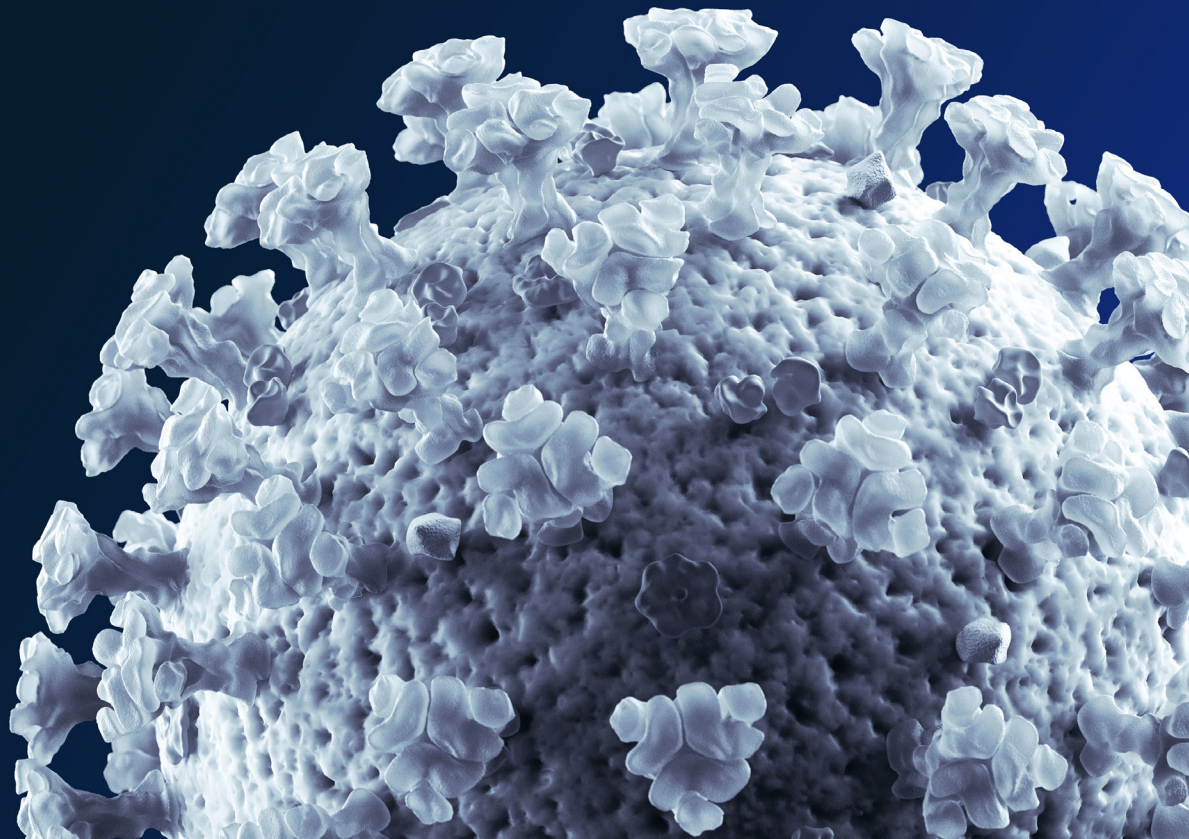


Risk Practice

COVID-19: Briefing note, March 9, 2020

A range of outcomes is possible. Decision makers should not assume the worst.

by Matt Craven, Linda Liu, Mihir, Mysore, and Matt Wilson



© Andriy Onufriyenko/Getty Images

Less than ten weeks have passed since China reported the existence of a new virus to the World Health Organization. This virus, now known as SARS-CoV-2, causing COVID-19 disease, spread quickly in the city of Wuhan and throughout China. The country has experienced a deep humanitarian challenge, with more than 80,000 cases and more than 3,000 deaths. COVID-19 progressed quickly beyond China's borders. Four other major transmission complexes are now established across the world: East Asia (especially South Korea, with more than 7,000 cases, as well as Singapore and Japan), the Middle East (centered in Iran, with more than 5,800 cases), Europe (especially the Lombardy region in northern Italy, with close to 5,900 cases, but with widespread transmission across the continent), and the United States, with more than 200 cases. Each of these transmission complexes has sprung up in a region where millions of people travel every day for social and economic reasons, making it difficult to prevent the spread of the disease. In addition to these major complexes, many other countries have been affected. Exhibit 1 offers a snapshot of the current progress of the disease and its economic impact.

The next phases of the outbreak are profoundly uncertain. In our view, the prevalent narrative, focused on pandemic, to which both markets and policy makers have gravitated as they respond to the virus, is possible but underweights the possibility of a more optimistic outcome. In this briefing note, we attempt to distinguish the things we know from those we don't, and the potential implications of both sets of factors. We then outline three potential economic scenarios, to illustrate the range of possibilities, and conclude with some discussion of the implications for companies' supply chains, and seven steps businesses can take now to prepare.

Our perspective is based on our analysis of past emergencies and on our industry expertise. It is only one view, however. Others could review the same facts and emerge with a different view. Our scenarios should be considered only as three among many possibilities. This perspective is current as of March 9, 2020. We will update it regularly as the outbreak evolves.

What we know, and what we are discovering

What we know. Epidemiologists are in general agreement on two characteristics of COVID-19:

- **The virus is highly transmissible.** Both observed experience and emerging scientific evidence show that the virus causing COVID-19 is easily transmitted from person to person. The US Centers for Disease Control and Prevention estimates that the virus's reproduction number (the number of additional cases that likely result from an initial case) is between 1.6 and 2.4, making COVID-19 significantly more transmissible than seasonal flu (whose reproduction number is estimated at 1.2 to 1.4) (Exhibit 2).
- **The virus disproportionately affects older people with underlying conditions.** Epidemiologists Zunyou Wu and Jennifer McGoogan analyzed a report from China Centers for Disease Control and Prevention that looked at more than 72,000 cases and concluded that the fatality rate for patients 80 and older was seven times the average, and three to four times the average for patients in their 70s.¹ Other reports describe fatality rates for people under 40 to be 0.2 percent.

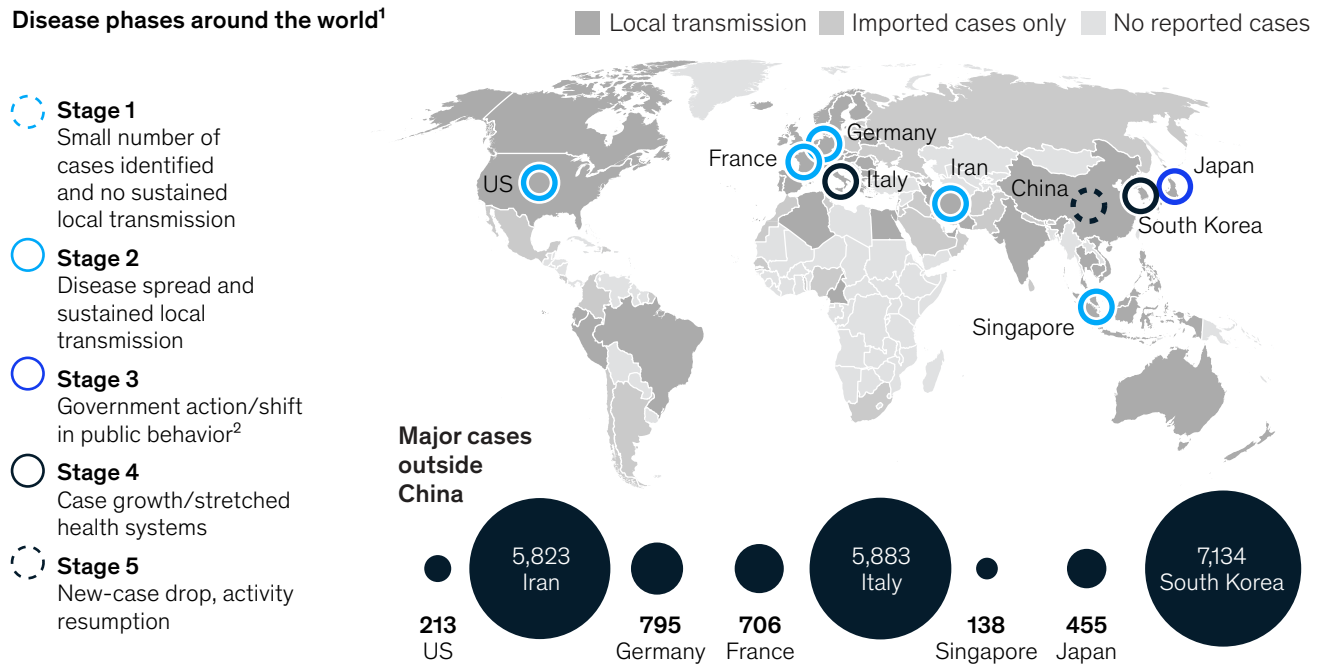
What we are still discovering. Three characteristics of the virus are not fully understood, but are key variables that will affect how the disease progresses, and the economic scenario that evolves:

- **The extent of undetected milder cases.** We know that those infected often display only mild symptoms (or no symptoms at all), so it is easy for public-health systems to miss such cases. For example, 55 percent of the cases on board the Diamond Princess cruise ship did not exhibit significant symptoms (even though many passengers were middle-aged or older). But we don't know for sure whether official statistics are capturing 80 percent, 50 percent, or 20 percent of cases.

¹ Wu Zunyou and Jennifer M. McGoogan, "Characteristics of and important lessons from the coronavirus disease 2019 (COVID-19) outbreak in China," *JAMA: Journal of the American Medical Association*, February 2020, jamanetwork.com.

Critical indicators of the impact of COVID-19 (March 9, 2020)

Disease phases around the world¹



¹The stage indicators highlight representative transmission sites. There are other sites at stages 1 and 2 that are not represented on this map. The previous version of the map used community transmission and local transmission interchangeably, based on the WHO definition. ²Not all affected regions enter stage 3, but significant government intervention/economic impact signal prolonged recovery. Source: CNBC; *Economist*; EgyptAir; International Air Transport Association; Johns Hopkins Center for Systems Science and Engineering; *New York Times*; OAG Aviation Worldwide; Reuters; World Health Organization situation reports

Impact of COVID-19 on Hubei, China

Question: How deeply is Hubei (especially Wuhan city) affected, and when could economic activity restart?

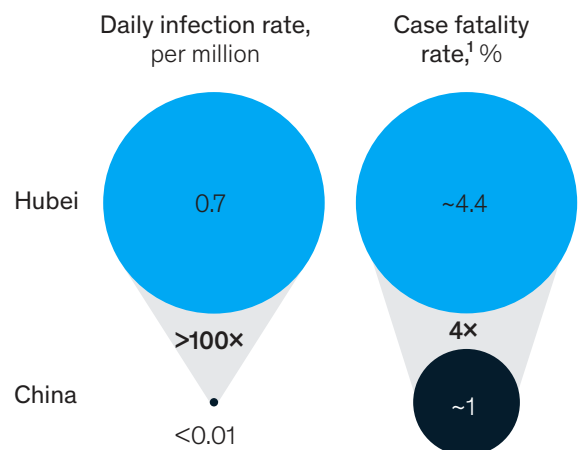
LATE
Q2

- Hubei remains deeply affected
- Return to economic activity tough to foresee until mid Q2

Hubei recovery milestones to watch

- 1 Rate of confirmed cases consistently decreasing
- 2 New suspected/confirmed cases rate consistent with other provinces
- 3 Quarantine lifted
- 4 No additional spikes in case count
- 5 Public transport resumes
- 6 Factory activity returns to pre-outbreak levels

Hubei epidemiological status



¹Case-fatality rate (CFR) calculated as (deaths on day X) / (cases on day X). Note that previous versions of this dashboard calculated CFR = (deaths on day X) / (cases on day X-7) to account for disease incubation period. We changed the definition because the old formula was causing confusion for some readers.

Source: Baidu QianXi; Centers for Disease Control; Columbia University; *Economist*; EgyptAir; *Jakarta Post*; Johns Hopkins Center for Systems Science and Engineering; London School of Hygiene & Tropical Medicine; National Bureau of Statistics of China; *New York Times*; OAG Aviation Worldwide; Organisation for Economic Co-operation Development; Peking University HSBC Business School; Reuters; TomTom Traffic Index; World Health Organization situation reports; Xian Jiaotong University; McKinsey Global Institute

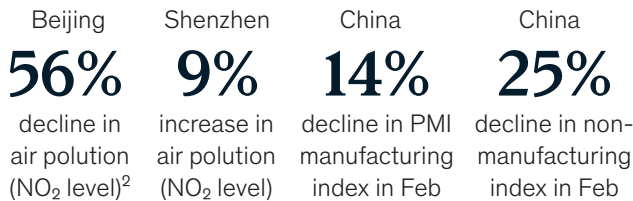
Impact on China's economy

Question: How quickly could economic activity restart in the rest of China?¹

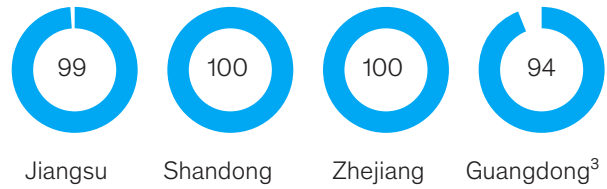
LATE Q1

- Restart has begun but faces challenges—worker shortage and goods movement
- Larger companies witnessing higher business-resumption rate
- Small businesses are facing labor disruption—fewer workers returning
- Industrial activity likely to return late Q1

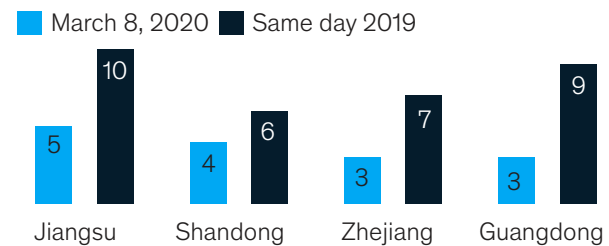
Industrial indicators



Industrial enterprises that have resumed work, %



Labor availability: inbound labor to major industrial provinces in China, index⁴



¹Latest data from Guangdong as of March 5, 2020, Shandong as of March 1, 2020, Zhejiang as of Feb 26, 2020, and Jiangsu as of March 1, 2020. ²Nitrogen dioxide 7-day average (March 5 to March 9) compared with 2019. ³Latest data from Guangdong as of March 5, 2020, while other provinces were as of Feb 17, 2020. ⁴The Baidu migration index represents the movement of population into a particular province in China. The index magnitudes are proportional to the volume of people as of Feb 24, 2020.

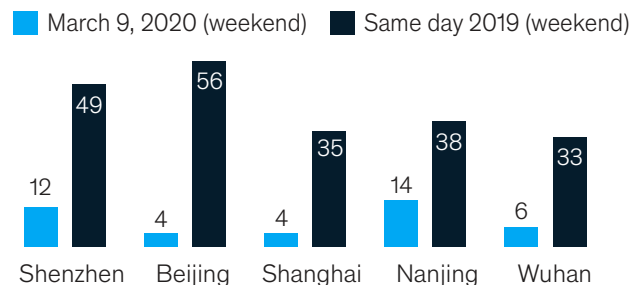
Impact on Chinese consumers' confidence

Question: How quickly will Chinese consumer confidence and purchasing activity return?

EARLY Q2

- Lags behind economic restart but has proved resilient (eg, online boom)
- Certain sectors (eg, tourism, hospitality) will be affected well into Q2 or longer

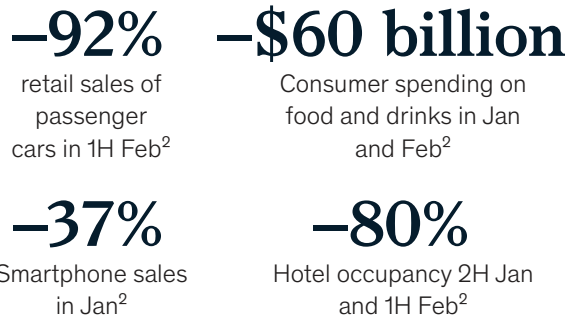
Automobile-traffic index¹



School restart dates, number of provinces



Example consumer-behavior metrics (anecdotal)



¹Car traffic only. Congestion level measures % increase in travel time compared with free-flow condition. ²Year-over-year comparison.

— **Seasonality.** There is no evidence so far about the virus's seasonality (that is, a tendency to subside in the northern hemisphere as spring progresses). Coronaviruses in animals are not always seasonal but have historically been so in humans for reasons that are not fully understood. In the current outbreak, regions with higher temperatures (such as Singapore, India, and Africa) have not yet seen a broad, rapid propagation of the disease.

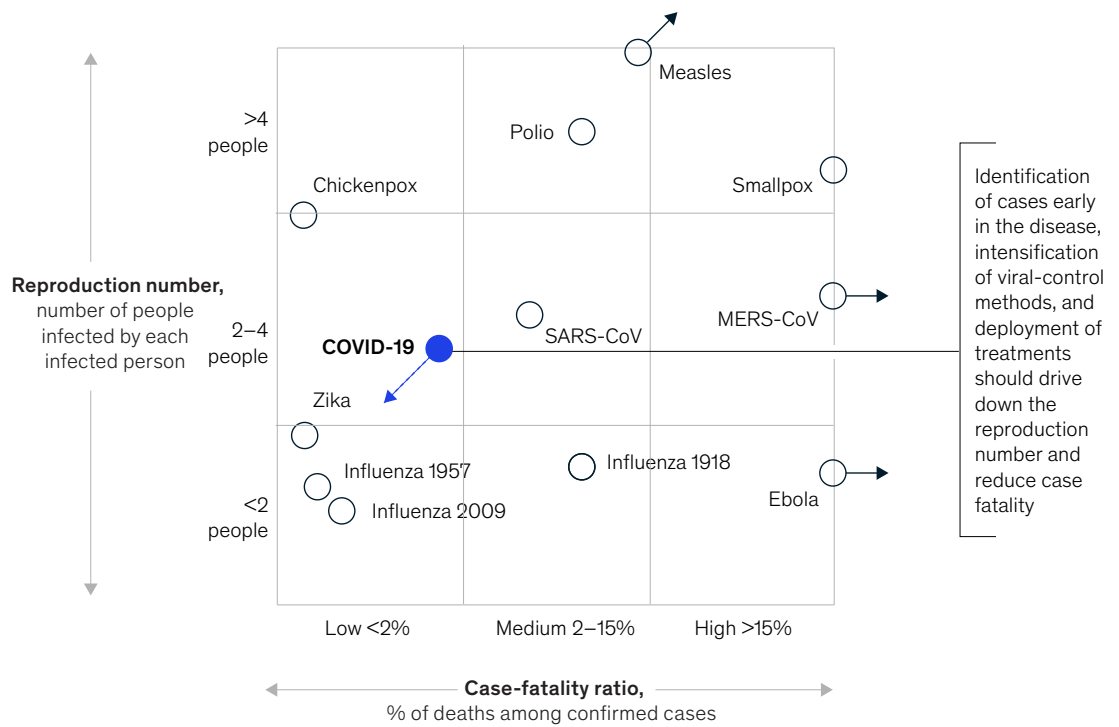
— **Asymptomatic transmission.** The evidence is mixed about whether asymptomatic people can transmit the virus, and about the length of the incubation period. If asymptomatic transfer is a major driver of the epidemic, then different public-health measures will be needed.

These factors notwithstanding, we have seen that robust public-health responses, like those in China outside Hubei and in Singapore, can help stem

Exhibit 2

COVID-19 is more infectious than influenza.

Reproduction¹ and fatality² for selected human viruses



¹As determined at the beginning of an outbreak; can be reduced by effective intervention.

²Case-fatality numbers are reflective of the outbreak setting and depend on a number of factors, including patient's age, community immunity, health-system capabilities, etc. This graphic aims to offer a broad comparison.

Source: World Health Organization; McKinsey analysis

the epidemic (Exhibit 3). But it remains to be seen how these factors will play out and the direct impact they will have. The economic impact too will vary considerably.

Economic impact

In our analysis, three broad economic scenarios might unfold: a quick recovery, a global slowdown, and a pandemic-driven recession. Here, we outline all three (Exhibit 4). We believe that the prevalent pessimistic narrative (which both markets and policy makers seem to favor as they respond to the virus) underweights the possibility of a more optimistic outcome to COVID-19 evolution.

Quick recovery

In this scenario, case count continues to grow, given the virus's high transmissibility. While this

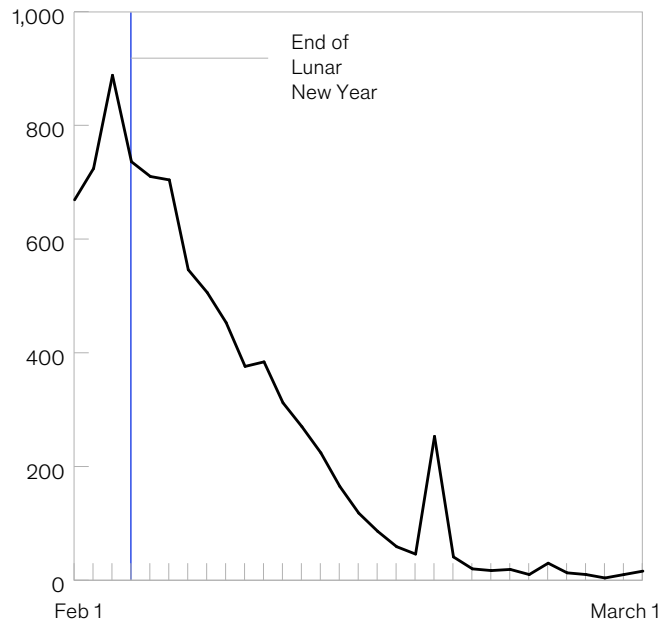
inevitably causes a strong public reaction and drop in demand, other countries are able to achieve the same rapid control seen in China, so that the peak in public concern comes relatively soon (within one to two weeks). Given the low fatality rates in children and working-age adults, we might also see levels of concern start to ebb even as the disease continues to spread. Working-age adults remain concerned about their parents and older friends, neighbors, and colleagues, and take steps to ensure their safety. Older people, especially those with underlying conditions, retrench pull back from many activities. Most people outside the transmission complexes continue their normal daily lives.

The scenario assumes that younger people are affected enough to change some daily habits (for example, they wash hands more frequently) but not so much that they shift to survival mode and take

Exhibit 3

New cases in China have fallen dramatically.

Daily incremental cases outside Hubei, number



Source: *BMJ*; expert interviews; World Bank Development Indicators; World Health Organization

Exhibit 4

Three scenarios for COVID-19 would have three very different outcomes.

Assumptions

	Quick recovery	Global slowdown	Global pandemic and recession
Public-health response	● Similar effectiveness to China	● Less effective than China	● Less effective than China
Seasonality	● Virus is seasonal	● Virus is seasonal	● Virus is not seasonal
Fatality ratio	● Similar to flu	● Higher than or near flu, dependent on health-system response	● Higher than flu, because of disease characteristics or insufficient health-system response
Change in behaviors	● Localized. Working populations change some habits but most economic activity persists	● Mostly local, some general. Greater shift in daily behaviors	● Generalized

Expected economic impact

	Quick recovery	Global slowdown	Global pandemic and recession
China	● Recovery is largely complete, including Hubei by early Q2	● Recovery is largely complete, including Hubei by early Q2	● Recovery leads to resumption of pre-outbreak routines, which drives new transmissions; complete by Q3
Rest of world	<ul style="list-style-type: none"> ● Relatively fast rebound by end Q1 in Europe and US after initial acute drop in consumer demand ● Other economies (Middle East, rest of Asia, Africa, LatAm) see varied impact 	<ul style="list-style-type: none"> ● Europe, US see economic slowdown until mid Q2 ● Certain sectors (aviation, hospitality) deeply affected ● Other sectors, such as consumer, see acute initial drop but recover by end Q2 	<ul style="list-style-type: none"> ● Europe, US see generalized reaction ● Global recession ● Consumer confidence does not recover until end Q3 or beyond

Source: Expert interviews; McKinsey analysis

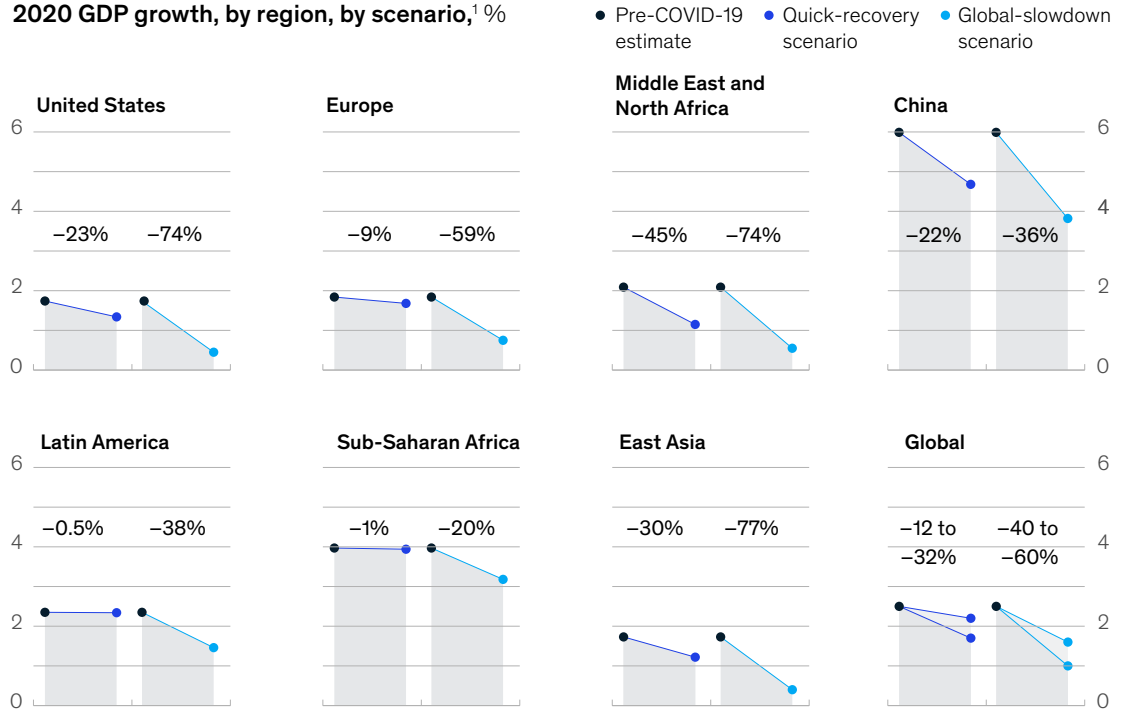
steps that come at a higher cost, such as staying home from work and keeping children home from school. A complicating factor, not yet analyzed, is that workers in the gig economy, such as ride-share drivers, may continue to report to work despite requests to stay home, lest they lose income. This scenario also presumes that the virus is seasonal.

In this scenario, our model developed in partnership with Oxford Economics suggests that global GDP growth for 2020 falls from previous consensus

estimates of about 2.5 percent to about 2.0 percent (Exhibit 5). The biggest factors are a fall in China's GDP from nearly 6 percent growth to about 4.6 percent; a 0.5 percent drop in GDP growth for East Asia; and a 0.3 percent to 0.5 percent drop for other large economies around the world. The US economy recovers by the end of Q1. By that point, China resumes most of its factory output; but consumer confidence there does not fully recover until end Q2. These are estimates, based on a particular scenario. They should not be considered predictions.

Global GDP in 2020 could slide or fall sharply due to the COVID-19 outbreak, depending on scenario.

2020 GDP growth, by region, by scenario,¹ %



¹Global-slowdown scenario model outputs are provisional and subject to change.

Source: Industry reports; Oxford Economics; press articles; World Health Organization; McKinsey analysis

Global slowdown

This scenario assumes that most countries are not able to achieve the same rapid control that China managed. In Europe and the United States, transmission is high but remains localized, partly because individuals, firms, and governments take strong countermeasures (including school closings and cancellation of public events). For the United States, the scenario assumes between 10,000 and 500,000 total cases. It assumes one major epicenter with 40 to 50 percent of all cases, two or three smaller centers with 10 to 15 percent of all cases, and a “long tail” of towns with a handful or a few dozen cases. This scenario sees some spread in Africa, India, and other densely populated areas, but the transmissibility of the virus declines naturally with the northern hemisphere spring.

This scenario sees much greater shifts in people’s daily behaviors. This reaction lasts for six to eight weeks in towns and cities with active transmission, and three to four weeks in neighboring towns. The resulting demand shock cuts global GDP growth for 2020 in half, to between 1 percent and 1.5 percent, and pulls the global economy into a slowdown, though not recession.

In this scenario, a global slowdown would affect small and midsize companies more acutely. Less developed economies would suffer more than advanced economies. And not all sectors are equally affected in this scenario. Service sectors, including aviation, travel, and tourism, are likely to be hardest hit. Airlines have already experienced a steep fall in traffic on their highest-profit international routes

(especially in Asia–Pacific). In this scenario, airlines miss out on the summer peak travel season, leading to bankruptcies (FlyBe, the UK regional carrier, is an early example) and consolidation across the sector. A wave of consolidation was already possible in some parts of the industry; COVID-19 would serve as an accelerant.

In consumer goods, the steep drop in consumer demand will likely mean delayed demand. This has implications for the many consumer companies (and their suppliers) that operate on thin working-capital margins. But demand returns in May–June as concern about the virus diminishes. For most other sectors, the impact is a function primarily of the drop in national and global GDP, rather than a direct impact of changed behaviors. Oil and gas, for instance, will be adversely affected as oil prices stay lower than expected until Q3.

Pandemic and recession

This scenario is similar to the global slowdown, except it assumes that the virus is not seasonal (unaffected by spring in the northern hemisphere). Case growth continues throughout Q2 and Q3, potentially overwhelming healthcare systems around the world and pushing out a recovery in consumer confidence to Q3 or beyond. This scenario results in a recession, with global growth in 2020 falling to between –1.5 percent and 0.5 percent.

Supply-chain challenges

For many companies around the world, the most important consideration from the first ten weeks of the COVID-19 outbreak has been the effect on supply chains that begin in or go through China. As a result of the factory shutdowns in China during Q1, many disruptions have been felt across the supply chain, though the full effects are of course still unclear.

Hubei is still in the early phases of its recovery; case count is down, but fatality rates remain high, and many restrictions remain that will prevent a resumption of normal activity until early Q2. In the rest of China, however, many large companies report that they are running at more than 90 percent capacity as of March 1. While some real challenges remain, such as lower than usual availability of migrant labor, there is little question that plants are returning back to work quickly.

Trucking capacity to ship goods from factories to ports is at about 60 to 80 percent of normal capacity. Goods are facing delays of between eight and ten days on their journey to ports.

The Baltic Dry Index (which measures freight rates for grains and other dry goods around the world) dropped by about 15 percent at the onset of the outbreak but has increased by nearly 30 percent since then. The TAC index, which measures air-freight prices, has also risen by about 15 percent since early February.

In the next few months, the phased restart of plants outside Hubei (and the slower progress of plants within Hubei) is likely to lead to challenges in securing critical parts. As inventories are run down faster, parts shortages are likely to become the new reason why plants in China cannot operate at full capacity. Moreover, plants that depend on Chinese output (which is to say, most factories around the world) have not yet experienced the brunt of the initial Chinese shutdown and are likely to experience inventory “whiplash” in the coming weeks.

Perhaps the biggest uncertainty for supply-chain managers and production heads is customer demand. Customers that have prebooked logistics capacity may not use it; customers may compete for prioritization in receiving a factory’s output; and the unpredictability of the timing and extent of demand rebound will mean confusing signals for several weeks.

Responding to COVID-19

In our experience, seven actions can help businesses of all kinds. We outline them here as an aid to leaders as they think through crisis management for their companies. These are only guidelines; they are by no means exhaustive or detailed enough to substitute for a thorough analysis of a company's particular situation.

Protect your employees. The COVID-19 crisis has been emotionally challenging for many people, changing day-to-day life in unprecedented ways. For companies, business as usual is not an option. They can start by drawing up and executing a plan to support employees that is consistent with the most conservative guidelines that might apply and has trigger points for policy changes. Some companies are actively benchmarking their efforts against others to determine the right policies and levels of support for their people. Some of the more interesting models we have seen involve providing clear, simple language to local managers on how to deal with COVID-19 (consistent with WHO, CDC, and other health-agency guidelines) while providing autonomy to them so they feel empowered to deal with any quickly evolving situation. This autonomy is combined with establishing two-way communications that provide a safe space for employees to express if they are feeling unsafe for any reason, as well as monitoring adherence to updated policies.

Set up a cross-functional COVID-19 response team.

Companies should nominate a direct report of the CEO to lead the effort and should appoint members from every function and discipline to assist. Further, in most cases, team members will need to step out of their day-to-day roles and dedicate most of their time to virus response. A few workstreams will be common for most companies: a) employees' health, welfare, and ability to perform their roles; b) financial stress-testing and development of a contingency plan; c) supply-chain monitoring, rapid response, and long-term resiliency (see below for more); d) marketing and sales responses to demand shocks; and e) coordination and communication with relevant constituencies. These subteams should define specific goals for the next 48 hours, adjusted continually, as well as weekly goals, all based on

the company's agreed-on planning scenario. The response team should install a simple operating cadence and discipline that focuses on output and decisions, and does not tolerate meetings that achieve neither.

Ensure that liquidity is sufficient to weather the storm. Businesses need to define scenarios tailored to the company's context. For the critical variables that will affect revenue and cost, they can define input numbers through analytics and expert input. Companies should model their financials (cash flow, P&L, balance sheet) in each scenario and identify triggers that might significantly impair liquidity. For each such trigger, companies should define moves to stabilize the organization in each scenario (optimizing accounts payable and receivable; cost reduction; divestments and M&A).

Stabilize the supply chain. Companies need to define the extent and likely duration of their supply-chain exposure to areas that are experiencing community transmission, including tier-1, -2, and -3 suppliers, and inventory levels. Most companies are primarily focused on immediate stabilization, given that most Chinese plants are currently in restart mode. They also need to consider rationing critical parts, prebooking rail/air-freight capacity, using after-sales stock as a bridge until production restarts, gaining higher priority from their suppliers, and, of course, supporting supplier restarts. Companies should start planning how to manage supply for products that may, as supply comes back on line, see unusual spikes in demand due to hoarding. In some cases, medium or longer-term stabilization may be warranted, which calls for updates to demand planning, further network optimization, and searching for and accelerating qualification of new suppliers. Some of this may be advisable anyway, absent the current crisis, to ensure resilience in their supply chain—an ongoing challenge that the COVID-19 situation has clearly highlighted.

Stay close to your customers. Companies that navigate disruptions better often succeed because they invest in their core customer segments and anticipate their behaviors. In China, for example, while consumer demand is down, it has not disappeared—people have dramatically shifted

toward online shopping for all types of goods, including food and produce delivery. Companies should invest in online as part of their push for omnichannel distribution; this includes ensuring the quality of goods sold online. Customers' changing preferences are not likely to go back to pre-outbreak norms.

Practice the plan. Many top teams do not invest time in understanding what it takes to plan for disruptions until they are in one. This is where roundtables or simulations are invaluable. Companies can use tabletop simulations to define and verify their activation protocols for different phases of response (contingency planning only, full-scale response, other). Simulations should

clarify decision owners, ensure that roles for each top-team member are clear, call out the “elephants in the room” that may slow down the response, and ensure that, in the event, the actions needed to carry out the plan are fully understood and the required investment readily available.

Demonstrate purpose. Businesses are only as strong as the communities of which they are a part. Companies need to figure out how to support response efforts—such as by providing money, equipment, or expertise. For example, a few companies have shifted production to create medical masks and clothing.

The checklist in Exhibit 6 can help companies make sure they are doing everything necessary.

Exhibit 6

COVID-19 response: Companies can draw on seven sets of immediate actions.

1 Protect employees

- Follow the most conservative guidelines available from leading global and local health authorities (eg, CDC, WHO)
- Communicate with employees frequently and with the right specificity; support any affected employees per health guidance
- Benchmark your efforts (eg, some companies have started to curb nonessential travel)

2 Set up cross-functional response team

- Overall lead should be at the CEO or CEO-1 level; team should be cross-functional and dedicated
- Create 5 workstreams: a) employees; b) financial stress-testing and contingency plan; c) supply chain; d) marketing and sales; e) other relevant constituencies
- Define specific, rolling 48-hour and 1-week goals for each workstream based on planning scenario
- Ensure a simple but well managed operating cadence and discipline that's output and decision focused. Low tolerance for “meetings for the sake of meetings”
- Present minimum viable products: a) rolling 6-week calendar of milestones; b) 1-page plans for each workstream; c) dashboard of progress and triggers; d) threat map

3 Test for stress, ensure liquidity, and build a contingency plan

- Define scenarios that are tailored to the company. Identify planning scenario
- Identify variables that will affect revenue and cost. For each scenario, define input numbers for each variable through analytics and expert input
- Model cash flow, P&L, and balance sheet in each scenario; identify input-variable triggers that could drive significant liquidity events (including breach of covenants)
- Identify trigger-based moves to stabilize organization in each scenario (A/P, A/R optimization; cost reduction; portfolio optimization through divestments, M&A)

4 Stabilize the supply chain

- Define extent and timing of exposure to areas that are experiencing community transmission (tier-1, -2, -3 suppliers; inventory levels)
- Immediate stabilization (ration critical parts, optimize alternatives, prebook rail/air-freight capacity, use after-sales stock as bridge, increase priority in supplier production, support supplier restart)
- Medium/longer-term stabilization (updated demand planning and network optimization—solve for cash, accelerate qualification for alternative suppliers, drive resilience in supply chain)

5 Stay close to customers

- Immediate stabilization (inventory planning, near-term pricing changes, discounts)
- Medium/longer-term stabilization (investment and microtargeting for priority segments with long-term growth)

6 Practice plan with top team through in-depth tabletop exercise

- Define activation protocol for different phases of response (eg, contingency planning only, full-scale response, other)
- Key considerations: clarity on decision owner (ideally a single leader), roles for each top-team member, “elephant in room” that may slow response, actions and investment needed to carry out plan

7 Demonstrate purpose

- Support epidemic efforts where possible

The coronavirus crisis is a story with an unclear ending. What is clear is that the human impact is already tragic, and that companies have an imperative to act immediately to protect their employees, address business challenges and risks, and help to mitigate the outbreak in whatever ways they can.

We welcome your comments and questions at coronavirus_client_response@mckinsey.com.

For more of the latest information on COVID-19, please see reports from the European Centre for Disease Control and Prevention, the US Centers for Disease Control and Prevention, and the World Health Organization; and Johns Hopkins University's live tracker of global cases.

Matt Craven is a partner in McKinsey's Silicon Valley office. **Linda Liu** is a partner in the New York office, where **Matt Wilson** is a senior partner. **Mihir Mysore** is a partner in the Houston office.

Designed by Global Editorial Services
Copyright © 2020 McKinsey & Company. All rights reserved.