around 10% of tables to ensure adequate spacing, ensure 1m spacing between customers by placing 1m stickers at queue line, and collected customer contact details for contact tracing.

One restaurant spaced their touchscreen kiosks 1m apart with staff will disinfect the screens every 15-30 mins. They will have 1m floor markers along with safe distancing signages at various spots in stores. Staff are also required to wear masks and are prohibited from accepting personal cups.

Shopping malls and public venues continue to operate with crowd control and physical distancing measures

Crowd control measures in full force at malls, attractions and public venues, sealing entrances.

Limit capacity and disperse groups of more than 10

Malls limiting capacity of visitors with queue for entrance screening

Public areas implementing at least 1 metre physical distancing with seat markers

physical distancing at public transportation stops

Source: Interviews with plant managers in China on March 21-24, 2020
Approach for effective return to sustainable operations for a corporation

**Goals**
- Define near-term roadmap to restore sustainable workplace operations
- In parallel, re-imagine the long-term workforce to align with new post-COVID strategic objectives

**Approach**
- Define post-COVID workforce impacts in 2020 time frame in different scenarios
- Segment employees into relevant categories
- Define longer-term scenarios, and portfolio of strategic actions over time
- Refresh future of org plan to include post-COVID ‘next normal’ thinking
- Defined detailed plans for each segment
- Define roadmap to connect & align near-term plan to longer-term goals
Managing across the 5Rs requires a new architecture based on a team-of-teams approach.
Many leaders are experiencing a big increase in COVID-19 issues...

- How do I protect my people?
- How do I ensure transparency with customers?
- How do I stabilize my supply chain?
- How do I ensure working capital?
...but there is a tsunami of ever-more-complex issues that lie ahead

**COVID-19 initial issues**
- How do I protect my people?
- How do I ensure transparency with customers?
- How do I stabilize my supply chain?
- How do I ensure working capital?

**Economic recession**
- We are in the middle of the biggest demand drawdown since WW2 – Do we have a plan to survive that puts everything on the table?

**Return to work**
- Will we be in this situation for weeks or months?
- What will return to work really look like, and how can I do it without endangering my people?

**A new normal**
- This kind of sea-change, for this long a time, will mean that the world post COVID-19 could look very different than the world before it
- Do we know the big changes, and what it means?
When facing such a tsunami, companies make four mistakes

**Inadequate Discovery**
Optimism bias, lack of adequate ‘sensing mechanisms’ (e.g., escalation failures), over-reliance on past patterns, risk rationalization

*Industrial manufacturer:* pushed out fix timelines for failed product more than 12 times. Top management optimism bias was called out multiple times by regulators, politicians and other observers

**Constrained Solution Design**
Many crises have a technical core, which needs new solutions to be invented (e.g., BP top hat) or imported anew into the sector/ geography

*Energy company:* Many public failures to fix process safety issue before success. Challenge was that the fix needed new engineering innovation

**Slow or Bad Decision Quality**
Groupthink, political pressures, high-emotion situations; Unfamiliarity – pattern recognition-driven thinking fails; Desire to wait for more facts slows response

*Challenger disaster:* NASA engineers pressured Thiokol to change their ‘no-launch’ recommendation (Thiokol shifted their stance to satisfy their biggest customer) in-spite of a well-understood technical failure on O-rings.

**Inadequate Delivery (Execution failure)**
Chaos during disruptions frequently translates to lack of accountability and direction, ‘operations addiction’ on the part of top management, leading to failures of execution

*Automotive manufacturer:* Was criticized for multiple aspects of recall activity (e.g., unclear terms and conditions, inadequate call center staffing, other challenges)
The central question

How can I increase my organization’s capacity and speed to respond decisively to today’s issues…

…while uncovering the truth about the future, and shoring up defenses to meet it?

Nerve centers are a specific organizational construct, meant for institutions that are facing existential, high-velocity disruptions, that are designed to address this question.
How Nerve Centers achieve this – “team of teams” made of 4 teams

Deliver, Decide, Discover, Design

Team 1 – Deliver
Execution team(s)

Team 2 – Decide
Integrated Operations team

Team 3 – Discover
Scenario Planning team

Team 4 – Design
Strategic Moves team

Present focus

Deliver quickly & flawlessly on priorities provided by “Decide” team

Ensure “Deliver” goals are current & progress is occurring; decide whether to trigger a strategic move

Plan Ahead

Evaluate possible scenarios – near-term to long-term & derive implications; craft one planning scenario for other teams

Craft a portfolio of strategic actions with clear trigger points
Nerve Center needs to evolve from present focus to include plan ahead teams

Present focus
- Employee protection
- Customer management
- Supply chain
- Cash

Future focus – Plan ahead team
- Clear, unbiased scenarios
- Portfolio of strategic actions (across Resilience)
- Detailed plan for Return
- New strategy for the ‘new normal’ - Reimagination & Reform
A plan ahead team can offer quick responses to rapidly changing circumstances using 5 frames

1. Get a realistic view of your starting position
2. Develop scenarios for multiple versions of your future
3. Establish your posture and broad direction of travel
4. Determine actions and strategic moves that are robust across scenarios
5. Set trigger points that drive your organization to act at right time

5 frames of strategic crisis-action plan

Please refer to this link to read the full article

Source: Getting ahead of the next stage of the coronavirus crisis, April 2020
Nerve Center design is based on military command principles

Core concept: Create an organization that can Observe, Orient, Decide and Act faster than the environment

John Boyd’s OODA loop

John Boyd was a Colonel in the U.S. Air Force, whose ideas on the art of war revolutionized U.S. military thinking, especially after the Vietnam War

Boyd's key concept: The OODA loop.

The key to victory is to be able to make appropriate decisions faster than the rate at which the environment evolves
Market capitalization has declined across sectors, with significant variation to the extent of the decline.

Weighted average year-to-date local currency total shareholder returns by industry in percent\(^1\).

Width of bars is starting market cap in $.

---

1. Data set includes global top 3000 companies by market cap in 2019, excluding some subsidiaries, holding companies, companies with very small free float and companies that have delisted since.

Source: Corporate Performance Analytics, S&CF Insights, S&P Global
Even within sectors, there is significant variance between companies

Distribution of year-to-date total shareholder returns by industry percent

Source: Corporate Performance Analytics, S&CF Insights, S&P Global

1. Data set includes global top 3000 companies by market cap in 2019, excluding some subsidiaries, holding companies, companies with very small free float and companies that have delisted since

Current as of April 13, 2020

McKinsey & Company
Preliminary views of some of the hardest hit sectors
Based on the partially effective scenario

<table>
<thead>
<tr>
<th>Industry</th>
<th>Avg. stock price change¹</th>
<th>Industry specific examples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial</td>
<td>-40%</td>
<td>Preexisting industry conditions, challenges with airlines’ balance sheet resilience, and high fixed costs cause near-term cash flow issues and long-term growth uncertainty. It may take years to recover from production and supply chain stoppages, due to critical vendors located in areas impacted by the virus and liquidity challenges especially amongst Tier 3 suppliers. Long order backlogs mitigate some concerns, especially on narrowbody aircraft, though widebody demand could be structurally impacted in the near-term</td>
</tr>
<tr>
<td>Aerospace</td>
<td>-36%</td>
<td>Deep, immediate demand shock 5-6x greater than Sept 11: ~70-80% near-term demand erosion due to int’l travel bans &amp; quarantines now prevalent in 130+ nations N. Hemisphere summer travel peak season deeply impacted since pandemic fears coincide with peak booking period US gov’t is providing both grants and loans to the travel industry as part of a broader package; analysts estimate grants will last major carriers ~2-6 months Recovery pace faster for domestic travel (~2-3 quarters); slower for long-haul and int’l travel (6+ quarters)</td>
</tr>
<tr>
<td>Air &amp; Travel</td>
<td>-34%</td>
<td>Oil price decline driven by both short-term demand impact and supply overhang from OPEC+ decision to increase production Oversupply expected to remain in the market even after demand recovery, and post 2020, unless OPEC+ decides to cut production Erosion of gas demand driven by reduced power and industrial activity, combined with historically high storage levels, puts downward pressure on overall gas price levels. Cash cost gas price economics expected in the next 1-2 years, with potential volatility in the 2023-2024 horizon</td>
</tr>
<tr>
<td>Oil &amp; Gas</td>
<td>-22%</td>
<td>US insurers have been strongly affected, especially reinsurers and life &amp; health insurers Reduced interest rates and investment performance impacting returns – esp. for longer-tail lines Disruptions expected in new business and underwriting processes due to dependence on paper applications and medical underwriting Lock-downs around the world forced insurers to extend grace period for renewing the policies from 15 to 30+ days that will lead to drop in premiums in 2020</td>
</tr>
<tr>
<td>Insurance Carriers</td>
<td>-21%</td>
<td>Existing vulnerabilities (e.g., trade tensions, declining sales) amplified by acute decline in global demand</td>
</tr>
<tr>
<td>Automotive</td>
<td>-21%</td>
<td>Mar. 26 Survey of US auto consumers indicates 70% of car buyers are deferring by ~6 mo. or no longer intending to purchase; ~15% of Chinese light vehicle volume loss in 2020 under current recovery trend, and ~25-30% in EU and US markets Despite ongoing Chinese economic restart, where most Chinese factories open again with production ramping up, there is continued supply chain and production disruption as majority of EU and US OEMs have temporarily closed plants until mid-to-late April</td>
</tr>
</tbody>
</table>

1. In last 30 days for selected sector indices

Source: IHS Market, McKinsey Global Institute, Subject matter experts, press reports, Corporate Performance Analytics, S&CF Insights, S&P Capital IQ
Air & Travel

Current Impact

COVID-19 is an unprecedented crisis
The initial demand shock is worse than 9/11 or the 2008 Financial Crisis

US airline capacity (ASM)
7x bigger drop vs. Fin. Crisis
-19%  -11%

US hotel occupancy
8x bigger drop in occupancy vs. Fin. Crisis
-16%  -7%

Medium-term expectations (through 2020)

70-80% Capacity reductions in April
Flights to and from Europe, Middle East, and Africa were among the hardest hit; Intra-regional flights within the Americas are least impacted to date, but likely to decline further

31%-45% reduction in airline travel demand is estimated in the two most likely scenarios, returning to pre-crisis status quo over a 1-2 year period

A4 - Virus contained; strong growth rebound
A1 - Virus resurgence; slow long-term growth

Airline demand recovery dimensions for scenarios A1 and A4

Travel restrictions
1 month  12 month
A4  A1

Demand ramp up
6 month  36 month
A4  A1

Lasting travel behavior changes
No impact  10% reduction
A4  A1

GDP growth
Deep, lasting recession  Quick rebound to pre-crisis levels
A4  A1

Yield stimulation
None  Extensive
Past crises  A4

Early thoughts on evolution post-COVID

Convergence of remote work technologies, biosecurity issues, and sustainability concerns could structurally shift demand curves downward

Government intervention though a stimulus package, to ensure there is not a liquidity crisis, may have implications for industry structure as increasingly involved interventions may impact strategy and operations (e.g. equity stakes, conditions for support)

Given low oil price expectations for the short-term, operating costs may be reduced but could also impact aircraft leading market

1. For capacity, load factor, and occupancy, YoY change of Sept 2001 | 2. For capacity, YoY change of Feb 2009, for airline load factor and hotel occupancy rate, YoY change of March 2009, for hotel stocks | 3. Based on latest capacity adjustment announced by AA/DL/UA | 4. Based on forecast from United Airlines

Source: USDOT T100, STR (Week of March 15-March 21), press search

Current as of April 13, 2020
Commercial Aerospace

Current Impact

The underlying drivers for commercial aircraft equipment and services is driven by airlines; Airlines have significantly reduced capacity and grounded fleets

1. Narrow body orders declined 21% and wide body orders declined 18% from 2017 – 19. Narrow body cancellations grew 4% and wide body cancellations grew 5% during the same period
2. Boeing reported 18 gross wide body orders in Feb. and 43 737 MAX (narrow body) cancellations. Airbus reported 287 total gross orders and 13 cancellations as of 3/15
3. Assumes 2020 YTD backlog = ’19 backlog – ’20 cancellations YTD (66 cancellations YTD from Boeing and Airbus)
4. 2020 backlog years figures assume 2020 deliveries remain at 2019 levels
5. Calculates backlog years assuming no dip in 2019 and 2020 deliveries (deliveries remain at 2018 levels)
6. Actual backlog is 14.6 years (backlog shown in chart assumes no dip to deliveries in 2019)

Medium-term expectations (through 2020)

19-20YTD commercial aircraft orders, backlog, backlog years & deliveries

<table>
<thead>
<tr>
<th>Year</th>
<th>Net orders¹</th>
<th>Backlog</th>
<th>Deliveries</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>1,858</td>
<td>14,134</td>
<td>1,582</td>
</tr>
<tr>
<td>2019</td>
<td>1,306</td>
<td>14,002</td>
<td>1,188</td>
</tr>
<tr>
<td>2020 YTD²</td>
<td>235</td>
<td>13,946</td>
<td>?</td>
</tr>
</tbody>
</table>

Early thoughts on evolution post-COVID

Intrinsic demand for aircraft likely disappears in 2020

Airline balance sheet concerns will lead to restructuring of order books; cash conservation efforts at airlines constrain capital set aside for delivery payments

Low fuel price expectations for the short-term could extend life of older assets, but not into major heavy maintenance check cycles

Government intervention may mitigate near-term risk of employee furloughs and supply chain insolvencies

Source: Cirium

Current as of April 13, 2020
Short term price dynamics that do not involve an OPEC+ intervention increase the likelihood of having an under-investment scenario play out in the medium-term, resulting in a new price up-cycle following the sharp oversupply, volatility in the market in the 2023-2025 horizon with sporadic tightness, followed by a period of oversupply (given 80+mtpa LNG capacity taking FID in the last 2 years).

Early thoughts on evolution post-COVID

Based on our global COVID-19 scenarios, LNG demand will decline by 3-10% compared with pre-COVID-19 case to 320-350mtpa (compared with 380mtpa supply capacity). Near-term LNG prices will be driven by cash cost economics (with gas prices in Europe and Asia at $1-2/mmbtu premium to US gas prices).

Global oil demand substantially reduced due to restrictions in road transport and capacity declines in airlines across the world through Q3 2020.

Low short-term oil prices are expected to continue for most of 2020 unless we see a large supply cut. Production shut-ins could start to materialize in the short term and help to balance the market. Potential OPEC+ deal could be reached in the next few weeks.

Potential OPEC+ deal could be reached in the next few weeks.

Following the sharp oversupply, volatility in the market in the 2023-2025 horizon with sporadic tightness, followed by a period of oversupply (given 80+mtpa LNG capacity taking FID in the last 2 years).

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Potential OPEC+ deal could be reached in the next few weeks.
Appendix
Leaders need to think and act across 5 horizons

1. Resolve
   Address the immediate challenges that COVID-19 represents to the institution’s workforce, customers, technology, and business partners

2. Resilience
   Address near-term cash management challenges, and broader resiliency issues during virus-related shutdowns and economic knock-on effects

3. Return
   Create a detailed plan to return the business back to scale quickly, as the virus evolves and knock on effects become clearer

4. Reimagination
   Re-imagine the “next normal”—what a discontinuous shift looks like, and implications for how the institution should reinvent

5. Reform
   Be clear about how the regulatory and competitive environment in your industry may shift

Nerve center
Managing across the 5Rs requires a new architecture based on a team-of-teams approach.
1

Resolve

Address the immediate social and mental challenges that COVID-19 represents to the institution’s workforce, customers, and business partners, and take basic steps to protect liquidity.
## Resolve: Making hard decisions on immediate challenges

Resolve employee, customer, supply chain, immediate liquidity, and technology concerns

<table>
<thead>
<tr>
<th>Employees</th>
<th>Customers</th>
<th>Supply chain</th>
</tr>
</thead>
<tbody>
<tr>
<td>How do we manage safety for the returning workforce (e.g. in research labs, production facilities)? How do we offboard in socially responsible ways? Is there potential for employer controlled testing for employees?</td>
<td>How do I stay in touch with customers and remain relevant to them when they don’t desire or need my services? How do I inspire loyalty in my customers?</td>
<td>How do we create transparency across the supply chain and customer demand?</td>
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<tr>
<td><strong>Example actions</strong></td>
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<td><strong>Emerging concerns</strong></td>
<td><strong>Demonstrate flexibility to customers</strong> during times of hardship</td>
<td><strong>Monitor supply disruption risks by mapping supplier and sub-tier connectivity to COVID-19 associated shocks</strong></td>
</tr>
<tr>
<td>Implement physical mechanisms to reduce transmission (e.g., cleaning, staggering shifts)</td>
<td>Major airlines are offering change/cancel flexibility. Most are also allowing passengers to reseat themselves on the plane in accordance with physical distancing</td>
<td>Monitor extending lead times to gauge performance and capacity against supplier promises</td>
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<td>Invest in facility and employee level equipment and supplies (e.g., cleaning)</td>
<td>Going out of their way to keep customers and employees safe regardless of impact to balance sheet</td>
<td>Map inventory end to end across the supply chain to identify current days of inventory and to predict impacts of disruptions</td>
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<tr>
<td>Over-communicate with all employees on current and future plans to keep employees safe</td>
<td>• Major airlines are offering change/cancel flexibility. Most are also allowing passengers to reseat themselves on the plane in accordance with physical distancing</td>
<td>Validate realistic final demand with customers and ensure customers aren’t exhibiting bad behaviors</td>
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<td>Reskill and redeploy instead of offboarding employees where possible</td>
<td>• Hotels in Europe and Asia are providing “quarantine” service (e.g., room reservation with nobody next door)</td>
<td>Predict production capacity, logistics capacity, and availability of supply</td>
</tr>
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<td>Explore creative employment solutions (e.g., loan talent to other orgs, divest business line)</td>
<td>• Grocery stores are limiting purchases of essential items, limiting the number of customers in store, and temporary closing locations for deep cleans, among other safety measures</td>
<td>Establish four control towers to guide demand/capacity/S&amp;OP decisions and manage supply chain risks working with the Corporate Nerve Center</td>
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<td>Leverage and educate employees on applicable government support and benefits programs</td>
<td>Demonstrate commitment to healthcare</td>
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<td>Screen employees, visitors and clients based on temperature checks, travel history and self-reported or visible symptoms</td>
<td>• Coffeehouse chains, car rentals and shoe companies are offering free products and services to healthcare workers</td>
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<td>Offer testing or covering the cost of testing motivated by symptoms, contact tracing, travel history, etc.</td>
<td>• Furniture distribution centers are being repurposed as testing centers for NHS workers</td>
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<td></td>
<td>Other examples of companies being ‘agile’ in attracting customers</td>
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<td></td>
<td>• Rideshare companies are pivoting to delivery</td>
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<td></td>
<td>• Local restaurants and restaurant chains are offering free and contact-free food deliveries</td>
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Employees: Companies should invest and prioritize to protect the safety and morale of employees unable to work from home

Non-WFH employees face a unique set of concerns… However, best-in-class companies are finding new ways to address employee concerns while protecting them from unnecessary risk:

| Perceived unfairness: having to continue going into work while other employees stay home with their families | Major U.S. retailer |
| Safety risk: significant increase in potential exposure to disease (e.g., commute, customers and other employees in the workplace) | Flexible work policies including relaxing absenteeism policy (i.e. allowing workers to stay home for personal reasons) |
| Perceived value: Don’t feel as valued by company and that their safety is not prioritized | Food delivery companies |
| Fear of illness: In addition to clinical harm (e.g., fever, body aches), fear of being isolated from their families if ill | Leading UK retailer |
| | Leading Italian banks |
| | Global coffee shop retailer |

Major U.S. retailer
- Flexible work policies including relaxing absenteeism policy (i.e. allowing workers to stay home for personal reasons)

Food delivery companies
- Minimizing contact between deliverers and customers (e.g., cashless payment only, leaving bags at door, all employees provided masks and gloves)

Leading UK retailer
- Extending benefits to include back-up child and elderly care (up to 25 days) and mental health benefits (e.g., teletherapy sessions)

Leading Italian banks
- Limiting operating hours for all branches with access granted only upon pre-arranged appointment to minimize contact and increase sanitization time

Global coffee shop retailer
- Offering 14 days of “catastrophe pay” for U.S. workers exposed to COVID-19, over 60, pregnant, or have underlying health issues (in addition to existing sick pay)

Source: company websites, press search
Employees: We have observed 4 key levers to maximize engagement & productivity of work from home colleagues

A study China demonstrated a decrease in energy level during the pandemic

**Energy Value**

“What is your energy level from 1-10?” asked to 1,300 employees across 50 companies in China spanning 8 sectors

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<th>Before outbreak (early Jan)</th>
<th>Early crisis (late Jan – late Feb)</th>
<th>Late stage (late Feb – present)</th>
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<td>8.2</td>
<td>7.8</td>
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Respondents to the survey attributed the declining energy value to 3 primary factors

- Blurred boundary between work and life
- Anxiety deepening as the epidemic unfolded
- Telecommuting unsuitable for current work flows

Energy levels started to improve as increasing normalcy was established aided by 4 levers that companies used

**People**

- Provide psychological safety (e.g., delegate decision making powers, role model empathy)
- Communicate practical WFH tips (e.g., family communication, physical and mental need mgmt.)

**Structure**

- Define clear objectives and key results (OKRs) to effectively set and communicate goals and outcomes
- Allow high degree of autonomy in decision making with collaboration across BUs

**Process**

- Establish a clear cadence (e.g., pre-scheduled daily and weekly meetings, frequent check-ins)
- Define clear and integrated workflows, align strategic goals and clarify roles and responsibilities

**Technology**

- Leverage a suite of digital tools / new media to address specific work needs
- Setup an effective ergonomic, digitally enabled remote working environment to ensure productivity

Source: McKinsey GC Org Team
Customers: Set up agile Rapid Revenue Response squads to drive progress during the pandemic for B2B & B2C companies

Phase 1: Reset and calibrate
- Understand which trends and pockets are growing by analyzing customer insights, sentiment, and demand signals
- Diligence all your current commercial activities - from sales to communications to expenses
- Align on value proposition and what truly aligns to the immediate needs of your customers or prospects

Phase 2: Activate key levers
Prioritize B2B and B2C commercial levers to pursue:
- **Sales and channel**: Identify realistic opportunities and high growth channels, build remote selling capabilities, invest in customer outreach and customer service preparedness
- **Pricing/Promo**: reset pricing / discounts to meet customers’ evolving near-term needs
- **Marketing**: Reinvest marketing spend across opportunities and high-traffic channels that will drive highest ROI growth; ensure tone is sensitive, relevant and authentic
- **Product / CX**: Adjust offerings/SKUs to meet customers’ demand signals; establish genuine connection with customer and employee needs
- **Commercial Cost/Cash**: Manage discretionary spend, both working and non-working, re-allocating rapidly

Phase 3: Read and respond
- Evaluate performance of tactics activated, likely re-setting ROI measurement approach
- Continually optimize tactics that work
- Align on next wave of commercial tactics by integrating new customer insights and market demand signals

Source: McKinsey Marketing & Sales Practice
## Customers: Deep-dive on Sales & Channel and Pricing & Promotions for B2B and B2C companies

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<th>B2C</th>
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<td>Identify and prioritize highest ROI sales initiatives</td>
<td>Identify existing high-growth channels (e.g. eCommerce) and explore launching new and innovative channels—especially leveraging the gig economy with new workers are likely entering the workforce daily</td>
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<td>Review customer account coverage based on the customer’s new operating model</td>
<td>Ensure digital shelf and assortment are fully represented</td>
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<td>Empower sales teams to sell remotely with remote trainings, adequate remote working equipment and a realistic view of pipeline opportunities</td>
<td>Empower salesforce for remote and virtual work</td>
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<td>Invest in internal information and update demand tracking and forecasting</td>
<td>Optimize on-site performance and double down on customer service preparedness</td>
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<td>Get creative with customer outreach – pull in leadership, invest in company banners for video backdrops, shift some rewards and recognition to new work-from-home reality</td>
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<td>Understand customers evolving needs</td>
<td>Refresh item segmentation based on new shopping behaviors</td>
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<td>Implement “flex pricing”, value-focused messaging and loyalty rewards. Think about way to meet near-term customer needs, without needlessly destroying long term value (e.g., de-bundle offering, one time discounts)</td>
<td>Cater promotions to the current context with a focus on “if/then” plans, context specific products and services, eCommerce channels, etc.</td>
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<td>Ensure efficient deal execution process. Stand up a “value council” to develop clear guidelines and objectives for the commercial team to follow</td>
<td>Constantly reevaluate promotional effectiveness through the crisis</td>
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<td>Consider loosening return / cancellation policies and offering financing opportunities for larger purchases</td>
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Source: McKinsey Marketing & Sales Practice
Supply chain: Actions to consider in response to COVID-19

Immediate (1-4 weeks)

Understand exposure
- Estimate how demand changes across customers
  - Leverage direct communication channels with direct customer when determining demand signals
  - Use market insights/external databases to estimate demand for customer’s customers
  - Task S&OP team to build 3-6 plans under a range of demand scenarios month to determine required supply
- Determine how supply will be impacted and understand key risks
  - Work with tier 1 suppliers to understand supply chain risks throughout all tiers; complement with outside-in analytics where tier 1s do not have transparency
  - Account for all inventory (e.g., in transit, in warehouses, in spares stock) and calculate inventory buffer
  - Conduct scenario planning to understand how inventory buffer changes in various disease scenarios
  - Run supply chain “stress tests” vs. supplier balance sheets to understand when supply issues will start to stress financial or liquidity issues
  - Assess whether border closures or restrictions will disrupt supply chain

Take action to address anticipated shortages
- Evaluate any option for new supply sources
  - Identify alternative sources if supplies are affected and accelerate exploration of additional options
  - Determine possible geographies and supplier shortlists in case alternate supply is required
  - Identify ways to expedite qualification process and/or insource for components where supply is threatened
  - Contact authorities in areas where customs clearance could become a challenge
  - Determine what portion of supply can be swung to another site if shutdown persists based on sourcing strategy (single, dual, multi)
- Revise production plans as required based on:
  - Expected supply shortages
  - Products in most consumer need, with highest margin, or and highest opportunity cost / penalty production

Understand robustness of current supply chain logistics
- Estimate available logistics capacity; pre-book air freight1 / rail capacity as required by current exposure
- Collaborate with all parties to jointly leverage freight capacity, new/alternate supply sources, etc.
- Other actions
  - Watch for extending lead times to gauge performance and capacity against supplier promises
  - Use after sales stock as bridge to keep production running if needed

Protect employees and suppliers
- Work with supplier to source personal protective equipment for production lines operating in affected markets (e.g., glasses, gloves and masks)
- Engage with crisis communication teams to clearly communicate to employees on infection risk concerns (e.g., disseminate facts about virus from credible source) and work from home options
- Consider short-term stabilization for suppliers (e.g., low-interest loan) to allow for a faster restart

Mid-term (4-12 weeks)

Private sector focus

Continuous improvement
- Improve material supply stability

Private sector focus

Identify alternative options based on anticipated demand
- Evaluate alternative sourcing options for all the materials impacted – availability of suppliers, additional cost due to logistics, tariffs, estimate of price increase of the components
- Enhance the demand verification process to correct inflated demand to mitigate the bullwhip effect

Provide support for smaller suppliers
- Provide continuous support for mid-small size tier 2-3 suppliers in financial troubles
- Assess regional risks for current and backup suppliers

Kick off designing resilient supply chain for the future

- Codify & digitize processes and tools
  - Codify the processes and tools created during the crisis management as formal documentation
  - Digitalize process and tools to integrate demand, supply, and capacity planning

Develop systems to “bullet proof” supply chain
- Convert war room into a reliable supply chain risk management process
- Ensure stakeholders address vulnerabilities across all parts of the supply chain
- Trigger the new supply network design for resilience

Build collaborative relationship w/ ext. partners
- Work with government to ensure industry can ramp up as quickly as possible as crisis resolves
- Actively engage investors and other stakeholders to build transparency on the situation and get help

1. Given costs, airfreight might not be an option for many industries; availability is already limited
Resilience

Address near-term cash management challenges, and broader resiliency issues
6 steps toward end to end resilience plan

01 Identify and prioritize key risks
Identify and prioritize key macro, sector and company idiosyncratic risks based on exposure and impact

02 Develop tailored scenarios
Develop company specific scenarios based on the range of outcomes of the highest priority risks

03 Conduct stress testing of financials
Stress test the P&L, Balance Sheet, Statement of Cash Flows to assess and frame the potential gaps for planning

04 Establish portfolio of interventions
Identify an end to end portfolio of interventions and trigger points

05 Set up a cash management dashboard
Improve cash transparency and implement tighter cash controls to mitigate downside scenarios

06 Build the resilience dashboard
Build the dashboard of key leading indicators to monitor that can be dynamically updated
1&2: Efforts require continuous re-evaluation of financial and market forecasts and corresponding actions

1. Identify key risks

- Understand the impact of key macroeconomic variables (e.g., GDP, unemployment rate) on performance of your of PnL (e.g., revenue and cost)
- Impacted PnL variables could include:
  - Volume: consumer demand correlated with GDP
  - Cost: Commodity price evolution (e.g., oil and gas, food index) correlates with COGS
  - Price: housing prices and inflation correlate with price customers are willing to pay
- Refine a final list of no more than ~20 macroeconomic variables with quantified impact to key PnL items

2. Develop tailored scenarios

- Develop scenario narratives for Baseline and ~2-3 adverse scenarios, with overlay for duration and magnitude of Covid-19 near term shock
- Contextualize scenarios with assumptions on macroeconomic variables (e.g., in worst-case GDP declines 20%)
- For each scenario, link macroeconomic projections back to PnL (e.g., best-case scenario includes 10% drop in demand, 20% drop in price, and 30% drop in COGS)
- Ensure scenarios capture strategic, financial and operational risks with consideration of 2nd order impacts

Source: McKinsey Resilience tribe

Sample output

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Key activities

- Understand the impact of key macroeconomic variables (e.g., GDP, unemployment rate) on performance of your of PnL (e.g., revenue and cost)
- Impacted PnL variables could include:
  - Volume: consumer demand correlated with GDP
  - Cost: Commodity price evolution (e.g., oil and gas, food index) correlates with COGS
  - Price: housing prices and inflation correlate with price customers are willing to pay
- Refine a final list of no more than ~20 macroeconomic variables with quantified impact to key PnL items

Sample output

Key risks identified

<table>
<thead>
<tr>
<th>Key risks identified</th>
<th>Impact</th>
<th>Likelihood</th>
</tr>
</thead>
<tbody>
<tr>
<td>Economic (incl. currency) volatility</td>
<td></td>
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</tr>
<tr>
<td>Inflation/interest rate (incl. discretionary income, GDP growth, unemployment)</td>
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<tr>
<td>Inflation pressures</td>
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<tr>
<td>Oil prices</td>
<td></td>
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<tr>
<td>Commodity prices at key raw materials</td>
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<tr>
<td>Inflation rate and/or significant restrictions on marketing</td>
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<tr>
<td>Failure to shape or participate in critical industry/consumer trends or consolidate existing competitive position</td>
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<tr>
<td>Non-compliance with areas of higher regulatory scrutiny</td>
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<tr>
<td>Failure to manage key sustainability risks</td>
<td></td>
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<tr>
<td>Failure to deliver value from acquisitions</td>
<td></td>
<td></td>
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<tr>
<td>Cyber threats against most important digital assets</td>
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<td></td>
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<tr>
<td>Unstable or hostile political environments</td>
<td></td>
<td></td>
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<tr>
<td>Data privacy breaches harming trust/impediment</td>
<td></td>
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<tr>
<td>Changes in international tax environment</td>
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</tr>
</tbody>
</table>

Develop scenario narratives for Baseline and ~2-3 adverse scenarios, with overlay for duration and magnitude of Covid-19 near term shock

- Contextualize scenarios with assumptions on macroeconomic variables (e.g., in worst-case GDP declines 20%)
- For each scenario, link macroeconomic projections back to PnL (e.g., best-case scenario includes 10% drop in demand, 20% drop in price, and 30% drop in COGS)
- Ensure scenarios capture strategic, financial and operational risks with consideration of 2nd order impacts

Source: McKinsey Resilience tribe
3&4: Efforts require continuous re-evaluation of financial and market forecasts and corresponding actions

3. Conduct stress testing of financials

Key activities

- For each scenario,
  — assess impact on the financial statements (P&L, Balance Sheet and Cash Flows)
  — assess gap relative to Baseline
- Run simulations at Corporate level to assess range of outcomes to assess impact on credit quality, cash and liquidity
- Run 'reverse stress-tests' to determine conditions for credit/liquidity crunch

Sample output

4. Establish portfolio of interventions

- Prioritize critical areas of exposure and areas of lower/risk uncertainty
- Define & size portfolio of potential interventions (across operations, supply chain, capital, targeted M&A and divestitures and customer engagement)
- Launch quick wins on immediate stabilization (supply and demand-side) related to Covid-19
- Identify which are “no regrets” vs. trigger based and get pre-approval for higher risk moves, with clear agreement on conditions for activation

Source: McKinsey Resilience tribe
5: Example cash management dashboard: Prioritization of initiatives related to cash

Not Exhaustive

1. No cash release

Source: McKinsey Transformation
## 6: Example resilience scorecard: Outside-in perspective & select benchmarks

“Inside assessment” would reveal “strengths & weaknesses” in Co 1’s resilience

### DISGUISED EXAMPLE

<table>
<thead>
<tr>
<th>Through cycle interventions: Revenue</th>
<th>Marker of resilience</th>
<th>Metric (outside-in metrics)</th>
<th>Metric performance</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Through cycle interventions: Revenue</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Track record of growth</td>
<td>-10%   5%  10% -5% 5%</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Short-term Sales growth, 2018-2020 CAGR %</td>
<td>-5%   5%  10% 5%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Long-term Sales growth, 2013-2020 CAGR %</td>
<td>25%  10% 30% 15%  20%</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Starting point of cost structure &amp; track record of margin improvement</td>
<td>6%    7%  9% 8%   5%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gross Profit/Sales %, 2020</td>
<td>10%    8%  4% 6%  2%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SG&amp;A/Sales %, 2020</td>
<td>2%    -5% 10% -5%  2%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>R&amp;D/Sales, 2018-2020 avg</td>
<td>10%    -5% 10% 5%  25%</td>
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<tr>
<td></td>
<td></td>
<td>Long-term Adj EBITA margin delta, 2020 vs 2013 %pts</td>
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<td></td>
<td></td>
<td>Long-term TRS, 2013-2020 avg (also revenue contribution indicator)</td>
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<tr>
<td>Through cycle interventions: Costs</td>
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<tr>
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<td></td>
<td>Sharp Digital</td>
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<tr>
<td></td>
<td></td>
<td>[...] N/A outside-in measurement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unlock Balance Sheet</td>
<td>Healthy Balance Sheet with sufficient headroom</td>
<td>(Net debt and pension + OPEB) /market cap, 2020</td>
<td>0.5    0.2 (0.2) (0.5) 0.2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(Net debt and pension + OPEB) /EBITDA, 2020</td>
<td>1.5    0.5 (1.0) (2.0) 0.5</td>
<td></td>
</tr>
<tr>
<td>Band of Leaders</td>
<td>C-suite and Board having diversity of background and relevant experience of leading businesses through a downturn</td>
<td>% of C-suite leaders who have been in C-suite roles during last recession</td>
<td>50%    40% 20% 50% 45%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>% of Board members who have been CEOs of F-1000 companies during major crisis events/ downturns</td>
<td>30%    20% 0% 0% 10%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>% of C-suite leaders who have a different background from the CEO</td>
<td>100%   70% 85% 75% 30%</td>
<td></td>
</tr>
<tr>
<td>Organization Simplification</td>
<td>Lower Org complexity</td>
<td>FTE per Sales (# Employees per $M USD), 2020 (outside-in indicator)</td>
<td>1.0    1.2 1.5 1.5 1.8</td>
<td></td>
</tr>
<tr>
<td>Resilience Nerve Center</td>
<td>Early, disciplined decisions in the past – indicator of a nerve center driven approach</td>
<td>Short-term change in Adj EBITA, 2020 vs. 2018 %pts</td>
<td>0%    -5% 5% -5% 5%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Change in (Net debt and pension + OPEB) /EBITDA, 2020 vs. 2018 %</td>
<td>0%    50% -10% 90% -50%</td>
<td></td>
</tr>
</tbody>
</table>

Source: McKinsey Resiliency Tribe