McKinsey & Company

COVID-19: Briefing Note

Insights and best practices
for Advanced Industries sector

Updated: March 16, 2020

DOCUMENT INTENDED TO
PROVIDE INSIGHT AND BEST PRACTICES
RATHER THAN SPECIFIC COMPANY ADVICE

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

COVID-19 has seen a consistent case decline in countries that had experienced rapid case growth early (esp. China, South Korea)

However, cases outside of Asia are growing dramatically, driven primarily by complexes in Europe and the Middle East. The United States, while it has confirmed only a limited number of new cases, appears to be set for a large increase in cases once testing kits become widely available

Possible future scenarios

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

Prolonged Contraction: The virus spreads globally without a seasonal decline, creating a demand shock that lasts until Q2 2021. Health systems are overwhelmed in many countries, especially the poorest, with large-scale human and economic impact

Actions for companies to consider

A central, cross-functional Nerve Center can coordinate efforts to:

- Protect employees and give them a strong sense of shared purpose
- Screen and safeguard supply chains
- Rethink marketing and sales and engage customers
- Stress-test financials

Sources: World Health Organization Situation Reports, news reports, McKinsey analysis

Content

COVID-19 appears to be more dangerous than the flu

Latest as of March 13, 2020

Features of the disease to date[1]

1.5-2x

Higher reproduction than the flu

Up to 20%

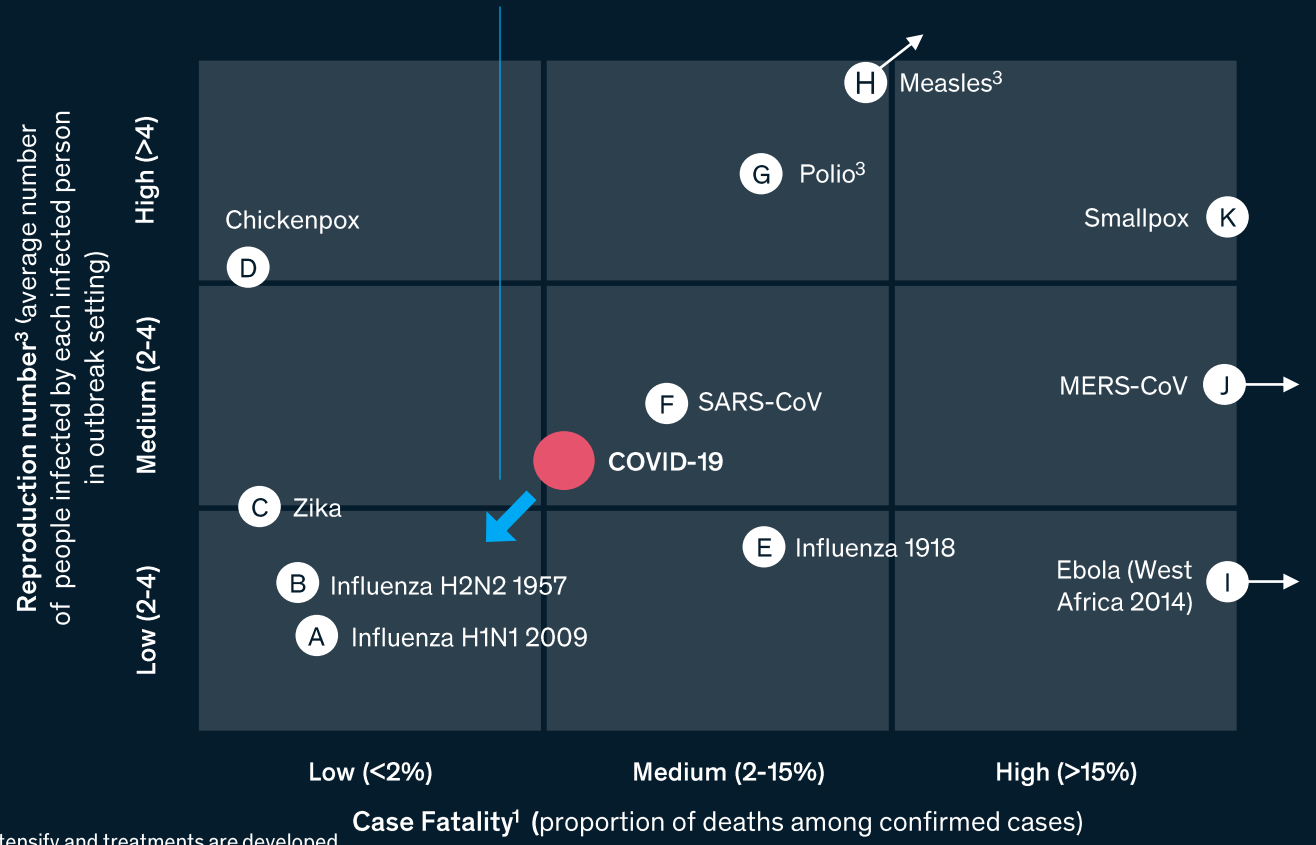
Of cases have a severe/critical form of the disease[6]

~0.9%

S. Korea case fatality rate after widespread testing. CFR appears higher where cases missed or health systems overwhelmed[2]

Comparison to other diseases[5]

Early identification of the disease, intensification of viral control, and treatment, when available, will reduce reproduction number and case fatality



1. Evidence on exact numbers are emerging, however expected to decrease as viral containment measures intensify and treatments are developed
2. WHO statement as 3.4% and latest calculated as deaths/ cases; dependent on conditions such as the patient's age, community immunity, and health system capabilities
3. In outbreak setting or the introduction of a new disease
4. Case Fatality numbers reflect outbreak settings and factors such as the patient's age, community immunity and health system capabilities
5. Estimates are very context and time specific, however are provided from prior outbreaks based on academic lit review
6. WHO estimates 15% severe and 5% critical

Sources: World Health Organization, CDC, Nature, The Lancet, PLOS One The Journal of Infectious Diseases, BMC Infectious Diseases, Infectious Disease Modelling, news reports

The global spread is accelerating with more reports of local transmission

Latest as of March 15, 2020

Current as of march 15, 2020

Impact to date

>153,000
Reported confirmed cases

>5,700
Deaths

>140
Countries or territories with reported cases[1]

>80
Countries or territories with evidence of local transmission[2]

~40
Countries or territories with more than 100 reported cases[1]

<1%
China's share of new reported cases March 9th-15th

~75%
New reported cases on March 9-15th from Europe

>40
New countries with cases March 9th-15th

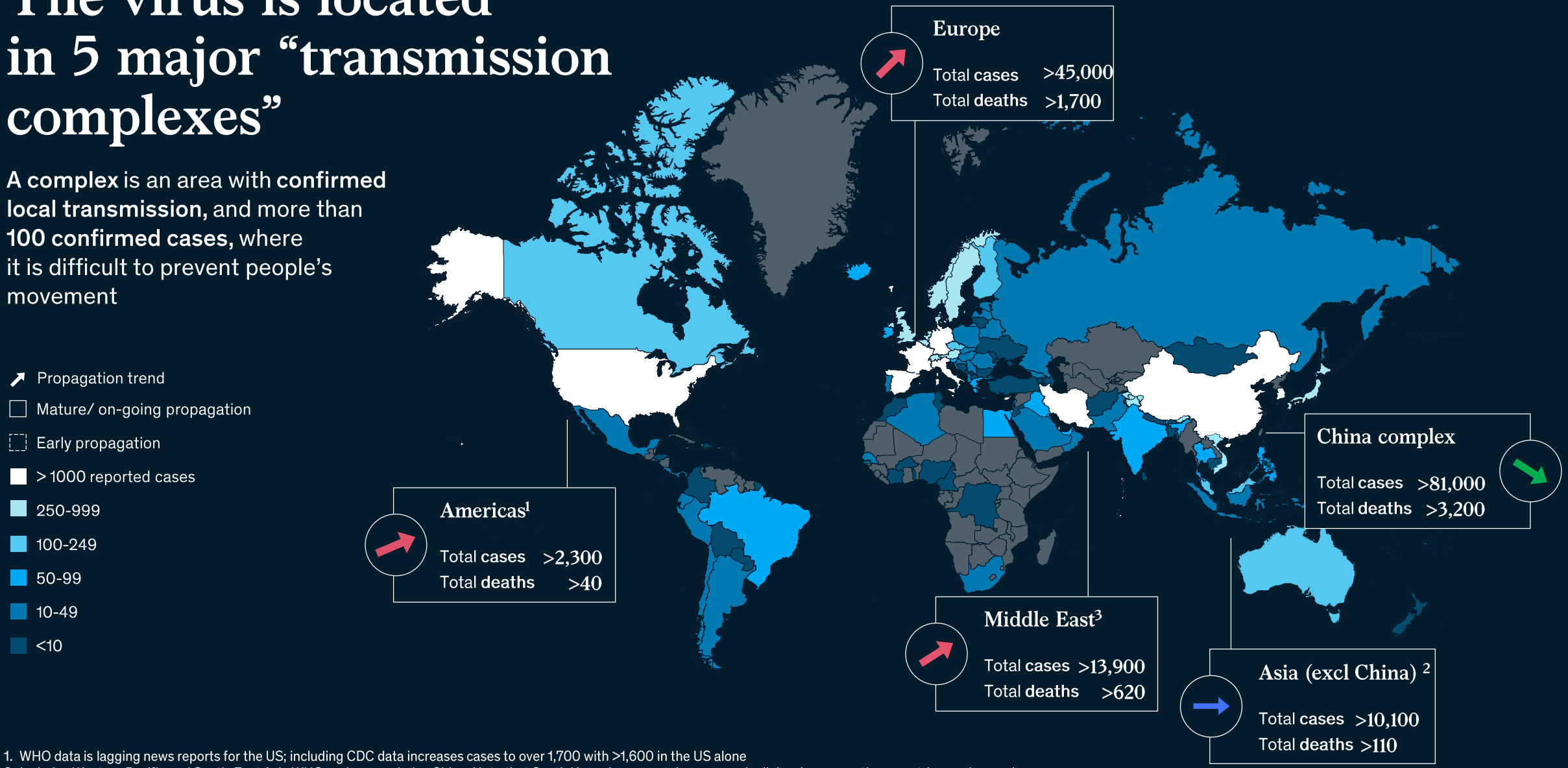
1. Previously counted only countries; now aligned with new WHO reports; excluding cruise ship;
2. Previously noted as community transmission in McKinsey documents; now aligned with WHO definition

Sources: World Health Organization, CDC, news reports

CURRENT AS OF MARCH 15, 2020

The virus is located in 5 major "transmission complexes"

A complex is an area with **confirmed local transmission,** and more than **100 confirmed cases,** where it is difficult to prevent people's movement



1. WHO data is lagging news reports for the US; including CDC data increases cases to over 1,700 with >1,600 in the US alone
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

Source: World Health Organization, team analysis

Progression varies widely among countries

Country				Status	Recent Actions
China	>81,000 Cases	>3,200 Deaths	~4.0% Case Fatality[2]	 New cases at low levels throughout China	Strict containment and quarantine Significant testing at facilities and in Hubei Construction of makeshift hospitals to increase capacity
South Korea	>8,100 Cases	>70 Deaths	~0.9% Case Fatality[2]	 New cases declined ~75% in the last week with potential decline or plateau[1]	Significant preparedness & rapid regulatory approval process for tests Rapid roll-out of diagnostics (e.g., diagnostic drive-through) Hospitalization available for lower-severity cases & significant hospital coordination
Italy	>21,100 Cases	>1,400 Deaths	~6.8% Case Fatality[2]	 ~3,500 new cases on March 15th – the highest in the world, corresponding to a ~180% increase in the last week[1]	Efforts initially focused on Northern Italy, but efforts now extend to the entire country, including cancellations of larger gatherings etc Healthcare recruiting efforts due to strain Schools closed nationwide
US[3]	>1,600 Cases	>40 Deaths	~2.4% Case Fatality[2]	 US cases are increasing daily, however official reporting may be lagging[1]	A national emergency was declared on March 13 with Congress aiming to provide testing free of charge >29 states have declared emergency with a range of actions including school closures, bans on large gatherings and large-scale testing plans

1. Number of new confirmed cases on March 15th compared to March 8th
2. Case Fatality calculated as (total deaths) / (total cases) – this rate is evolving and dependent upon several factors, including number of suspected cases that are tested
3. Estimated from CDC - CDC reports >1,600 cases whereas WHO lags with >12,000 cases; NYTimes reports >18,000 cases

Source: WHO situation reports, US CDC, press search

Overall, ~20% of cases are estimated to be severe/critical, requiring significant health capacity for testing and critical care infrastructure

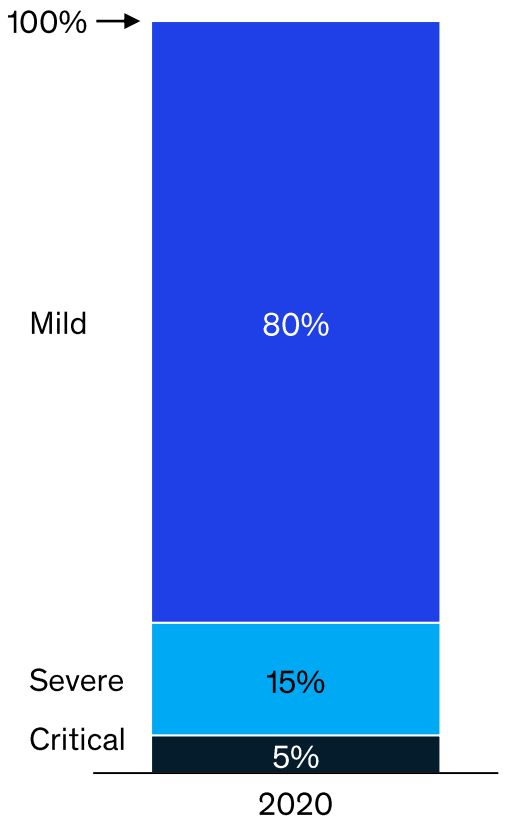
Context

WHO estimates ~20% of COVID-19 cases are severe (requiring oxygen) or **critical** (requiring ventilation)

This reflects a higher level of severity compared to influenza for instance

At a country level, mild cases may go undiagnosed

WHO estimated global distribution by severity of symptoms



Severity by country may vary

China

As of February 24, 2020 (~45K cases)

- **Similar mix of** mild / severe / critical confirmed cases to WHO estimate
- **~16K suspected cases were left undiagnosed,** driven by testing limitations

Italy

JAMA

ICU admissions in first two weeks represented 16% of all patients who tested positive for COVID-19

News reports

March 3, 2020	March 10, 2020	March 12, 2020
56% of patients who tested positive for COVID-19 are hospitalized	**ICUs almost at full capacity in Lombardy,** region hardest hit by COVID-19	**Northern regions trying to expand ICU** capacity with and 230+ ICU spots added

Source: JAMA, WHO March 6 reports, JAMA, WSJ and associated press interviews with Italian physicians

People 50+ in age are ~40-76% of diagnosed cases, however limited testing may skew potential case severity/volume in countries like Italy

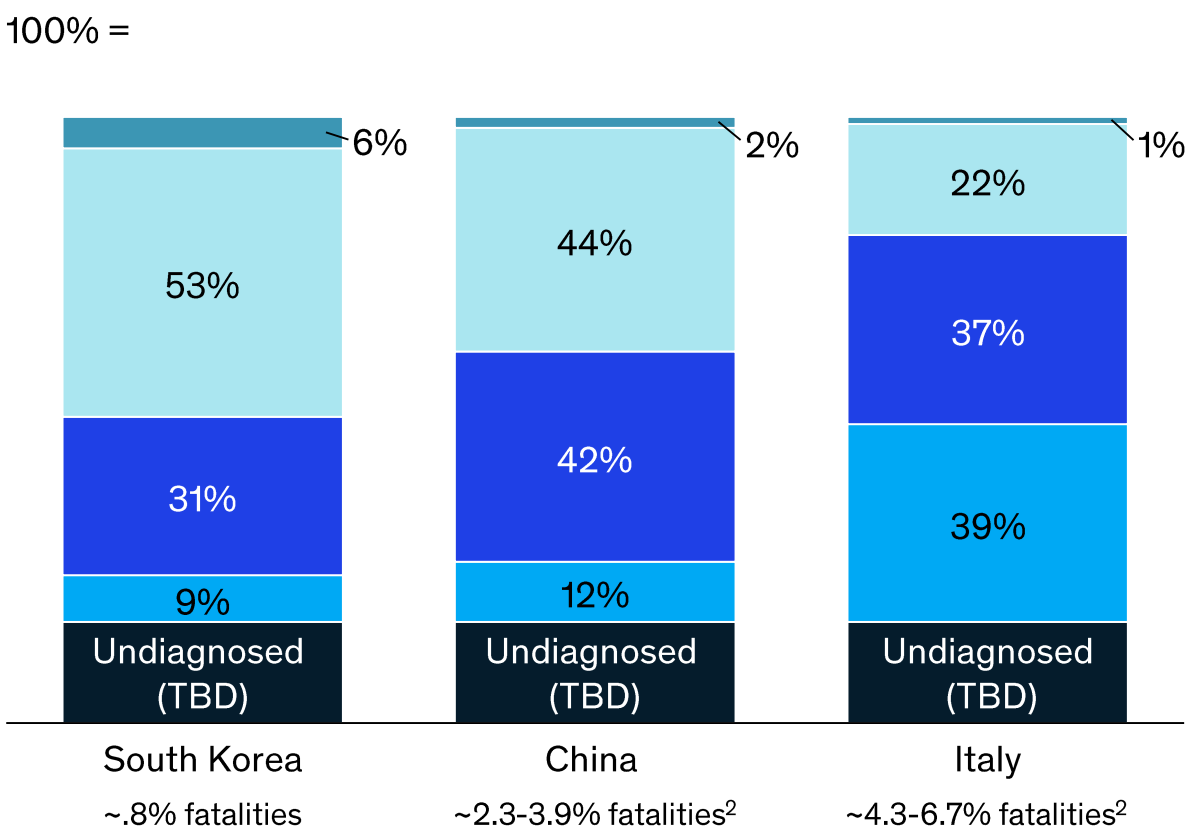
Data as of Feb 11 in China and as of March 10 in South Korea and Italy

Context

In all three countries, there is a significant differences in the age distribution

There is only a small percentage of cases found among the youngest populations (0-19) despite frequent contact with other individuals (school, public transport)

Total cases by country and age segment, Percent by age segment



People over 70 make up nearly 40% of total cases in Italy compared to 9% in South Korea and 12% in China

S. Korea has performed substantially more tests than Italy

While Italy has 2nd oldest population in the world, they are still likely missing milder or asymptomatic case and younger cases which could impacting fatality rates

1. Italy reports age segments slightly differently than South Korea and China thus categories are rounded
2. Note - Data reported from ISS March 10 reports 4.3%, however latest deaths/ cases from WHO indicates this may be higher
2. Note - Data reported from China Feb 11 reports 2.3%, however latest deaths/cases from WHO indicate this may be higher

Source: Korea CDC, China CDC, ISS Italian National Health Service

Case fatality rate data from three countries shows that older populations are at greater risk overall

As of data from Feb 11 in China and as of March 10 in South Korea and Italy*

Context

WHO has estimated case fatality rates at 3.4%

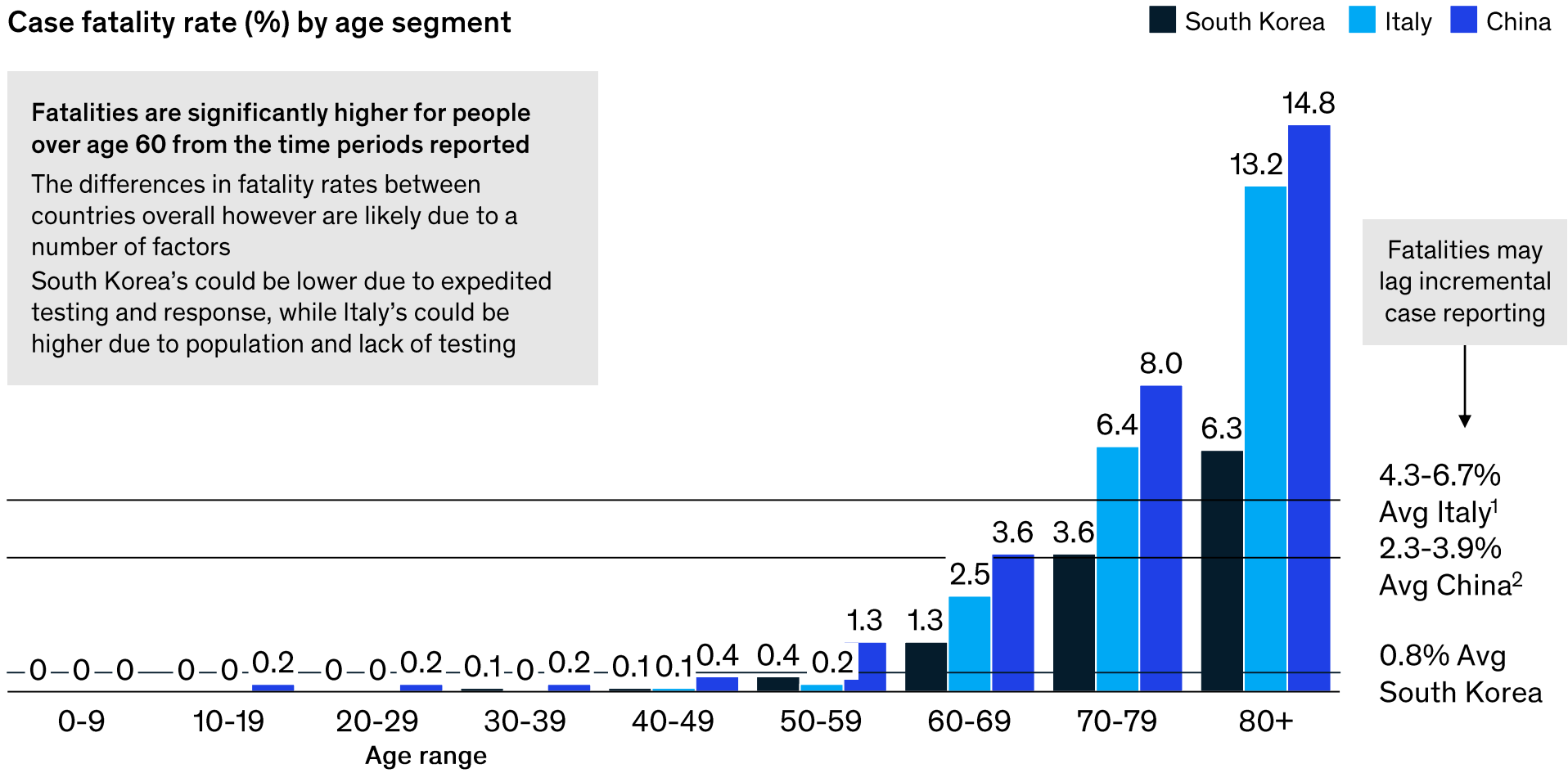
Rates vary significantly by age, co-morbidity, health system strength and other factors

Case fatality rate (%) by age segment

Fatalities are significantly higher for people over age 60 from the time periods reported

The differences in fatality rates between countries overall however are likely due to a number of factors

South Korea's could be lower due to expedited testing and response, while Italy's could be higher due to population and lack of testing



1. Note - Data reported from ISS March 10 reports 4.3%, however latest deaths/ cases from WHO indicates this may be higher
2. Note - data reported from China Feb 11 reports 2.3%, however latest deaths/cases from WHO indicate this may be higher

Source: L'Istituto Superiore di Sanità (ISS) Italy, WHO, Korea CDC, China CDC

Content

Scenario overview

The situation now

COVID-19 has seen a consistent case decline in countries that had experienced rapid case growth early (esp. China, South Korea)

However, cases outside of Asia are growing dramatically, driven primarily by complexes in Europe and the Middle East. The United States, while it has confirmed only a limited number of new cases, may experience a large increase in cases once testing kits become widely available

Epidemiological scenarios

Delayed Recovery

China and East Asian countries continue their current recovery and control the virus by late Q1 or early Q2 2020

European and US case count growth rises rapidly through mid-April

Prolonged Contraction

China and East Asian face a surge of re-infection as they attempt to restart economic activity

The virus is not seasonal with a mutated virus resurging in the fall of 2020

Economic impacts

China and East Asian countries start recovery but supply chains remain impaired

US and Europe large-scale quarantines, travel restrictions, and social distancing drive drop-off in consumer spending and business investment in 2020

China and East Asia experience double-dip slowdowns as the economic recovery is derailed in 2020 and pushed into Q1 2021

The US and Europe experience demand-side reductions in consumer and business spending and deep recessions in 2020

Sources: World Health Organization Situation Reports, news reports, McKinsey analysis

Delayed recovery

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

Epidemiological scenario

European and US case count growth rises rapidly through mid-April

Tests available, and extent of cases fully discovered by mid-April; More aggressive shutdowns and social distancing slows spread

New case counts peak by end April and declines by June with stronger public health response and seasonality of virus

Fall 2020 sees a resurgence of the virus. Although countries have better public health preparedness globally

Iran continues to be epicenter in Middle East; South East and South Asia, Africa, and Latin America are spared worst effects due to their warm climates and young demographics

China and East Asian countries continue their current recovery and control the virus by late Q1 or early Q2 2020

Economic impacts

China and East Asian countries start recovery but supply chains remain impaired in much of Q2 and consumer spending subdued

In US and Europe, large-scale quarantines, travel restrictions, and social distancing drive drop-off in consumer spending and subsequently business investment in 2020

- Layoffs drive unemployment rates higher
- Corporate bankruptcies spike, putting pressure on the banking/financial system
- Monetary easing has limited impact with already low rates and fiscal responses prove insufficient and poorly timed
- Self-reinforcing recession dynamics extend GDP declines through Q3; recovery begins in Q4

2020 Global GDP growth falls sharply, driven by recessions in US and Europe and slower growth in China and other Asian countries.

Prolonged contraction

The virus spreads globally without a seasonal decline, creating a demand shock that lasts until Q2 2021. Health systems are overwhelmed in many countries, especially the poorest, with large-scale human and economic impact

Epidemiological scenario

European and US public health measures deliver initial containment of the virus only by early June

The virus does not prove to be seasonal with a mutated virus resurging in the fall of 2020, leading to a spike in cases across geographies throughout Q2

Restrictions on travel and quarantines in the US, Europe, China, and East Asia are tightened further in an attempt to stem the tide

Iran continues to be epicenter in Middle East; South East and South Asia, Africa, and Latin America are spared worst effects due to their warm climates and young demographics

China and East Asian countries face a surge of re-infection as a result of attempt to restart economic activity

Economic impacts

China and East Asia experience double-dip slowdowns as the economic recovery is derailed in 2020 and pushed into Q1 2021

The US and Europe experience demand-side reductions in consumer and business spending and deep recessions in 2020

- Layoffs and bankruptcies in the most affected sectors rise sharply throughout 2020, feeding into a self-reinforcing downward spiral
- Financial system distress is significant but a full-scale banking crisis averted due to better capitalization of banks and new macro-prudential supervision in place
- Fiscal and monetary policy responses prove insufficient to break the headwinds

The global economic impact is severe, with significant GDP contraction in most major economies in 2020 and a slow-moving recovery beginning in only Q2 2021

Content

COVID-19 has created a global humanitarian and economic crisis requiring a concerted response

AS OF MARCH 16

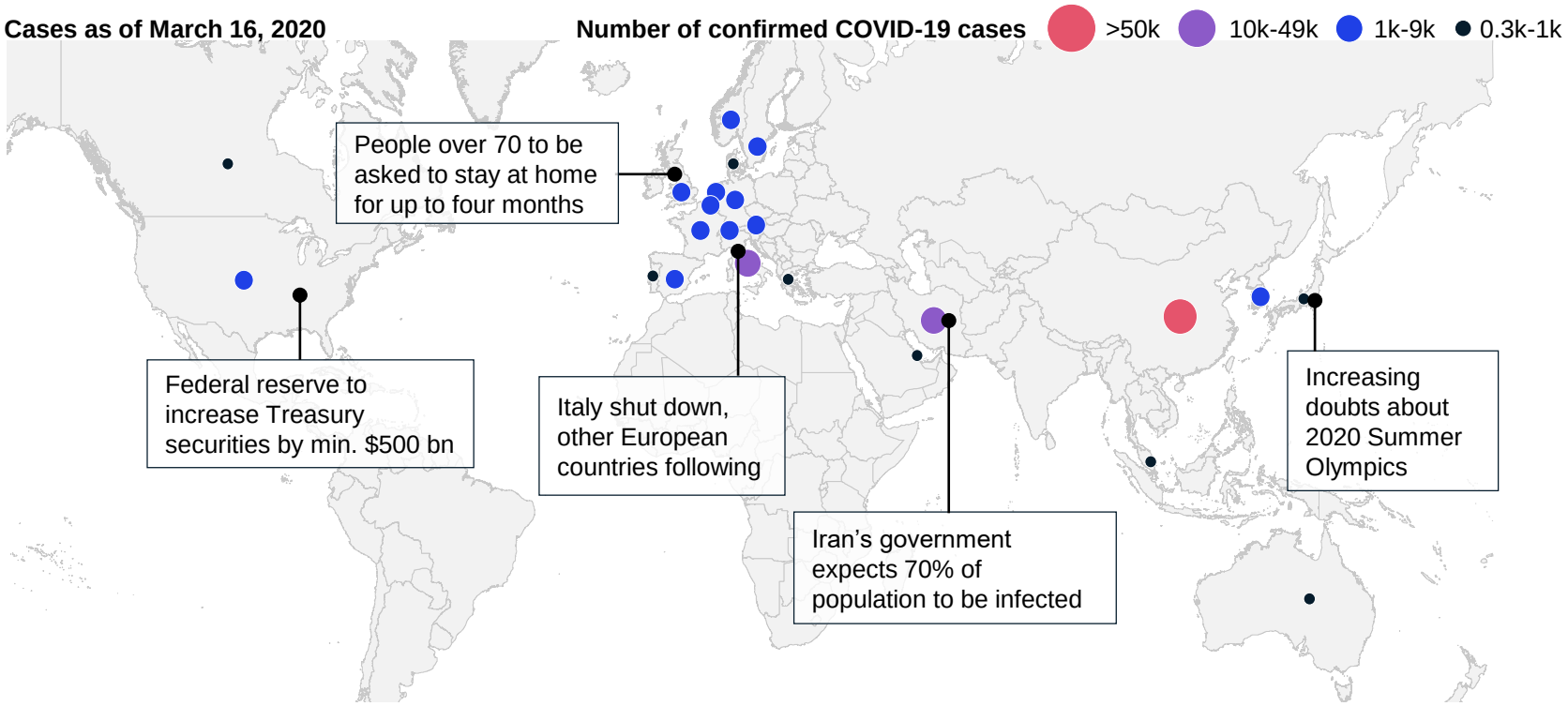
The global spread of COVID-19 has created a global humanitarian crisis with implications on people's lives, families, organizations, and communities

Advanced industries will be particularly affected, given the global reach of their employees, customers, operations, and supply chains

Securing employees' health and protecting customers and their communities is the most important priority

In addition, economic implications will have to be identified and mitigated, with a focus on People & Operations, Supply Chain, Marketing & Sales, and Financial Sustainability through a holistic approach and proven best practice

Cases as of March 16, 2020

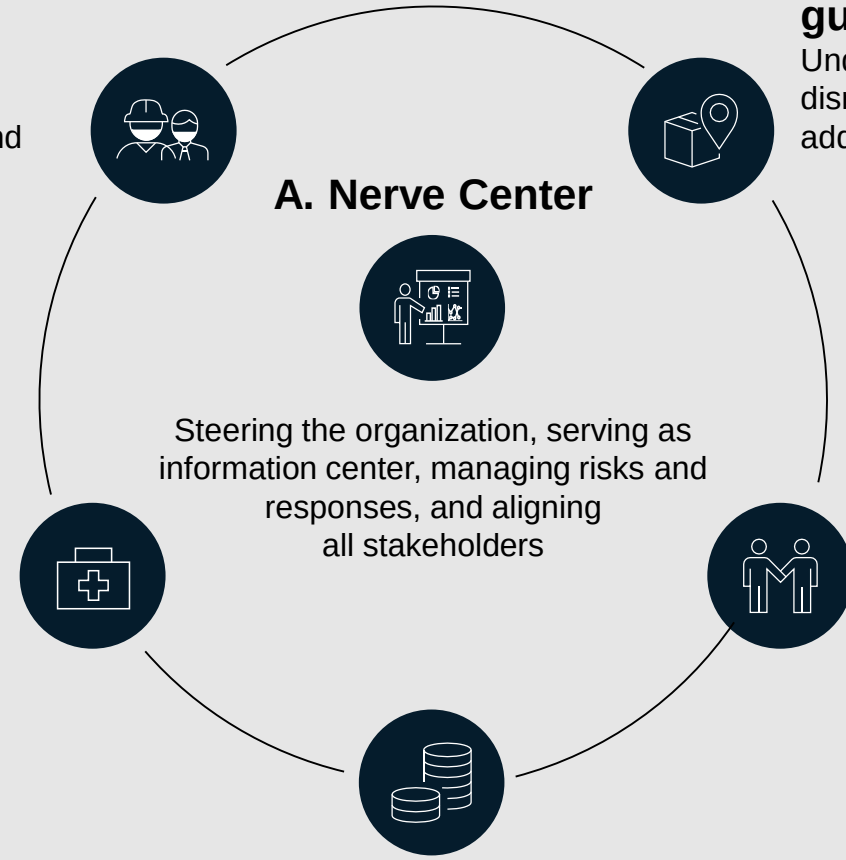


Source: Worldometers.info

Typical immediate actions

- Set up agile nerve centers
- Protect employees' health
- Screen and safeguard supply chains
- Rethink marketing & sales
- Financial stress testing

Typical elements of a COVID-19 crisis response toolbox



B. Protect employees
Protect employees and maintain operations considerately (production and non-production)

C. Screen and safe-guard supply chain
Understand risk of supply chain disruptions and take actions to address anticipated shortages

D. The new normal in marketing & sales
Identify and mitigate risks of declining sales and preserve customer loyalty

E. Financial stress testing
Define scenarios tailored to the company and take action to maintain own and ecosystem's financial health

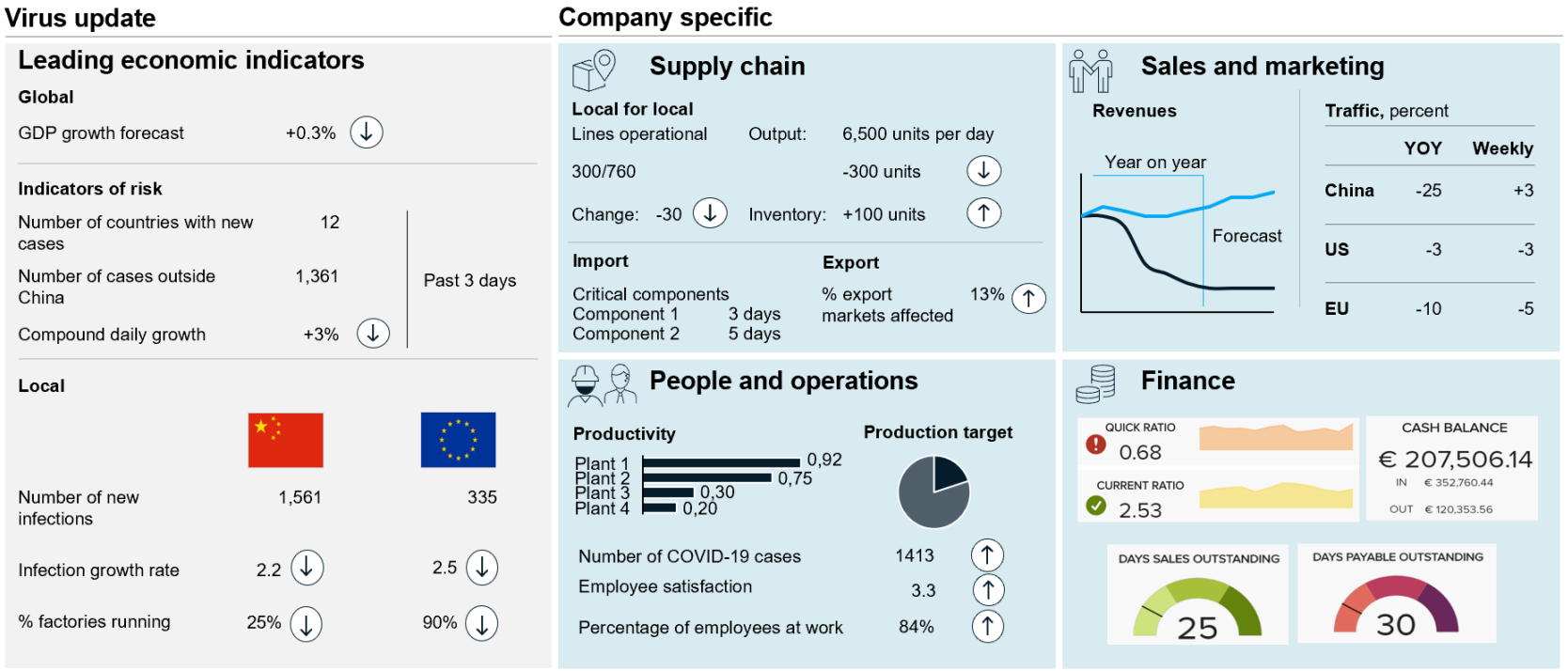
F. Demonstrate purpose
Support epidemic efforts where possible

Source: McKinsey

A: Establishing a crisis management Nerve Center to inform and steer

Steering the organization, serving as information center, managing risks

Threat map – a central element of a Nerve Center, providing an overview of the virus' impact and enabling rapid mobilization and intervention



Source: McKinsey

Nerve Center

Immediate actions — Nerve Center

A1. Establish a Nerve Center
Define crisis response Nerve Center with focused, agile, cross-functional team and sufficient decision-making power

A2. Control and plan
Gather intelligence through tools, such as the threat map, as well as create scenarios and initial plans. Based on scenarios, build rolling 1-week goals and 6 week calendar of milestones per functional team. Practice plans with top team through in-depth table-top exercise.

A3. Manage stakeholders
Create communications process, tools, roles, and plan to drive key messages. Be sure to maintain consistent communication with employees, suppliers, customers, and shareholders

A4. Address primary threats
Quickly identify operational risks and develop interventions to optimize company resilience through this crisis

A5. Mitigate root causes
Explore which operational or cultural changes to permanently adopt going forward

A2: The Nerve Center is organized to monitor development of the crisis and effectiveness of your response

Threat Map dashboard

Develop the dashboard design to be consumed by all levels of organization (e.g., leaders, analysts, etc.)

Co-build with IT to create real-time data feeds from internal data lakes and public databases – updating with automated processes whenever possible

Use dashboard to identify new risks and monitor intervention impacts

Risk Log

Establish a nerve center crisis hotline for organization to quickly raise risks

Collect new risks identified by team or function into a log, and maintain status updates on existing risks being monitored

Leverage risk log to quickly develop interventions and trigger implementation

Integrated plan

Create a twice weekly update cadence across affected regions and functions to collect existing plans and activities

Leverage integrated plan to coordinate efforts and provide optimal direction to teams within the greater organization

Syndicate weekly to leadership and use to steer update conversations

Source: McKinsey

B: Beyond protecting employee health, sustaining operations is on the agenda

Protect employees through best practices and creative methods

NON-EXHAUSTIVE

Exemplary list of actions to protect employee health

BASELINE: ALWAYS FOLLOW HEALTH GUIDELINES IN YOUR REGION

Monitor and communicate health risks	Daily updated information at site entrance, within site, intranet, via text Set health as standard agenda item in regular meetings Conduct trainings to inform about behavior to avoid transmission
Provide personal protection equipment	Hand out masks, gloves, hand sanitizer etc. If supplies cannot be obtained, consider own manufacturing
Regularly sanitize buildings	Install anti-viral filters Increase frequency of cleaning
Provide on-site health personnel	Health personnel to instruct employees and monitor their health
Adapt shift patterns	Where operationally possible, split teams into shifts
Implement targeted processes and policies	Monitor temperature of employees, e.g. before entering buildings Stagger lunches in cafeteria Restrict site entrance to people who have recently been in a region affected by the virus Support with organized transportation to avoid public transportation Follow conservative guidelines, e.g. on travelling internationally Regularly benchmark own efforts with peers

Protection of employee health is also the basis for any "secondary" measure to sustain further operations

Source: McKinsey

Immediate actions – Protect employees

B1. Communicate and protect employees' health
With measures ranging from providing protective equipment to frequent checking of people temperature

B2. Enable work from home
If possible for roles enable work from home using a wide range of remote collaboration tools

B3. Establish scenario based contingency plans
In case infections are detected on site or missing prerequisites for normal production

B4. Update operations procedures
Retool and adjust procedures to account for changes that deviate from standard processes (e.g., safety protocols, operating hours, ramp-up processes etc.)

B5. Prioritization of production capacity use
to accommodate for employees staying at home or remote work

B5: Prioritization criteria for operations in light of limited production capacity

A balance of customer service, production efficiencies and strategic importance

Illustrative

Most severe ● ● ● ● ● Least severe

2/24 production planning	Quantity needed	Strategic importance	Customer service	Constrained materials[2]		Production efficiency[1]		Aligned actions	Risk level after actions
				Part 1	Part 2	Hourly output	Product family		
Request 1	10,000	Heat SKU in E-COMM	Severe OOS, will be taken off shelf if not replenished in 1 week	1:1		8,000	A	Priority 1	Low risk
Request 2	10,000	For US client with long shipping lead-time	OOS for more than 1 week		1:3	9,000	C	Priority 1 and change to air freight	Low risk
Request 3	10,000	Bundled product for request 1	OOS for less than 1 week			5,000	C	Priority 1	Low risk
Request 4	10,000	N/A	OOS for less than 1 week		1:3	2,000	C	N/A	Mid risk
Request 5	10,000	New product, already announced in the market with limited inventory	Severe OOS in some customer warehouses		1:2	5,000	A	Priority 1	Low risk
Request 6	10,000	N/A	OOS for about 1 week	1:1	1:1	5,000	A	Priority 2	Mid risk
Request 7	10,000	Phasing out, last production	Severe OOS in some customer warehouses	1:1		2,000	B	N/A	Low risk
Request 8	10,000	N/A	OK	1:2		4,000	B	N/A	Low risk
Request 9	10,000	N/A	OOS risk		1:1	6,000	A	Priority 2	Mid risk
Request 10	10,000	N/A	OK	1:2		4,000	D	N/A	Low risk
Request 11	10,000	N/A	OK	1:2		5,000	E	N/A	Low risk

1. Change of product family will cost 45 minutes loss on the production line
2. The ratio indicates how many units of part X are needed to produce 1 product

Source: McKinsey

Revised prioritization of orders needed due to disruption of supply chain and plants

Integrated decision process of Production, Supply Chain and Marketing & Sales

Criteria to consider are

- Risk
- Profit
- Customer Service
- Strategic relevance (e.g., market entry)

C: Transparency on impact on supply chain is critical to taking effective measures

Making sure operations are uninterrupted by protecting supply chain

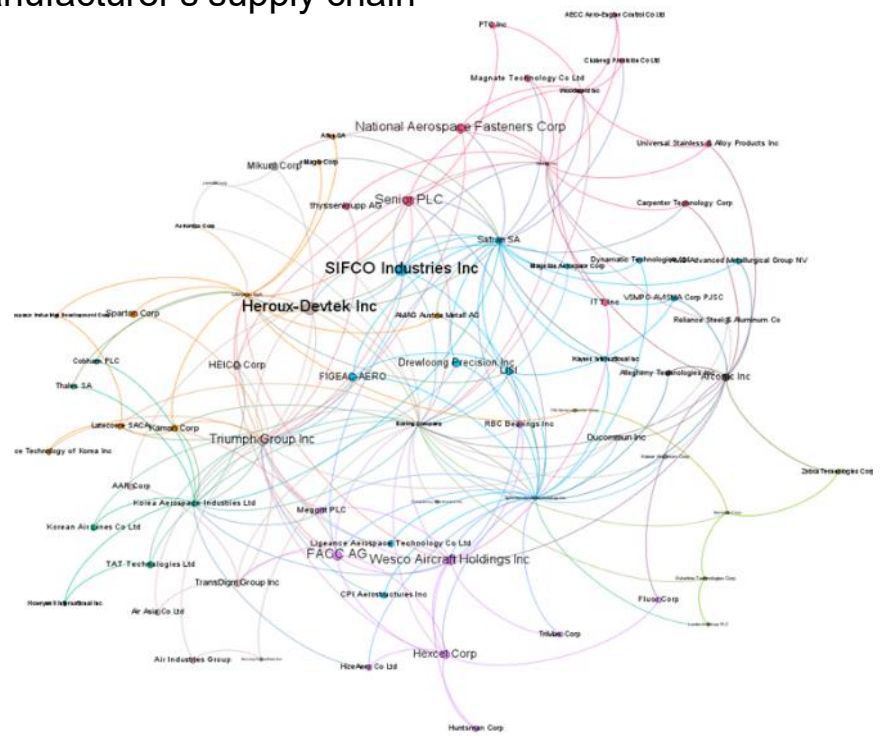
Mapping a supply chain at Tier 2+ level[1]

Outside-in analysis of an aircraft manufacturer's supply chain[2]

Closeness centrality score

Betweenness centrality score

Eigencentrality score



Map leverages Bloomberg supply chain database

1. Supplier mapping analysis in development in McKinsey's Manufacturing & Supply Chain Practice
2. **Closeness centrality** identifies companies able to influence the entire network most quickly; **betweenness centrality** measures nodes that are bridges across the supply chain; and **eigencentrality** measures a company's extended connections

Source: McKinsey analysis, Bloomberg

Immediate actions – Screen and safeguard supply chain

C1. Understand exposure
Determine which components and suppliers are system critical, understand the risk of disruption first from Tier1-2 suppliers and then onwards

C2. Quantify impact
Establish impact of supply chain disruptions to system critical components through scenarios and optimizing availability

C3. Take actions to address anticipated shortages
Shift volumes where contingency suppliers in-place, pre-book freight capacity, stock-up on critical parts, and plan to leverage aftermarket inventory

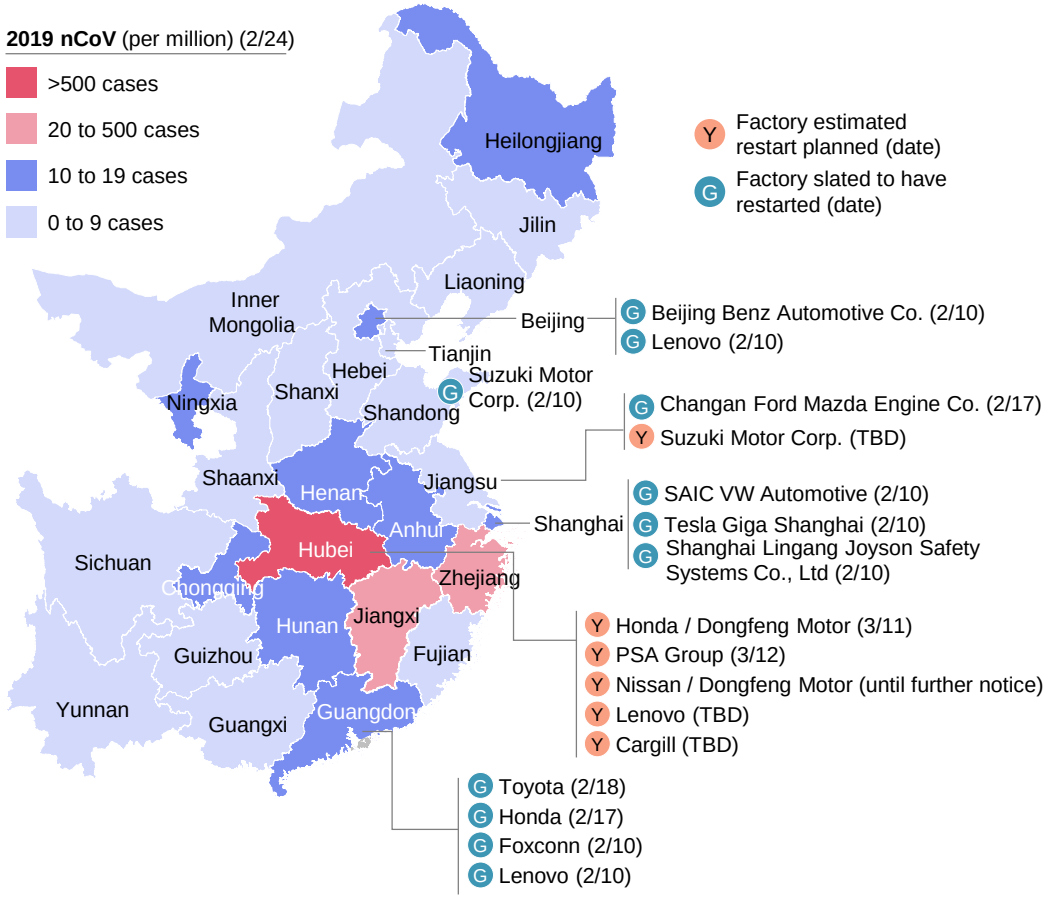
C4. Onboard new suppliers
Quickly identify new suppliers from lower-risk geographies, identify ways to expedite qualification process for parts, and evaluate how negotiating dynamics might be affected

C5. Ensure resources for restart
Ensure proper health and safety supplies are procured and onsite

C1: Transparency required on supply chain status – Outside Hubei, China is attempting to restart, but this may be slow

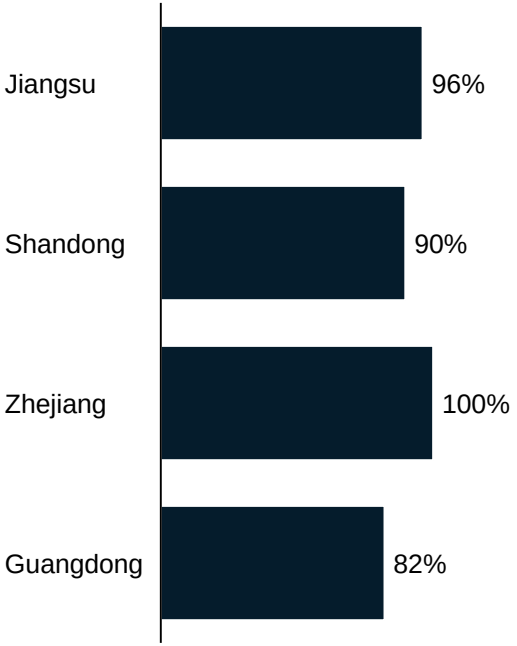
Illustrative based on data as of Feb 27

Many examples of factories restarting have been reported along the eastern coast of China, away from the epicenter in Wuhan[1]



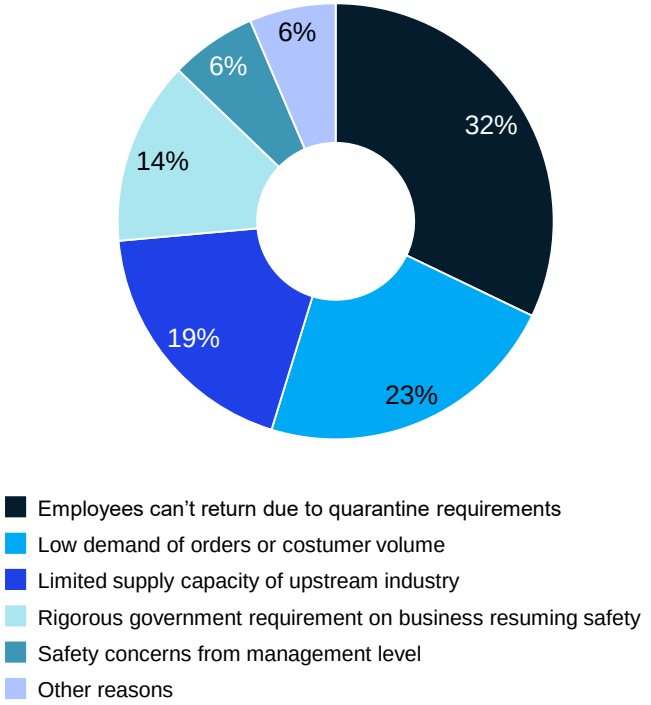
Large industrial enterprises and state owned companies are leading the way

Resuming status of "Above designated size" industrial enterprises[2]



Challenges being faced by organizations

% of responses on the single selection of "Which factor stopped business resuming"



1. Dates estimated given latest available information - situation rapidly unfolding and subject to change; 2. "Above designated size" (ADS) industrial enterprise is a definition by China Statistic Bureau, namely enterprises that has more than RMB 20 million annual main business income;

Source: Press search, Peking University HSBC Business School, Japan Times, Automotive News Europe, Reuters, Xinhua Net, Just Auto, The Japan News, The Epoch Times, South China Morning Post, CNN, Expert interviews

C1: Supply chains are being disrupted around the world, but the but full impacts have not yet been felt

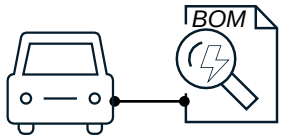
	Supply – production	Logistics – transportation		Customer demand
Situation today	**80% plants restarted** Across China, ex-Hubei, with large enterprises restarting, albeit with ~60% capacity, at much higher rate than smaller ones	**2M idle containers** 8.8% of global container capacity affected by reduced demand **52% BDI increase** Baltic Dry Index[1] 52% higher since CLNY[3] but at same level as Feb 2019	**60% China flights suspended[5]** Commercial flights account for ~50% of air cargo capacity, some airlines converting flights for cargo[6] **2x TAC index** TAC index rate +98% for US-China, +117% EU-China[2], +21% China-US, and +2% for China-EU since CLNY[3]	**60% truck staff available** 1-14 day quarantine and capacity induced increase in freight transport times **MED** Demand for express last-mile delivery has spiked in China due to quarantine and social distancing	**90% decline in car sales** China consumer sentiment sharply lower; online/express deliveries up **MED** Europe & US sentiments evolving, but localized
What to expect	**MED** Parts and labor shortages leading to further SC disruptions (e.g., decreased production capacity) Other regions will be facing production capacity reductions Customer pressure for prioritization	**7,000 TEU/wk reduction** Volumes will return as factories restart, may see peak for restocks Future capacity 2.3% reduction for a Asia-US route from May due to sea freight alliance revisions **MED** Impact on freight will take an extended period of time to correct with slower ramp-up Logistics capacity returns but faces constraints; near-term price increases	**5% global air traffic decrease[4]** Decline in capacity available due to travel ban on commercial flights YoY global air freight belly capacity reduction of 14% in March 2020[4] Rates likely to continue to increase	**High** Trucking capacity constraints in China likely to ease Declines at US ports foreshadow declines in US intermodal (rail)	**High** Demand slump may persist Inventory “whiplash” - 7-8 weeks for auto, 2-4 weeks for high-tech Inventory hoarding and demand spikes due to uncoordinated actors exacerbate SC

1. Assessment of risk premium to ship raw materials on a number of shipping routes
2. Frankfurt (FRA) to Shanghi (PVG) used as a proxy
3. End of extended Chinese Lunar New Year holiday (2/7-3/13 for BDI, 2/10-3/2 for US-China TAC, 2/10-3/9 for other TAC routes)
4. Estimated prior to implementation of EU-US travel ban
5. Commercial flights from China
6. Companies such as Cathay Pacific and Singapore Airlines now starting to fly empty passenger aircrafts as dedicated cargo planes

Source: Baidu, WSJ, Bloomberg, Alphaliner, Quartz, TAC index, IATA, Seabury Consulting, A.P. Moller-Maersk Group of Denmark, Agility Logistics

C1: Data-backed approaches to prioritize components that may likely be affected should be hypothesis driven

Overview of prioritization process



Determine critical components

Derive risk index for each BOM commodity to identify highest risk commodities

Risk index is based on Product-Production technology matrix that considers supplier landscape (diversification in terms of number and geography as well as shipping type)

Product category	Production technology: A: Innovative	B: Standard Dedicated Complex tools	C: Standard Dedicated Simple tools	D: Standard Generic Simple tools
Metals	8	6	4	2
Semi-conductors	10	8	7	4
Glasses	8	6	4	2
Plastics	9	8	3	2
Rubber	7	5	3	1
Chemicals	7	6	3	3
Ceramics	7	5	3	3
Rare earth elements	7	5	3	3

Risk (1-10)

Critical (>6)

Assess interruption risk down to Tier 2+

Build hypotheses for impact of interruptions for key parts and suppliers triangulating information sources:

- Facility exposure by industry
- Shipment impacts
- Export levels countries/regions
- Category of parts (e.g., electronics)

Determine where components are traditionally sourced

Supplier risk assessment used to create list of areas to explore with Tier 1

Work with Tier 1 to address Tier 2+

Share key questions with Tier 1 to ask who and where their suppliers are

Create information sharing agreements with Tier 1 and their suppliers to determine whether Tier 2-4 are experiencing interruption

Set up joint agreement to monitor lead times as sense check for interruption

Buy directly large quantities of small but critical parts from Tier 2+ to secure supply

Establish recovery plan for critical suppliers by commodity

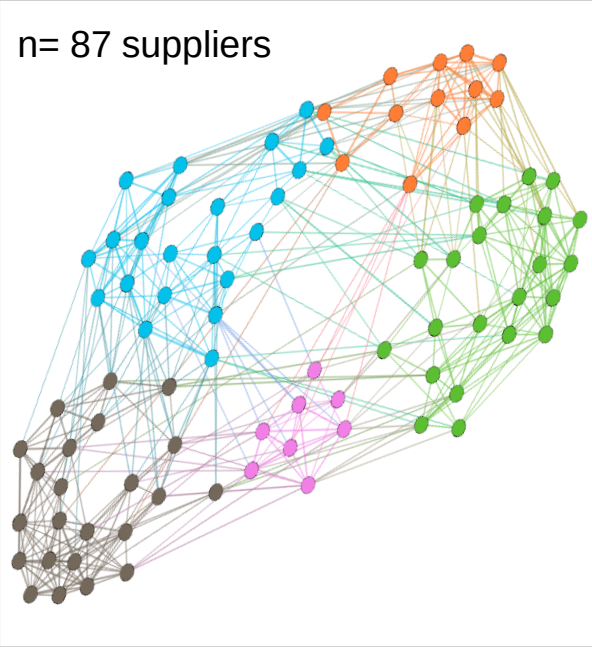
Monitor production readiness by BU in case supply stopped

Source: McKinsey

C4: Leverage a supplier discovery tool to find additional suppliers during a crisis in <24 hours

Outside-in example

Example results for speaker suppliers



Cluster characteristics

Cluster name	Share of total	# of suppliers
A Automotive speakers	27%	23
B Professional Audio equipment including speakers	25%	22
C Multimedia speaker systems	25%	22
D Mobile Phone speakers	14%	12
E Marine audio	9%	8

Analysis description

Supplier discovery tools typically leverage multiple sources in order to create a comprehensive database of potential suppliers. Leveraging AI, the discovery tool matches suppliers to requested detailed product descriptions

How to typically use

Describe desired part to a search tool's team, e.g. round rubber gasket

The team runs in initial database search and provides results of 50-60 sample suppliers

Review list with industry experts to identify which are a match or not

AI then leverages this additional criteria to identify a full list of appropriate suppliers for desired part

Source: McKinsey

D: COVID-19 requires adaption of marketing and sales efforts and balancing of product mix

Identify sales risks, mitigate downturn and consider long-term implications

China provides evidence how COVID-19 changes customer journey for traditional offline car purchases

	Purchase trigger	Initial consideration	Information gathering	Purchase experience
Observations	**Increased willingness to purchase** due to hygiene concerns related public/shared mobility **Deferral of car purchase decisions** due to economic uncertainty	Increased **demand for air-purification / anti-viral functionality** **Uncertain availability of some models** considered by customers due to supply chain disruptions	**Much wider usage of online channels**, as customers would find all necessary information online, whereas frequenting of car dealerships is perceived as health risk	**Reframed purchase experience** from going to dealership **to home-based**, for the first time
Action need	**Understand how purchase triggers** change throughout COVID-19 development cycle	**Adjust marketing to focus on available models and on features with increased value-add** under COVID-19 conditions	**Shift marketing channel mix online** in alignment with long-term strategy and in line with capabilities	**Enable online sales channels** as per existing capabilities and in line with long-term strategy

Learn from the experience and actions taken in China as the virus spreads to more regions globally

Source: McKinsey

Immediate actions – Marketing & Sales

D1. Adapt marketing mix
Emphasize online marketing channels as offline channels become less frequented due to virus concerns

D2. Realign sales channels
Enable customers and dealers to make/offer online purchases

D3. Adjust product features
Adjust product features to account for health and safety concerns, promoting features such as air purification

D4. Balance product mix
Identify target product mix for a 3-4 week horizon and balance it by targeted incentives such as promotions, discounted upselling options etc., as COVID-19 impacts both the types of products demanded and what kind of product can be delivered

D1, D2, D3: OEMs in China are adjusting both product features and marketing and sales channels

D1. Adapt marketing efforts

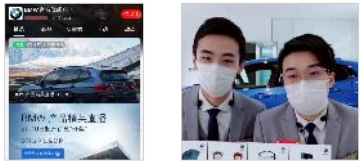
Emphasis on online marketing-channels

Mercedes-Benz

Dealer's online showroom & live-show

BMW

Brand showroom & live-show



Dealer VR showroom & live-show

D2. Realign sales channels

Promotion of "home-based" / "zero-touch" sales and after-sales channels

Home-based test drive and handover

JAGUAR LAND ROVER

Online sales and aftersales take/delivery services

NIO

Zero-touch charging/swapping service

D3. Adjust product features

Adding product features oriented towards hygiene

吉利汽车 GEELY AUTO

Focus on raising level of air filtering within vehicle

Feature brought to market as standard within 20 days

PLEASE NOTE: THIS IS AN EXAMPLE FOR MARKETING AND SALES MEASURES, THOUGH THE TRUE HEALTH BENEFIT OF AIR FILTERING IS UNCLEAR

E: Liquidity and profitability are jeopardized by COVID-19, as profit warnings suggest

Maintain own and ecosystem's financial health

NON-EXHAUSTIVE

Effects of COVID-19 on profitability and liquidity

Customers defer or cancel purchases

Rising procurement expenses due to costly nature of alternative sourcing

Asset utilization below economic optimum due to supply chain challenges and dampening of demand

Capital costs rise as increase in industry-specific risk drives interest rates

Costs for FOREX hedging increase due to pick up in volatility

Evidence of profit warnings

Source: McKinsey

Immediate actions – Financial stress testing

E1. Internal liquidity – Conduct financial stress-testing and mitigate effects from sales downturn and costly crisis response measures on liquidity, e.g. through renegotiation of payment terms with suppliers

E2. Financial-year profitability – Utilize cost levers to mitigate effects of COVID-19 on profitability targets for ongoing financial year, e.g. by setting up a spend control tower

E3. External support – Support liquidity of suppliers, dealers etc. to keep ecosystem viable, e.g. by granting dealerships more lenient payment terms

E4. Growth opportunities – Support suppliers, dealers etc. in mitigating effects of crisis in order to stay alive financially in longer term

E2: Setting up a spend control tower to support financial year profitability in times of COVID-19

Illustrative

Spend control tower

Objectives

Get current committed spend under control, reassessing value in face of COVID-19

Become spend conscious to increase resilience against effects of COVID-19

Enable quick decisions during COVID-19 crisis by setting clear guidelines

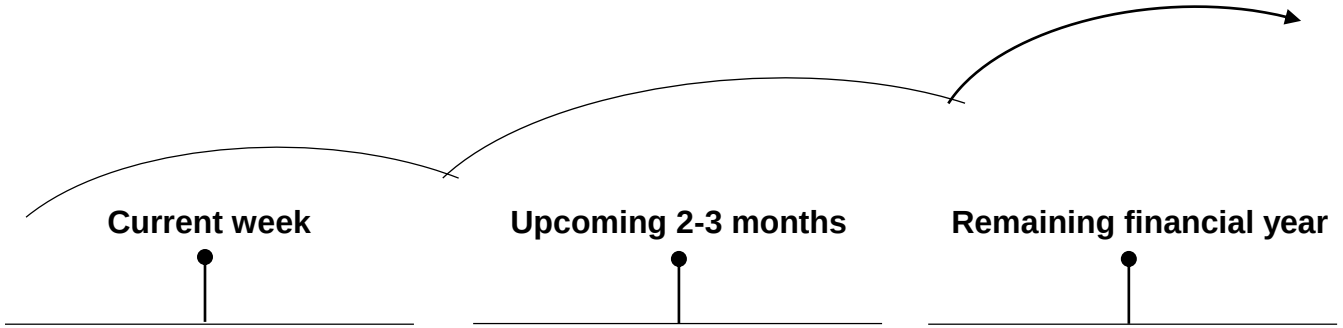
Setup

Function leaders review already committed spending for upcoming 3-4 weeks in light of changed conditions under COVID-19, **following a defined prioritization logic**

Review of new spend requests occurs in daily or weekly meetings, where function leaders use the same prioritization logic and approve, deny, delay, or send back for further information

Function leaders maintain **bias toward "no"** and only approve requests that are both critical and urgent

Uncertainty linked to COVID-19 requires prioritization of spending along three horizons



Immediate production relevance

E.g., deprioritize spending on billboard advertising in areas with limited economic activity

Value of optionality

E.g., deprioritize spending on factory locations that will not be utilized beyond breakeven in any scenarios in upcoming 2-3 months

Medium-term strategic alignment

E.g., defer expensive product launches that would only have positive financial impact in 2021

Source: McKinsey

Content

A: Nerve center – Actions to respond to COVID-19

Steering the organization, serving as information center, managing risks and aligning all stakeholders

Immediate (2-4 weeks) – all actions

Establish Nerve Center

1. **Identify a response leader** with the right temperament, values, experience and reputation
2. **Appoint dedicated workstreams in the nerve center** for each module of the crisis response toolbox
3. **Define the crisis organization and ramp up nerve center** – keep it focused, agile, cross-functional, independent, and well-funded; position it at C-suite/CEO-1 level
4. **Establish the nerve center as the "single source of truth"** regarding crisis initiatives, with all identified risks and interventions running through it
5. **Ensure that this nerve center has the right level of peer review and accountability** so that it doesn't become a black box (or overpromise/ underdeliver)

Control & Plan

6. **Define the values that will guide the team** through the response
7. **Define timing and exposure level for primary threats** that you face (operational, technical, financial, legal)
8. **Identify how stakeholders will likely react to primary threats** (customers, partners, competitors, regulators, employees, government, suppliers), incl. 2nd order effects

Stabilize Stake-holders

9. **Put in place an intel gathering system** that allows you to stay abreast of an evolving situation and separate fact from fiction
10. **Establish a communications plan, process, roles and tools** to drive key messages with key stakeholders (i.e. customers and capital markets)
11. **Appoint a single point of accountability** (from business, not communication) to connect with key stakeholders

Address Primary Threats

12. **Conduct scenario analysis**, identifying the most likely scenarios of COVID-19 development and their impact on the markets served as well as regulatory requirements in production locations (i.e. ordinance to shut down)
13. **Define parts of the business that need to slow down or stop** given the high risk environment
14. **Put in place emergency protocols to provide crisis funding** while ensuring compliance with provisioning requirements
15. **Hire battle-tested third parties**, if necessary (i.e.,crisis communication firms, legal counsel etc.)

Mitigate Root Cause

16. **Initiate a review of crisis response measures** conducted in various departments; define carefully how the team wants to scope it, who should lead it, and how independent and transparent it should be
17. **Identify and kick-off implementation of resilience-building measures and crisis responses processes** based on lessons learnt from review of COVID-19 crisis response

Source: McKinsey

B: People and Operations – Actions to respond to COVID-19

Protect people and keeping sites up and running (production and non-production)

Immediate (2-4 weeks)

Communicate and protect employees	1 **Follow all official guidelines** issued by local health authorities 2 **Monitor and communicate health risks daily –** being transparent about decisions related to resuming or shutting down operations; use all available communication channels 3 **Conduct trainings** to teach employees how to prevent viral transmission 4 **Provide on-site health personnel** to monitor health of employees 5 **Provide personal protection equipment**, such as providing masks, gloves and hand sanitizer etc.; if supplies cannot be obtained consider own manufacturing (e.g. Foxconn has set up production of masks) 6 **Regularly sanitize buildings** to secure safety of operations, e.g. by installing anti-viral filters or increasing cleaning frequency 7 **Implement new targeted processes** such as monitoring temperature of employees, staggered lunch in cafeteria etc. 8 **Adapt shift patterns** and split teams to create contingency
Enable work from home	9 **Enable** and encourage **work-from-home** for those roles where it is possible
Increase morale	10 **Develop incentives for employees to return to work** once crisis subsides and operations are safe to resume 11 **Address morale** with initiatives that fit company and/or local culture 12 **Provide formal relief programs** to ensure time-off for workers whose relatives are sick
Define contingency plans	13 **Conduct people and operations specific scenario planning** based on global COVID-19 development scenarios identified by nerve center as well as firm-specific scenarios (i.e., infection among employees) 14 **Build contingency plans** based on people and operations specific scenarios
Update operations procedures	15 **Retool and adjust procedures to account for any changes in operations that deviate from business as usual**, e.g., product (mix) changes, operating hours, ramp-up process, logistics
Prioritize production capacity	16 **Coordinate between Sales & Marketing, Supply Chain, and Nerve Center,** identify production mix that optimizes company result, given supply chain, demand, or production constraints

Mid-term (3-4 months)

Continuously improve health standards	17 **Monitor and benchmark trends** and practices in hygiene with regards to production and workplace health 18 **Implement best practice** health initiatives and continuous training 19 **Continually evaluate operational procedures** that may create undue risk of viral transmission

Source: McKinsey

C: Screen and safe-guard supply chain – Actions to respond to COVID-19

Understand risk of supply chain disruptions and take actions to address anticipated shortages

Immediate (2-4 weeks)

Understand exposure

1. **Determine truly critical components** (i.e. parts required for assembly) and understand **risks of tier 1 to tier 2 suppliers onwards**
2. **Determine current inventory buffer** and locations[1]
3. **Identify origin of supply** (e.g. crisis locations such as Hubei or Lombardy) to identify severity of risk
4. **Monitor extending lead times** to gauge performance and capacity against supplier promises

Quantify impact

5. **Conduct scenario planning** to understand financial and operational **implications in prolonged shutdown**
6. **Estimate 3-6 month real demand signal** (esp. from crisis areas) to determine required supply

Take action to address anticipated shortages

7. **Look to ramp up now on alternative sources** if critical supplies come from crisis areas – and accelerate understanding of additional options
8. **Pre-book freight[2] capacity** (air, sea, truck, rail) as required by current exposure and **collaborate** with all parties **to jointly leverage freight capacity**
9. **Optimize constrained** production determining highest margin and highest opportunity cost / penalty production
10. **Use after sales stock as bridge** to keep production running
11. Ensure that **nerve center addresses operational considerations**
12. **Determine what portion of supply can be swung to another site** (non-crisis geography) if shutdown persists based on sourcing strategy (single, dual, multi)

Onboard new suppliers

13. **Determine alternative supplier shortlists** utilizing analysis like clean-sheeting or supplier search platforms to expand scope of known potential suppliers
14. **Identify ways to expedite qualification process** for new suppliers

Ensure resources required to restart

15. **Work with suppliers to source personal protective equipment for production lines** – China, for example, is requiring all production facilities use glasses, gloves, and masks
16. 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
17. **Consider short-term stabilization for suppliers** (e.g., low-interest loan) to allow for a faster restart

Mid-term (3-4 months)

Continuously improve material supply stability

18. Evaluating **alternative sourcing options for all the materials impacted** – availability of suppliers, additional cost due to logistics, tariffs, estimate of price increase of the components
19. Determine **possible geographies and supplier shortlists** utilizing advanced analytics tools for clean-sheeting or identifying alternative suppliers
20. **Continuous support the mid-small size tier 2-3 suppliers** in financial troubles

Kick off designing resilient supply chain for the future

21. Establish a **supply chain risk function**
22. **Reflect on supply chain pressure points during crisis** and begin designing a supply chain for resilience
23. **Codify the processes and tools** created during the crisis management as formal documentation
24. Convert war room into a **reliable risk management process**

Build collaborative relationship with external partners

25. Work with government for **potential tax benefits**
26. **Actively engage investors** and other stakeholders to build transparency on the situation and get help

1. For example, a buffer stock from Chinese New Year may provide a cushion and potential false sense of security for those impacted by Hubei. Impact likely to be felt first in JIT supply chains (e.g. automotive).
2. Given costs, airfreight might not be an option for many industries; availability is already limited

Source: McKinsey

The new normal in marketing & sales – Actions to respond to COVID-19

Identify sales risks and mitigate downturn and aim for strategic advantage

	Immediate (2-4 weeks)	Mid-term (FY 2020)
Adapt marketing mix	1 **Analyze and monitor value-add of different marketing and promotional efforts** and identify effects of virus on their effectiveness 2 **Set up a dedicated sales management team** to minimize potential sales channel conflicts or over-investment in ongoing promotions 3 **Develop a social media engagement strategy** in-house on a "war room footing", possibly outsourcing execution to digital agencies 4 **Cut offline-marketing expenditure** or shift to online if value-add is found to be low or negative 5 **Prepare revised marketing strategies** for regions not yet affected by virus 6 **Exit sponsoring contracts with low value-add** (e.g., sports events with limited viewership)	16 **Assess impact of short-term changes in marketing efforts** and consider for long-term strategy 17 **Seek to strengthen partnerships with leading O2O (online-to-offline) platforms**, comprising both brand-to-consumer and store-to-consumer, as well as apps, mini-programs, and social communities like chat groups 18 **Revise promotion channel mix targets** to give greater share to online 19 **Re-align long-term marketing strategy,** factoring in changed positioning resulting from tactical responses to COVID-19
Realign sales channels	7 **Assess internal capabilities to shift sales channels to online** (i.e. test if direct online-sales viable or only enablement of dealerships to receive triggers from online interactions) 8 **Adjust sales channels,** emphasizing virtual demos, at-home demos etc. and enable online purchasing in accordance with internal capabilities 9 **Update revenue and profit forecasts, and realign incentives** for dealerships and business unit heads to set rational targets and avoid pushing sales at the expense of profits	20 **Identify sales channel shifts desirable in long-term**, using data gathered during crisis 21 **Emphasize development of social direct-to-consumer (DTC) channels**, comprising both brand-to-consumer and store-to-consumer, as well as apps, mini programs, and social communities like chat groups 22 **Seize channel shifts to sustainably reposition supply chain** to support an omnichannel strategy that goes beyond differences in last-mile-delivery
Adjust product features	10 **Determine features** (e.g., air filtering) that increase customer value under crisis conditions 11 **Hone vehicle content** by adding in-demand features (air filters, etc.)	23 **Accelerate development and launch of product features with increased value-add** under different scenarios of COVID-19
Balance product mix	12 **Identify a new short-term target product mix** by determining orders that would probably not be fulfilled on time or at a loss, given current supply chain and sales situation 13 **Identify changes in individual customers' purchase decision sets**, leveraging data analytics (i.e. cookies) to identify divergence between expected sales and target product mix 14 **Incentivize customers to buy products according to target product mix** (i.e., promotions, discounted up-selling options etc.) 15 **Change demonstration vehicles for dealer use** according to target product mix	24 **Optimize long-term product mix** by leveraging data collected through online channels during COVID-19 crisis

Source: McKinsey

E: Financial stress testing – Actions to respond to COVID-19

Take action to maintain own and ecosystem's financial health

Immediate (2-4 weeks)

Internal liquidity

1. **Conduct stress-testing** of cash flows, P&L and balance sheet based on scenarios defined by nerve cetnre; identify input variable triggers that could drive significant liquidity events (incl. breach of convenants)
2. **Set up a cash control tower** to challenge all internal payment requests, and review customer payments as well as inventory levels
3. **Negotiate longer payment terms with suppliers** or establish consignment arrangements over duration of crisis
4. **Incentivize advance payments** through e.g. pulling ahead of product launches or discounts for customers who pay a deposit
5. **Identify and utilize supportive government policies**, such as accelerated loans or preferential interest rates
6. **Negotiate with banks for extended payment terms for lines of credit**

Financial year profitability

7. **Set up a spend control tower** to help regulate indirect spending in order to prevent costs for crisis response measures from spiraling
8. **Reduce staff costs** by offering voluntary unpaid leave or redeploying employees to unaffected regions
9. **Postpone costly product launches** that would not contribute to financial year profitability
10. **Determine underutilized, loss-making production locations** and identify opportunities to temporarily suspend operations until crisis ceases
11. **Stop, cancel or delay all non-essential CAPEX** or other investments with a payback period greater than three months until operations resume back to normal
12. **Review contracts for extreme event clauses** and identify what can be cancelled in light of COVID-19 crisis (e.g., sponsoring contracts, facility leases etc.)

External support

13. **Grant dealers more lenient payment terms** during duration of COVID-19 crisis if own position allows for it
14. **Consider financing of suppliers** to avoid bankruptcies and long-term disruptions stemming from COVID-19 outbreak (e.g., through advance payments or acceptance of price increases)

Mid-term (3-4 months)

Partnerships

15. **Identify potential partnership and M&A opportunities** for mutual benefit in face of crisis
16. **Review measures** (e.g. indirect spend approval processes) to maintain for sustainable improvement in profitability and resilience
17. **Build more flexibility into supplier contracts** to enable more agile response in case of extreme events going forward

Source: McKinsey