COVID-19: Briefing materials

Global health and crisis response
Updated: April 3, 2020
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.

Read more on McKinsey.com
Executive summary

The situation now

At the time of writing, COVID-19 cases have exceeded 900,000 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—among the deepest in recent times—that are being met by attempts at bailouts.

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.

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.

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

1. Resolve
   Address the immediate challenges that COVID-19 represents to the workforce, customers and partners

2. Resilience
   Address near-term cash management challenges, and broader resiliency issues

3. Return
   Create a detailed plan to return the business back to scale quickly

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 environment in your industry (regulations, role of government) could evolve

Establishing a Nerve Center can ensure speed without sacrificing decision quality across these five dimensions.
The global spread is accelerating with more reports of local transmission

Latest as of April 3, 2020

Impact to date

<table>
<thead>
<tr>
<th>Cases</th>
<th>Countries or territories with reported cases¹</th>
<th>Countries or territories with evidence of local transmission²</th>
<th>Countries or territories with more than 1000 reported cases¹</th>
<th>New countries or territories with cases March 27–April 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;1 million</td>
<td>&gt;200</td>
<td>&gt;160</td>
<td>49</td>
<td>6</td>
</tr>
<tr>
<td>&gt;52,000</td>
<td>Reported confirmed cases</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;52%</td>
<td>Europe share of new reported cases March 27-April 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt;38%</td>
<td>US share of new reported cases March 27–April 2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>~.2%</td>
<td>China share of new reported cases March 27–April 2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

Sources: World Health Organization, John Hopkins University, CDC, news reports
The virus has spread worldwide despite containment efforts

Europe
- Total cases: >503,000
- Total deaths: >33,600

China
- Total cases: >82,500
- Total deaths: >3,300

Middle East
- Total cases: >58,000
- Total deaths: >3,200

Asia (excl. China)
- Total cases: >30,000
- Total deaths: >600

Africa
- Total cases: >4,500
- Total deaths: >120

South America
- Total cases: >15,000
- Total deaths: >400

North America
- Total cases: >256,000
- Total deaths: ~6,000

Oceania
- Total cases: >5,800
- Total deaths: >20

Source: World Health Organization, Johns Hopkins University, McKinsey analysis

1. Johns Hopkins data used for U.S., all other North America countries reporting from WHO
2. Includes Western Pacific and South-East Asia WHO regions; excludes China; note that South Korea incremental cases are declining; however other countries are increasing
3. Eastern-Mediterranean WHO region
Greatest share of recent cases comes from Europe, although U.S. cases are rapidly accelerating

Cumulative number of cases since March 1 – April 2
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
Cases and deaths continue to increase across the region. Effects of national lockdowns are beginning to show effect in Italy (which recorded relatively flat incremental cases for the past 3-4 days); close monitoring should continue in upcoming days to understand the impact of distancing measures across European states.

United States
Dramatic rise in cases in the past week have led the U.S. to exceed all other countries (including China) in total cases; incremental cases are now above 10,000 per day with highest concentrations in New York, New Jersey and California.

U.S. data from Johns Hopkins University CSSE (observed at 1700PT); 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 measures taken

Cumulative number of cases

Days since 100th case

Select country detail

- **Italy**: After more than two weeks of national lockdown, incremental cases and deaths are flattening, indicating that public health are reducing transmission.

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

- **United States**: Cases and deaths are accelerating rapidly amidst containment responses that vary at state and local levels; U.S. now has the highest number of confirmed cases in the world.

---

1. U.S. data from Johns Hopkins University CSSE; all other data from WHO Situation Reports
Sources: WHO situation reports, Johns Hopkins University, press search
US: Exponential growth in the past two weeks has made the US the newest COVID-19 epicenter

Incremental cases and tests per day

Number of reported cases

- **Feb 29** – Washington is first state to declare a State of Emergency
- **Mar 11** – U.S. begins to suspend travel from European countries, except U.K.
- **Mar 16** – President Trump announced public health measures as part of “15 Days to Slow the Spread” campaign
- **Mar 13** – Drive-through testing in the U.S. begins in New Rochelle, NY
- **Mar 16** – President Trump announced public health measures as part of “15 Days to Slow the Spread” campaign
- **Mar 13** – Drive-through testing in the U.S. begins in New Rochelle, NY
- **Mar 20** – Government bans entry to foreign national who had been in 28 EU countries within the last 14 days
- **Mar 29** – President Trump extends physical distancing measures in the U.S. through April 30
- **Mar 11** – U.S. begins to suspend travel from European countries, except U.K.
- **Mar 16** – President Trump announced public health measures as part of “15 Days to Slow the Spread” campaign
- **Mar 13** – Drive-through testing in the U.S. begins in New Rochelle, NY
- **Mar 20** – Government bans entry to foreign national who had been in 28 EU countries within the last 14 days
- **Mar 29** – President Trump extends physical distancing measures in the U.S. through April 30
- **Feb 29** – Washington is first state to declare a State of Emergency

Source: Johns Hopkins University, COVID Tracking Project, NY Times, press search
Italy: The number of new cases has trended slowly down over the last 10-14 days

Incremental cases and tests per day

Number of reported cases

- **Feb 21** – Cluster of 16 cases identified in northern Italy
- **Feb 23** – Officials lock down 10 towns in Lombardy after spike in cases
- **Feb 26** – Testing criteria are relaxed, allowing contacts of confirmed cases to be tested
- **Mar 6** – Authorities begin testing all 3,300 residents of northern town of Vò (new cases now zero)
- **Mar 8** – Lockdown extended to all of Lombardy and 14 other northern provinces
- **Mar 9** – Italy begins national lockdown; travel banned
- **Mar 20** – Italy testing at rate of ~3500 per million, amongst highest in western Europe

Source: WHO situation reports, CNN, New York Times, press search
South Korea: Rigorous investigation of outbreak clusters and rapidly scaled testing capabilities limited spread

Incremental cases per day and tests performed in South Korea

Number of reported cases

February

- Feb 4 – Government approves first test kit after 16 reported cases
- Feb 9, 16 – ‘Patient-31’ exposes ~1000 congregants in Daegu church
- Feb 24 – 15 countries impose travel restrictions on South Korea

March

- Mar 3 – Korea pioneers drive-through testing inspired by fast food chains
- Mar 9 – ~180,000 individuals tested
- Mar 20 – Localized outbreaks, including another infected church congregation, point to ongoing need for surveillance and response

China: Rapid lockdowns were employed to manage outbreak before ramping up testing and response capabilities

Incremental cases per day and total reported cases in China

Number of reported cases per day

Jan 23 – City of Wuhan is locked down and travel from nearby cities is restricted
Feb 7 – All students asked not to return to school following Chinese New Year
Feb 21 – Government eases traffic restrictions, encourages work to resume in less-affected areas
Mar 1 – 28 provinces (more than 4/5ths of total) have resumed normal inter-provincial passenger transport
Feb 3 – Hong Kong closes all but 3 of 14 border control points
Feb 19 – China begins to sustain daily new case reports below 2,000
Feb 24 – 320,000 tests conducted to date in Guangdong
Mar 10 – Closure of last of 16 temporary hospitals
Jan 24 – All tourist activity in Hubei canceled

1. Changes in new case tracking and reporting methodology yield spike in reported cases

Source: WHO situation reports, New York Times, Chinese government official notices and reports, press search
Key considerations for disease progression

A  Growing evidence on the extent and role of asymptomatic cases and transmission
Although the range is large for estimated share of total cases (~20-50% for percentage of cases that are asymptomatic and ~10-60% for percentage of transmission due to asymptomatic cases)
There is significantly higher prevalence than confirmed cases, that could require continued strict social distancing for a while

B  Seasonality is unlikely to be a major contributor to stopping the spread of COVID-19
Prevailing outlook is that while COVID is likely to transmit more effectively in winter than summer, seasonality alone will not be enough to curtail transmission, requiring ongoing public health intervention even as weather gets better

C  Promising testing innovations may greatly expand disease surveillance capabilities
At home sampling and point-of-care diagnostics can improve convenience and reduce processing times. Additionally, new antibody diagnostics under development may facilitate testing for prior exposure, which may allow significant segments of the population with immunity to resume activity

D  Economic restarts in Asia reflect possibility to restart limiting local transmission however need for renewed travel restrictions
experience from Hong Kong, Singapore and Taiwan has shown spike in cases following return to in-person employment and relaxation of travel restrictions. While most cases are categorized as imported, Hong Kong especially has also seen renewed growth in local transmission. In response all three economies have reinstituted restrictions on travel and in-person gatherings.
## A: Emerging evidence indicates that asymptomatic cases could be drivers of transmission

### Officials agree asymptomatic / pre-symptomatic cases are quite common

*"The risk of catching COVID-19 from someone with no symptoms at all is very low. However, many people with COVID-19 experience only mild symptoms. This is particularly true at the early stages of the disease. It is therefore possible to catch COVID-19 from someone who has, for example, just a mild cough and does not feel ill."

*"One of the pieces of information that we have pretty much confirmed now is that a significant number of individuals that are infected actually remain asymptomatic. That may be as many as 25%. That's important, because now you have individuals that may not have any symptoms that can contribute to transmission, and we have learned that in fact they do contribute to transmission."

### Emerging evidence suggests that 20-50% of cases are asymptomatic / pre-symptomatic...

| March 15: Announcement by the Iceland government based on 425 confirmed cases | ~50 | ~50 |
| March 12: EU CDC report based on ~13,000 lab confirmed cases in Italy | 44 | 56 |
| March 16: announcement by the South Korea CDC based on ~8,200 reported cases | ~20 | ~80 |
| Study of 643 infected cases on Diamond Princess cruise ship published March 12 in Eurosurveillance journal | 18 | 82 |

### And that asymptomatic / pre-symptomatic transmission may account for 10-60% of cases

| Study based on 135 cases in Tianjin, China published March 8 on medRxiv (preprint server for health science) | 62 | 38 |
| Study based on 91 cases in Singapore published March 8 on medRxiv (preprint server for health science) | 48 | 52 |
| Study of 468 reported cases in China published March 19 via early release in Emerging Infectious Diseases journal | 43 | 87 |

---

**Public health response needs to account for possible widespread transmission asymptomatic individuals**

- Countries / territories with limited confirmed cases and testing could still have significant transmission prevalent
- Resurgence could be driven by asymptomatic transmissions
- Could require continued strict social distancing for a while

**Antibody blood tests are currently the best method for detecting asymptomatic cases**

B: Seasonality is unlikely to be a major contributor to stopping the spread of COVID-19

Some early evidence indicates negative association between temperature/humidity and COVID-19 transmission...

- High temperature and high relative humidity show association with reduced transmission of COVID-19 in regressions in China data1
- Majority of COVID-19 cases fall within temperate climates (95% of cases falling between 2.0-9.5 degrees Celsius)2

...However, climate and seasonality alone are broadly not expected to stop or significantly slow transmission

- Applying observed association between temperature/humidity and transmission rates, North American and European countries would see little impact of climate on transmission until late June3
- Historical pandemic influenza analogues do not exhibit same patterns as seasonal flu in terms of waning during summer months4

For the novel coronavirus SARS-CoV-2, we have reason to expect…it may transmit somewhat more efficiently in winter than summer, though we don’t know the mechanism(s) responsible. The size of the change is expected to be modest, and not enough to stop transmission on its own”

Marc Lipsitch, PhD, Harvard School of Public Health

2. Miguel B. Araújo and Babak Naimi 2020
3. Qasim Bukhari and Yusuf Jameel 2020
4. Marc Lipsitch 2020

Ongoing public health measures and private sector response leaders should not rely on seasonal changes to provide immediate or significant relief

Ongoing disease containment and surveillance will continue to be critical in the near term until validation of reduced transmission
C: Two major test-types detect either active or past infections

<table>
<thead>
<tr>
<th>Types</th>
<th>Technology</th>
<th>Details</th>
<th>Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Molecular</td>
<td>RT-PCR</td>
<td>Reverse transcription polymerase chain reaction</td>
<td>Steps of amplifying and detection of viral genome identifies presence of virus; Predominant testing method globally and most accurate; Lab based tests typically takes ~3 days for results; Near point of care takes &lt;1 hour for results</td>
</tr>
<tr>
<td></td>
<td>Isothermal amplification</td>
<td>Rapid diagnostics with a single step identification of virus; Typically near point of care (e.g., hospitals, clinics) taking &lt;20min</td>
<td>Recently approved tests</td>
</tr>
<tr>
<td></td>
<td>CRISPR</td>
<td>CRISPR protein used after isothermal amplification to detect viral RNA presence</td>
<td>Experimental / proof of concept</td>
</tr>
<tr>
<td>Immunological / serologic tests</td>
<td>Lateral flow tests</td>
<td>Detects presence of antibodies and antigens based on binding to enzymes; Negative test results don't imply lack of infection but just antibodies below detection limit; test most effective 8-10 days since infection started; Lateral flow tests are shorter, point of care, self administered (like a pregnancy test), Typically &lt;15 min; CLIA / ELISA tests are primarily lab based / near point of care; typically takes &lt;1 hour for results</td>
<td>Starting to become available in Europe, only one in EUA in the US; Over 30 tests under consideration</td>
</tr>
<tr>
<td></td>
<td>CLIA: Chemiluminescence Immuno Assay</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>ELISA: Enzyme linked immune sorbert assay</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


Improved speed and scale of live case confirmation will be critical to facilitating test and trace strategies for lower burden settings or for countries that have successfully contained initial outbreaks and are moving towards economic restart.

Antibody tests with scaled distribution can enable recovered populations to resume normal activity.
D: Asian jurisdictions have restarted economy, containing local transmission, though travel related transmissions persist

Some Asian jurisdictions have been able to restart their economies with limited local transmission.

Imported cases reflect a high fraction of the total, which may drive longer imposition of travel restrictions relative to other public health measures.
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

Current as of April 3, 2020
### Scenarios for the economic impact of the COVID-19 crisis

**GDP impact of COVID-19 spread, public health response, and economic policies**

<table>
<thead>
<tr>
<th>Virus spread and public health response</th>
<th>Rapid and effective control of virus spread</th>
<th>Effective response, but (regional) virus resurgence</th>
<th>Broad failure of public health interventions</th>
<th>Ineffective interventions</th>
<th>Partially effective interventions</th>
<th>Highly effective interventions</th>
<th>Knock-on effects and economic policy response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Effectiveness of the public health response in controlling the spread and human impact of COVID-19</td>
<td>Strong public health response succeeds in controlling spread in each country within 2-3 months</td>
<td>Public health response initially succeeds but measures are not sufficient to prevent viral resurgence so social distancing continues (regionally) for several months</td>
<td>Public health response fails to control the spread of the virus for an extended period of time (e.g., until vaccines are available)</td>
<td>Self-reinforcing recession dynamics kick-in; widespread bankruptcies and credit defaults; potential banking crisis</td>
<td>Policy responses partially offset economic damage; banking crisis is avoided; recovery levels muted</td>
<td>Strong policy responses prevent structural damage; recovery to pre-crisis fundamentals and momentum</td>
<td>Speed and strength of recovery depends on whether policy moves can mitigate self-reinforcing recessionary dynamics (e.g., corporate defaults, credit crunch)</td>
</tr>
<tr>
<td>Scenarios</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B1</td>
<td>Virus contained, but sector damage; lower long-term trend growth</td>
<td>A3</td>
<td>Virus contained, slow recovery</td>
<td>A4</td>
<td>Virus contained; strong growth rebound</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B2</td>
<td>Virus resurgence; slow long-term growth</td>
<td>A1</td>
<td>Virus resurgence; slow long-term growth</td>
<td>A2</td>
<td>Virus resurgence; return to trend growth</td>
<td>Muted World Recovery</td>
<td></td>
</tr>
<tr>
<td>B3</td>
<td>Pandemic escalation; prolonged downturn without economic recovery</td>
<td>B4</td>
<td>Pandemic escalation; slow progression towards economic recovery</td>
<td>B5</td>
<td>Pandemic escalation; delayed but full economic recovery</td>
<td>Strong World Rebound</td>
<td></td>
</tr>
</tbody>
</table>

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

Current as of April 3, 2020
Scenario A3: Virus Contained

The virus continues to spread across the Middle East, Europe and the US 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 US, 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—COVID-19 crisis
Local currency units indexed, 2019 Q4=100

<table>
<thead>
<tr>
<th>Quarter</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>
<th>2021 Q3</th>
<th>2021 Q4</th>
</tr>
</thead>
</table>
| Source: McKinsey analysis, in partnership with Oxford Economics

1. Seasonally adjusted by Oxford Economics

<table>
<thead>
<tr>
<th>Region</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>-3.5%</td>
<td>-0.5%</td>
<td>2020 Q4</td>
</tr>
<tr>
<td>USA</td>
<td>-8.0%</td>
<td>-2.4%</td>
<td>2020 Q4</td>
</tr>
<tr>
<td>World</td>
<td>-5.3%</td>
<td>-1.8%</td>
<td>2021 Q1</td>
</tr>
<tr>
<td>Eurozone</td>
<td>-10.1%</td>
<td>-4.7%</td>
<td>2021 Q2</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.

(Economic impacts continued on the next page...)

Current as of April 3, 2020
Scenario A1: Muted World Recovery

Real GDP growth—COVID-19 crisis
Local currency units indexed, 2019 Q4=100

1. Seasonally adjusted by Oxford Economics

Source: McKinsey analysis, in partnership with Oxford Economics
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?

- 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**
How long could the disruption last?

- 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**
What shape could recovery take?

- 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
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. Width of bars is starting market cap in $.

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 2, 2020
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 2, 2020
### 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>-46%</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>-44%</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. 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>-42%</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.</td>
</tr>
<tr>
<td>Oil &amp; Gas</td>
<td>-29%</td>
<td>Existing vulnerabilities (e.g., trade tensions, declining sales) amplified by acute decline in global demand. Mar. 26 Survey of US auto consumers indicates 70% of car buyers are deferring by ~6 mo. or no longer intending to purchase; &gt;2M units lost in China by Feb. Despite ongoing Chinese economic restart, there is continued supply chain and production disruption as majority of EU and US OEMs have temporarily closed plants and Hubel manufacturing remains at ~50% capacity.</td>
</tr>
<tr>
<td>Automotive</td>
<td>-29%</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.</td>
</tr>
<tr>
<td>Insurance</td>
<td>-29%</td>
<td></td>
</tr>
<tr>
<td>Carriers</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Current Impact

The underlying drivers for commercial aircraft equipment and services are 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.
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)

<table>
<thead>
<tr>
<th>Net orders¹</th>
<th># aircraft</th>
<th>2018</th>
<th>19</th>
<th>2020 YTD²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross orders</td>
<td>3,000</td>
<td>1,858</td>
<td>1,306</td>
<td>235</td>
</tr>
<tr>
<td>Cancelled orders</td>
<td>-1,000</td>
<td>0</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Gross orders</td>
<td>2,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cancelled orders</td>
<td>1,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gross orders</td>
<td>1,000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cancelled orders</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Backlog</th>
<th># aircraft</th>
<th>2018</th>
<th>19</th>
<th>2020 YTD³, ⁴, ⁵</th>
</tr>
</thead>
<tbody>
<tr>
<td>~10 year backlog⁶</td>
<td>2018</td>
<td>14,134</td>
<td>14,002</td>
<td>13,946</td>
</tr>
<tr>
<td></td>
<td>2019</td>
<td>14,002</td>
<td>13,946</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2020</td>
<td>13,946</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Deliveries</th>
<th># aircraft</th>
<th>2018</th>
<th>19</th>
<th>2020(F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>737 Max impacted deliveries</td>
<td>2,000</td>
<td>1,582</td>
<td>1,188</td>
<td>?</td>
</tr>
</tbody>
</table>

### Early thoughts on evolution post-COVID

Intrinsic demand for aircraft likely disappears in 2020.

1. **Airline balance sheet concerns will lead to restructuring of order books; cash conservation efforts at airlines constrain capital set aside for delivery payments.**
2. **Low fuel price expectations for the short-term could extend life of older assets, but not into major heavy maintenance check cycles.**
3. **Government intervention may mitigate near-term risk of employee furloughs and supply chain insolvencies.**

---

¹ Net orders: Gross orders – Cancelled orders
² 2020 YTD: Year-to-date 2020
³ Backlog years: Years of deliveries remaining
⁴ 2020 YTD: Assumes no dip to deliveries in 2019
⁵ 2020 YTD: Assumes no dip to deliveries in 2019 and 2020 deliveries remain at 2018 levels
⁶ ~10 year backlog: Backlog years assuming no dip in 2019 and 2020 deliveries

Source: Cirium
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%  -30-70%

US hotel occupancy
8x bigger drop in occupancy vs. Fin. Crisis
-16%  -7%  -56%

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
The two most likely scenarios for airline travel demand estimate a 31%-45% reduction, and return to pre-crisis status quo over 1-2 year periods:
A4 (virus contained, strong growth rebound)
A1 (virus resurgence, slow long-term growth)

Airline demand recovery dimensions for scenarios A1 and A4

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

Early thoughts on evolution post-COVID
Demand may not recover where it used to be vs. prior crises – as consumer confidence may be shaken and employers adjust work-from-home policies to support greater reliance on remote technologies
Government intervention though a stimulus package of either grants, loans or tax relief can supplement company cash flow to ensure there is not a liquidity crisis
Given low oil price expectations for the short-term, operating costs may be reduced but could also impact aircraft leading market

Now, YoY change Mar 2019 vs. 2020

Current as of April 3, 2020

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

Current Impact

LNG
COVID-19 has affected regions that account for over 80% of global LNG demand; Chinese LNG imports (17% of global imports) fell by 7% year on year from January to March 2020, triggering Force Majeure clauses on contracts.

Oil
Demand decline due to COVID-19 (5.4-11.4mbd for 2020 under A3 & A1 scenarios) and OPEC+ deal failure pushed oil prices under $30/bbl. Short term demand destruction (potential to be 20mbd for April) could lead to storage constraints and regional prices to fall even sharper, while US drilling activity has already been cut (44 fewer rigs running, -8% in the last week).

Chinese LNG imports Jan 1st to Mar. 15th

<table>
<thead>
<tr>
<th>Year</th>
<th>Mt</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>2017</td>
<td>6.1</td>
<td></td>
</tr>
<tr>
<td>2018</td>
<td>10.5</td>
<td>72%</td>
</tr>
<tr>
<td>2019</td>
<td>13.1</td>
<td>25%</td>
</tr>
<tr>
<td>2020</td>
<td>12.2</td>
<td>-7%</td>
</tr>
</tbody>
</table>

Medium-term expectations (through 2020)

Based on our global COVID-19 scenarios, LNG demand could be reduced.

Global oil demand substantially reduced due to restrictions in road transport (e.g. in China, multiple European countries, and USA) and capacity declines in airlines across the world through Q2 and 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.

Early thoughts on evolution post-COVID

LNG suppliers will likely face prolonged shutdowns and cargo cancelations as the market tries to balance.

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.
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>Supply chain</th>
<th>Customers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Are my policies working (e.g., safety, productivity)? How well? How do I adapt to new developments (e.g., longer closures of business)?</td>
<td>How do I revise demand planning based on the evolving outbreak?</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>
</tr>
</tbody>
</table>

### Emerging concerns
- **Continuous re-evaluation of financial models:** stress-testing financial forecasts based on latest developments (e.g., longer than 2 week closures) and adjusting policies accordingly
- **Monitoring productivity:** Comprehensive set of KPIs being tracked via dashboards (e.g., focus on productivity vs. utilization)
- **Tracking incidence:** Clear reporting mechanism for suspected / confirmed covid-19 infections and database that tracks cases
- **Redeploying “idle” talent against areas of the business experiencing demand surges:** Making short term adjustments to workforce deployment to maximize productivity and minimize service disruption
- **Partnering with other companies to redeploy “idle” talent externally** for the good of the broader community

### Example actions
- **Conduct scenario planning** to understand how inventory buffer changes in various disease scenarios
- **Task S&OP team to build 3-6 plans under a range of demand scenarios month to determine required supply**
- **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**
- **Run supply chain “stress tests” vs. supplier balance sheets** to understand when supply issues will start to stress financial or liquidity issues

### Private sector focus

#### Demonstrate flexibility to customers during times of hardship
- **Airlines:** Major airlines are offering change/cancel flexibility. Most are also allowing passengers to reseat themselves on the plane in accordance with physical distancing.
- **Hotels in Europe and Asia** are providing “quarantine” service (e.g., room reservation with nobody next door)
- **Hotels** are live streaming hotel room housekeeping to show how thoroughly they are cleaning their rooms between guests.

#### Demonstrate commitment to healthcare
- **Car rentals** are offering free rental cars to NYC healthcare workers
- **Furniture distribution centers** are being repurposed as testing centers for NHS workers

#### Other examples of companies being ‘agile’ in attracting customers
- **Hotels** are offering point compensation for guests who purchased pre-paid non-refundable reservations.
- **Rideshare companies** are pivoting to delivery
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

Safety risk: significant increase in potential exposure to disease (e.g., commute, customers and other employees in the workplace)

Perceived value: Don’t feel as valued by company and that their safety is not prioritized

Fear of illness: In addition to clinical harm (e.g., fever, body aches), fear of being isolated from their families if ill

Major US 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 US workers exposed to COVID-19, over 60, pregnant, or have underlying health issues (in addition to existing sick pay)

Source: company websites, press search

Private sector focus
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

<table>
<thead>
<tr>
<th>Energy Value</th>
<th>Energy Levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before outbreak (early Jan)</td>
<td>8.2</td>
</tr>
<tr>
<td>Early crisis (late Jan – late Feb)</td>
<td>7.8</td>
</tr>
<tr>
<td>Late stage (late Feb – present)</td>
<td>8.2</td>
</tr>
</tbody>
</table>

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 commercial levers to pursue:
- **Sales and channel**: Build remote selling capabilities, re-allocate resources
- **Pricing**: reset pricing / discounts to new demand curve; consider contract flexibility where relevant
- **Marketing**: Reinvest marketing spend across opportunities that will drive highest ROI growth
- **Product / CX**: Adjust offerings to meet customers' needs; match with demand signals
- **Commercial cost**: Stop spending quickly in discretionary areas, re-allocating rapidly

Prioritize B2C commercial levers to pursue:
- **Sales and channel**: Remote customer lead gen and activation
- **Pricing/Promo**: Reset to new demand curve
- **Marketing**: Shift to high-traffic channels; adjust customer comms, tone, and offers
- **Product**: Focus SKUs; match with demand signals
- **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

Private sector focus

Source: McKinsey Marketing & Sales Practice

Repeat and optimize: “Activate key levers” and “Read and respond”
## Supply chain: Actions to consider in response to COVID-19

### Immediate (1-4 weeks)

<table>
<thead>
<tr>
<th>Understand exposure</th>
<th>Estimate how demand changes across customers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Leverage direct communication channels with direct customer when determining demand signals</td>
</tr>
<tr>
<td></td>
<td>Use market insights/external databases to estimate demand for customer’s customers</td>
</tr>
<tr>
<td></td>
<td>Task S&amp;OP team to build 3-6 plans under a range of demand scenarios month to determine required supply</td>
</tr>
<tr>
<td>Determine how supply will be impacted and understand key risks</td>
<td></td>
</tr>
<tr>
<td></td>
<td>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</td>
</tr>
<tr>
<td></td>
<td>Account for all inventory (e.g., in transit, in warehouses, in spares stock) and calculate inventory buffer</td>
</tr>
<tr>
<td></td>
<td>Conduct scenario planning to understand how inventory buffer changes in various disease scenarios</td>
</tr>
<tr>
<td></td>
<td>Run supply chain “stress tests” vs. supplier balance sheets to understand when supply issues will start to stress financial or liquidity issues</td>
</tr>
<tr>
<td></td>
<td>Assess whether border closures or restrictions will disrupt supply chain</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Take action to address anticipated shortages</th>
<th>Evaluate any option for new supply sources</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Identify alternative sources if supplies are affected and accelerate exploration of additional options</td>
</tr>
<tr>
<td></td>
<td>Determine possible geographies and supplier shortlists in case alternate supply is required</td>
</tr>
<tr>
<td></td>
<td>Identify ways to expedite qualification process and/or insource for components where supply is threatened</td>
</tr>
<tr>
<td></td>
<td>Contact authorities in areas where customs clearance could become a challenge</td>
</tr>
<tr>
<td></td>
<td>Determine what portion of supply can be swung to another site if shutdown persists based on sourcing strategy (single, dual, multi)</td>
</tr>
<tr>
<td></td>
<td>Revise production plans as required based on:</td>
</tr>
<tr>
<td></td>
<td>Expected supply shortages</td>
</tr>
<tr>
<td></td>
<td>Products in most consumer need, with highest margin, and or highest opportunity cost / penalty production</td>
</tr>
<tr>
<td></td>
<td>Understand robustness of current supply chain logistics</td>
</tr>
<tr>
<td></td>
<td>Estimate available logistics capacity; pre-book air freight¹ / rail capacity as required by current exposure</td>
</tr>
<tr>
<td></td>
<td>Collaborate with all parties to jointly leverage freight capacity, new/alternate supply sources, etc.</td>
</tr>
<tr>
<td></td>
<td>Other actions</td>
</tr>
<tr>
<td></td>
<td>Watch for extending lead times to gauge performance and capacity against supplier promises</td>
</tr>
<tr>
<td></td>
<td>Use after sales stock as bridge to keep production running if needed</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Protect employees and suppliers</th>
<th>Work with supplier to source personal protective equipment for production lines operating in affected markets (e.g., glasses, gloves and masks)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>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</td>
</tr>
<tr>
<td></td>
<td>Consider short-term stabilization for suppliers (e.g., low-interest loan) to allow for a faster restart</td>
</tr>
</tbody>
</table>

### Mid-term (4-12 weeks)

<table>
<thead>
<tr>
<th>Continue improving material supply stability</th>
<th>Identify alternative options based on anticipated demand</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>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</td>
</tr>
<tr>
<td></td>
<td>Enhance the demand verification process to correct inflated demand to mitigate the bullwhip effect</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Provide support for smaller suppliers</th>
<th>Kick off designing resilient supply chain for the future</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Codify &amp; digitize processes and tools</td>
</tr>
<tr>
<td></td>
<td>Codify the processes and tools created during the crisis management as formal documentation</td>
</tr>
<tr>
<td></td>
<td>Digitalize process and tools to integrate demand, supply, and capacity planning</td>
</tr>
<tr>
<td></td>
<td>Develop systems to “bullet proof” supply chain</td>
</tr>
<tr>
<td></td>
<td>Convert war room into a reliable supply chain risk management process</td>
</tr>
<tr>
<td></td>
<td>Ensure stakeholders address vulnerabilities across all parts of the supply chain</td>
</tr>
<tr>
<td></td>
<td>Trigger the new supply network design for resilience</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Build collaborative relationship w/ ext. partners</th>
<th>Work with government to ensure industry can ramp up as quickly as possible as crisis resolves</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Actively engage investors and other stakeholders to build transparency on the situation and get help</td>
</tr>
</tbody>
</table>

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

**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**

<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>
<td></td>
</tr>
<tr>
<td>Downturn/recovery in key markets (including level of disposable income, GDP growth, unemployment)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inflation/pressures</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oil prices</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commodity prices of key raw materials</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inflated tax increases and/or significant restrictions on marketing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Defaults to shape or participate in critical industries, consumer trends or consolidation existing competitive position</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-compliance with areas of higher regulatory scrutiny</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Failure to manage key sustainability risks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Failure to deliver value from acquisitions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cyber threats against novel important digital assets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unstable or hostile political environments</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Data privacy breach harming trust/impediments</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Changes in an international tax environment</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Develop tailored scenarios

**Key activities**

- 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

McKinsey & Company
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

4. Establish portfolio of interventions

Key activities
- 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

Sample output

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

Not Exhaustive

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>Track record of growth</td>
<td>Short-term Sales growth, 2018-2020 CAGR %</td>
<td>Co 1: -10%</td>
<td>Co 5: 5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Long-term Sales growth, 2013-2020 CAGR %</td>
<td>Co 4: -5%</td>
<td>Co 5: 5%</td>
</tr>
<tr>
<td>Through cycle interventions: Costs</td>
<td>Starting point of cost structure &amp; track record of margin improvement</td>
<td>Gross Profit/Sales %, 2020</td>
<td>Co 4: 25%</td>
<td>Co 5: 20%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SG&amp;A/Sales %, 2020</td>
<td>Co 2: 6%</td>
<td>Co 5: 20%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>R&amp;D/Sales, 2018-2020 avg</td>
<td>Co 4: 10%</td>
<td>Co 5: 5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Long-term Adj EBITA margin delta, 2020 vs 2013 %pts</td>
<td>Co 1: 2%</td>
<td>Co 3: 2%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Long-term TRS track record</td>
<td>Co 1: 10%</td>
<td>Co 5: 25%</td>
</tr>
</tbody>
</table>

### Sharp Digital
- [...] N/A outside-in measurement

### Unlock Balance Sheet
- Healthy Balance Sheet with sufficient headroom
- (Net debt and pension + OPEB) /market cap, 2020: 0.5
- (Net debt and pension + OPEB) /EBITDA, 2020: 1.5

### Band of Leaders
- C-suite and Board having diversity of background and relevant experience of leading businesses through a downturn
- % of C-suite leaders who have been in C-suite roles during last recession: 50%
- % of Board members who have been CEOs of F-1000 companies during major crisis events/downturns: 40%
- % of C-suite leaders who have a different background from the CEO: 70%

### Organization Simplification
- Lower Org complexity
- FTE per Sales (# Employees per $M USD), 2020 (outside-in indicator): 1.0

### Resilience Nerve Center
- Early, disciplined decisions in the past – indicator of a nerve center driven approach
- Short-term change in Adj EBITA, 2020 vs. 2018 %pts: 0%
- Change in (Net debt and pension + OPEB) /EBITDA, 2020 vs. 2018 %: 0%
Create a detailed plan to return the business back to scale quickly
There are 6 building blocks for a successful Return

- **Restarting supply chain**: Secure alternative supply sources (if needed) to provide materials to industry
- **Separation of regions**: Categorize regions based on severity to manage return based on region-specific situations
- **Testing & transparency**: Build transparency on the state of infection in local populations so the “healthy” cohort can return to work
- **Infection reduction norms**: Ensure conformance to transmission reduction norms in professional and public life
- **Health system capacity**: Ensure healthcare capacity, preventing “drift” while ramping up surge capacity for additional intervention windows as needed
- **Rehiring and retraining**: Prepare workforce to meet the new demands of the “next normal”

These building blocks should be rolled out and sequenced according to local realities.
These building blocks can be sequenced for a return plan

**SAMPLE PLAN FRAMEWORK – MEANT FOR ILLUSTRATIVE PURPOSES ONLY**

<table>
<thead>
<tr>
<th>Phases</th>
<th>Partial continuation</th>
<th>Phased reopening</th>
<th>Fiscal recovery</th>
<th>Recovery and preparedness</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td>Containment phase prior to thinking about any return to the “next normal”, with the primary goal of returning employees to the office</td>
<td>Once diseases have been contained, strategically return safe portions of employees while avoiding relapse into Phase 1</td>
<td>Enable the lifting of all physical distancing measures once disease is no longer a large threat to the workforce</td>
<td>Period of investing in infrastructure to rebuild organizational readiness and resilience for future pandemics</td>
</tr>
<tr>
<td><strong>Phase indicators</strong></td>
<td>Disease proliferation: Cases plateauing, of cases occasionally unknown, etc</td>
<td>Regulatory approval: Employees allowed to return to work</td>
<td>Consumer Demand: Risen to pre-crisis levels</td>
<td>No more firefighting of COVID-19 disease implications</td>
</tr>
<tr>
<td></td>
<td>Confinement of employees &amp; customers in place: Shelter-at-home regulation in place, majority of employees WFH</td>
<td>Consumer demand: Steadily increasing</td>
<td>Customer behaviors: Shifting back to “next normal expectation”</td>
<td>Corporate desire to mitigate risk and prepare better for future pandemics</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Disease containment: Ability to verify healthy workers, surrounding community healthy, disease on the decline, hospitals not overstretched</td>
<td>Supply chain: Limited disruption</td>
<td>Develop more robust WFH policies and infrastructure for larger part of workforce</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Reassurance measures at workplace (e.g. temperature checks prior to entering workplace)</td>
<td>Employees: Feel safe and protected returning to workplace</td>
<td>Reduce # of large gatherings to only when necessary</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Safety and protection policies (e.g., mandatory masks/gloves to be worn by all employees, regular deep-cleaning of work environment, physical distancing in the workplace)</td>
<td>Targeted outreach to customers to improve comfort and encourage pre-crisis behavior</td>
<td>Reduce travel requirements for roles</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Split the business for staggered return to work (e.g. different teams returning at different times)</td>
<td>Require / incentivize employee vaccination for COVID once vaccine is obtained</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Clear safeguard protocols for any employees that display illness (mandatory work from home)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Continued regular deep-cleaning of office space</td>
<td></td>
</tr>
</tbody>
</table>

Sample actions that business can take

- Maintain physical distancing of workforce (e.g., remote working facilities enabled)
- Clear protection guidelines with protective equipment provided for employees that are required to be present at workplace
- Clear process for tracking incidence in workforce and notifying at-risk employees

Source: National Coronavirus response: A road map to reopening, McKinsey analysis
Reimagination and reform

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

Be clear about how the regulatory and competitive environment in your industry may shift.
The “next normal” will be re-imagined across multiple pillars

Consumer
“What will change for consumers and shoppers?”

Supply chain
“What will supply chains models shift with the increasing focus on resiliency and digitization?”

Government/regulation
“How could health and the overall economic regulations be impacted?”

Organizational
“How will workforce norms & operating models adapt?”

Corporate valuation
“How will valuations shift given corporates need to invest in resilience capability?”
Nerve center

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

- 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?

COVID-19 initial issues

- 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?

Economic recession

- 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?

Return to work

- 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?

A new normal
When facing such a tsunami, companies make four mistakes

1. **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

2. **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

3. **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.

4. **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

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 US Air Force, whose ideas on the art of war revolutionized US 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.
Appendix
Reimagination & Reform details
# Consumer: The next normal

Degree of shift in Consumer behavior, Regulation, Organizations, and Supply Chain all drive a “next normal”

## Illustrative “next normal” of Consumer behavior

**Shifts in loyalty** – altered baskets due to availability, health attributes, brand (re)-trial

**A fresh reset of the price/value relationship** – economic downturn shifts demand to lower price points and private label

**Home recast as the coffee shop, spa, restaurant, and more with ease and convenience** – consumers find convenient and less expensive ways of “getting the job done”

**Blending of demographic “norms”** – millennials increasingly “settling down” and cooking, men doing more out of home shopping leads to brand, category and shopper behavior shifts

**The return of center store and large brands** – leveraging familiarity, availability backed by at scale supply chains

**The e-Boomer (really e-everyone)** – Online as a destination for stock-up and grocery/c-stores for the fill-in / fresh, leading to a seismic channel shift

**High times for the lower end** – Dollar, discount and supercenters further benefit from price and stable supply

**Re-luring to retail** – Outside grocery, declines in brick and mortar require new tactics to re-engage when restrictions are lifted

**De-urbanization** – reverse in the trend of recent years following the shelter at home experience

**Sustainability remerging, redefined** – simultaneously meeting environmental and public health goals

---

Source: McKinsey Consumer Practice
**Supply chain: The next normal**

Degree of shift in Consumer behavior, Regulation, Organizations, and Supply Chain all drive a “next normal”

### Illustrative “next normal” of supply chain

<table>
<thead>
<tr>
<th>Levers for Organizations</th>
<th>Degree of change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimal</td>
</tr>
<tr>
<td><strong>Resilience</strong></td>
<td>Unchanged focus on ‘efficient’ supply chain, with lowest cost today as primary goal</td>
</tr>
<tr>
<td><strong>Supply Chain</strong></td>
<td>Status quo with limited digitization and lack of visibility across supply chain</td>
</tr>
<tr>
<td><strong>Digitization</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: McKinsey Supply Chain Practice
## Regulations: The next normal

Degree of shift in Consumer behavior, Regulation, Organizations, and Supply Chain all drive a “next normal”

### Illustrative “next normal” of government regulation

<table>
<thead>
<tr>
<th>Levers for Regulation</th>
<th>Degree of change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Minimal</td>
</tr>
<tr>
<td>Health and safety regulations</td>
<td>Workplace safety inspected for hazardous materials, risk of bodily harm, and unsanitary conditions, with progressive physical distancing</td>
</tr>
<tr>
<td>Protecting health Employee benefits</td>
<td>Companies manage sick leave policies as desired (e.g., doctor’s note required, 8 days per year)</td>
</tr>
<tr>
<td>Travel restrictions</td>
<td>No additional travel restriction, but increased sanitization of long distance transport</td>
</tr>
<tr>
<td>Trade policy</td>
<td>Trade policy focused on maximizing economic growth</td>
</tr>
<tr>
<td>Sustaining economy Labor regulations</td>
<td>At-will contracts allow companies to hire &amp; fire employees adhering to current regulations</td>
</tr>
<tr>
<td>Reskilling</td>
<td>No focused new ‘reskilling’ policies</td>
</tr>
<tr>
<td></td>
<td>Substantial</td>
</tr>
<tr>
<td>Health and safety regulations</td>
<td>Workplace sanitation regulation significantly increased with mandatory deep-cleaning, regular temperature checks, etc</td>
</tr>
<tr>
<td>Protecting health Employee benefits</td>
<td>Health insurance expanded (e.g., guidelines streamlined for vaccination)</td>
</tr>
<tr>
<td>Travel restrictions</td>
<td>All public transit sanitized regularly with random temperature checks</td>
</tr>
<tr>
<td>Trade policy</td>
<td>Focus on economic security as a driver of policy (e.g., increasing domestic production of pharma and PPE)</td>
</tr>
<tr>
<td>Sustaining economy Labor regulations</td>
<td>New regulations aim to avoid mass layoffs in crisis situations (e.g., encourage rolling furloughs, contract reworking), with protected benefits for ‘gig economy’ workers</td>
</tr>
<tr>
<td>Reskilling</td>
<td>Emphasis on reskilling for the ‘next normal’ (e.g., more remote working, reskilling workers for tradesman related work, reskilling workers for internal / external redeployment)</td>
</tr>
</tbody>
</table>

Source: McKinsey Global Institute
## Organizations: The next normal
Degree of shift in Consumer behavior, Regulation, Organizations, and Supply Chain all drive a “next normal”

### Illustrative “next normal” of how Organizations configure

<table>
<thead>
<tr>
<th>Levers for Organizations</th>
<th>Degree of change</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Where work happens</strong></td>
<td></td>
</tr>
<tr>
<td>White-collar employees</td>
<td>White-collar employees remain “in the office”</td>
</tr>
<tr>
<td><strong>How people organize</strong></td>
<td></td>
</tr>
<tr>
<td>Traditional pyramidical</td>
<td>Traditional pyramidical structure to cover all functions needed to execute projects</td>
</tr>
<tr>
<td><strong>How decisions are made</strong></td>
<td></td>
</tr>
<tr>
<td>Defined process for execution of tasks (e.g., command and control, red-tape approvals)</td>
<td>Defined process for execution of tasks (e.g., command and control, red-tape approvals)</td>
</tr>
<tr>
<td><strong>Workforce size and composition</strong></td>
<td></td>
</tr>
<tr>
<td>WF predominantly consists of full-time employees</td>
<td>WF predominantly consists of full-time employees</td>
</tr>
</tbody>
</table>

**Source:** McKinsey Organization Practice