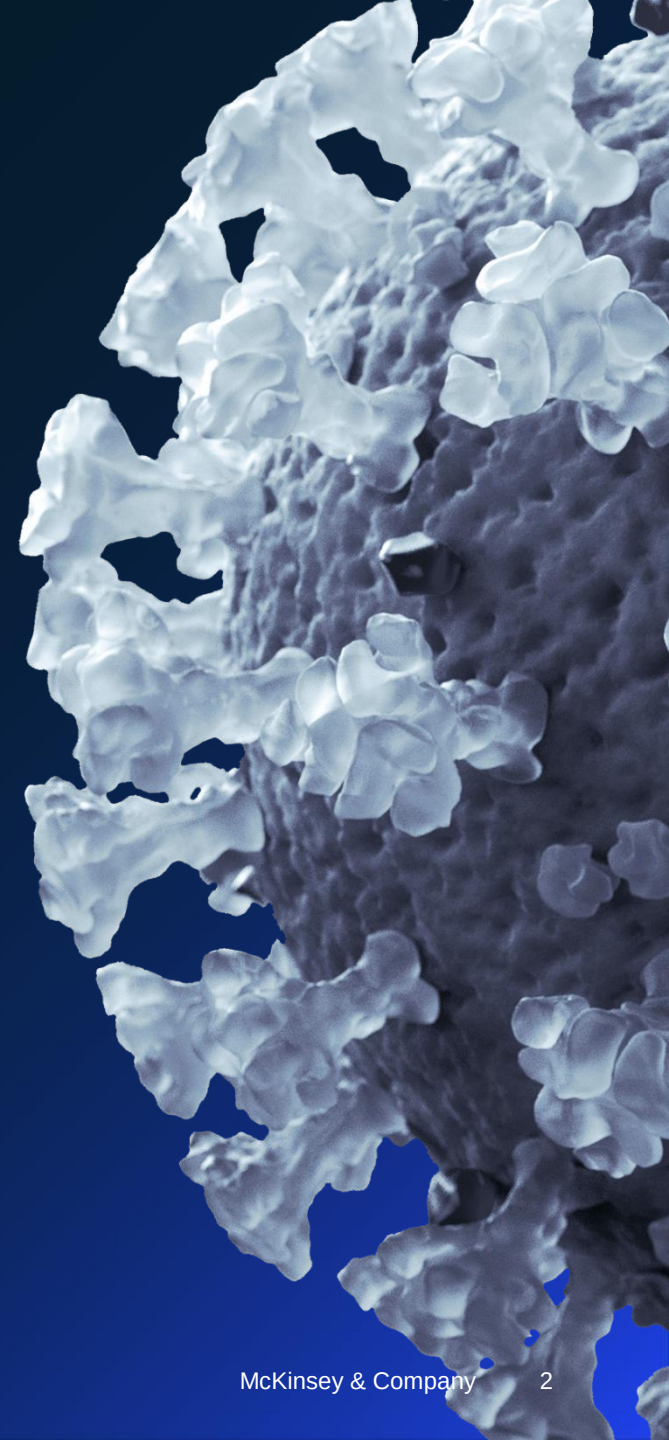
McKinsey & Company

COVID-19: Briefing note

Global health and crisis response

Updated: March 25, 2020



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

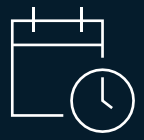
Thousands of health professionals are heroically battling the virus, putting their own lives at risk. Governments and industry are working together to understand and address the challenge, support victims and their families and communities, and search for treatments and a vaccine.

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

Sources: World Health Organization situation reports, news reports, McKinsey analysis

Contents

The global spread is accelerating with more reports of local transmission

Latest as of March 25, 2020

Impact to date

Current as of March 25, 2020

>380,000
Reported confirmed cases

>16,000
Deaths

194
Countries or territories with reported cases[1]

>115
Countries or territories with evidence of local transmission[2]

>75
Countries or territories with more than 100 reported cases[1]

0.4%
China's share of new reported cases March 18–24

>160%
Increase in reported cases March 18–24 from Europe

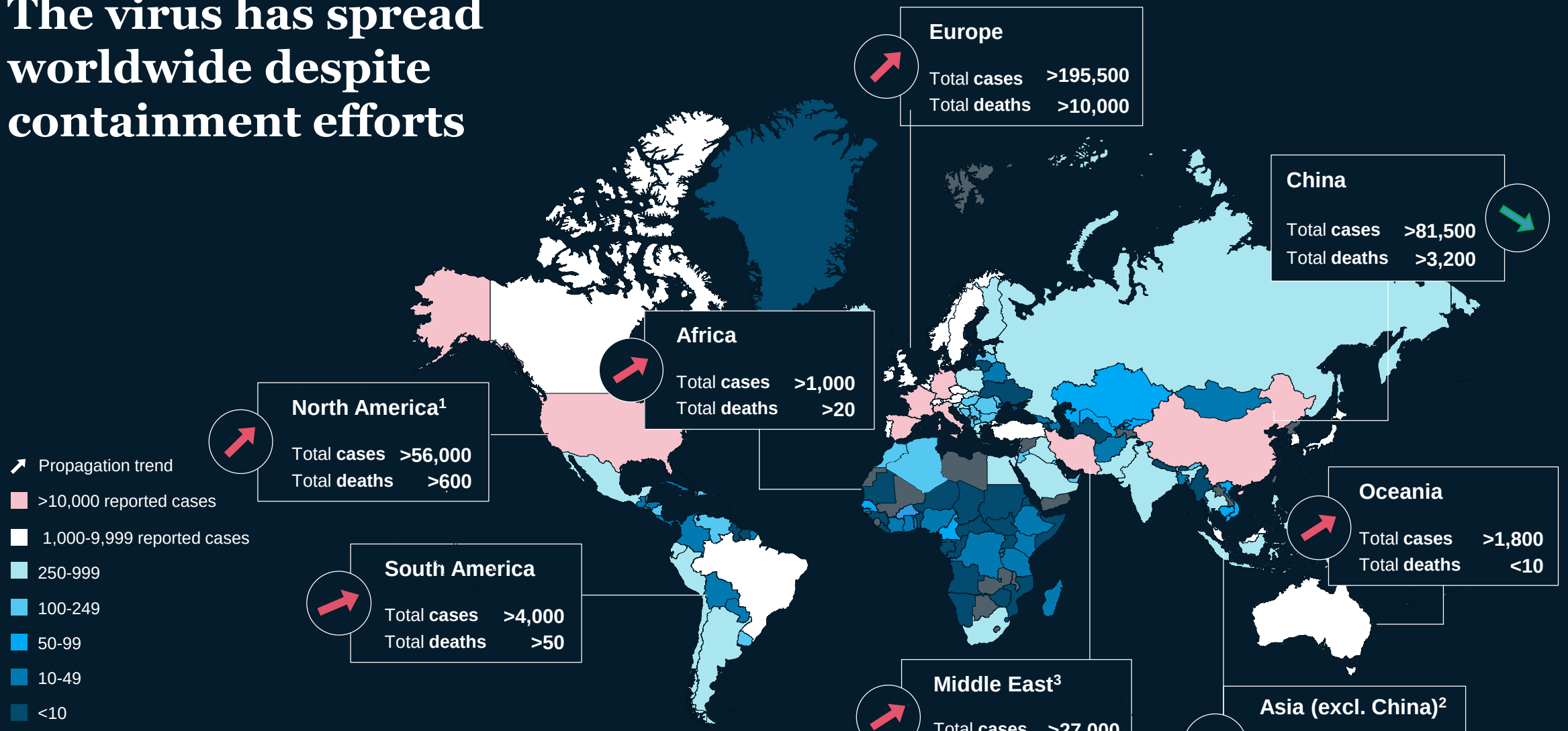
35
New countries or territories with cases March 18–24

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

Sources: World Health Organization, John Hopkins University, CDC, news reports

The virus has spread worldwide despite containment efforts

Current as of March 25, 2020



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

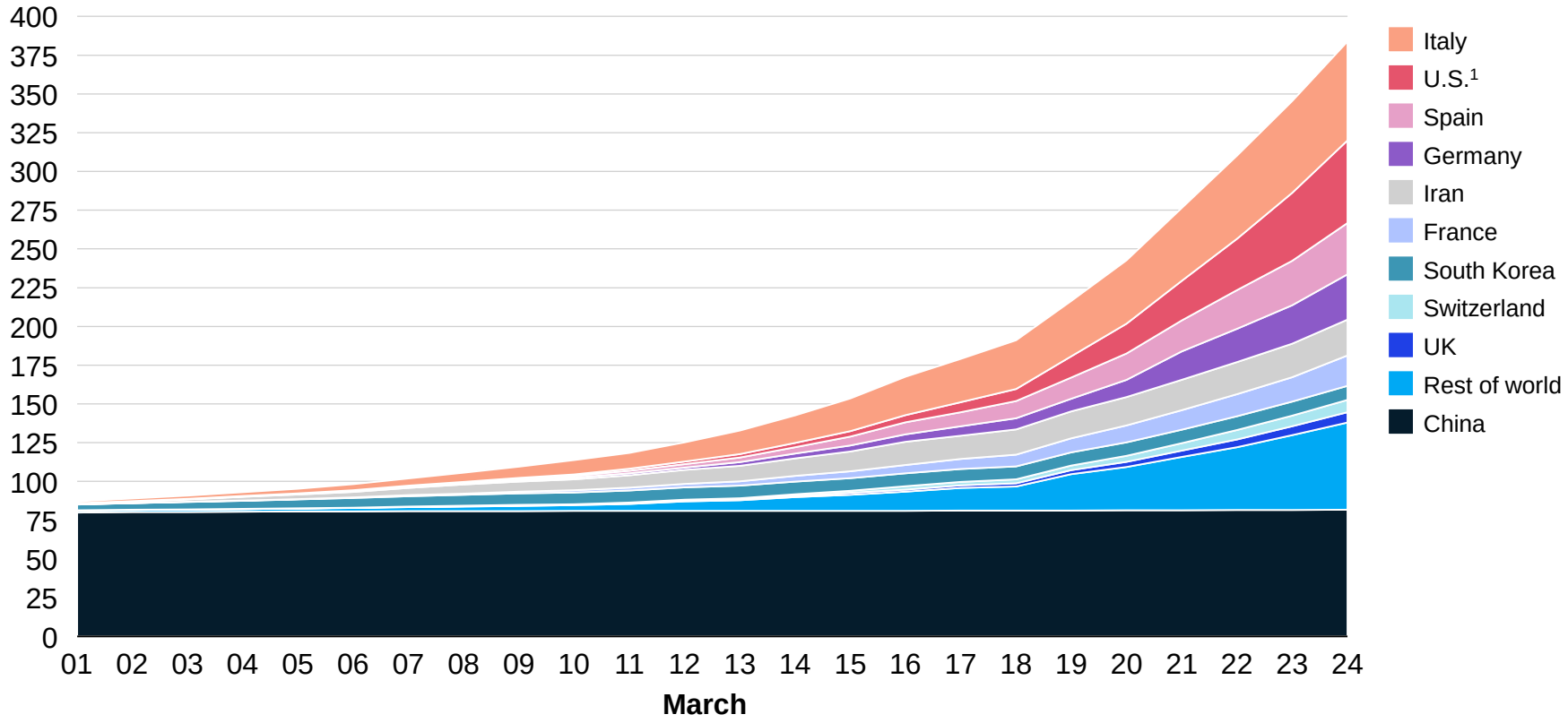
Source: World Health Organization, Johns Hopkins University, McKinsey analysis

Greatest share of recent cases comes from Europe, although U.S. cases are rapidly accelerating

Current as of March 25, 2020

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.

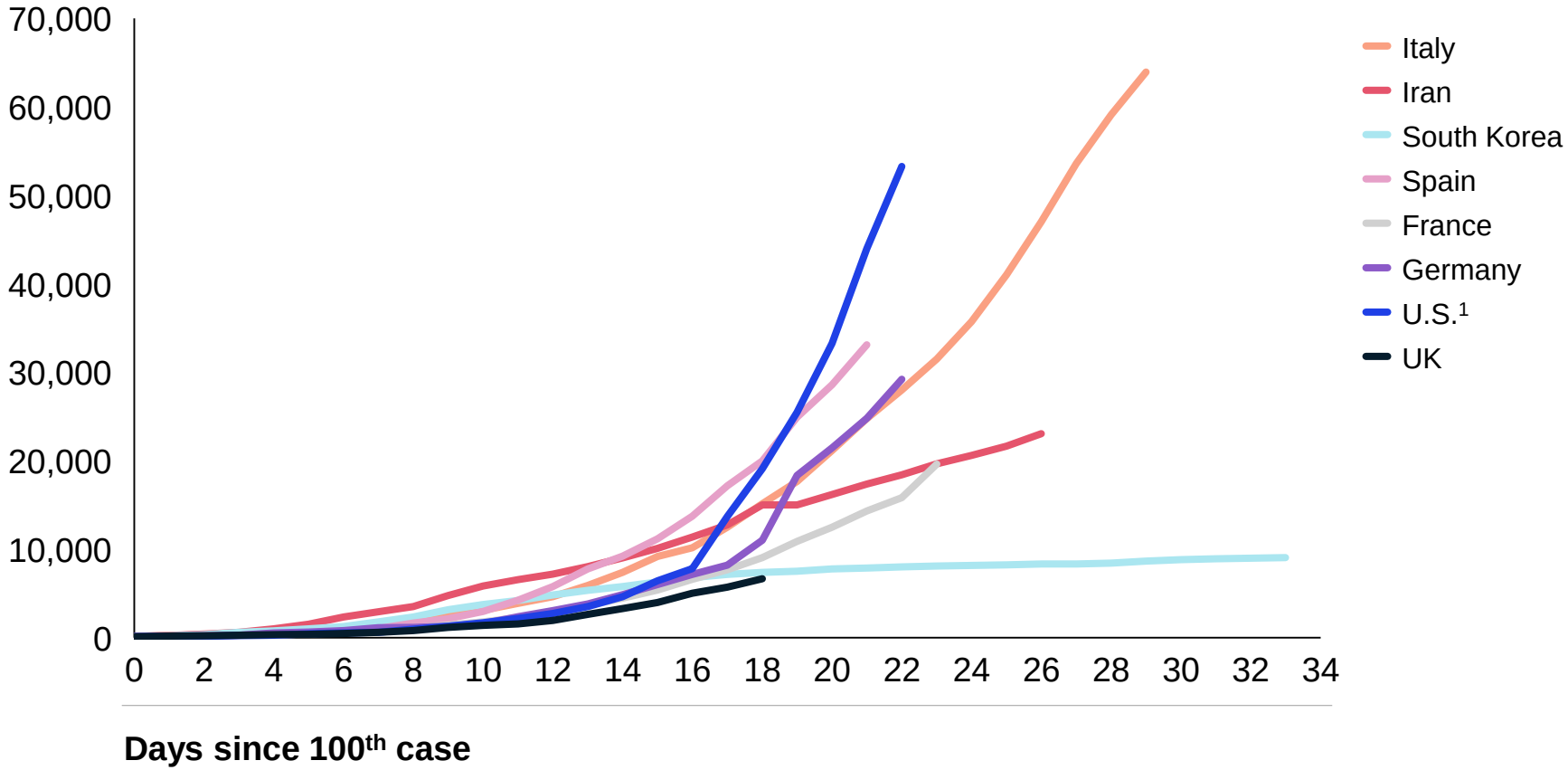
United States:
The U.S. has seen total cases increase nearly ~8x in the last week, from ~6,500
on March 17 to ~50,000+ on March 24; the U.S. now has the third largest number of total cases, following China and Italy and is growing at a rate of ~10k cases per day (March 23-March 24).

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

Sources: WHO situation reports, Johns Hopkins University, press search

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

Sources: WHO situation reports; Johns Hopkins University, press search

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.

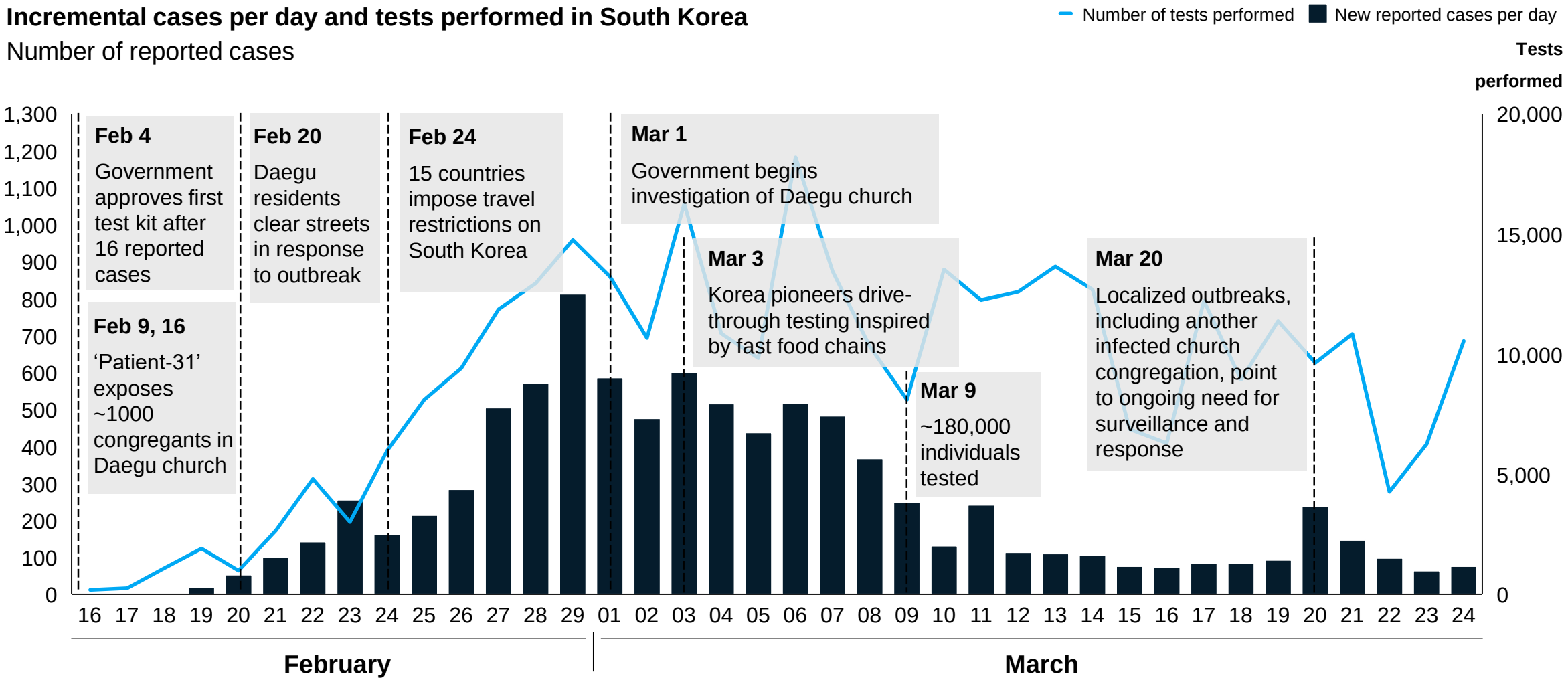
South Korea: Aggressive testing, contact tracing and surveillance, and mandatory quarantines are helping isolate virus clusters and dramatically slow spread of outbreak in Daegu.

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

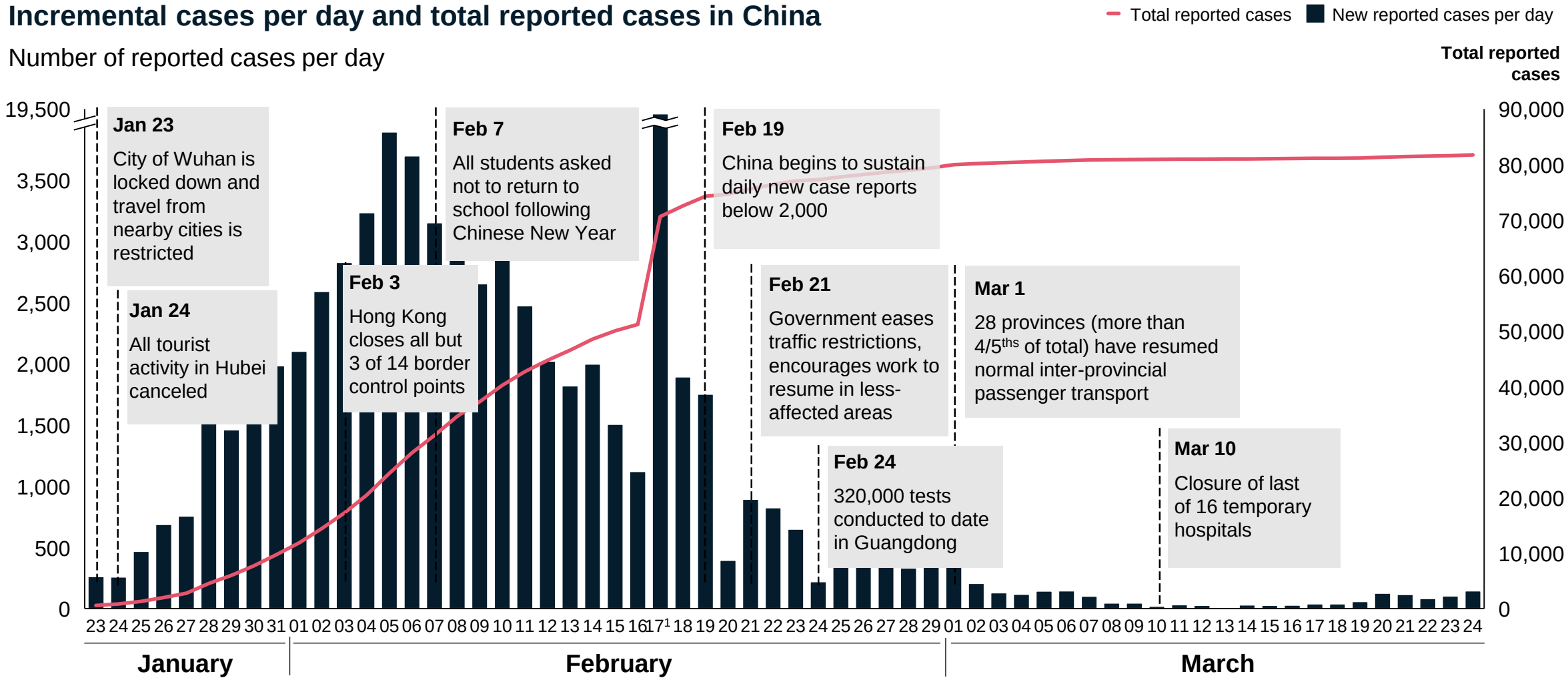
Number of reported cases



Source: WHO situation reports, CNN, New York Times, Korean CDC, press search

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

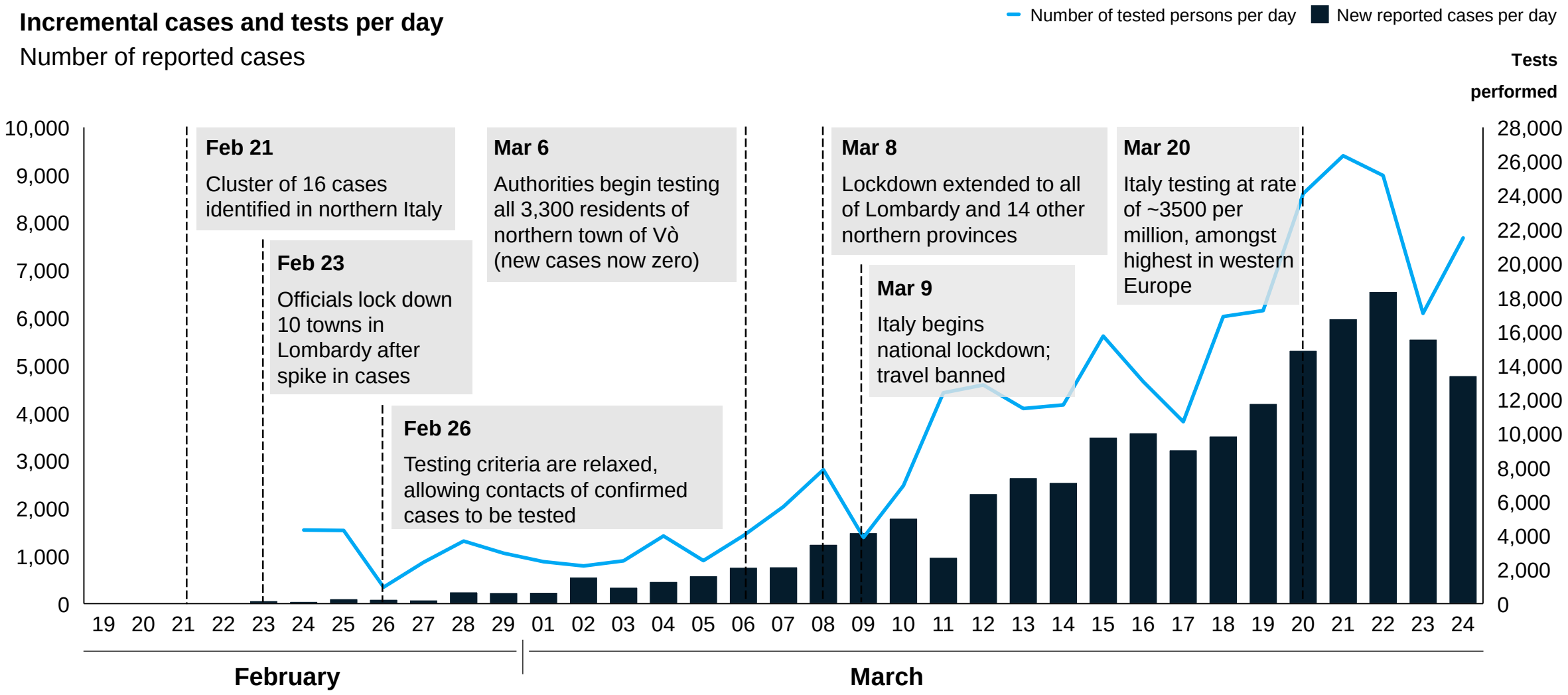
Incremental cases per day and total reported cases in China



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



Source: WHO situation reports, CNN, New York Times, press search

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"

Test, track, and isolate

"South Korea model"

Characteristic actions

Border closures and city-level lockdowns, quarantines

"Shelter-in-place" restrictions on individual movement

Mandatory closures of businesses

Aggressive testing of suspected cases, clusters (5000+ tests per million population)

Contact tracing and isolation via surveillance

Quarantine enforced by government monitoring

Testing

XX = tests per million people[1]

5,000 → 10,000

	U.S.	France	Spain	UK	Italy	Norway
Countries' responses	**~310** State and city-level closures; testing lagging other countries	**~560** National lockdown with strict police enforcement; has performed targeted vs. widespread testing	**~640** National lockdown limiting non-essential movements; reported logistical issues limiting testing capabilities	**~960** Early strategy focused on scaling testing vs. lockdowns, though officials began enforcing lockdown March 20	**~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	**~8,000** Quickly scaled testing, e.g. drive-through testing available 7 days after first confirmed case; instituted punishment for quarantine violations

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.

Sources: University of Oxford, Sante Publique France, Istituto Superiore di Sanità (ISS), UK Department of Health and Social Care, Ministerio de Sanidad, Consumo y Bienestar Social, U.S. CDC, press search

Contents

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

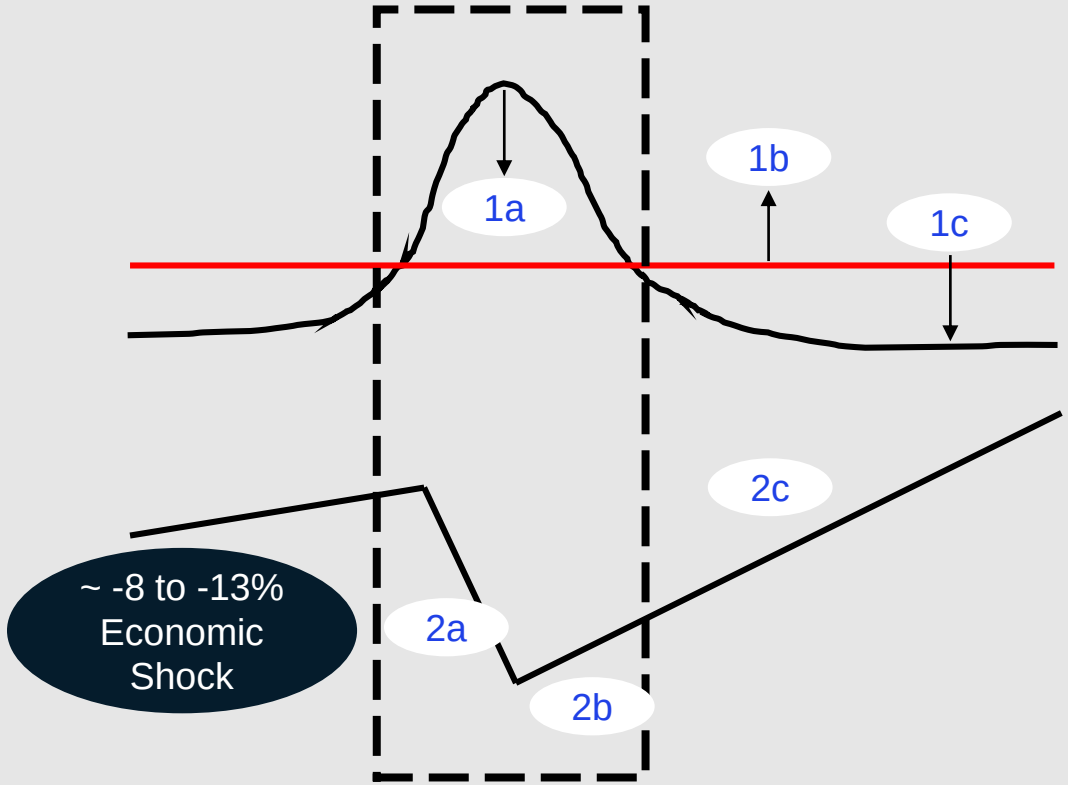
Imperative 2: **SAFEGUARD OUR LIVELIHOODS**

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



Source: McKinsey analysis, in partnership with Oxford Economics

Scenarios for the economic impact of the COVID-19 crisis

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

Virus spread and public health response

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

Rapid and effective control of virus spread

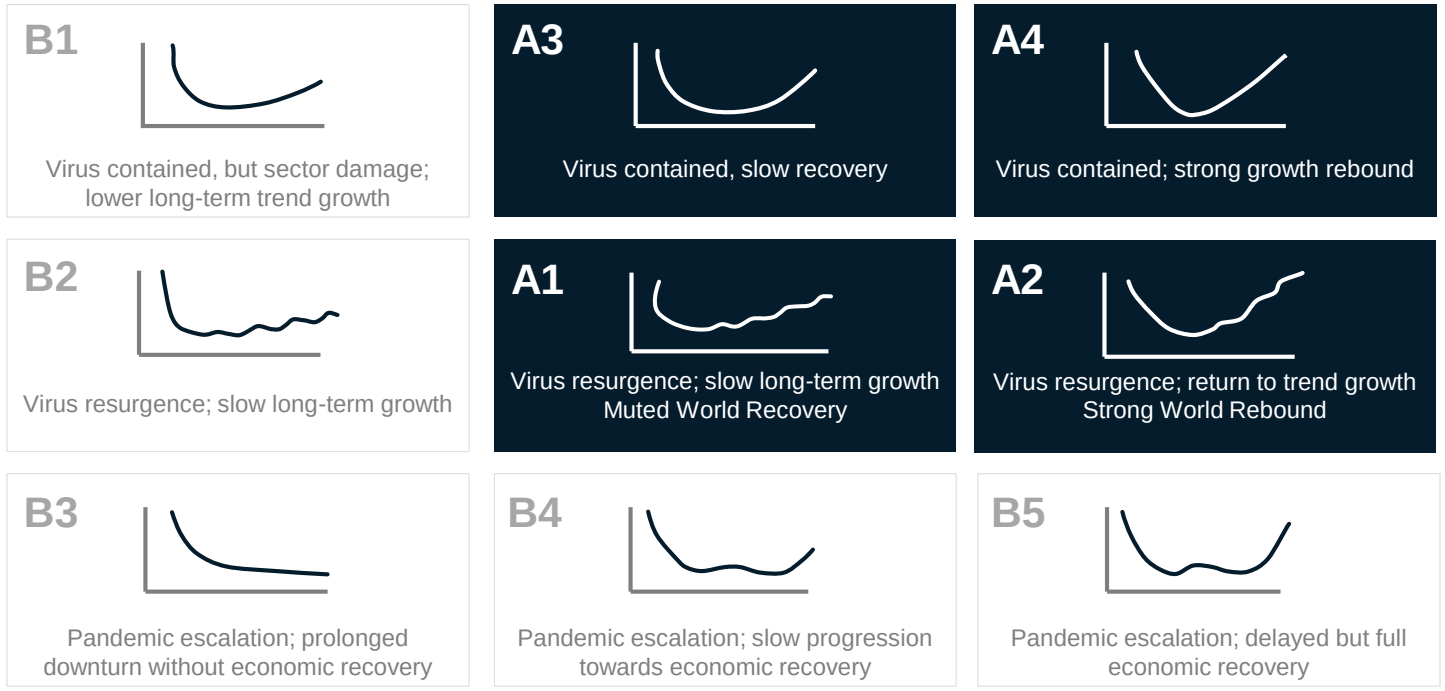
Strong public health response succeeds in controlling spread in each country within 2-3 months

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)



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)

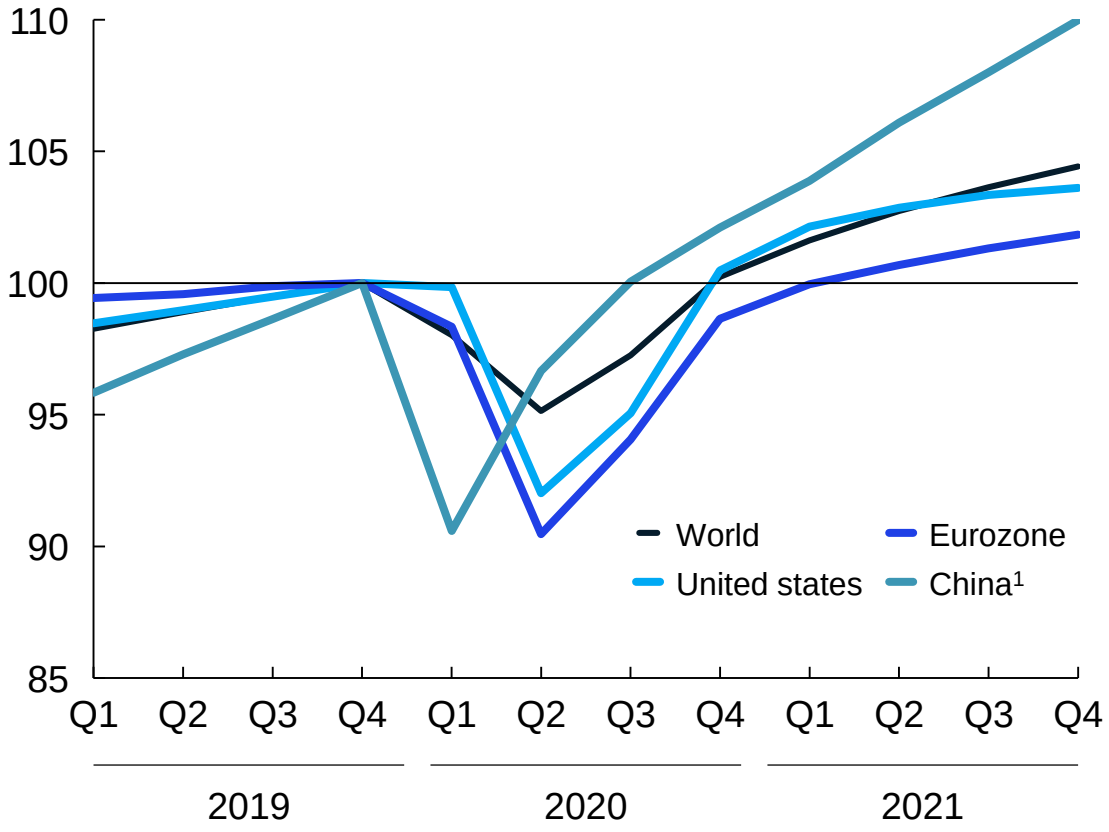
Source: “Safeguarding our lives and our livelihoods: The imperative of our time,” Sven Smit, Martin Hirt, Kevin Buehler, Susan Lund, Ezra Greenberg, and Arvind Govindarajan

Scenario A3
Virus contained

Real GDP, Local Currency Indexed

Real GDP Growth – COVID-19 Crisis

Local Currency Units Indexed, 2019 Q4=100

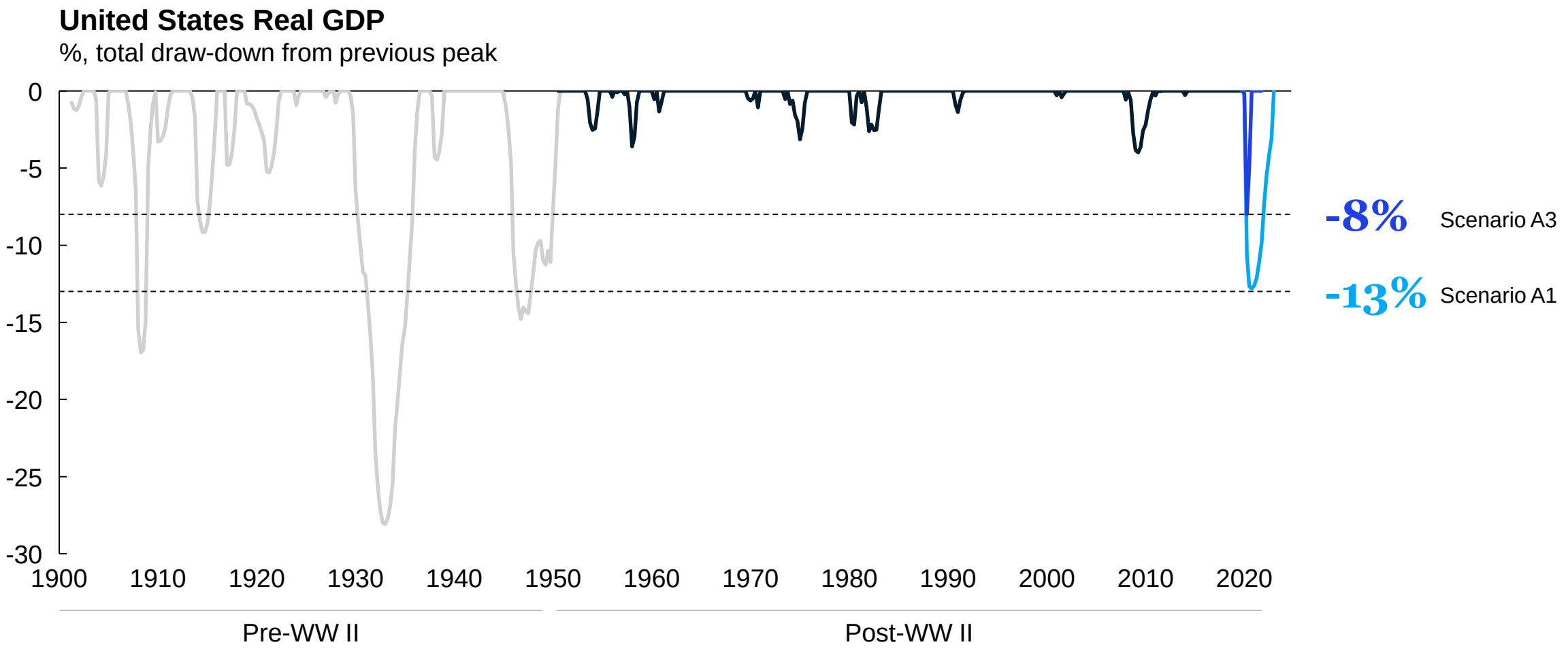


	Real GDP Drop 2019Q4-2020Q2 % Change	2020 GDP Growth % Change	Time to Return to Pre-Crisis Quarter
China	-3.3%	-0.4%	2020 Q3
USA	-8.0%	-2.4%	2020 Q4
World	-4.9%	-1.5%	2020 Q4
Eurozone	-9.5%	-4.4%	2021 Q1

1. Seasonally adjusted by Oxford Economics

Source: McKinsey analysis, in partnership with Oxford Economics

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



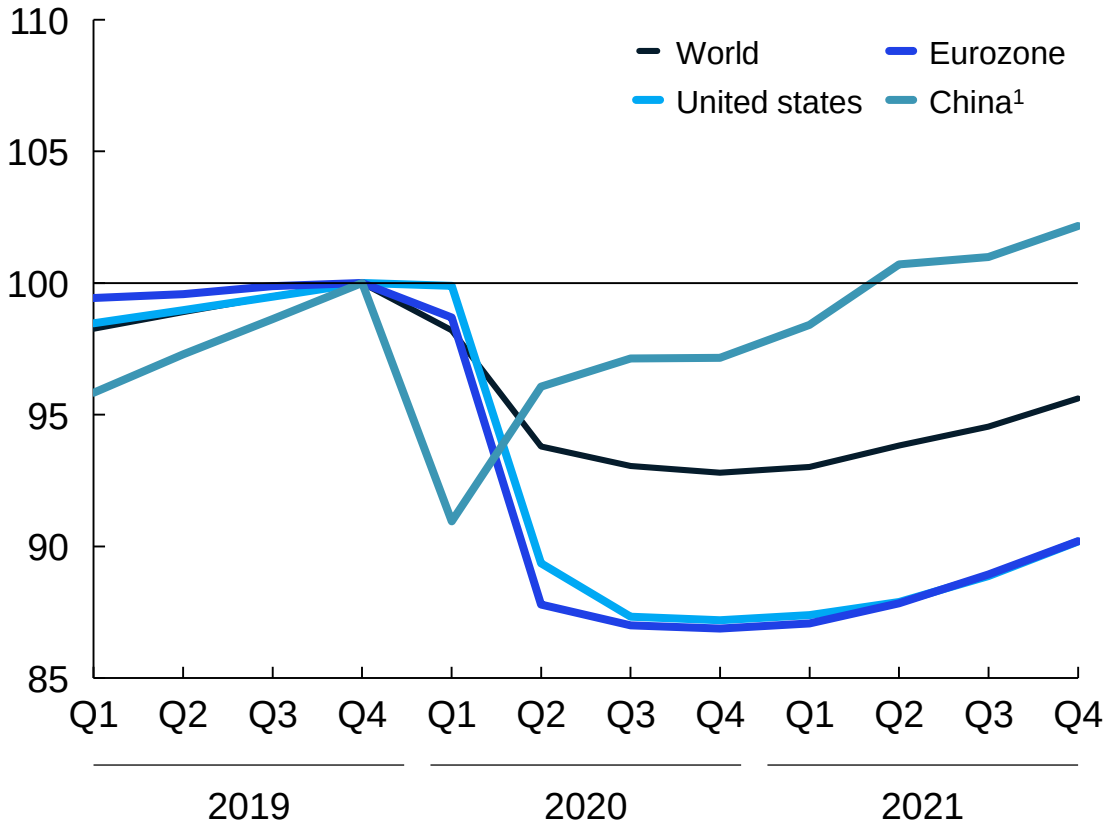
Source: Historical Statistics of the United States Vol 3, Bureau of economic analysis; McKinsey team analysis, in partnership with Oxford Economics

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

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	-3.9%	-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

Current as of March 25, 2020

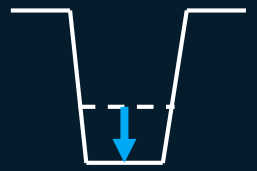
◯ Epidemiological indicator

● Economic indicator

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

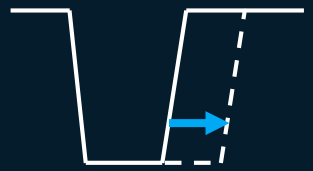


How deep are the demand reductions?

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

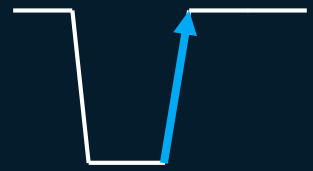


How long could the disruption last?

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?

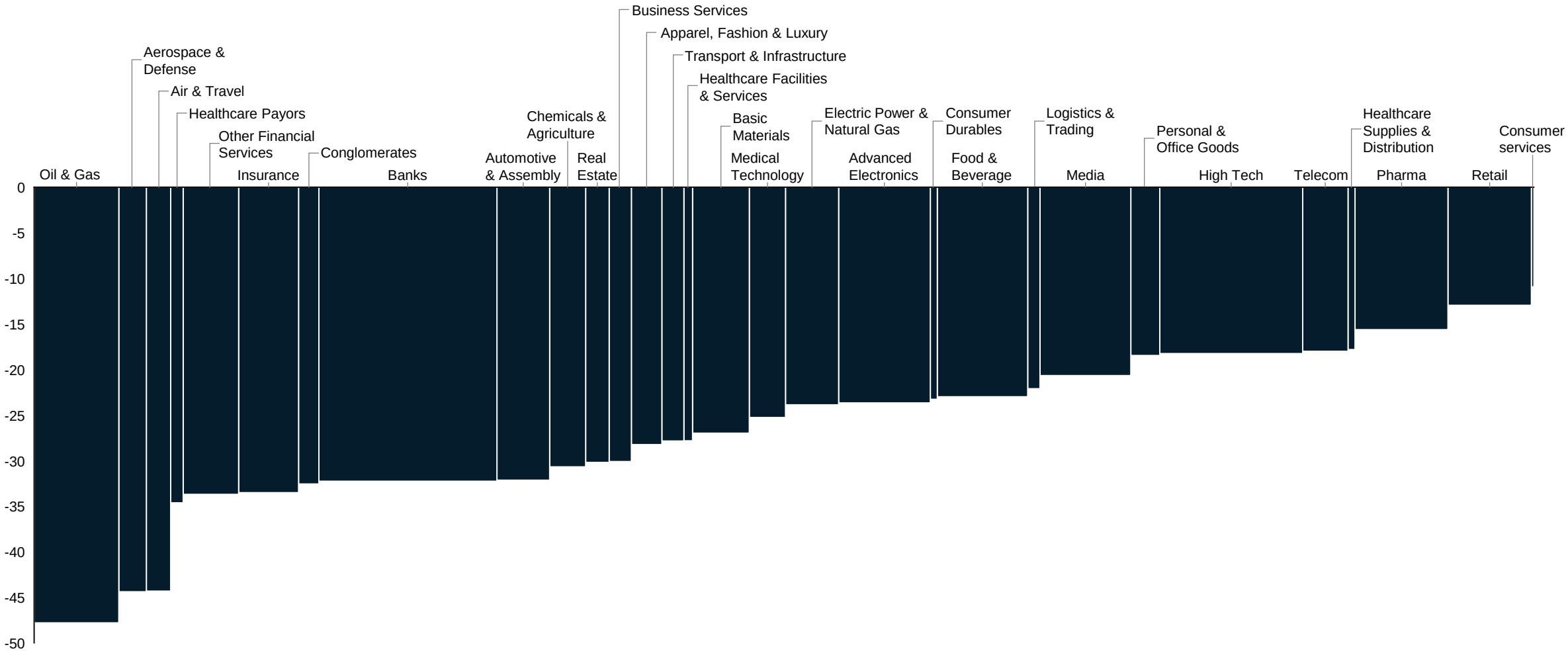
Indicators to monitor

- 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

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 $

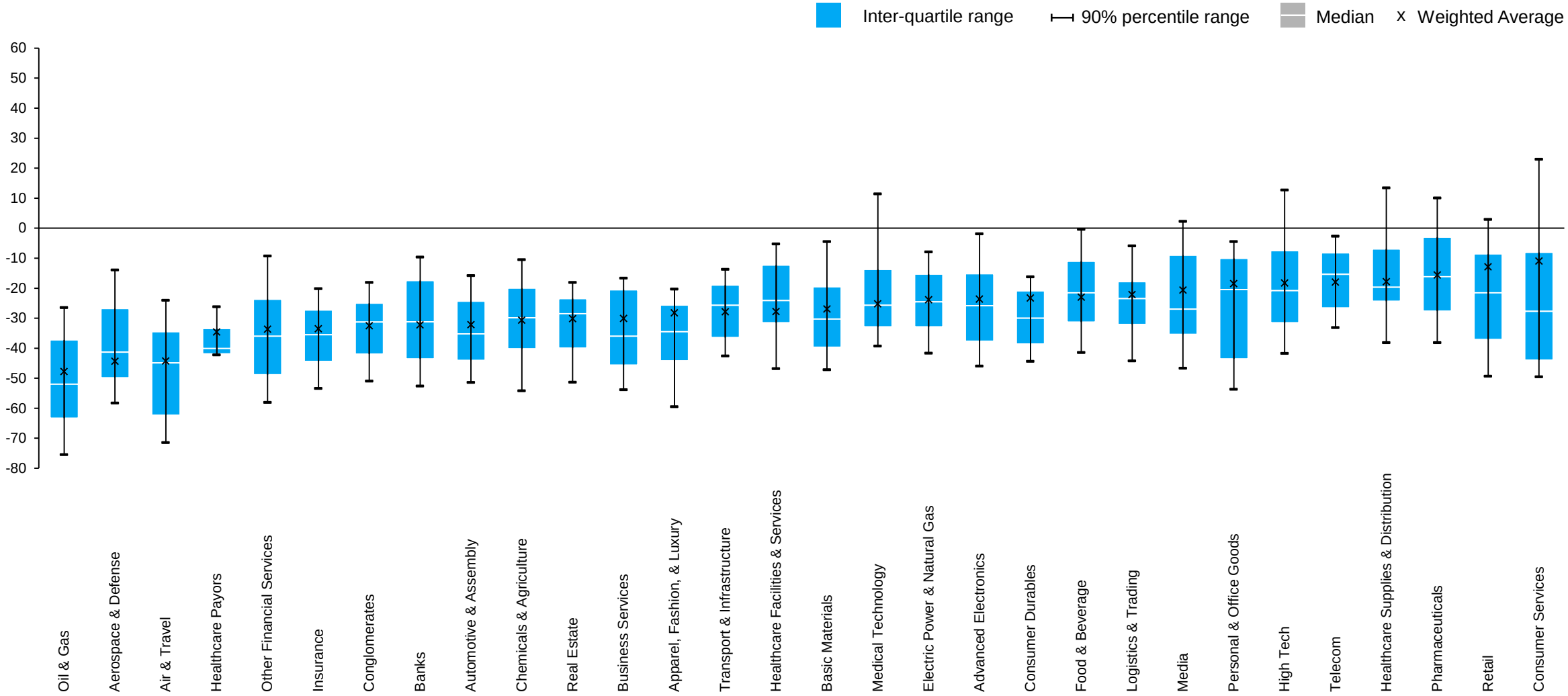


1. Data set includes global top 3000 companies by market cap in 2019, excluding some subsidiaries, holding companies, companies with very small free float and companies that have delisted since

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

Even within sectors, there is significant variance between companies

Distribution of year-to-date total shareholder returns by industry percent[1]



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

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

The hardest hit sectors may not see restart until 2021

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

	Aerospace/defense	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	-47%	-51%	-38%	-48%	-35%	-36%
Industry specific examples	**Aircraft delivery shocks** mitigated by size of order backlog; which is currently large (~4 years for wide-body, ~9 years for narrow) **Aftermarket maintenance will be deeply impacted** immediately due to lower aircraft flight hours and operators' cash constraints **Production at F-35 plants in Japan & Italy disrupted** with unclear impact on delivery schedules; expectations for additional disruption as US cases grow	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 N. Hemisphere summer travel peak season deeply impacted since pandemic fears coincide with peak booking period Recovery pace faster for **domestic travel** (~2-3 quarters); slower for **long-haul and int'l travel** (6+ quarters)	**US insurers have been strongly affected**, especially reinsurers and life & health insurers **Reduced interest rates** and investment performance **impacting returns – esp. for longer-tail lines** **Disruptions expected in new business and underwriting processes** due to dependence on paper applications and medical underwriting	**Oil price decline** driven by both short-term demand impact and supply overhang from OPEC+ decision to increase production **Oversupply expected to remain in the market even after demand recovery**, and post 2020, unless OPEC+ decides to cut production	**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 Headwinds to persist into Q3 given **tight inventories** (<6 weeks), **supply chain complexity** (therefore, minimal ability to shift)	**Overall decline** in private consumption and exports of services. **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) Retail **stores temporarily closed** in many parts of the world – high regional variation

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

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Leaders need to think and act across 5 horizons

Resolve

Address the immediate challenges that COVID-19 represents to the institution's workforce, customers, and business partners

Resilience

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

Return

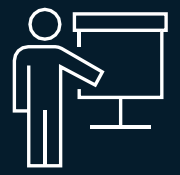
Create a detailed plan to return the business back to scale quickly, as the virus evolves and knock on effects become clearer

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 regulatory and competitive environment in your industry may shift



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	• **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	• **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	**Build a plan to prioritize & protect valuable customers:** • 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) **Build customer trust through transparency:** • 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	• 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

Any **lack of clarity** in roles and responsibilities, decision rights or objectives is **amplified** in a remote environment

Difficult of **navigating large or hierarchical organizational** structures

People

Sense of lack of direction / isolation can degrade morale and performance

Misunderstandings or lack of clarity on priorities leading to **wasted work**

Isolation and lack of social interaction leading to **lower employee motivation** and **less cohesion** as a team

Process

Lower communications efficiency due to missing in-person touch, time it takes to write vs talk, finding time together, or bad connectivity

Difficulty in self-organizing to address real-time challenges

Risk to overlook **dependencies** and create **island solutions**

Technology

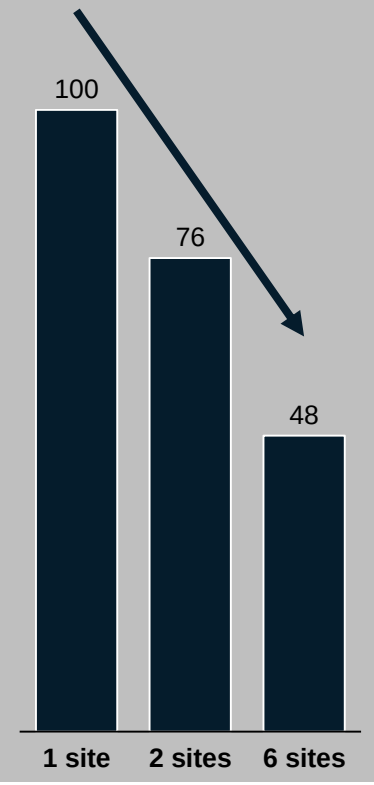
Outdated architecture, slow VPN access

Missing tooling (e.g. for VC, co-creation, DevOps) exacerbate collaboration challenges

Impractical security inhibits remote work, leads to team members adopting insecure workarounds

Productivity decay with # of sites

Complexity units per man-week, indexed



Sources: Press searches; Web pages; Interviews; McKinsey Numetrics; Team analysis

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**

Sources: Press search; interviews; McKinsey Numetrics; team analysis

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	• 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	• 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	• 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	• 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	• 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	• 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)

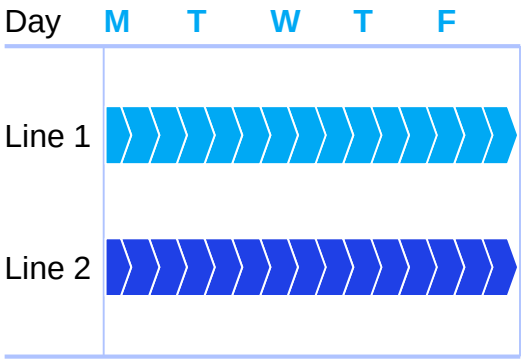
Changing shift patterns is an option to limit exposure

Resolve

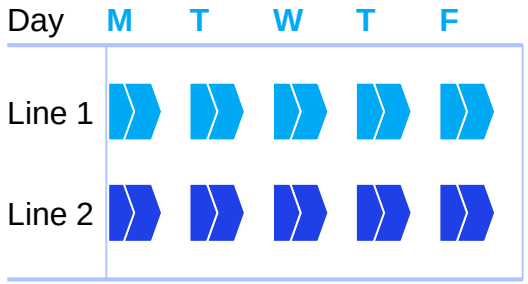
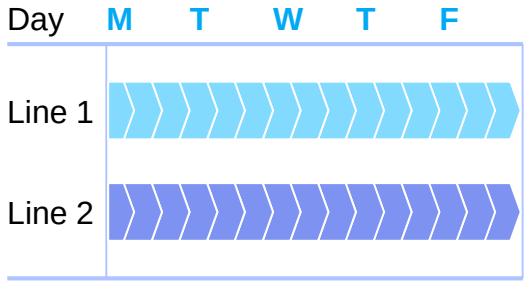
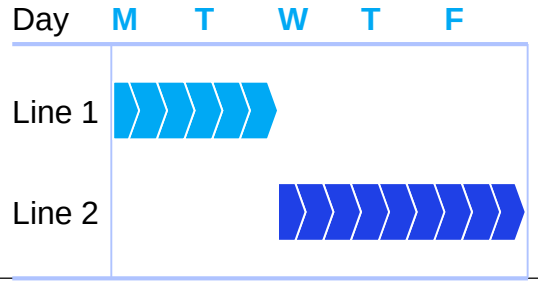
Current situation – 3 shifts

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.

	Description	Pros	Cons
Option 1 – Reduction in shifts 	16h x 5day model 5 ramp ups per week Allows for deep cleaning on 3rd shift	Incremental change, easy to implement Dedicated people to each line Maintenance can be done in 3rd shift Flexible	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

Source: Adapting production shifts to low demand in asset-heavy industries

Resilience

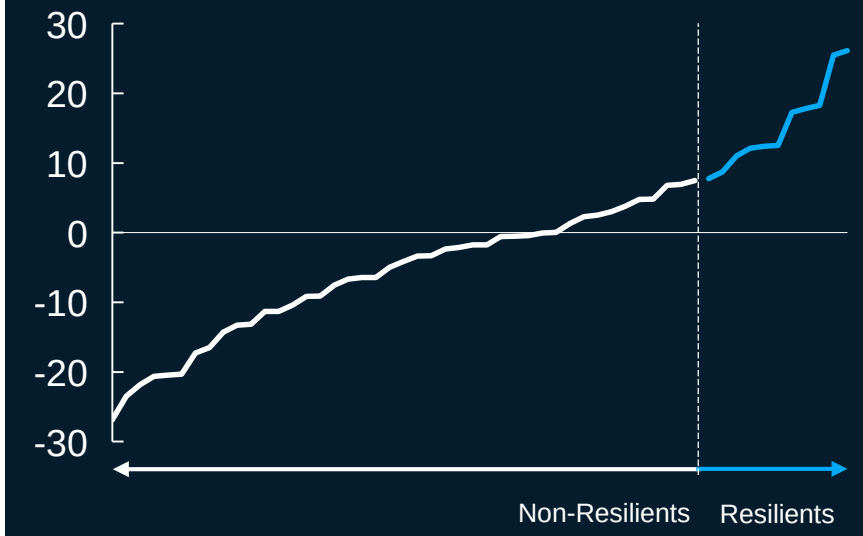
Address near-term cash management challenges, and broader resiliency issues during virus-related shutdowns and economic knock-on effects

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 resilients 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

Resilience

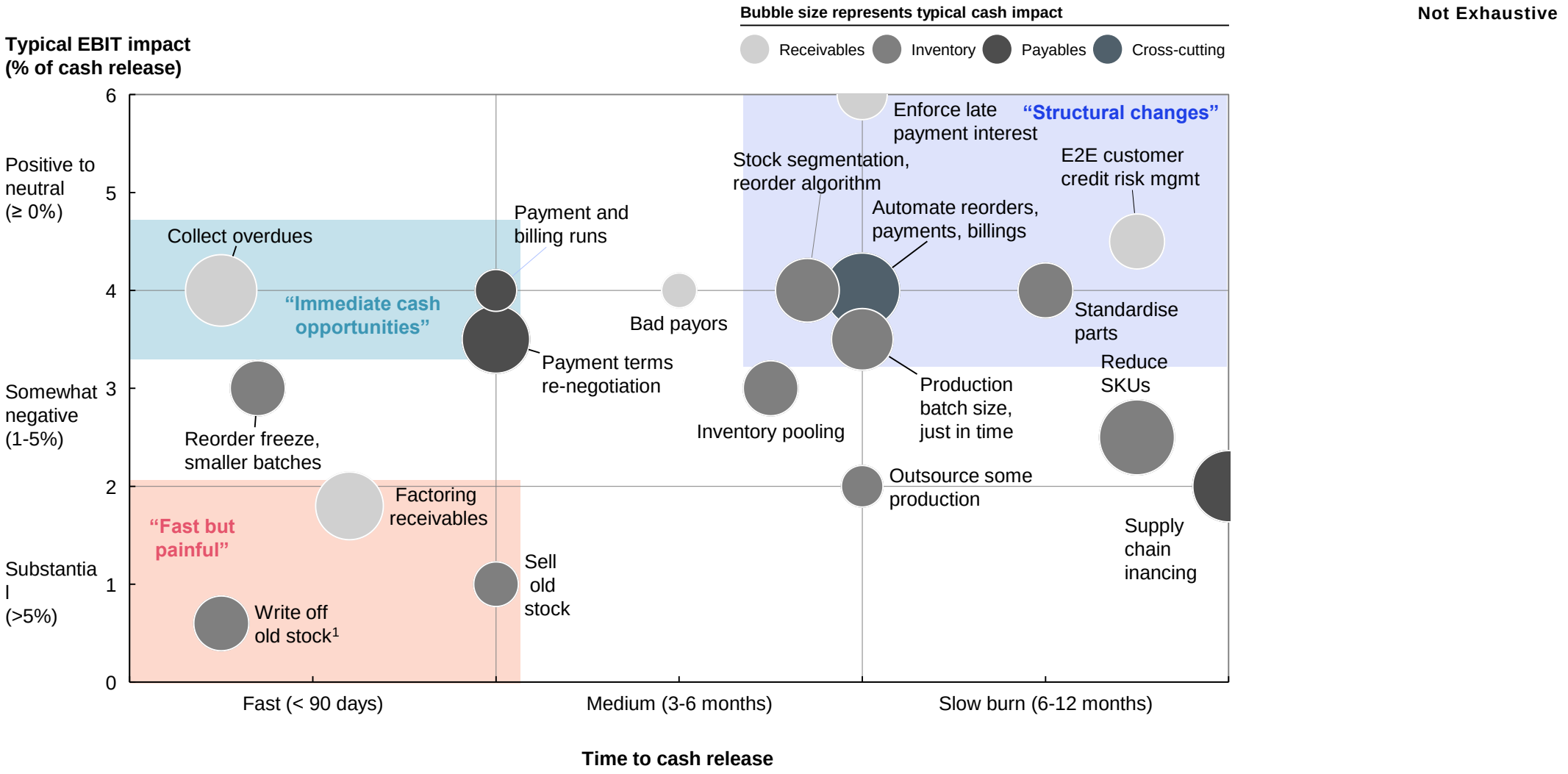
		Compared to Non-resilients,
Speed		
EBITDA & revenues outperformance	Resilients companies sustained[1] organic revenue growth early and throughout the recession and on revenue in recovery	Resilients **increased revenue by 30%** …
Early & hard moves	Resilients moved faster, harder on productivity; preserved 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

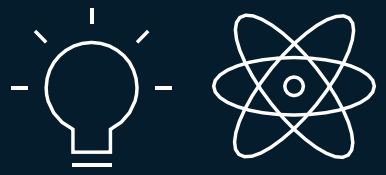
Companies should be prepared for the “return”

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)	How this may evolve
'Shelter at home' moves are causing the largest demand drawdowns modern economies have seen in decades	A self-sustaining recession may occur if governments are not able to respond effectively to the new threats that economies face
The virus spread, and public health and economic response vary widely across countries today	The speed and effectiveness of countries response could reshape political and economic relationships globally
Consumers are recalibrating on spend, having experienced a new model of lower in-person & even higher virtual connections, while learning new skills	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
Doctors are pointing to the inherent challenges of providing hospital-centered care during pandemics	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

Reimagination

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

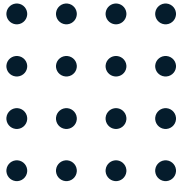
Maintains multiple scenarios; provides one planning scenario. Facilitates future state exercises

Owns
- Reform

Input to
- Reimagination
- Resolve

Divergent / creative thinking

5% of Nerve Center capacity



Team 2 - Design

Strategic moves team

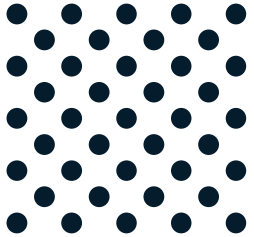
Uses planning assumptions (& scenarios) to craft trigger based portfolio of strategic moves

Owns
- Resilience
- Reimagination

Input to
- Resolve

Divergent / creative thinking

5% of Nerve Center capacity



Team 3 - Decide

Integrated operations team

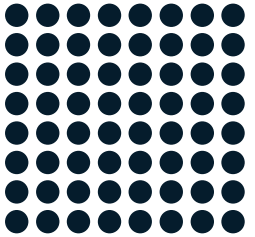
Maintains operating cadence, risk maps, situation reports, tracks progress, and ensures ownership

Owns
- Timing & facilitation of strategic decision-making

Input to
- All 5 Rs

Mix – Divergent / convergent

10% of Nerve Center capacity



Team 4 - Deliver

Workforce, SC, customer, cash

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

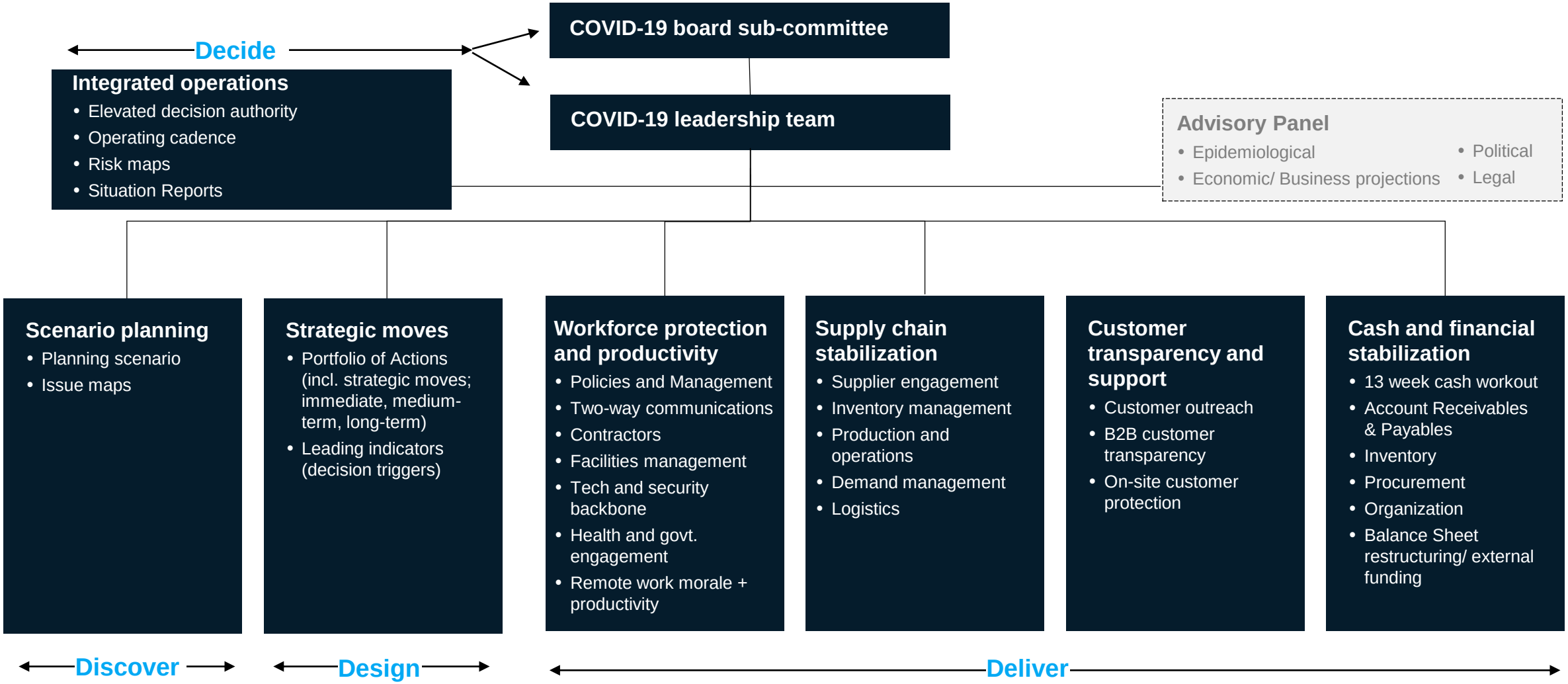
Owns
- Resolve
- Return

Convergent / linear thinking

80% of Nerve Center capacity

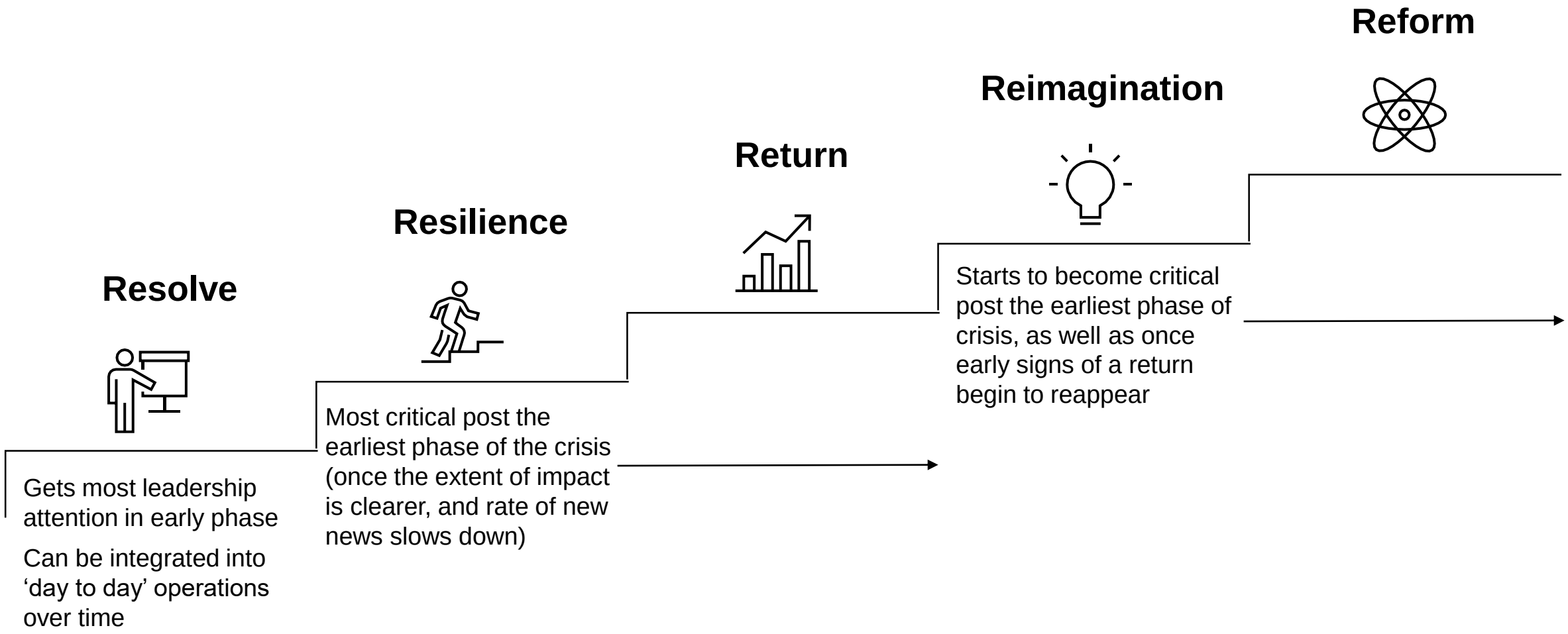
Managing across 5Rs requires a new architecture: Nerve Center

"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

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
Situation today	**~80% plants restarted** Across China, ex-Hubei, with large enterprises restarting, albeit with partial capacity, at much higher rate than smaller ones	**1.4M idle containers** 5.5% of global container capacity affected by reduced demand **66% BDI increase** Baltic Dry Index[1] 66% higher since CLNY[3] but at 10% lower levels compared to March 2019	**60% China flights suspended[5]** Commercial flights account for ~50% of air cargo capacity, some airlines converting flights for cargo[6] **2x TAC index** TAC index rate +27% for U.S.–China, +93% EU–China[2], +37% China–U.S., and +45% for China–EU since CLNY[3]	**60% truck staff available** 1–14 day quarantine- and capacity-induced increase in freight transport times **MED** Demand for express last-mile delivery has spiked in China due to quarantine and social distancing	**20.5% decline in retail sales** China consumer sentiment since January sharply lower; online/express deliveries up **MED** Europe and U.S. sentiments evolving, but localized
What to expect	**MED** Parts and labor shortages leading to further supply chain disruptions (e.g., decreased production capacity) Other regions will be facing production capacity reductions Customer pressure for prioritization	**7,000 TEU/week reduction** Volumes will return as factories restart, may see peak for restocks Future capacity 2.3% reduction for a Asia-U.S. route from May due to sea freight alliance revisions **MED** Impact on freight will take an extended period of time to correct with slower ramp-up Logistics capacity returns but faces constraints; near-term price increases	**5% global air traffic decrease[4]** Decline in capacity available due to travel ban on commercial flights YoY global air freight belly capacity reduction of 14% in March 2020[4] Rates likely to continue to increase	**High** Trucking capacity constraints in China likely to ease Declines at U.S. ports foreshadow declines in U.S. intermodal (rail)	**High** Demand slump may persist Inventory “whiplash”—7–8 weeks for auto, 2–4 weeks for high-tech Inventory hoarding and demand spikes due to uncoordinated actors exacerbate supply chain

1. Assessment of risk premium to ship raw materials on a number of shipping routes, data as of 3/13
2. Frankfurt (FRA) to Shanghi (PVG) used as a proxy
3. End of extended Chinese Lunar New Year holiday (2/7-3/13 for BDI, 2/10-3/2 for 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

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

COVID-19 Leading indicator dashboard for China

Tracking toward economic restart

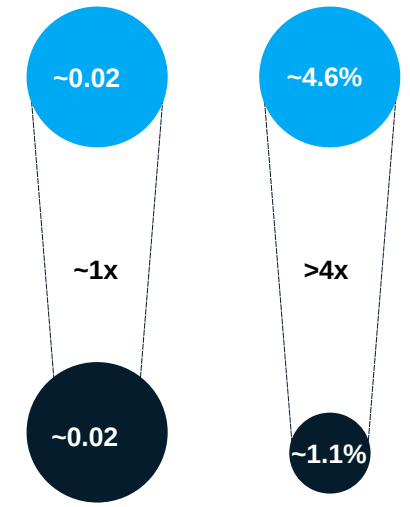
Hubei impact

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

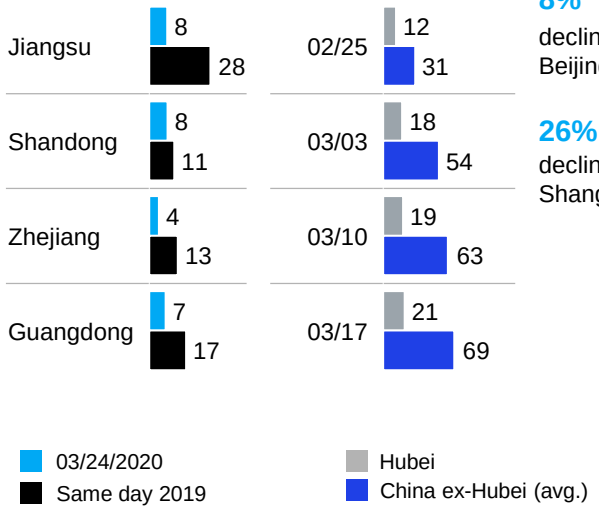
- Steady decline in confirmed cases
- New suspected and confirmed cases rates consistent with other provinces
- Quarantine lifted
- Public transport resumes
- Factory activity returns to pre-outbreak levels



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



Air pollution (NO_2 level)

8% decline in Beijing[4]

26% decline in Shanghai[4]

PMI manufact.

14pt decline in Feb

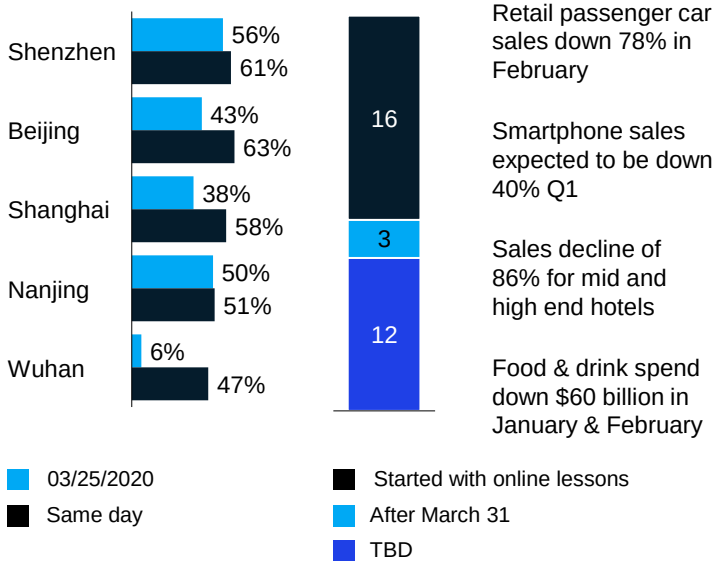
Small businesses face more labor disruption

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



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

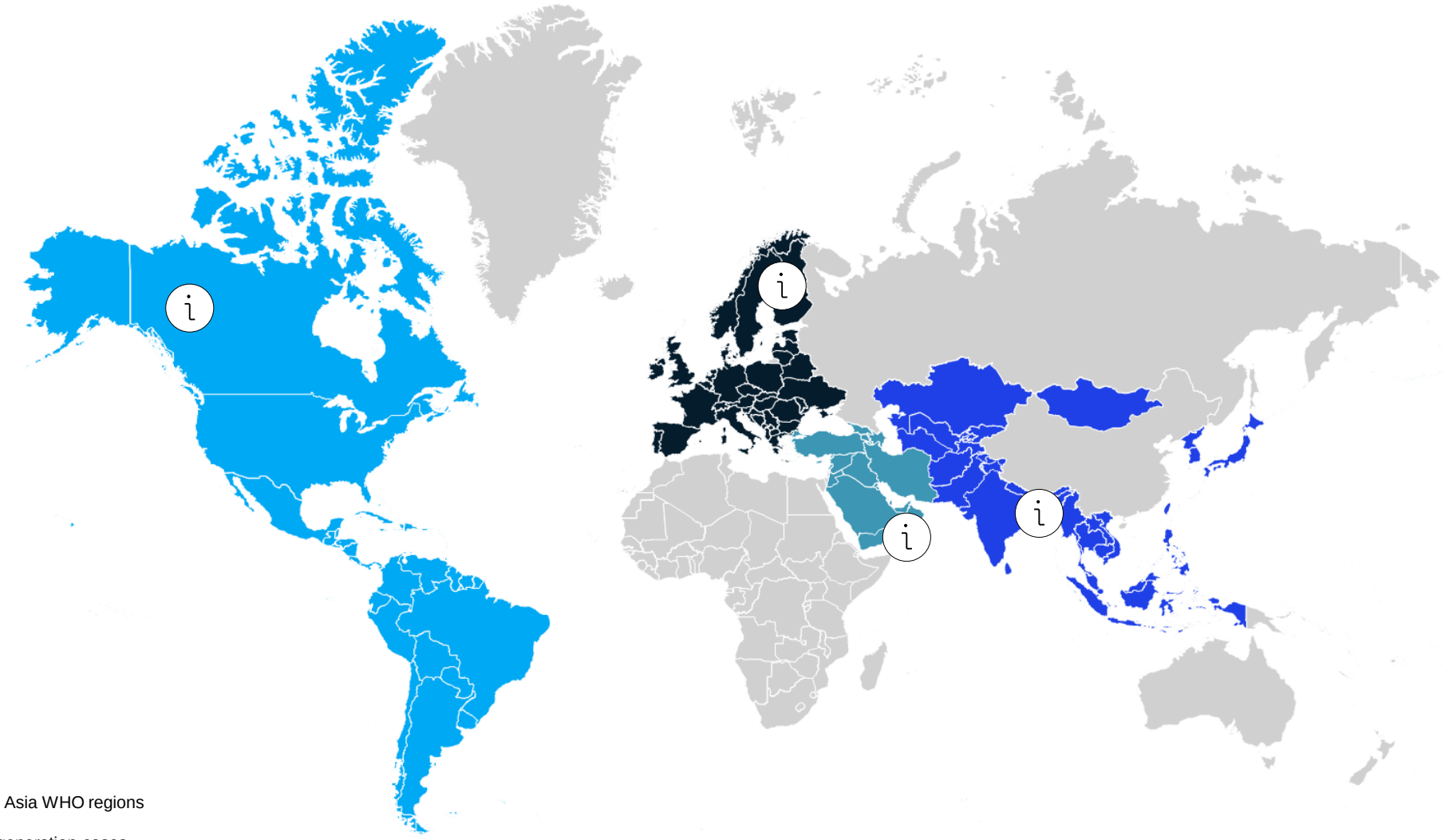
Source: WHO Situation Reports; National Bureau of Statistics of China; McKinsey Global Institute; OCED data, Johns Hopkins CSSE, press research, TomTom traffic index, Baidu QianXi, CDC, New York Times, Reuters, The Economist, Peking University, HSBC Business School, Tencent News, Sina News, Beijing Environmental Protection Monitoring Center, Shenzhen Environment Network

COVID-19 leading indicator dashboard

Propagation of COVID-19 across new transmission complexes

Click on buttons for more detail

- Europe
- Americas
- South-Asia (ex-China)[1]
- Middle East[2]



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

Source: WHO situation reports, TomTom traffic index, Baidu QianXi, CDC, IATA, BBC, New York Times, Japan Times, NPR, Reuters, press search

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	1,046 → 1,237 → 966 → 1,028 → 1,411	7.3%[6]	142	x9	**Data N/A**	Country-wide
Rest of region	02/15	4,166	3,630	195 → 359 → 348 → 678 → 429	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 congestion[5]

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

Source: WHO Situation Reports, TomTom traffic index, Baidu QianXi, CDC, IATA, BBC, NYT, Japan Times, NPR, Reuters, press research

Europe

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
Italy	01/31	63,927	53,778	5,322 → 5,986 → 6,557 → 5,560 → 4,789	8.6%[6]	143	x 18	60 / 13	Country-wide
France	01/25	19,615	17,841	1,834 → 1,598 → 1,821 → 1,525 → 3,794	3.4%	126		71 / 9	Country-wide
Germany	01/28	29,212	27,916	2,801 → 7,324 → 3,140 → 3,311 → 4,438	0.3%	127		59 / 23	Country-wide
Spain	02/01	33,089	31,450	3,431 → 2,833 → 4,946 → 3,646 → 4,517	5.2%	123		46 / 8	Country-wide
Rest of region	01/29	43,014	40,112	3,448 → 5,503 → 5,253 → 5,420 → 5,582	1.2%				

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- 03/25/2019
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Americas

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
US	01/23	42,164	41,468	3,355 4,777 0 16,354 10,591[5]	1.0%	111		69 9	Local
Rest of region	01/27	7,280	7,069	772 829 808 977 1,837	0.9%				

Current phase

- **Stage 1:** Small number of cases identified; no sustained local transmission
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Traffic congestion[5]

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

Source: WHO Situation Reports, TomTom traffic index, Baidu QianXi, CDC, IATA, BBC, NYT, Japan Times, NPR, Reuters, press research

South 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	6	63 / 47	Country-wide
Singapore	01/24	507	341	32, 40, 47, 23, 52	0.4%	117	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

- **Stage 1:** Small number of cases identified; no sustained local transmission
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- Warning level 3
- Alert level 2
- None

Traffic congestion[5]

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

Source: WHO Situation Reports, TomTom traffic index, Baidu QianXi, CDC, IATA, BBC, NYT, Japan Times, NPR, Reuters, press research

Current as of March 25, 2020

COVID-19 Stage Detail

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

Source: WHO Pandemic Stages

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

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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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