

COVID-19: Briefing note

Global health and crisis response

Updated: March 25, 2020

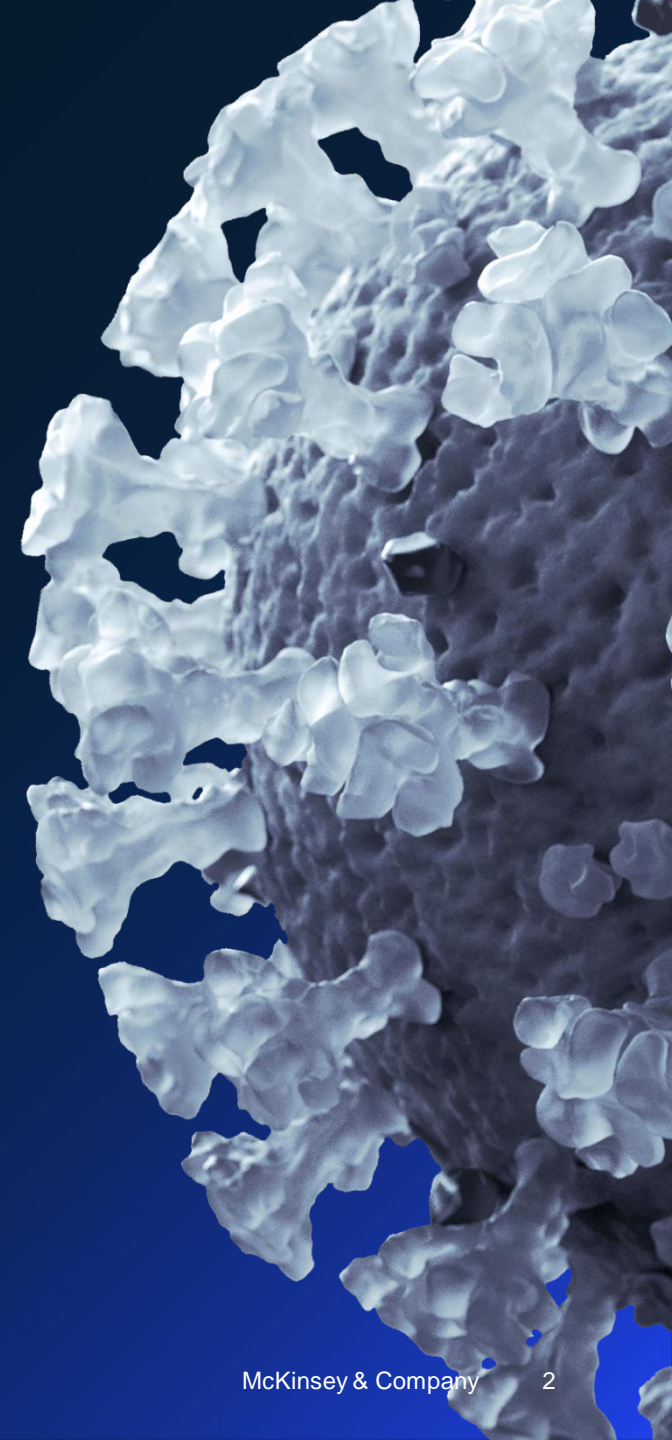
COVID-19 is, first and foremost, a global humanitarian challenge.

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.

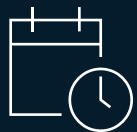
Companies around the world need to act promptly.

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 380,000 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, including 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 for institutions

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

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

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

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

Reform: Be clear about how the environment in your industry (regulations, role of government) could evolve

Across these dimensions, establishing a Nerve Center can ensure speed without sacrificing decision quality

Contents

01

COVID-19
The
situation
now

02

Scenarios
and path
forward

03

Sector-
specific
impact

04

Planning &
managing
COVID-19
responses

05

Leading
indicator
dashboards

The global spread is accelerating with more reports of local transmission

Latest as of March 25, 2020

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

Impact to date

>380,000

Reported confirmed cases

>16,000

Deaths

194

Countries or territories with reported cases¹

>115

Countries or territories with evidence of local transmission²

>75

Countries or territories with more than 100 reported cases¹

0.4%

China's share of new reported cases March 18–24

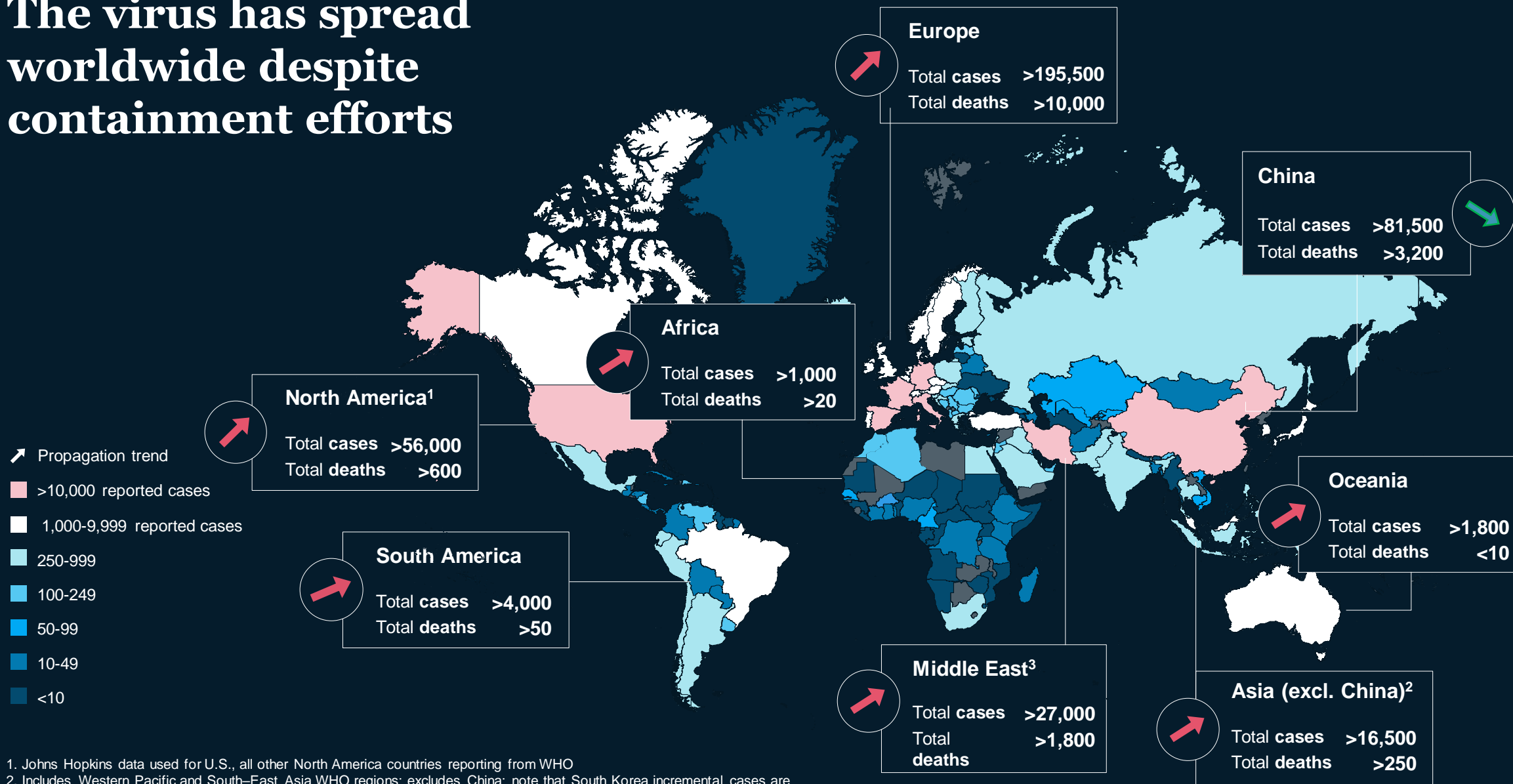
>160%

Increase in reported cases March 18–24 from Europe

35

New countries or territories with cases March 18–24

The virus has spread worldwide despite containment efforts



1. Johns Hopkins data used for U.S., all other North America countries reporting from WHO

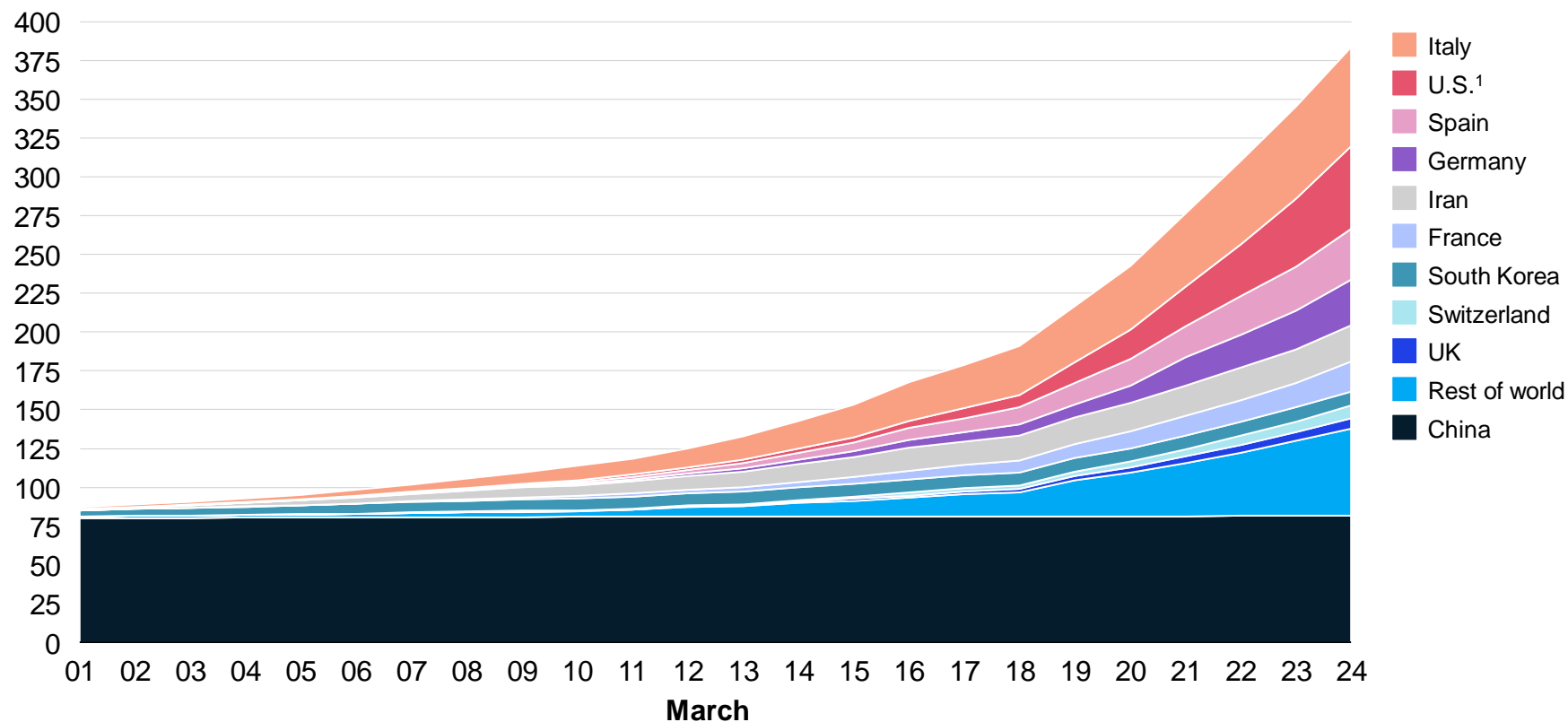
2. Includes Western Pacific and South-East Asia WHO regions; excludes China; note that South Korea incremental cases are declining, however other countries are increasing

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 – March 24

Thousands



Asia:

Incremental cases for China and South Korea have slowed significantly, with majority of new cases in China categorized as imported versus local transmission.

Europe:

In contrast, European transmission has increased significantly this month, led by Italy with nearly 60,000 total cases. Close monitoring of incremental case counts across a number of European countries in the upcoming days will be critical to determining if distancing measures are having effect.

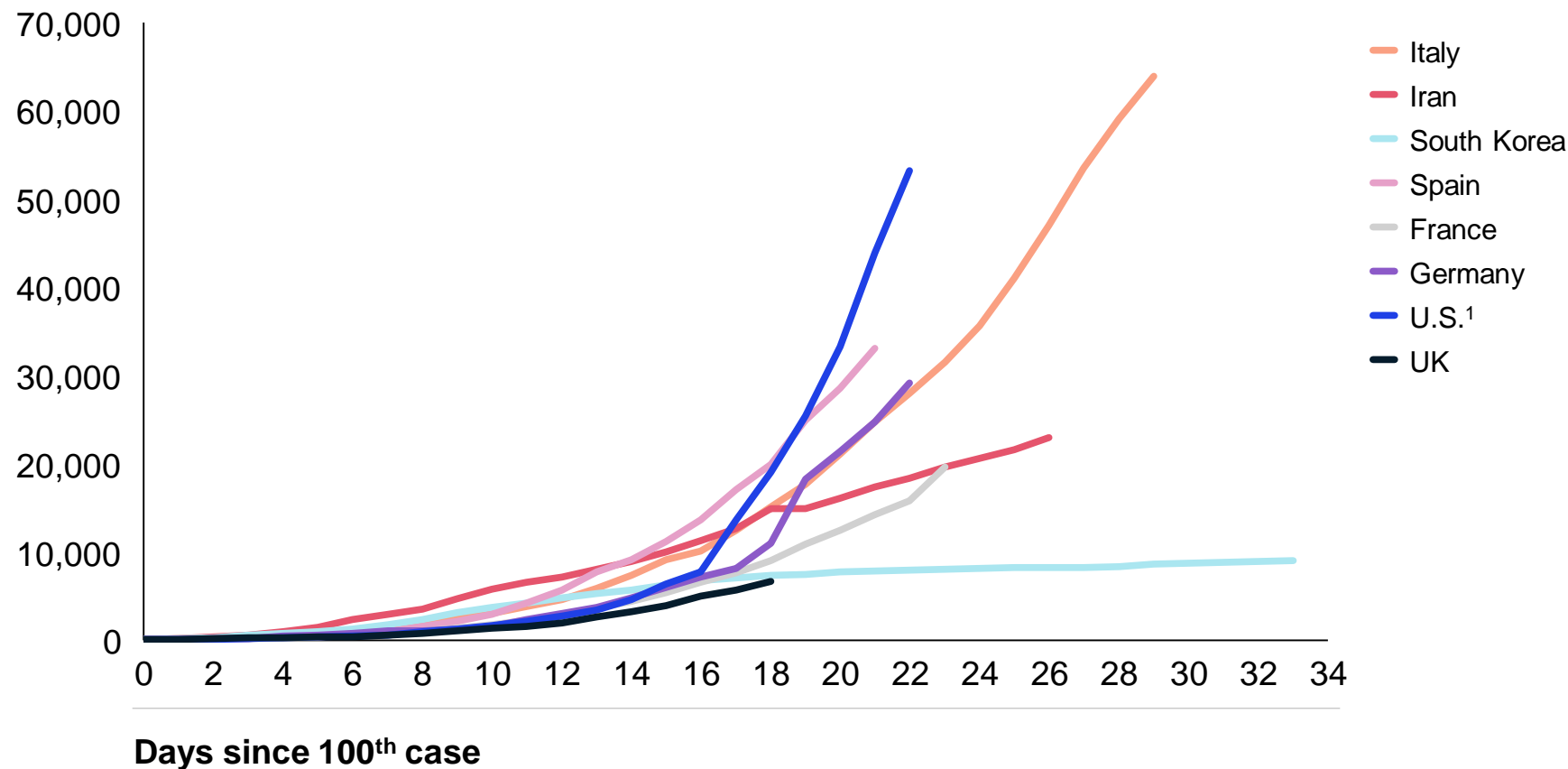
United States:

The U.S. has seen total cases increase nearly ~8x in the last week, from ~6,500 on March 17 to ~50,000+ on March 24; the U.S. now has the third largest number of total cases, following China and Italy and is growing at a rate of ~10k cases per day (March 23-March 24).

1. U.S. data from Johns Hopkins University CSSE (March 24 data point from live tracker from 1400PT); all other data from WHO Situation Reports

Countries begin with similar trajectories but curves diverge based on range of measures taken

Cumulative number of cases



1. U.S. data from Johns Hopkins University CSSE (March 24 data point from live tracker from 1400PT); all other data from WHO Situation Reports

Select country detail

Italy: Despite enforcement of national lockdown, cases are continuing to rise; low testing rates among non-critical cases in select regions may be allowing the virus to spread in undiagnosed clusters.

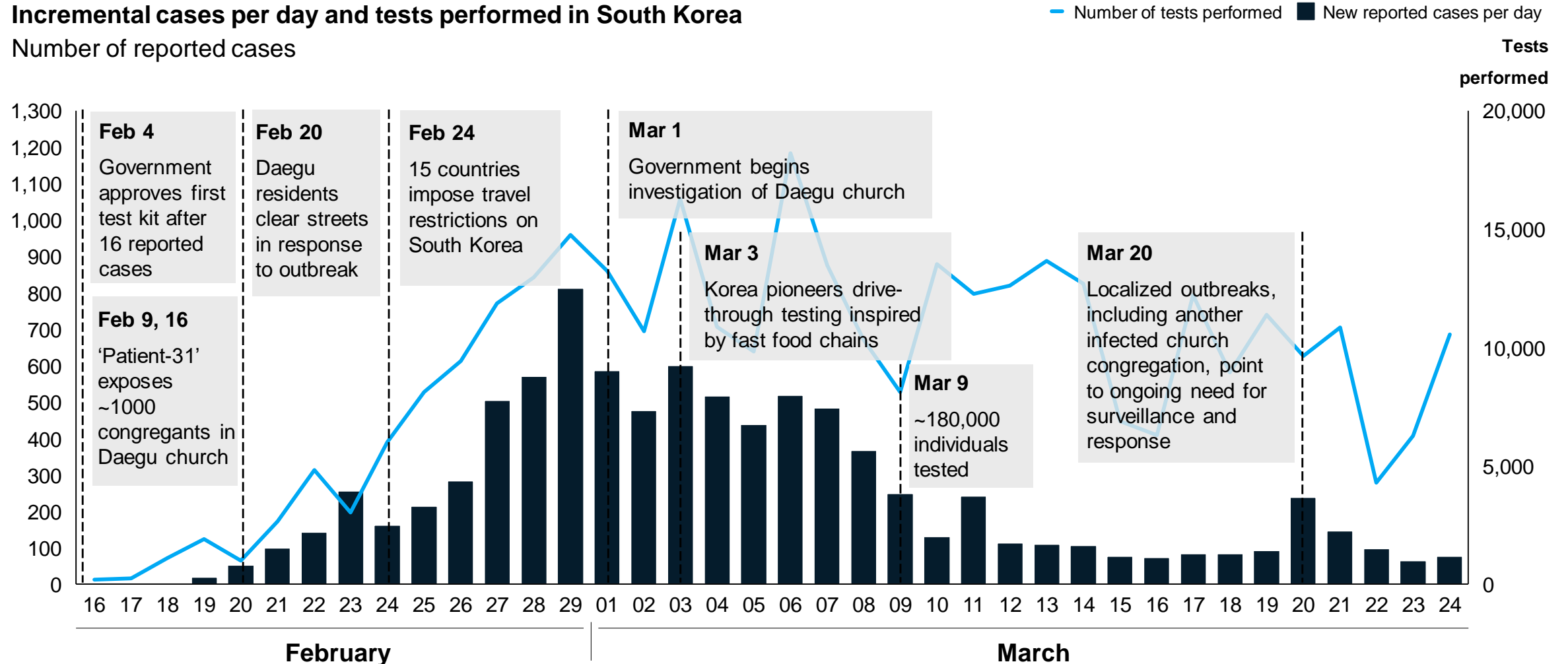
South Korea: Aggressive testing, contact tracing and surveillance, and mandatory quarantines are helping isolate virus clusters and dramatically slow spread of outbreak in Daegu.

United States: Accelerating transmission and recent scale up in testing have seen dramatic rise in cases at a rate higher than that of Italy; social distancing measures are being rolled out primarily at the state and local level.

South Korea: Rigorous investigation of outbreak clusters and rapidly scaled testing capabilities limited spread

Incremental cases per day and tests performed in South Korea

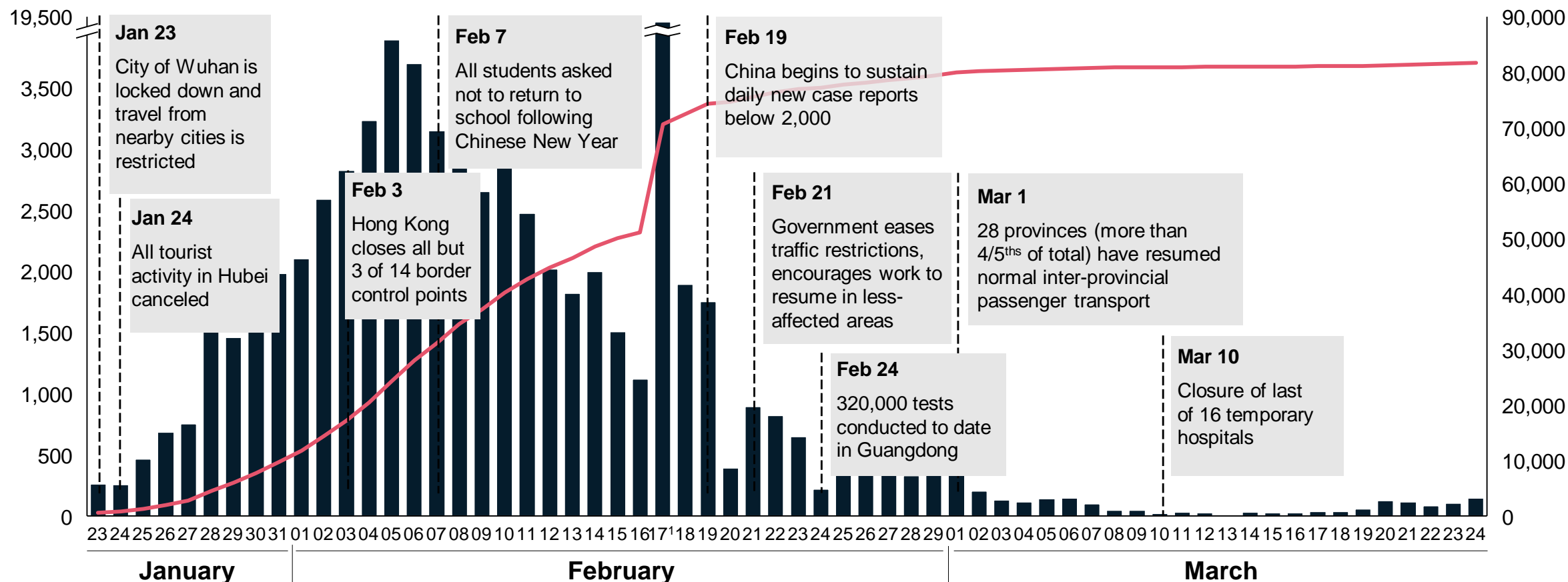
Number of reported cases



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



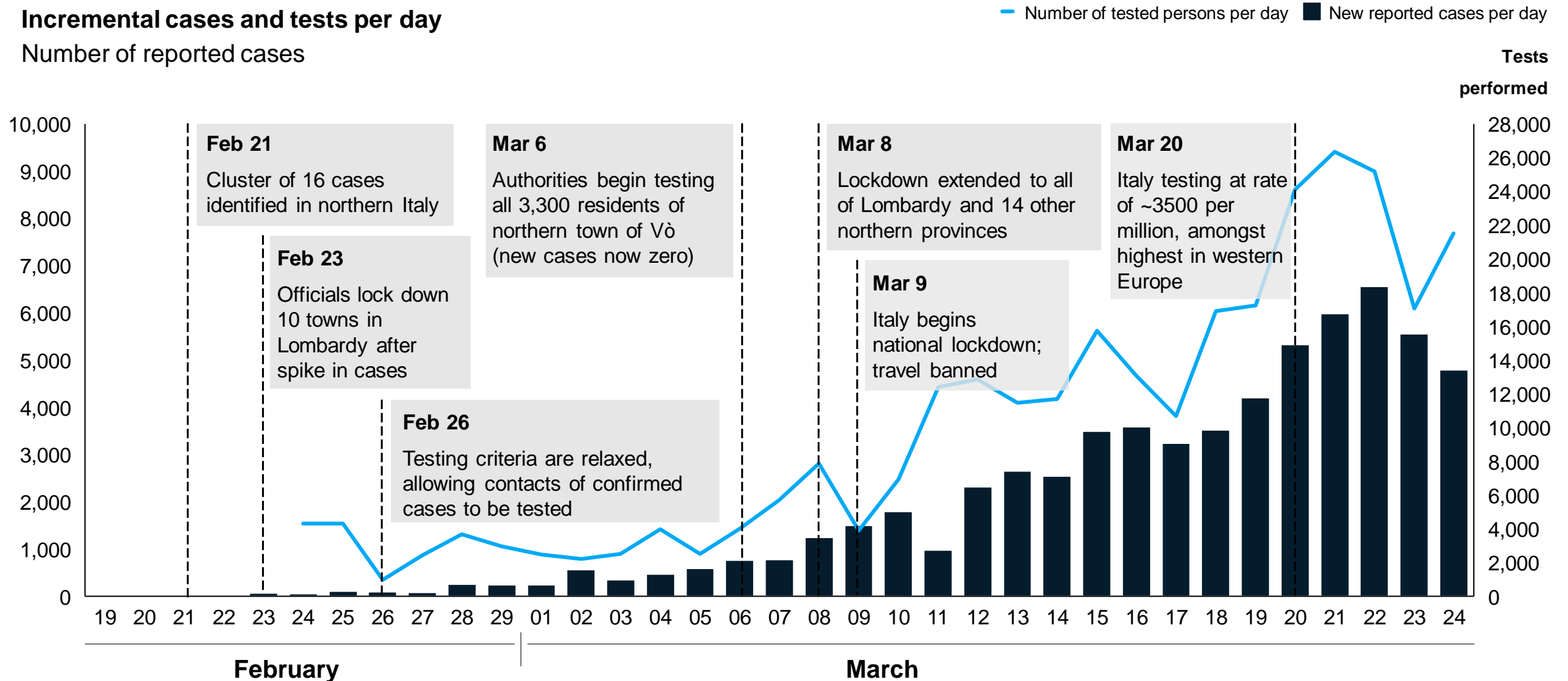
1. Changes in new case tracking and reporting methodology yield spike in reported cases

Source: WHO situation reports, New York Times, Chinese government official notices and reports, press search

Italy: As the country scales testing, the effects of national lockdown on viral transmission have yet to be determined

Incremental cases and tests per day

Number of reported cases



Western countries are largely instituting the “Early China model,” focused on immediate containment while ramping up testing

Most appropriate
for high-burden settings

Most appropriate
for low-to-medium
burden settings

Contain and restrict movement

“Early China model”

Border closures and city-level lockdowns, quarantines
“Shelter-in-place” restrictions on individual movement
Mandatory closures of businesses



Test, track, and isolate

“South Korea model”

Aggressive testing of suspected cases, clusters (5000+ tests per million population)
Contact tracing and isolation via surveillance
Quarantine enforced by government monitoring

Characteristic actions

Testing

XX = tests per million people¹

Countries' responses

U.S.



~310

State and city-level closures; testing lagging other countries

France



~560

National lockdown with strict police enforcement; has performed targeted vs. widespread testing

Spain



~640

National lockdown limiting non-essential movements; reported logistical issues limiting testing capabilities

UK



~960

Early strategy focused on scaling testing vs. lockdowns, though officials began enforcing lockdown March 20

Italy



~3,500

Imposed strict regional and national lockdowns early; testing per capita is ~4x most peer EU countries with some regions testing nearly full population

Norway



~8,000

Quickly scaled testing, e.g. drive-through testing available 7 days after first confirmed case; instituted punishment for quarantine violations

5,000

10,000 →

1. Based on University of Oxford, "Our World in Data- How many tests for COVID-19 are being performed around the world?", accessed March 20, 2020. U.S., Italy and Norway figures from March 20, Spain from March 18, UK from March 17, France from March 15.

Contents

01

COVID-19
The
situation
now

02

**Scenarios
and path
forward**

03

Sector-
specific
impact

04

Planning &
managing
COVID-19
responses

05

Leading
indicator
dashboards

The Imperative of our Time

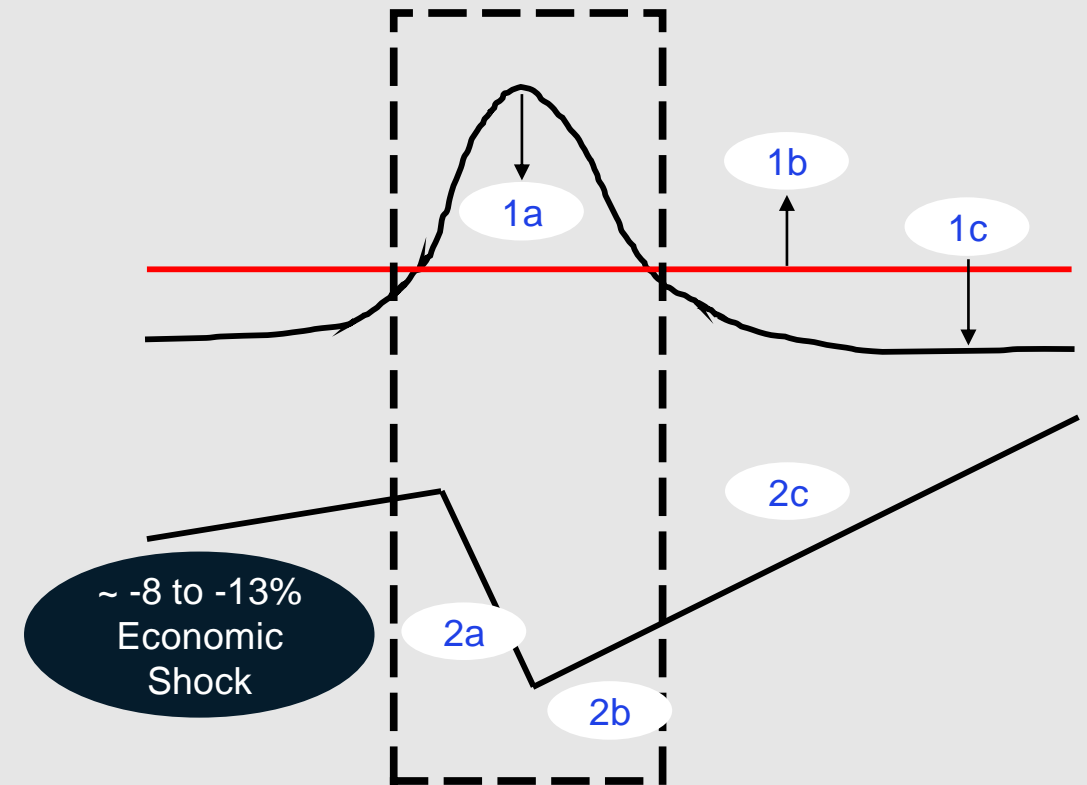
Imperative 1: **SAFEGUARD OUR LIVES**

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

Imperative 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



Scenarios for the economic impact of the COVID-19 crisis

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

Virus spread and public health response

Effectiveness of the public health response in controlling the spread and human impact of COVID-19

Rapid and effective control of virus spread

Strong public health response succeeds in controlling spread in each country within 2-3 months

Effective response, but (regional) virus resurgence

Public health response initially succeeds but measures are not sufficient to prevent viral resurgence so social distancing continues (regionally) for several months

Broad failure of public health interventions

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

B1



Virus contained, but sector damage; lower long-term trend growth

A3



Virus contained, slow recovery

A4



Virus contained; strong growth rebound

B2



Virus resurgence; slow long-term growth

A1



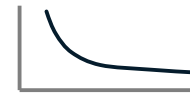
Virus resurgence; slow long-term growth
Muted World Recovery

A2



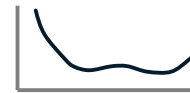
Virus resurgence; return to trend growth
Strong World Rebound

B3



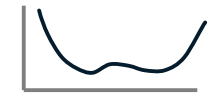
Pandemic escalation; prolonged downturn without economic recovery

B4



Pandemic escalation; slow progression towards economic recovery

B5



Pandemic escalation; delayed but full economic recovery

Ineffective interventions

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

Partially effective interventions

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

Highly effective interventions

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

Knock-on effects and economic policy response

Speed and strength of recovery depends on whether policy moves can mitigate self-reinforcing recessionary dynamics (e.g., corporate defaults, credit crunch)

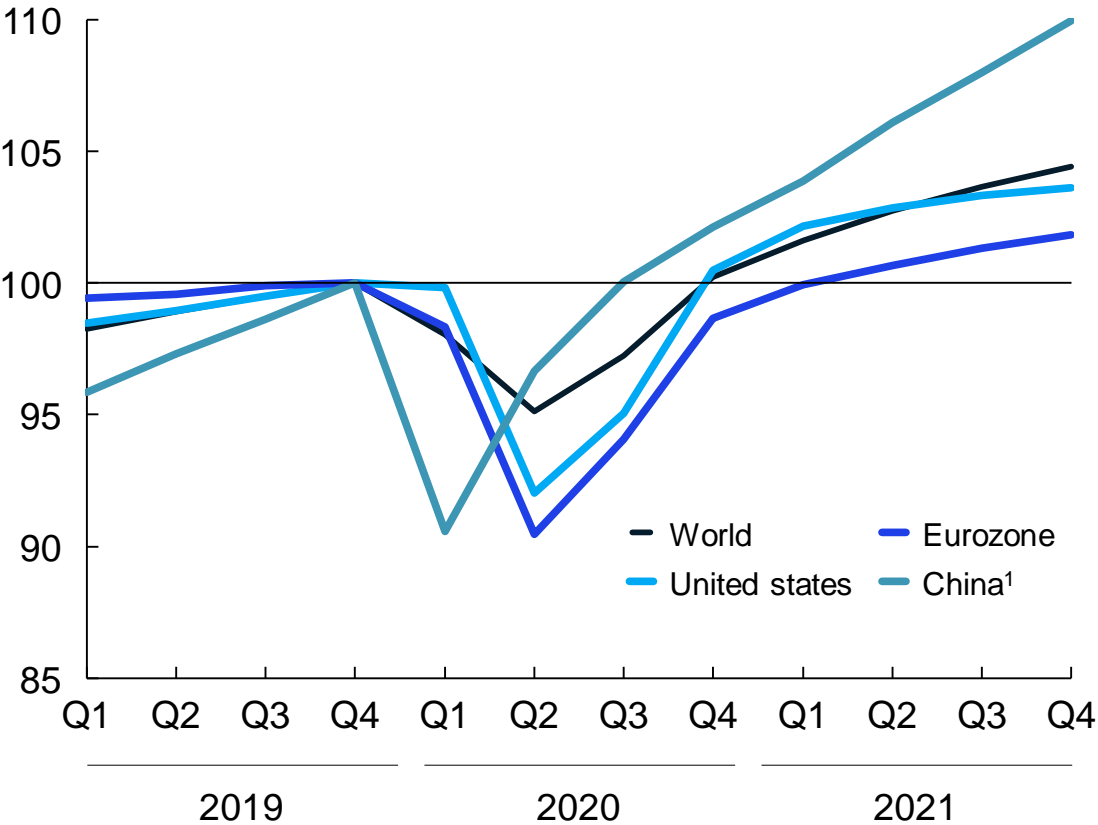
Scenario A3

Virus contained

Real GDP, Local Currency Indexed

Real GDP Growth – COVID-19 Crisis

Local Currency Units Indexed, 2019 Q4=100

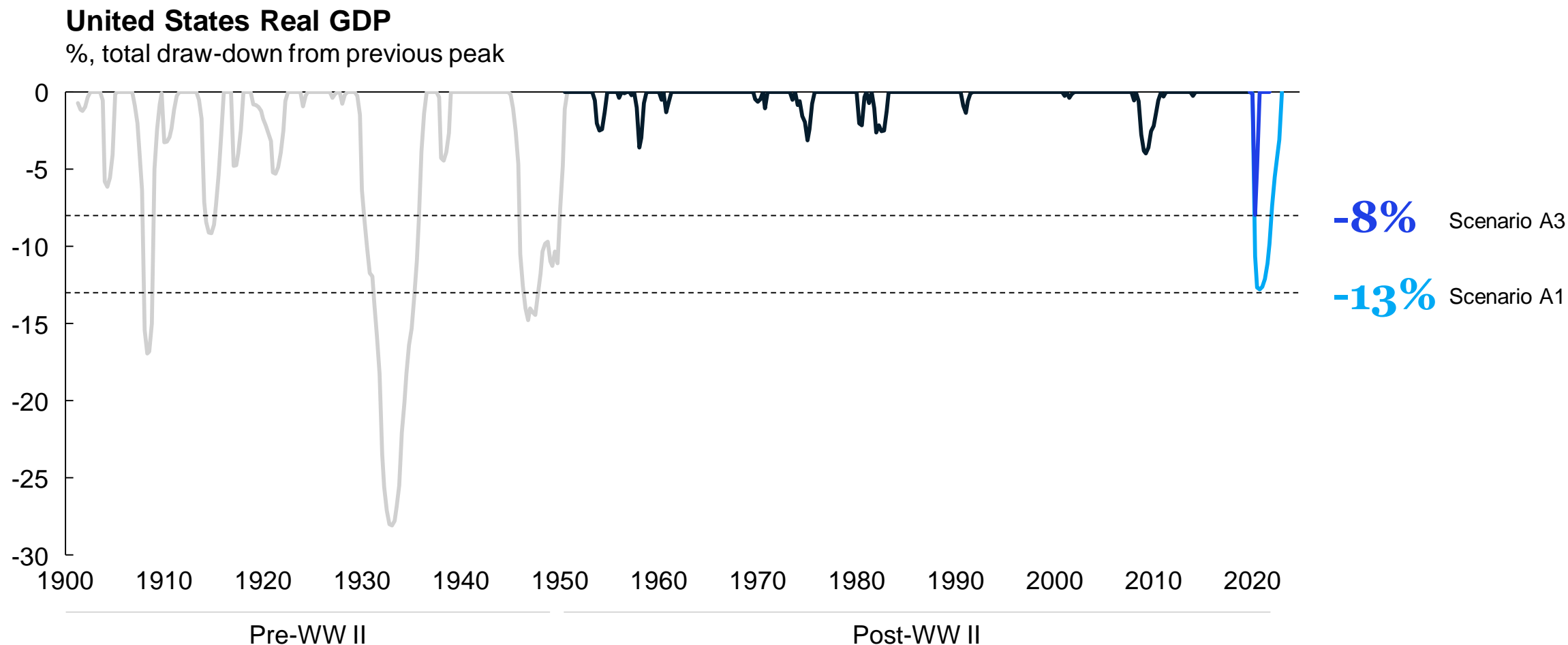


1. Seasonally adjusted by Oxford Economics

Source: McKinsey analysis, in partnership with Oxford Economics

| | Real GDP Drop 2019Q4-2020Q2 % Change | 2020 GDP Growth % Change | Time to Return to Pre-Crisis Quarter |
|----------|--|--------------------------------|--|
| China | -3.3% | -0.4% | 2020 Q3 |
| USA | -8.0% | -2.4% | 2020 Q4 |
| World | -4.9% | -1.5% | 2020 Q4 |
| Eurozone | -9.5% | -4.4% | 2021 Q1 |

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



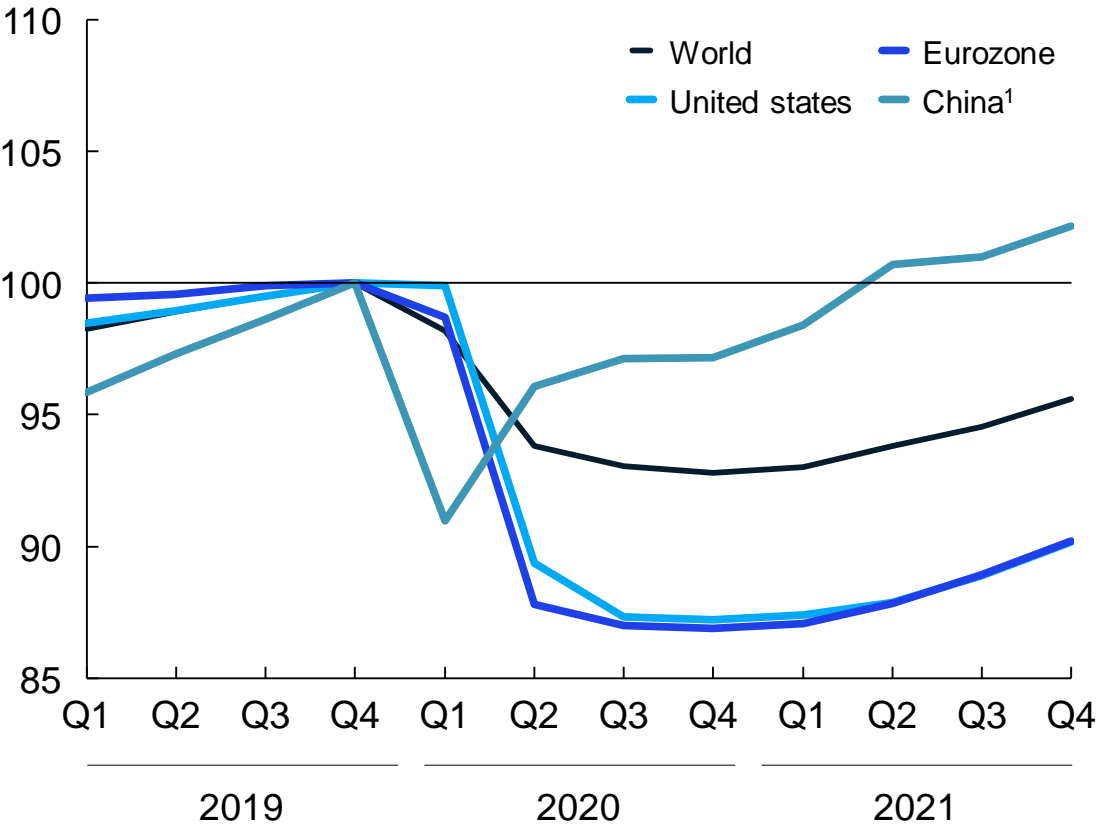
Scenario A1

Muted Recovery

Real GDP, Local Currency Indexed

Real GDP Growth – COVID-19 Crisis

Local Currency Units Indexed, 2019 Q4=100



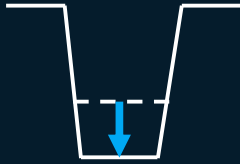
1. Seasonally adjusted by Oxford Economics

| | Real GDP Drop 2019Q4-2020Q2 % Change | 2020 GDP Growth % Change | Time to Return to Pre-Crisis Quarter |
|----------|--|--------------------------------|--|
| China | -3.9% | -2.7% | 2021 Q2 |
| USA | -10.6% | -8.4% | 2023 Q1 |
| World | -6.2% | -4.7% | 2022 Q3 |
| Eurozone | -12.2% | -9.7% | 2023 Q3 |

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?

Indicators to monitor

- 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
- 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)

Length of disruption

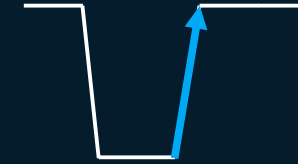


How long could the disruption last?

Indicators to monitor

- 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
- Late payments/credit defaults
- Stock market & volatility indexes
- Purchasing managers index
- Initial claims for unemployment

Shape of recovery



What shape could recovery take?

Indicators to monitor

- 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)
- 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

Contents

01

COVID-19
The
situation
now

02

Scenarios
and path
forward

03

**Sector-
specific
impact**

04

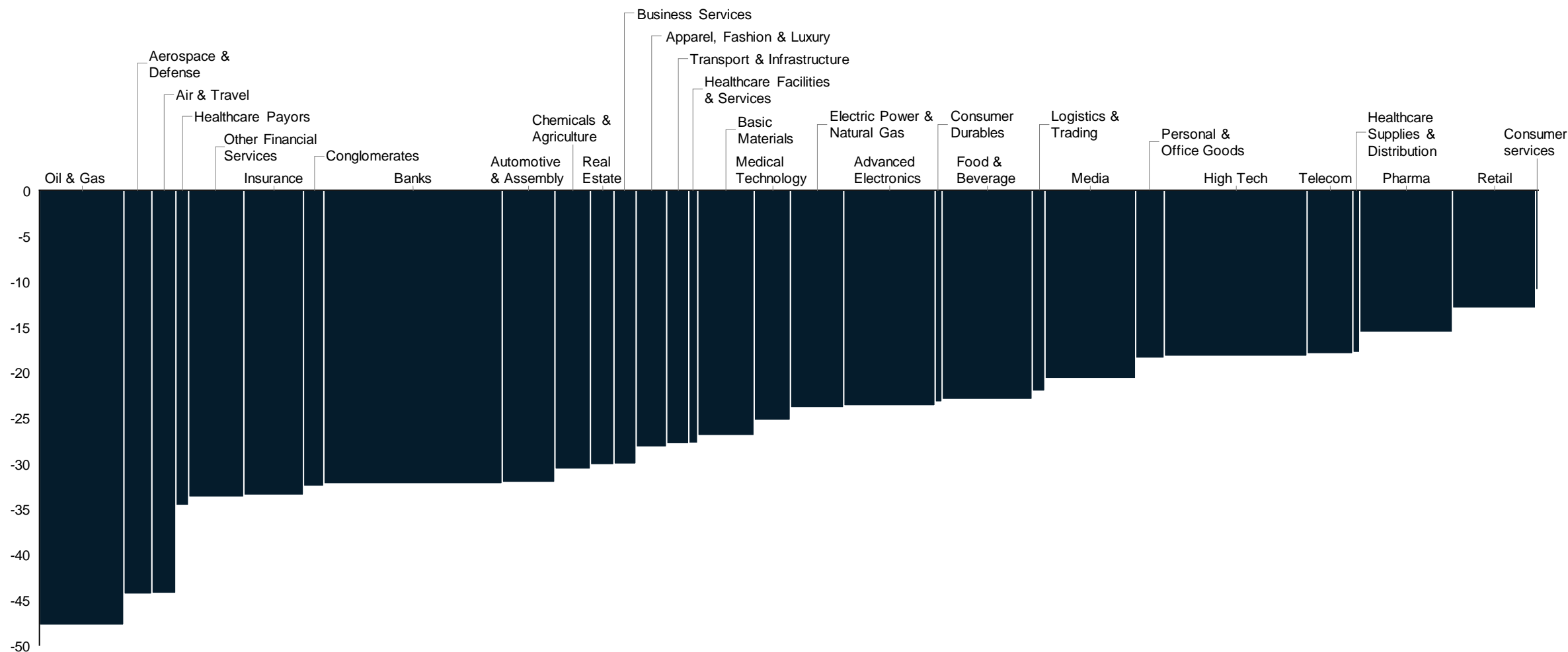
Planning &
managing
COVID-19
responses

05

Leading
indicator
dashboards

Market capitalization has declined across sectors, with significant variation to the extent of the decline

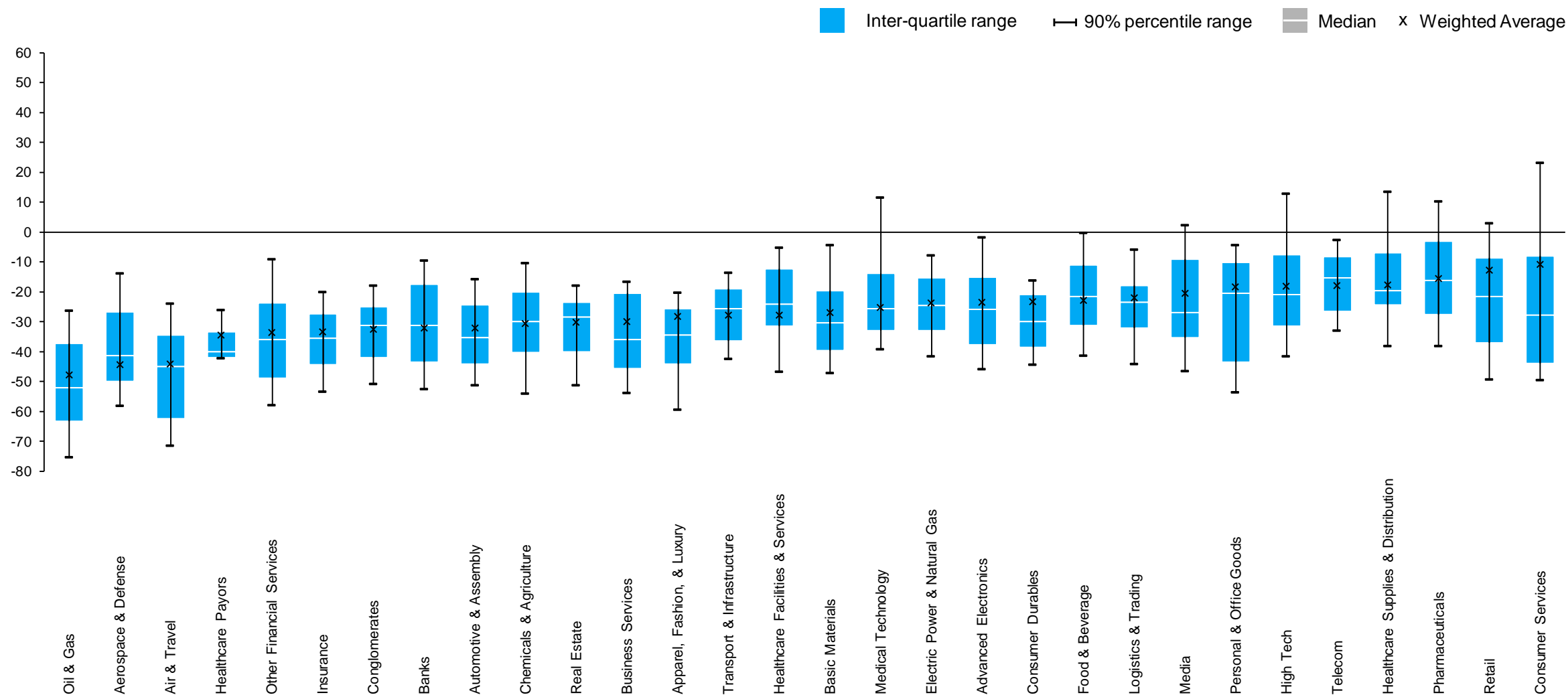
Weighted average year-to-date local currency shareholder returns by industry in percent.¹ Width of bars is starting market cap in \$



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

Even within sectors, there is significant variance between companies







Distribution of year-to-date total shareholder returns by industry percent¹



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

The hardest hit sectors may not see restart until 2021

Preliminary views of hardest hit sectors based on partially effective scenario - subject to change

| |  |  |  |  |  |  |
|--|--|---|--|--|---|--|
| | Commercial Aerospace | Air & Travel | Insurance carriers | Oil and gas | Automotive | Apparel/fashion/luxury |
| Estimated degree of impact, in terms of duration | Longest | | | | | |
| Estimated global restart | Q3 / Q4 2021 | Q1 / Q2 2021 | Q4 2020 | Q3 2020 | Q3 2020 | Late Q2 / Q3 2020 |
| Avg. change in stock price | -44% | -44% | -33% | -48% | -32% | -28% |
| Industry specific examples | <p>Preexisting industry challenges, a quick drop in possible revenue, and high fixed costs cause near-term cash flow and long-term growth uncertainty.</p> <p>It may take years to recover from production and supply chain stoppages, due to critical vendors located in areas impacted by the virus.</p> <p>Long order backlogs mitigate some concerns, though rapid adoption of remote work technologies may put a dent in high-profitability business travel.</p> | <p>Deep, immediate demand shock 5-6x greater than Sept 11; ~70-80% near-term demand erosion due to int'l travel bans & quarantines now prevalent in 130+ nations</p> <p>N. Hemisphere summer travel peak season deeply impacted since pandemic fears coincide with peak booking period</p> <p>Recovery pace faster for domestic travel (~2-3 quarters); slower for long-haul and int'l travel (6+ quarters)</p> | <p>US insurers have been strongly affected, especially reinsurers and life & health insurers</p> <p>Reduced interest rates and investment performance impacting returns – esp. for longer-tail lines</p> <p>Disruptions expected in new business and underwriting processes due to dependence on paper applications and medical underwriting</p> | <p>Oil price decline driven by both short-term demand impact and supply overhang from OPEC+ decision to increase production</p> <p>Oversupply expected to remain in the market even after demand recovery, and post 2020, unless OPEC+ decides to cut production</p> | <p>Existing vulnerabilities (e.g., trade tensions, declining sales) amplified by acute decline in Chinese demand, continued supply chain and production disruption (in China, rest of Asia, EU) to amplify impact despite ongoing Chinese economic restart</p> <p>Headwinds to persist into Q3 given tight inventories (<6 weeks), supply chain complexity (therefore, minimal ability to shift)</p> | <p>Overall decline in private consumption and exports of services.</p> <p>Demand for apparel categories down sharply overall and expected to take longer to return than economic restart; online growth exists (though hampered by labor shortage)</p> <p>Retail stores temporarily closed in many parts of the world – high regional variation</p> |

Contents

01

COVID-19
The
situation
now

02

Scenarios
and path
forward

03

Sector-
specific
impact

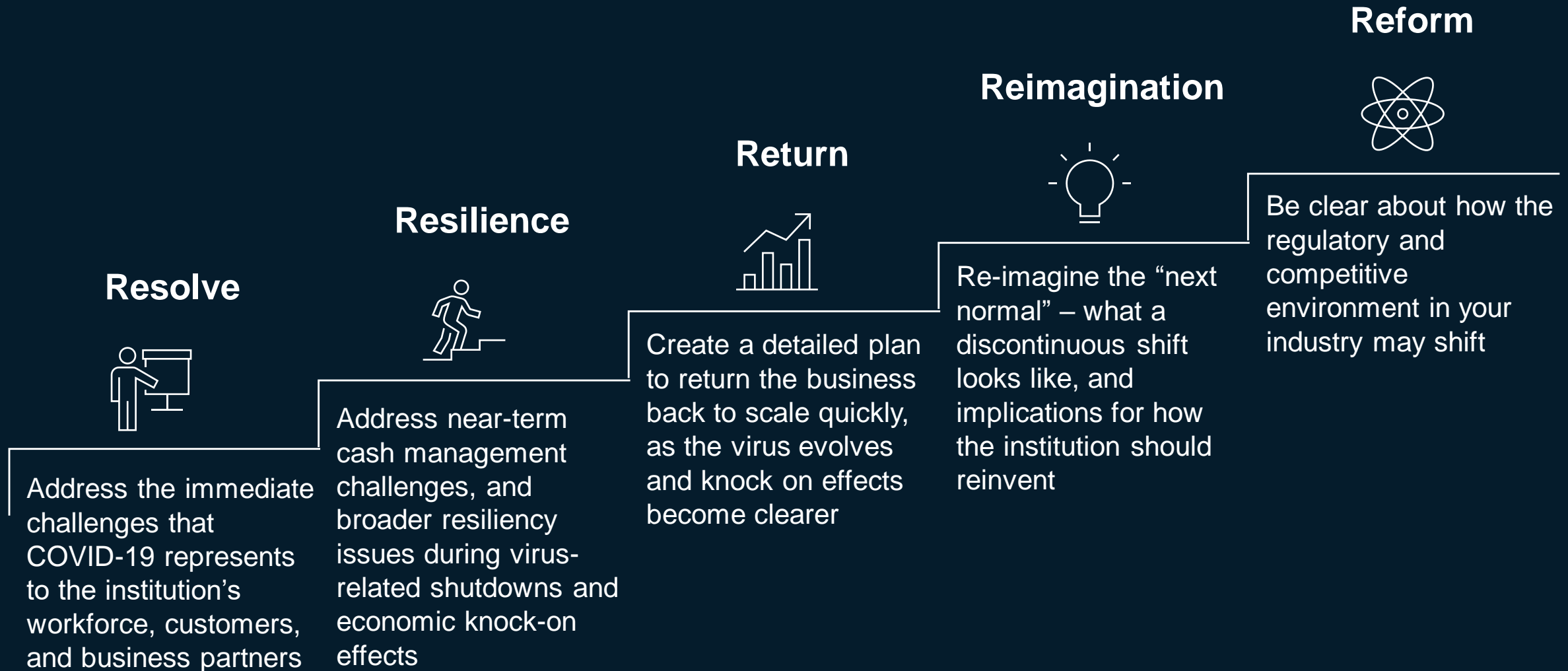
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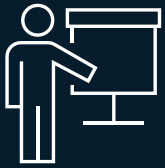
**Planning &
managing
COVID-19
responses**

05

Leading
indicator
dashboards

Leaders need to think and act across 5 horizons





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, and immediate liquidity concerns

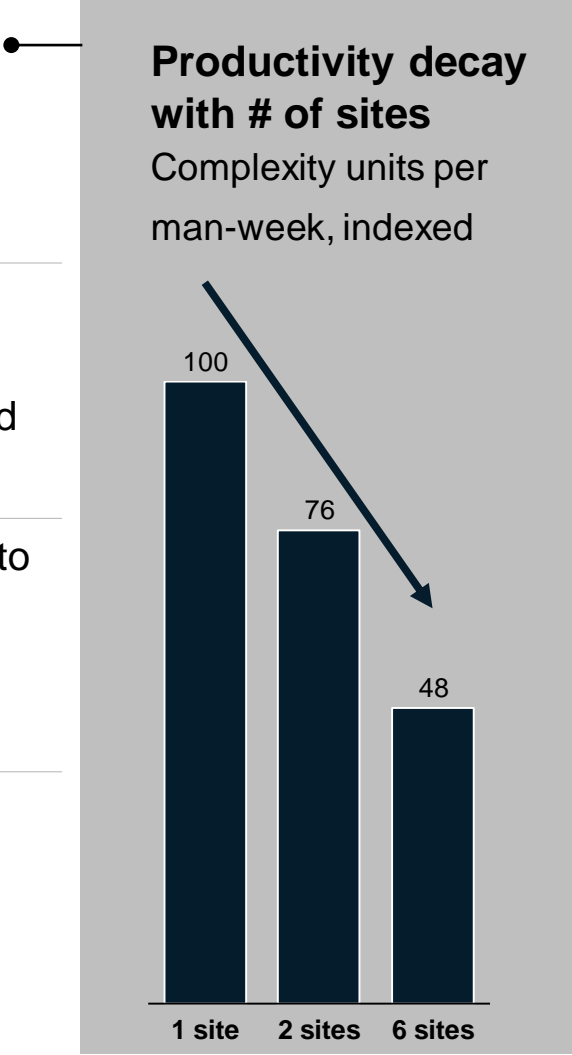
| | Emerging concerns | Example, new ideas that leading organizations are experimenting with |
|---------------------|--|--|
| Employees | Current mix of work-from-home and at-work social distancing, combined with economic anxiety is driving stress and reducing productivity | <ul style="list-style-type: none"> • New team structures that work remotely: smaller, cross functional network-of-teams vs. rigid top-down organization • New rules for leading remotely: clearly defined outcomes, multi-channel team communication; clear milestones or decision points; transparency • Investing in the right collaboration tools & adoption: active use of joint whiteboarding, polling, doc sharing, channel based communications • Caring culture: acceptance of WFH realities such as “always on” professionalism; informal socializing (virtual “water cooler” chats); authenticity • Leveraging technology team to empower remote work capability: online articles, collaboration tools, training on appropriate channels • Tighter routines for productivity: commit to norms, have team launches, clarify most critical meetings, set aside personal time & routine |
| Supply chain | Supply chain shifting from initial concern about China restart, to ensuring worker safety with social distancing norms, continuing logistics issues, and concern about macro-environment impact on demand planning | <ul style="list-style-type: none"> • 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 • Leverage direct communication channels with direct customer when determining demand signals • Use market insights/external databases to estimate demand for customer’s customers • Identify critical functions and roles and develop back-up plans • Enact “pods” for on-site personnel and leadership to minimize employee exposure while on site • Adapt reporting and sign off processes to reduce loss of productivity (e.g. devolved responsibility); train managers on how to manage remotely • Agree on adaptations required for collective bargaining units (e.g., unions) and contractors • Increase personal protective equipment where employees come in close contact with surfaces that can spread the virus • Ensure adequate IT resiliency both internally (e.g. admin support) & externally (e.g. vendors, contractors, and equipment) |
| Customers | Extreme demand reduction raising need to assuage customer concerns and put in place strict protections | <p>Build a plan to prioritize & protect valuable customers:</p> <ul style="list-style-type: none"> • Understand what matters to them—and how their situation will evolve • Focus on cultivating the most important segments (e.g., highest margin, continuous customers, community needs, contractual obligations) <p>Build customer trust through transparency:</p> <ul style="list-style-type: none"> • Don’t pursue “revenue at any cost”—judiciously choose where to invest, based on analysis and planning • Establish a rhythm of updates & engagement, offering more frequent update, targeted content, and/or individual outreach |
| Immediate liquidity | Revenue drops raising need to manage immediate liquidity | <ul style="list-style-type: none"> • Understand current available cash and project change over extended shutdown • Identify and execute immediate, low-risk levers to improve cash position (e.g., capital projects, voluntary spend, inventory working capital) • Stand up teams to run rolling 13-week cash forecasts, plan further action (e.g., monetize balance sheet), and control spend |

Employee work from home deep dive (1/2)

Key challenge of remote teams (if left unmitigated) is reduced efficiency and cohesion

Key sources of inefficiency and reduced cohesion

| | |
|---|--|
|  Structure | <p>Any lack of clarity in roles and responsibilities, decision rights or objectives is amplified in a remote environment</p> <p>Difficult of navigating large or hierarchical organizational structures</p> |
|  People | <p>Sense of lack of direction / isolation can degrade morale and performance</p> <p>Misunderstandings or lack of clarity on priorities leading to wasted work</p> <p>Isolation and lack of social interaction leading to lower employee motivation and less cohesion as a team</p> |
|  Process | <p>Lower communications efficiency due to missing in-person touch, time it takes to write vs talk, finding time together, or bad connectivity</p> <p>Difficulty in self-organizing to address real-time challenges</p> <p>Risk to overlook dependencies and create island solutions</p> |
|  Technology | <p>Outdated architecture, slow VPN access</p> <p>Missing tooling (e.g. for VC, co-creation, DevOps) exacerbate collaboration challenges</p> <p>Impractical security inhibits remote work, leads to team members adopting insecure workarounds</p> |



Employee work from home deep dive (2/2)

Approach to building effective teams in a distributed, online environment

Structure



- **Nature of work** (e.g. real-time collaborative, vs. standardized individual; type of data accessed) influencing **work-from-home arrangements** and **structure**
- **Smaller, cross-functional teams** with clear **roles and responsibilities** as well as synchronization mechanisms
- **A mixture of OKRs and KPIs** used to communicate goals to the team and track progress against deliverables

People



- **Leadership's** increased role in providing **direction, energizing teams & connecting** the dots
- Focus on **cultural elements** at individual and group level that drive performance in remote work (e.g. proactiveness)
- **Investment** into **soft aspects** to form a **cohesive group identity** despite social remoteness (e.g. through role-modeling, 1:1s, townhalls, retrospectives)

Processes



- Cadence of **meetings** to **synchronize work** and **remove blockers** across teams
- Clear **decision** and **escalation paths**, stage/quality-gates, workflows with roles & responsibilities to facilitate handovers
- **Tailored communication tools** catering to different scenarios and accounting for topic complexity, output, reaction time, and team preference
- **Single** digital **source** of **truth** across people (e.g. face book), content (e.g. standards, OKRs), performance (e.g. KPI dashboards) & process (e.g. task management boards)
- **Result-oriented performance management** on all levels: individual, team and tribe enabled by digital dashboards

Technology



- **Technology setup** and **infrastructure** for remote work (e.g. home office setup, VPN bandwidth, remote application access)
- Adoption of **suite** of **SaaS digital tools** to facilitate effective co-creation, communication and decision making (e.g. VC, file-share, real-time communication, document co-editing, task management, etc.)
- Automated **delivery pipelines** and **collaboration tools** to enable a remote product development environment
- **Strong** and **practical security standards** and **practices**

On-site employee safety – Manufacturing example (1/2)

Manufacturing workforce safety can be increased by creating operating pods, but design considerations apply

| Design considerations to building a pod | General guidance on how to apply levers | Example actions |
|---|---|---|
| Who to group into pods | Define the minimum size group to achieve desired production levels and minimize contact between employees and product | <ul style="list-style-type: none"> Remove any floating workers from potential pods Group pods vertically along production line and break inter line (workers working on multiple lines) and beginning/end of line transfer points (line employee picks up raw materials instead of a rover dropping off material) |
| What job is done | Reclassify jobs/roles to improve ability to form pods and decrease inter-pod contact | <ul style="list-style-type: none"> Reclassify jobs (can be temporary) vertically along production line so one worker does multiple jobs on same production line versus horizontally across multiple lines (line may need to slow) Remove or adjust unnecessary line contact (quality checks done by line employees versus central quality) |
| How the pod works together | Add additional safeguards within the pod to further limit exposure | <ul style="list-style-type: none"> Ensure job tasks within pod protect the pod from itself, including additional PPE and separation throughout the shift (tasks can be adjusted to ensure 6 ft. separation) Institute increased sanitation of pod and workplace (hand washing, deep cleaning after shift, etc...) Stagger break and lunch times/locations |
| When the pod performs work | Change shift time and structure to limit exposure | <ul style="list-style-type: none"> Adjust start/end times to avoid inter-pod contact for pods working at same time, if site has only day shifts for multiple lines – consider going to 24 hrs operation to limit lines on site at a time Adjust weekly schedule including going to 12-hr shifts and 2 week on/off to minimize the number of people on site over a day/week |
| Where the pod performs work | Move the location of work to create social separation between pods | <ul style="list-style-type: none"> Modify non-work arrangements to minimize exposure including where pod is housed and how they get to work (critical operations such as power plants and refineries are considering housing employees on site) Restrict access between pods, ideally with social barriers (card access, temporary walls) Move production lines to ensure adequate separation and consider temporary options (tents) Close public spaces (cafeterias, gyms) and find alternate locations for workers to eat and move around |
| Plan for pod event | Develop response scenarios for likely events such as a pod test positive | <ul style="list-style-type: none"> Practice and train on likely scenarios (immediate and long-term response) Define production flexibility and back-up options if line goes down Define backup pod staffing (refresh skills matrix to see who could cover, consider keeping a backup pod available in case of event) |

Note: Certain actions must be implemented together to ensure mitigation of risk

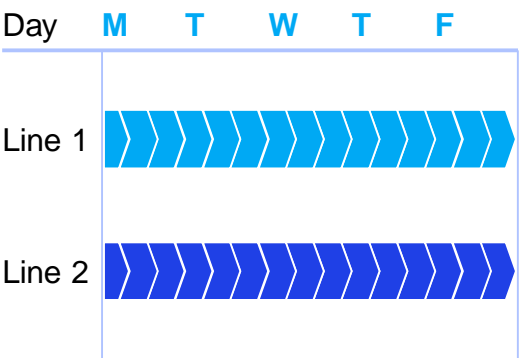
On-site employee safety – Manufacturing example (2/2)

Changing shift patterns is an option to limit exposure

Current situation – 3 shifts

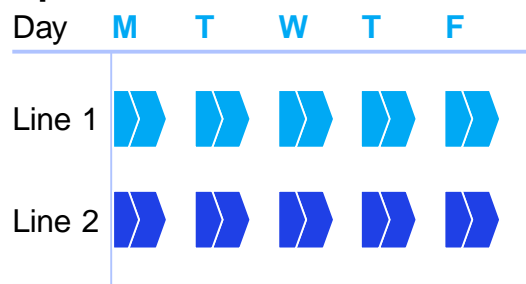
24 hours x 5 days model

Operators dedicated to either Line 1 or Line 2



Production “lines” are used for illustrative purposes but the reasoning can be extrapolated to manufacturing sites with the same products, different parts of a site, different steps in a process, etc.

Option 1 – Reduction in shifts



Description

16h x 5day model
5 ramp ups per week
Allows for deep cleaning on 3rd shift

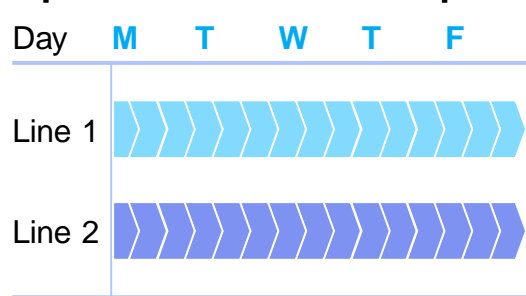
Pros

Incremental change, easy to implement
Dedicated people to each line
Maintenance can be done in 3rd shift
Flexible

Cons

Daily ramp ups and downs causing inefficiencies
Process cycle time must be shorter than 16h if cannot be interrupted

Option 2 – Reduction in pace



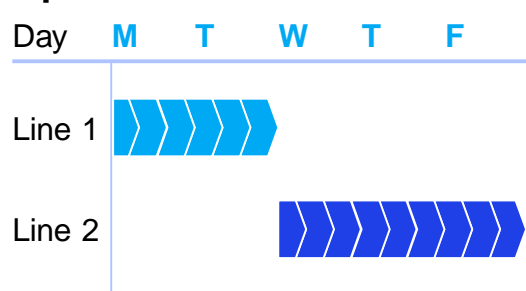
24h x 5day model
Production run at lower speed (less FTEs assigned to lines)

Incremental change, easy to implement
Dedicated people to each line
Flexible

One ramp-up and down per week

Depending on process, can result in inefficiencies

Option 3 – Dedication to a line



24h x 5day model
Operators are dedicated to line 1 and then to line 2 – creating time barrier for inter-line contact

Machines productive time/running time ratio is maximized
One ramp-up and down per week

Cross training is needed for whole staff, more difficult to implement
Needs good demand forecast



Resilience

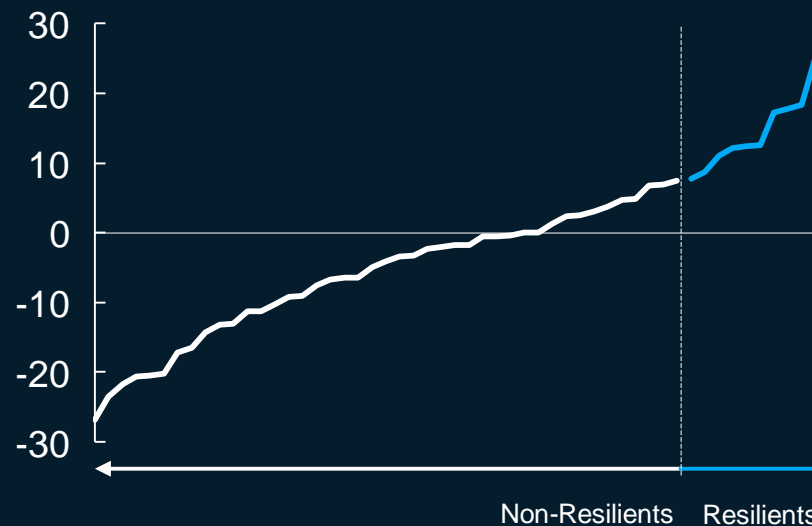
Address near-term cash management challenges, and broader resiliency issues during virus-related shutdowns and economic knock-on effects

Speed + Discipline – the key to Resilience

Teams seeking to boost Resilience during COVID-19 need to learn lessons from the companies that survived & thrived in the last recession – the Resilients

Sector-specific power curves show dramatic differences in performance during the recession

Mean TRS for Automotive sector 2007-11



- The top 20% of companies that emerged from the recession are called the Resilients
- These resilient companies didn't have any particular starting advantage (e.g., existing portfolio). Instead, they managed to achieve a small lead, which they then extended over the next 10 years
- **Two words that define their success: Speed & Discipline**



Speed+ Discipline – how the Resilients stood apart

Compared to Non-resilients,

Speed

EBITDA & revenues outperformance

Resilients companies sustained¹ organic revenue growth early and throughout the recession and on revenue in recovery

Resilients **increased revenue by 30% ...**

Early & hard moves

Resilients moved faster, harder on productivity; preserved growth capacity

Reduced operating costs by 3x and moved 12-24 months earlier ...

Discipline

M&A activities outperformance

Resilients divested more during the downturn and acquired more in the recovery

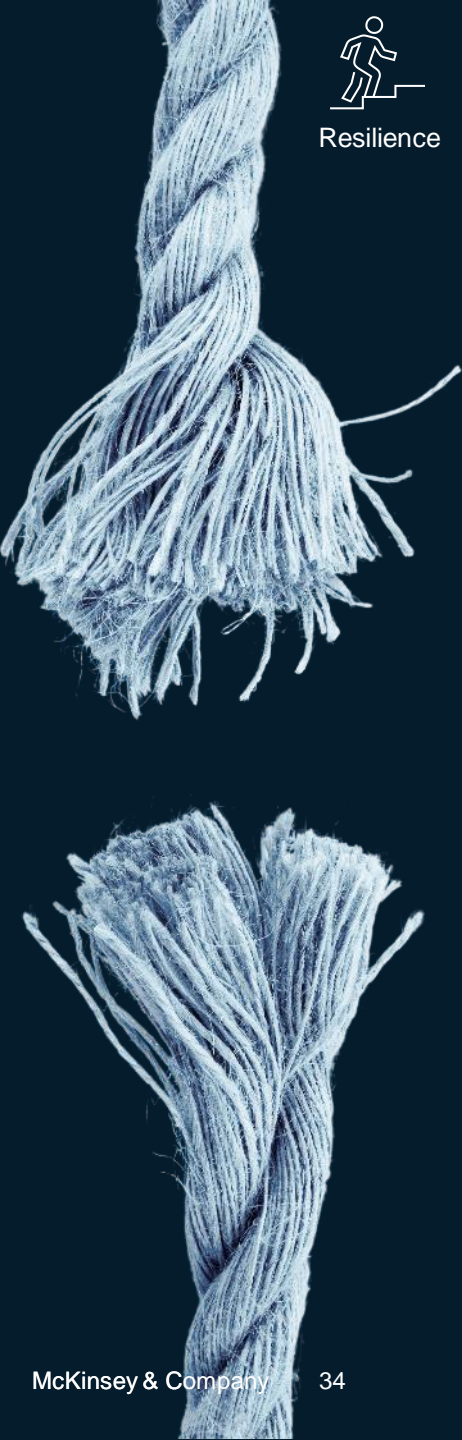
Divested by 1.5x in the downturn & acquired 1.2x in the recovery ...

De-leveraging outperformance

Resilients cleaned-up their balance sheets ahead of the downturn

Deleveraged ~5% pts. higher before the trough

¹ Resilients only lost 1% of organic revenue vs. 2007 level during 2009

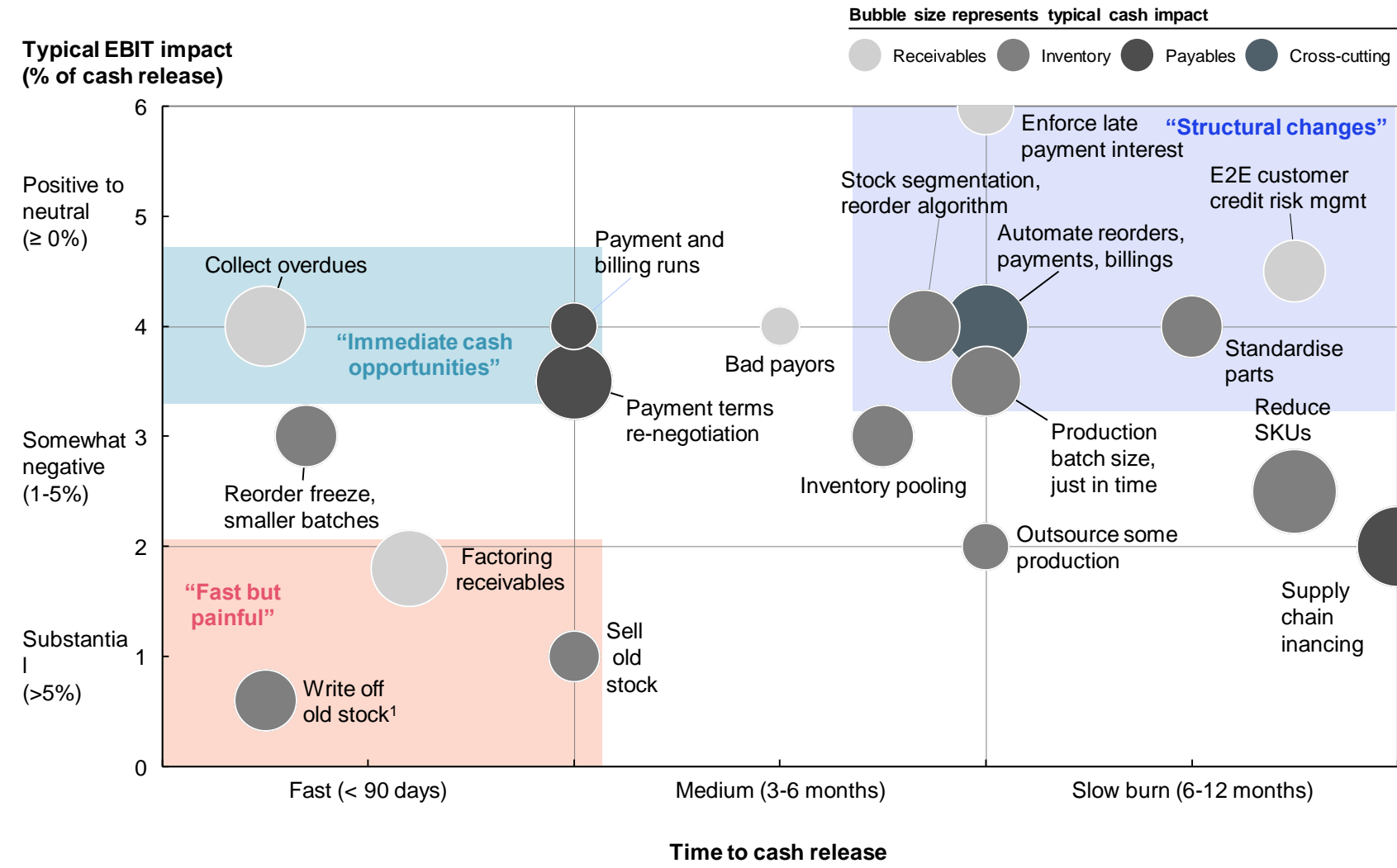




6 steps towards end to end Resilience plan

| Step | Description |
|---|---|
| 1 Identify and prioritize key risks | Identify and prioritize key macro, sector and company idiosyncratic risks based on exposure and impact |
| 2 Develop tailored scenarios | Develop company specific scenarios based on the range of outcomes of the highest priority risks |
| 3 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 |
| 4 Establish portfolio of interventions | Identify an end to end portfolio of interventions and trigger points |
| 5 Set up a cash war room / dashboard | Improve cash transparency and implement tighter cash controls to mitigate downside scenarios |
| 6 Build the resilience dashboard | Build the dashboard of key leading indicators to monitor that can be dynamically updated |

Example prioritization of initiatives related to cash





Return

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

Companies should be prepared for the “return”

Look for some of the following...

Decline in cases

- ☐ Sustained decline in the number of cases in your area without rebound
- ☐ No community transmission / very low levels in your area

Health response ready

- ☐ Relaxation of shelter-in-place / quarantine orders
- ☐ Testing widely available with fast turnaround

Herd immunity (will take time)

- ☐ Availability of antibody testing – available workforce who have immunity
- ☐ Availability of an effective vaccine (Spring 2021 soonest)

Then start thinking about...

Protect employees

- ☐ Controlled access to all job locations: mandatory temperature checks, hand-washing
- ☐ Targeted measures based on job function and “risk profile” instead of blanket shutdown

Reassure customers

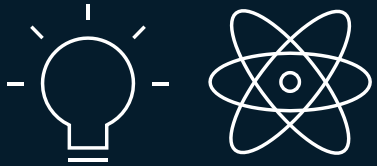
- ☐ Invest in a “safe environment”: pre-flight tests of passengers and crew for airlines, in-store sanitizers for retail, transparent safety record e.g. “X days since last infection”

Restore supply chain

- ☐ Diversify supply chain and critical vendors to different geographic locations
- ☐ Explore contractual features like take-or-pay to pool risk while rebuilding demand

Reinstate or revise?

- ☐ Consider the effects of business interruption or work-from-home – what business practices should be reinstated, revised, or even removed?



Reimagination & 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

Reimagination: Could we really emerge in a new normal?

Why this could be possible

The facts today (examples)

‘Shelter at home’ moves are causing the largest demand drawdowns modern economies have seen in decades

The virus spread, and public health and economic response vary widely across countries today

Consumers are recalibrating on spend, having experienced a new model of lower in-person & even higher virtual connections, while learning new skills

Doctors are pointing to the inherent challenges of providing hospital-centered care during pandemics



How this may evolve

A self-sustaining recession may occur if governments are not able to respond effectively to the new threats that economies face

The speed and effectiveness of countries response could reshape political and economic relationships globally

When consumer demand returns, it may be for different categories than what existed previously, and virtual services could get adopted far faster than originally expected

The world may move closer to a more community or patient centered model of healthcare, aided by newer advances in AI, health monitoring, telemedicine

Resetting to new normal is hard

- Much like resilients' research, our research on companies more broadly (Strategy Beyond the Hockey Stick) shows that most companies (80% of all corporations) did not add economic value beyond their cost of capital
 - Only 8% of the companies studied were able to successfully move towards adding economic value consistently
 - The ones that did so, did it through 5 moves that may be critical for companies to consider
-



Needs appetite for big moves



M&A: Conduct deals adding to 30% of market cap over a decade



Reallocation: Reallocate 50% of capital among BUs over a decade



Capex: Top 20% in sector on capital spending per unit of sales



Productivity: Increase productivity to be in top 30% of industry



Differentiation: Increase gross margin to be top 30% of industry

Reform: What does the “day after” look like?

The need for governments to intervene could drive meaningful changes to regulatory environment across sectors globally

- Will healthcare go through a regulatory driven reform movement, similar to the financial sector after 2008/09 financial crisis?
- How will pre-existing concerns on trade barriers play out in the post-COVID environment?
- To what degree will bailouts of sectors come with conditions that meaningfully change the landscape of that sector in the future?
- Will concerns around supply chain resilience spur a large-scale nearshoring or en masse qualifications of other suppliers, partly a result of regulatory and government considerations?
- Will the twin trends of remote work and gig economy mean that a move towards a new organizational social contract is accelerated, with new regulatory implications for worker rights?



Nerve Center

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

Managing across 5Rs requires a new architecture: Nerve Center

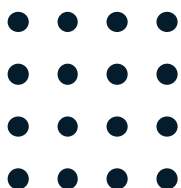
“Team of teams” with clear roles, responsibilities, and decision authority



Team 1 - Discover
Scenario planning team

Maintains multiple scenarios;
provides one planning scenario.
Facilitates future state exercises

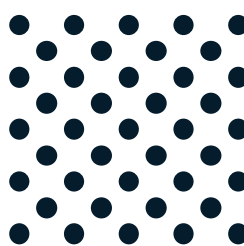
- Owns
- Reform
- Input to
- Reimagination
 - Resolve



Team 2 - Design
Strategic moves team

Uses planning assumptions (&
scenarios) to craft trigger based
portfolio of strategic moves

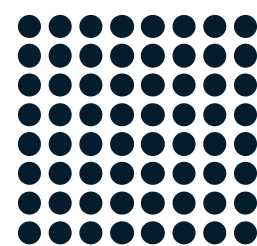
- Owns
- Resilience
 - Reimagination
- Input to
- Resolve



Team 3 - Decide
Integrated operations team

Maintains operating cadence,
risk maps, situation reports,
tracks progress, and ensures
ownership

- Owns
- Timing & facilitation of
strategic decision-making
- Input to
- All 5 Rs



Team 4 - Deliver
Workforce, SC, customer, cash

Ensures extreme clarity & builds
a cross-functional team to
achieve outcome

- Owns
- Resolve
 - Return

Divergent / creative thinking

5% of Nerve Center capacity

Divergent / creative thinking

5% of Nerve Center capacity

Mix – Divergent / convergent

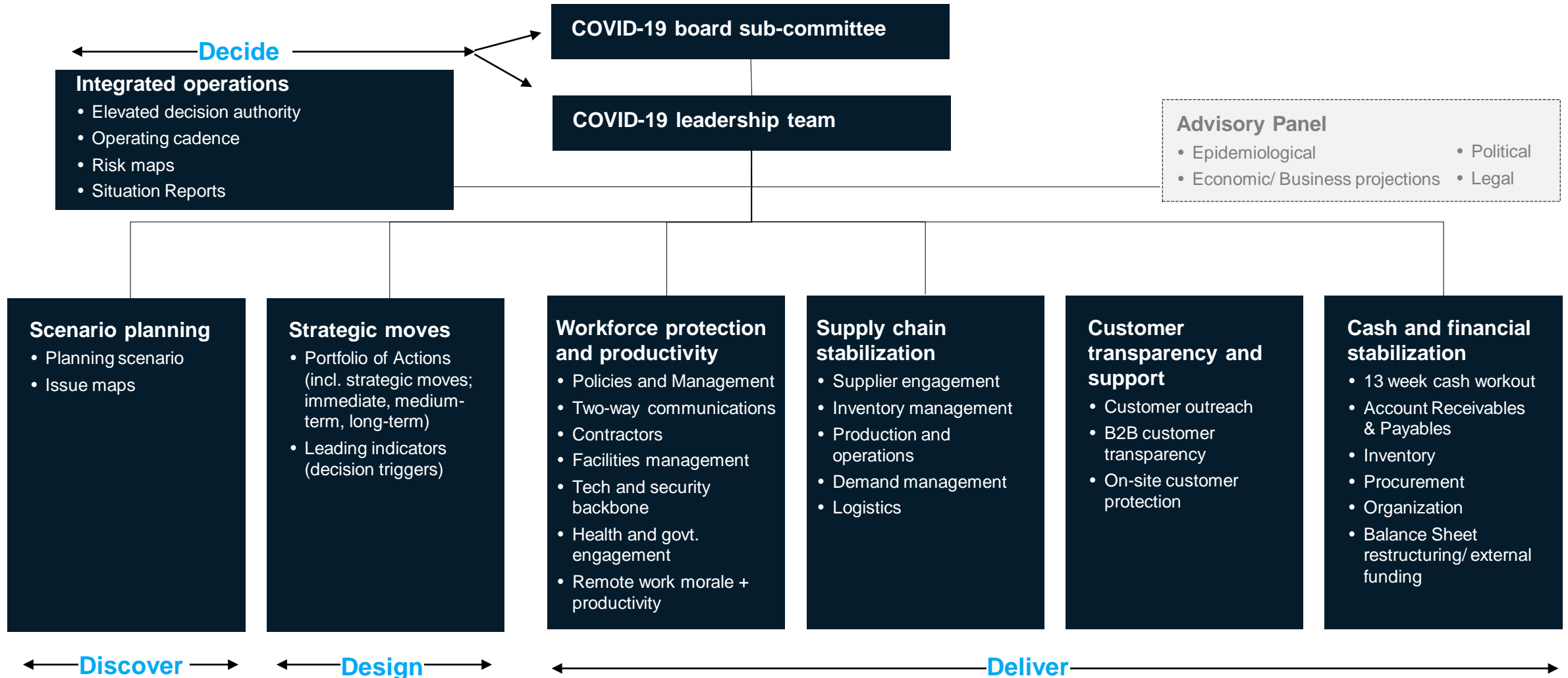
10% of Nerve Center capacity

Convergent / linear thinking

80% of Nerve Center capacity

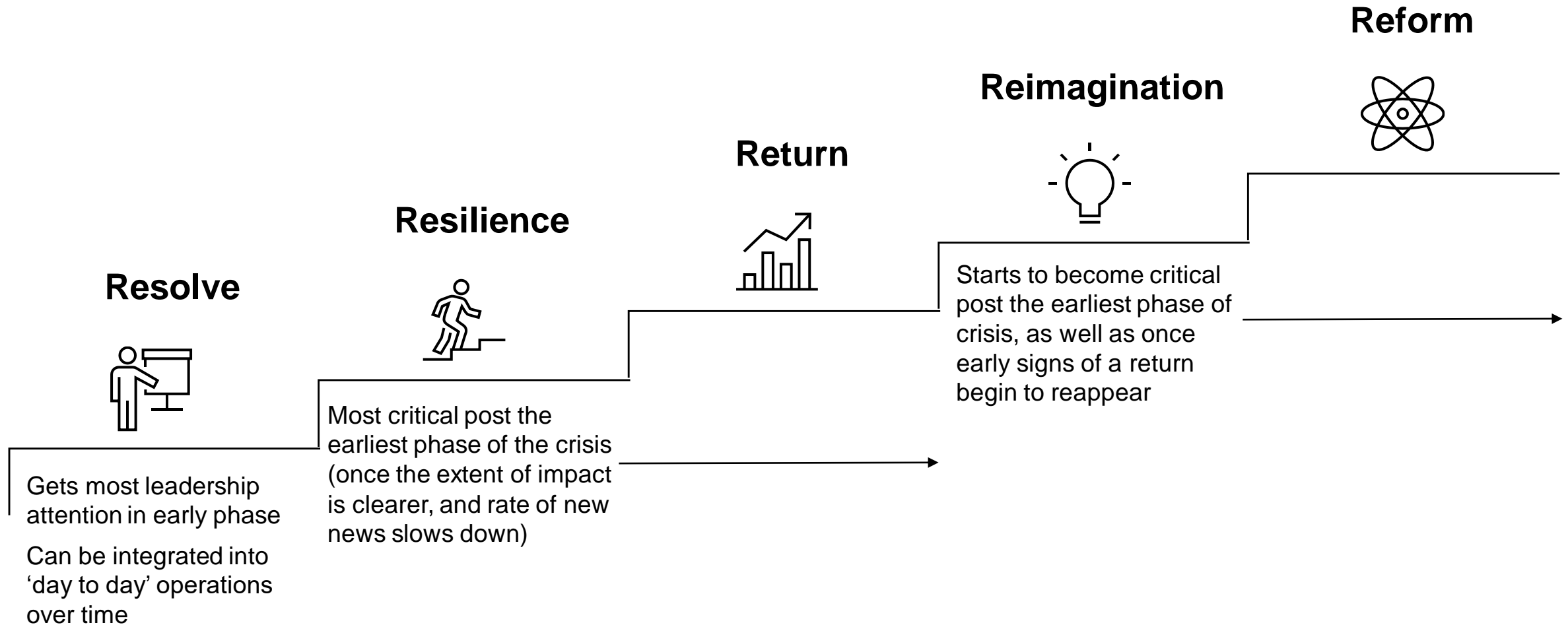
Managing across 5Rs requires a new architecture: Nerve Center

“Team of teams” with clear roles, responsibilities, and decision authority



Leaders should expect Nerve Center to evolve as crisis shifts

Basic structure and operating principles remain unchanged, but leadership time dedication changes



Contents

01

COVID-19
The
situation
now

02

Scenarios
and path
forward

03

Sector-
specific
impact

04

Planning &
managing
COVID-19
responses






05

**Leading
indicator
dashboards**

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

Impact

- High
- Medium
- Low

| | Supply—production | Logistics—transportation | | Customer demand | |
|-----------------|---|--|---|---|--|
| |  |  | or  | or  |  |
| Situation today | <p>~80% plants restarted</p> <p>Across China, ex-Hubei, with large enterprises restarting, albeit with partial capacity, at much higher rate than smaller ones</p> | <p>1.4M idle containers</p> <p>5.5% of global container capacity affected by reduced demand</p> <p>66% BDI increase</p> <p>Baltic Dry Index¹ 66% higher since CLNY³ but at 10% lower levels compared to March 2019</p> | <p>60% China flights suspended⁵</p> <p>Commercial flights account for ~50% of air cargo capacity, some airlines converting flights for cargo⁶</p> <p>2x TAC index</p> <p>TAC index rate +27% for U.S.–China, +93% EU–China², +37% China–U.S., and +45% for China–EU since CLNY³</p> | <p>60% truck staff available</p> <p>1–14 day quarantine- and capacity-induced increase in freight transport times</p> <p>MED</p> <p>Demand for express last-mile delivery has spiked in China due to quarantine and social distancing</p> | <p>20.5% decline in retail sales</p> <p>China consumer sentiment since January sharply lower; online/express deliveries up</p> <p>MED</p> <p>Europe and U.S. sentiments evolving, but localized</p> |
| What to expect | <p>MED</p> <p>Parts and labor shortages leading to further supply chain disruptions (e.g., decreased production capacity)</p> <p>Other regions will be facing production capacity reductions</p> <p>Customer pressure for prioritization</p> | <p>7,000 TEU/week reduction</p> <p>Volumes will return as factories restart, may see peak for restocks</p> <p>Future capacity 2.3% reduction for a Asia-U.S. route from May due to sea freight alliance revisions</p> <p>MED</p> <p>Impact on freight will take an extended period of time to correct with slower ramp-up</p> <p>Logistics capacity returns but faces constraints; near-term price increases</p> | <p>5% global air traffic decrease⁴</p> <p>Decline in capacity available due to travel ban on commercial flights</p> <p>YoY global air freight belly capacity reduction of 14% in March 2020⁴</p> <p>Rates likely to continue to increase</p> | <p>High</p> <p>Trucking capacity constraints in China likely to ease</p> <p>Declines at U.S. ports foreshadow declines in U.S. intermodal (rail)</p> | <p>High</p> <p>Demand slump may persist</p> <p>Inventory “whiplash”—7–8 weeks for auto, 2–4 weeks for high-tech</p> <p>Inventory hoarding and demand spikes due to uncoordinated actors exacerbate supply chain</p> |

1. Assessment of risk premium to ship raw materials on a number of shipping routes, data as of 3/13
 2. Frankfurt (FRA) to Shanghai (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 U.S.–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

COVID-19 Leading indicator dashboard for China

Tracking toward economic restart

Hubei impact

How deep is the impact, and when could economic activity restart?

Late Q2 Hubei remains deeply impacted; return to economic activity tough to foresee until mid Q2

Recovery milestones

Steady decline in confirmed cases

New suspected and confirmed cases rates consistent with other provinces

Quarantine lifted

Public transport resumes

Factory activity returns to pre-outbreak levels

Daily infection rate, per million

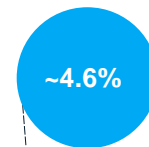


~1x



■ Hubei

Crude case fatality ratio¹



>4x



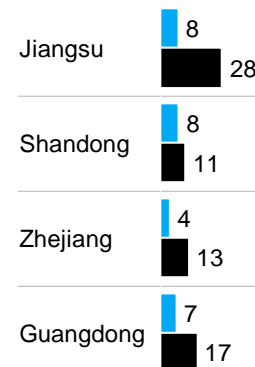
■ China other (avg.)

China economic restart

When could economic activity restart in China (ex-Hubei)?

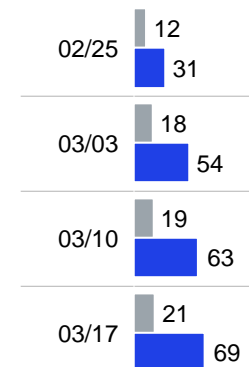
Late Q1 Restart has begun, especially for larger companies, despite challenges such as labor shortages and movement of goods

Labor availability (movement of workers to major industrial provinces)²



■ 03/24/2020
■ Same day 2019

Return to work index (largest manufacturing cities by output in mainland China)³



■ Hubei
■ China ex-Hubei (avg.)

Air pollution (NO₂ level)

8% decline in Beijing⁴

26% decline in Shanghai⁴

PMI manufact.

14pt decline in Feb

Small businesses face more labor disruption

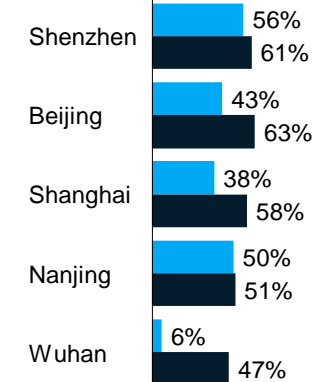
China consumer confidence

When will Chinese consumer confidence and purchasing activity return?

Q2 Consumer spending in China spend may lag behind economic restart

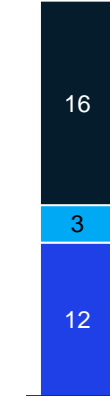
Tourism and some other sectors impacted well into Q2

Congestion in major cities⁵



■ 03/25/2020
■ Same day

Earliest school restarts



■ Started with online lessons
■ After March 31
■ TBD

Example consumer behavior metrics (anecdotal)

Retail passenger car sales down 78% in February

Smartphone sales expected to be down 40% Q1

Sales decline of 86% for mid and high end hotels

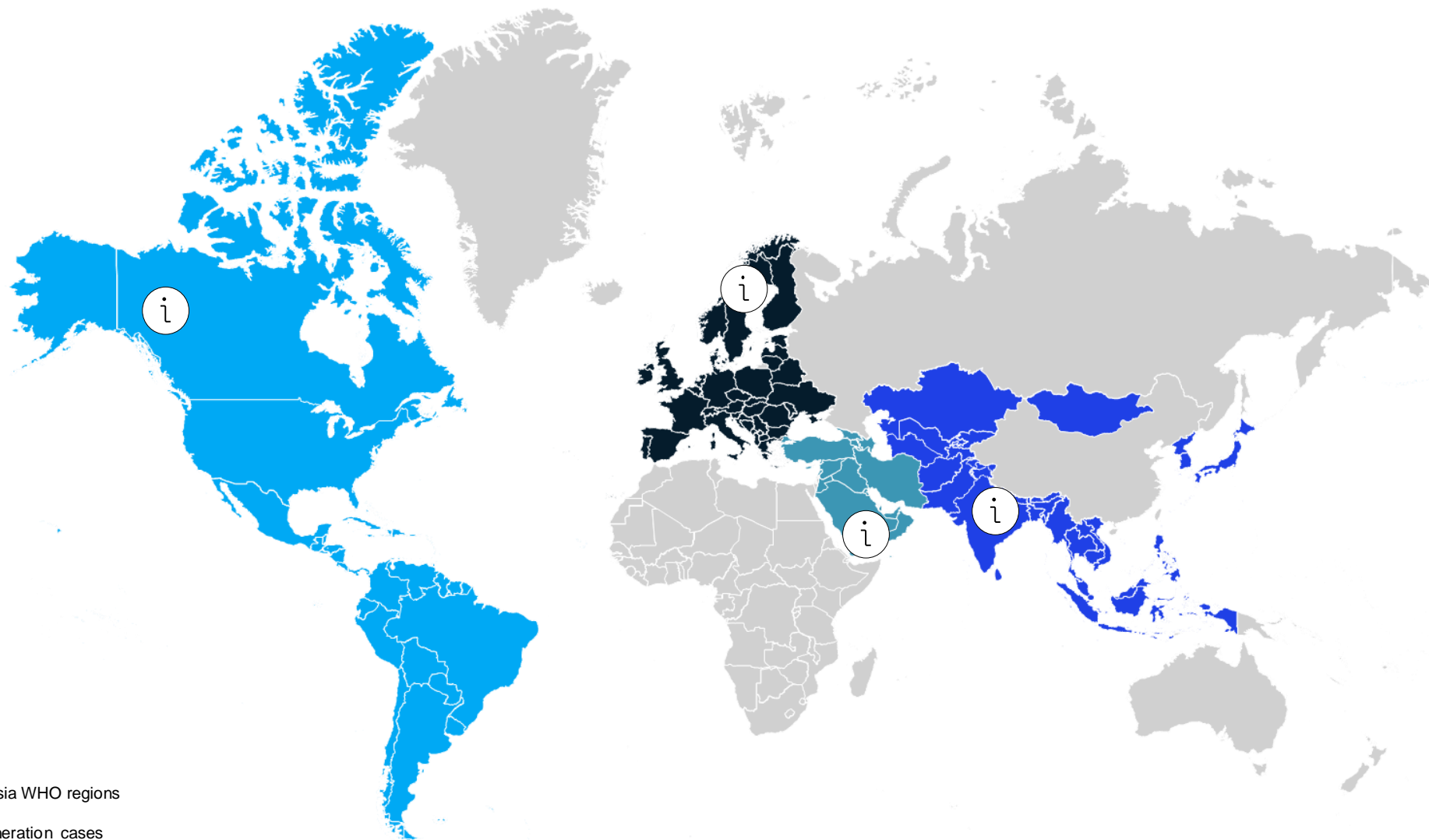
Food & drink spend down \$60 billion in January & February

COVID-19 leading indicator dashboard

Propagation of COVID-19 across new transmission complexes

 Click on buttons for more detail

-  Europe
-  Americas
-  Asia (ex-China)¹
-  Middle East²



1. Includes Western Pacific (excl China) and Southeast Asia WHO regions

2. Eastern-Mediterranean WHO region

Note: All countries and regions have documented 3rd-generation cases

i Middle East



| Example country | Epidemiological Indicators ⁷ | | | | | Economic/policy indicators | | | |
|-----------------|---|-----------------------|---------------------------|----------------------|--|--|---|---------------------------------|-----------------|
| | Date of initial case | Total number of cases | New cases in last 14 days | 5-day new case trend | Crude case fatality ratio ¹ | Number of countries/territories restricting travel | Number of airlines suspending service to country ³ | Traffic congestion ⁴ | School closures |
| Iran | 02/20 | 23,049 | 15,007 | | 7.3% ⁶ | 142 | x9 | Data N/A | Country-wide |
| Rest of region | 02/15 | 4,166 | 3,630 | | 1.3% | | | | |

Current phase

- Stage 1:** Small number of cases identified; no sustained local transmission
- Stage 2:** Disease spread and sustained local transmission
- Stage 3:** Government action and shifts in public behavior. Not all affected regions enter stage 3, but interventions and economic impact signal prolonged recovery

- Stage 4:** Case growth and stretched health systems
- Stage 5:** New cases drop, activity resumes

CDC travel health notice

- Warning level 3
- Alert level 2
- None

Traffic congestion⁵

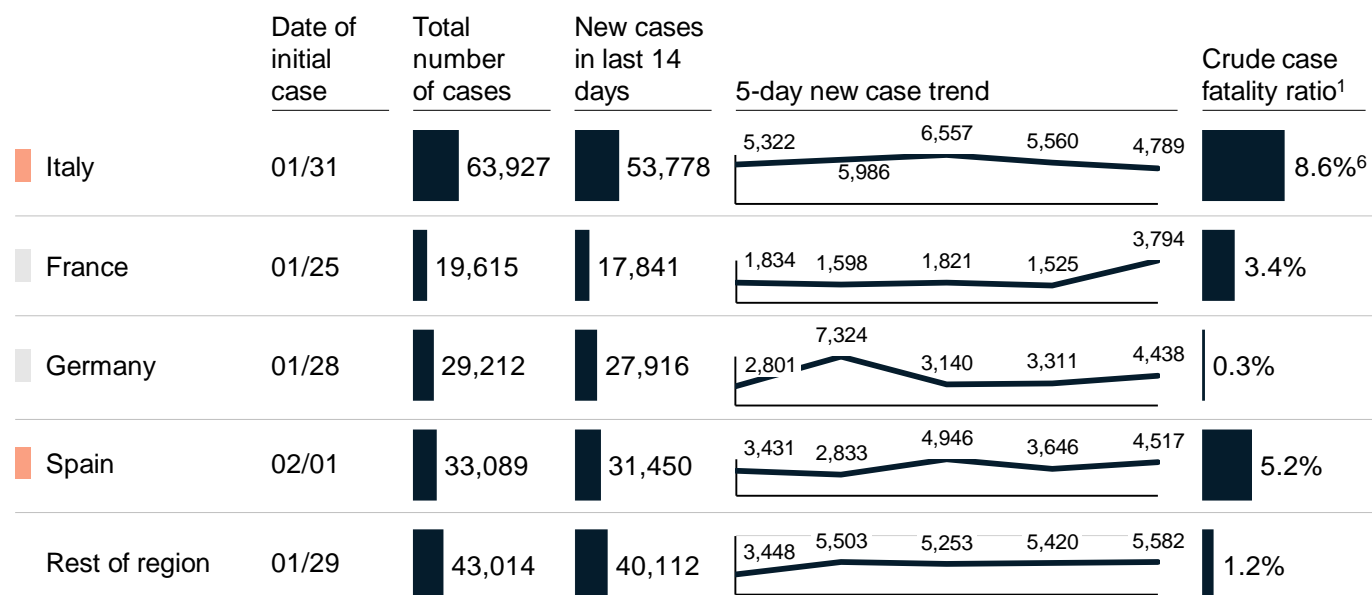
- 03/25/2019
- 03/25/2020

i Europe

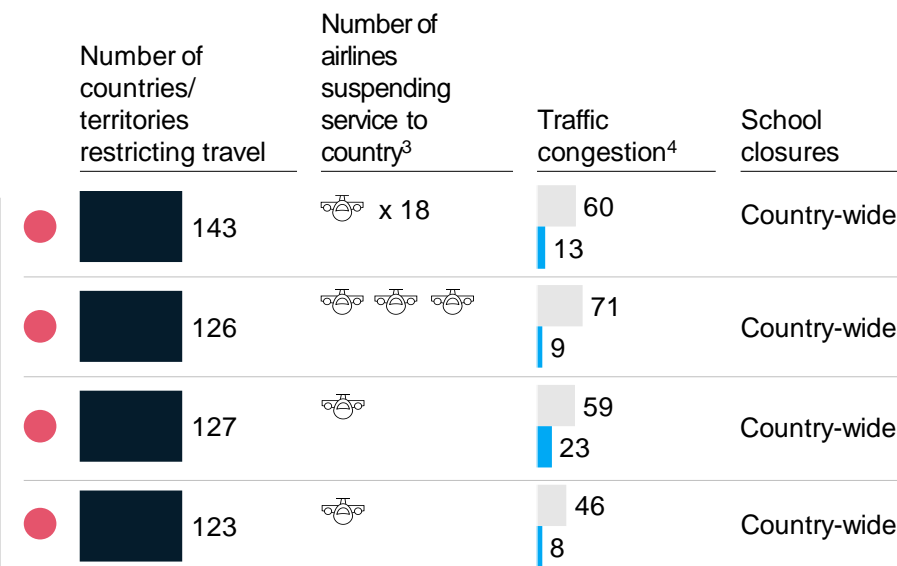


Example country

Epidemiological Indicators⁷



Economic/policy indicators



Current phase

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- Stage 4:** Case growth and stretched health systems
- Stage 5:** New cases drop, activity resumes

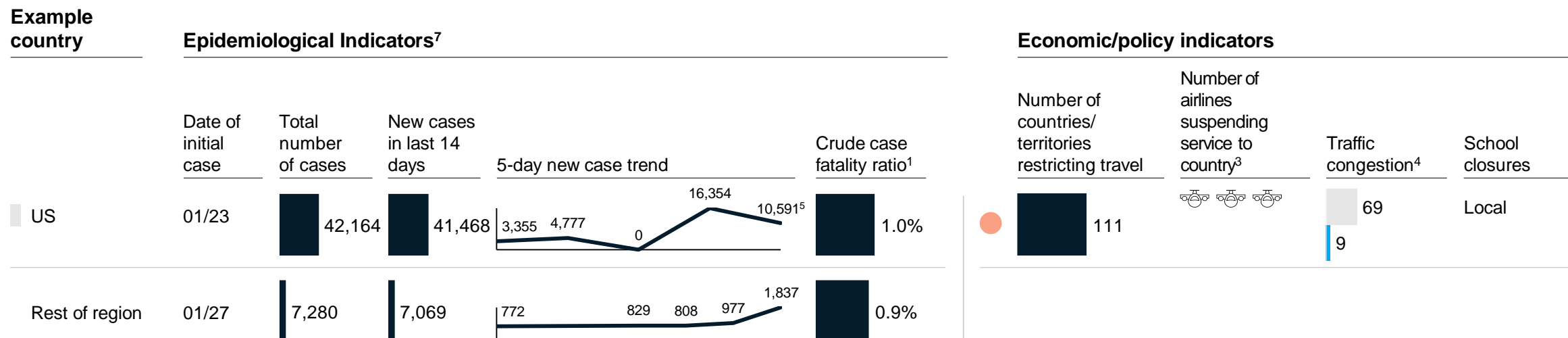
CDC travel health notice

- Warning level 3
- Alert level 2
- None

Traffic congestion⁵

- 03/25/2019
- 03/25/2020

i Americas



Current phase

- Stage 1:** Small number of cases identified; no sustained local transmission
- Stage 2:** Disease spread and sustained local transmission
- Stage 3:** Government action and shifts in public behavior. Not all affected regions enter stage 3, but interventions and economic impact signal prolonged recovery

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- Stage 5:** New cases drop, activity resumes

CDC travel health notice

- Warning level 3
- Alert level 2
- None

Traffic congestion⁵

- 03/25/2019
- 03/25/2020




i Asia (ex-China)



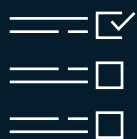
| Example country | Epidemiological Indicators ⁷ | | | | | Economic/policy indicators | | | |
|-----------------|---|-----------------------|---------------------------|----------------------|--|--|---|---------------------------------|-----------------|
| | Date of initial case | Total number of cases | New cases in last 14 days | 5-day new case trend | Crude case fatality ratio ¹ | Number of countries/territories restricting travel | Number of airlines suspending service to country ³ | Traffic congestion ⁴ | School closures |
| South Korea | Prior to 01/20 | 9,037 | 1,282 | 239 147 98 64 76 | 1.2% | 141 | x 13 | Data N/A | Country-wide |
| Japan | Prior to 01/20 | 1,128 | 560 | 77 46 50 43 39 | 3.6% | 119 | x 13 | 63 47 | Country-wide |
| Singapore | 01/24 | 507 | 341 | 32 40 47 23 52 | 0.4% | 117 | x 2 | 60 24 | Not noted |
| Rest of region | Prior to 01/20 | 4,161 | 3,826 | 542 339 473 617 630 | 1.1% | | | | |

| Current phase | CDC travel health notice | Traffic congestion ⁵ |
|--|--|--|
| Stage 1: Small number of cases identified; no sustained local transmission Stage 2: Disease spread and sustained local transmission Stage 3: Government action and shifts in public behavior. Not all affected regions enter stage 3, but interventions and economic impact signal prolonged recovery | Stage 4: Case growth and stretched health systems Stage 5: New cases drop, activity resumes | Warning level 3 Alert level 2 None |

COVID-19 Stage Detail

| | Stage 1 | Stage 2 | Stage 3 | Stage 4 | Stage 5 |
|---|--|--|---|--|---|
|  Epidemiological indicators | <p>Small number of cases identified</p> <p>No sustained local transmission</p> | <p>Disease spread and sustained local transmission</p> | <p>Disease spread widely and sustained local transmission</p> | <p>Case growth and stretched health systems</p> | <p>New cases drop, while surveillance continues to monitor subsequent waves</p> |
|  Economic indicators | <p>No significant impacts</p> | <p>Minor impact, primarily on supply side</p> | <p>Government interventions are instituted, impacting consumption</p> | <p>Consumption slump and inventory “whiplash” due to quarantine measures</p> <p>Inventory hoarding due to uncoordinated actors exacerbating supply chain</p> | <p>Consumption begins to rise, as quarantine begins to be rolled back</p> |
|  Social indicators | <p>Activity remains normal</p> | <p>Governments may begin coordinating containment activities</p> <p>Activity remains mostly normal</p> | <p>Shifts in public behavior begin in response to and multi-sectoral government actions</p> | <p>Larger numbers of citizens remain at home in response to the implementation of gov’t contingency plans</p> | <p>Social activity begins to resume</p> |

References



COVID-19 leading indicator dashboard for China

1. Case fatality ratio calculated as (deaths on day X) / (cases on day X). Previous versions of this dashboard calculated CFR = (deaths on day X) / (cases on day X-7) to account for incubation
2. Measures movement of population into destinations as of 3/22/2020
3. Wuhan included only for comparison
4. 7-day average (17-Mar to 24-Mar) compared to 2019
5. Car traffic only. Congestion reflects percentage increase in travel time compared to free-flow conditions



Region-specific details

1. Case fatality rate calculated as (deaths on day X) / (cases on day X). Dashboards before February 29 calculated CFR as (deaths on day X) / (cases on day X-7) to account for incubation
2. Assessment based on observed stoppage in growth of cases and medical community's opinion validated by external sources
3. Anecdotal reports of airline suspensions based on press searches
4. Based on representative cities: Tokyo, Singapore, Milan, Paris, Berlin, Madrid, Los Angeles
5. 0 new reported cases in US on 3/22 likely a reporting anomaly and not indicative of overall trend
6. Crude case fatality ratio likely to fall as testing becomes more widely available
7. Epidemiological data current as of 3/24 WHO situation report

Note: All countries and regions have documented third-generation cases

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