

An hourglass with a wooden frame and a glass bulb, resting on a wooden surface. The hourglass is illuminated from the side, creating a strong shadow. The background is dark and out of focus.

BCG

Executive
Perspectives

How to end the global pandemic in 2022

May 2021



BCG Executive Perspectives

Objectives of this document

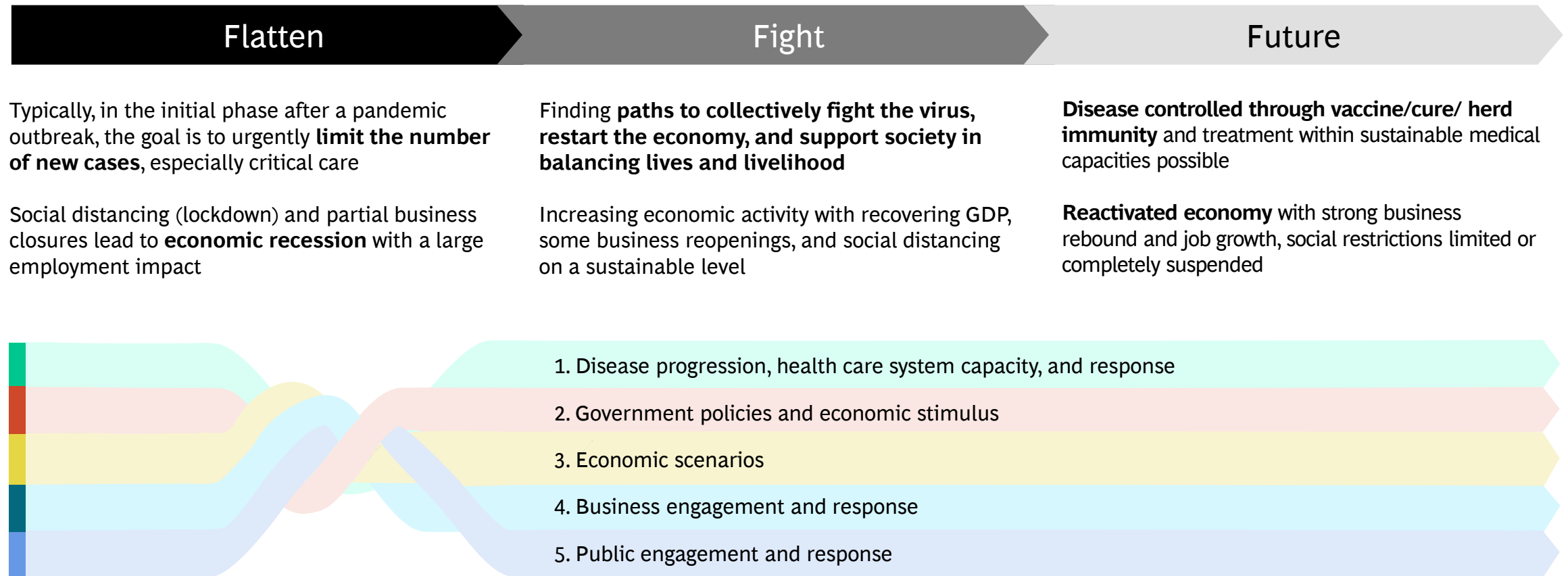
COVID-19 is a global societal crisis

We at BCG believe that the COVID-19 outbreak is first and foremost a societal crisis, threatening lives and the wellbeing of our global community. Society now, more than ever, needs to collaborate to protect people's lives and health, focus on ending the pandemic, and search for longer-term management solutions

Leaders need to drive an integrated response to navigate the crisis

It is the duty of health, political, societal, and business leaders to navigate through this crisis. A complex interplay of epidemic progression, societal response, government action, sector impact, and company action is occurring. This document intends to help leaders find answers and shape opinions to navigate the crisis in their own environments. It encourages thinking across the multiple time horizons over which we see the crisis manifest

The COVID-19 recovery will be driven by disease progression, de-averaged economic impact, government policies, and business and public responses



All of the above five factors result in specific economic and social outcomes in each phase

“No one is safe until everyone is safe”

- from COVAX¹, a global health initiative aimed at equitable access to COVID-19 vaccines

Stark vaccine inequity

100X+

discrepancy in vaccination rates between high- and low-income countries

Delayed vaccine rollouts

2.7B

people in countries that can take several years to finish initial round of vaccination, which can lead to new variants

Rapidly spreading variants

<6 mo.

time taken for variant B.1.1.7 to spread from 1 to 120 countries

“Ending the pandemic as quickly as possible will take a global effort... it's about one world, protected.” - from COVAX

1. COVAX is led by UNICEF, Gavi, the Vaccine Alliance, WHO, and others
Source: World Health Organization, World Bank, Gavi, CDC, press search, BCG

Summary

Global cooperation and action can end the pandemic in 2022 instead of 2024

1. Dire situation globally

- 1 Global COVID cases are **peaking**, resurging in areas like India and South America
- 2 Based on existing plans, will take until **2024** to emerge from pandemic globally

2. Short term: Actions to end global pandemic by 2022

- 1 US to have **excess vaccine supply** first; use COVAX¹ to protect most **vulnerable 20%**
- 2 Enough supply for global population by end of **2021**; ensure equitable distribution
- 3 Private sector and external organizations can help set up **throughput** infrastructure
- 4 Improve vaccine equity within nations by reducing vaccine **hesitancy**
- 5 Act quickly to suppress dangerous **variants** that can worsen pandemic globally

3. Longer term: Strengthen health systems

COVID-19 will remain a threat over the **longer term**; global security dependent on stronger global health infrastructure for ongoing management (e.g., boosters)

1. COVAX is a global initiative aimed at equitable access to COVID-19 vaccines, led by UNICEF, Gavi, the Vaccine Alliance, WHO, and others
Source: Gavi, BCG



BCG Executive Perspectives

AGENDA

Ending the global pandemic by 2022

- Current COVID trends and trajectory
- Actions needed to end pandemic next year and manage longer term

Updated analyses and impact

- Epidemic progression and virus monitoring
- Economic and business impact

Vaccine rollout challenges exacerbated by global COVID-19 resurges, pushing death toll past 3M worldwide

As of 02 May 2021

WALL STREET JOURNAL May 2, 2021



India set global record for daily new COVID-19 cases – over 400K, and reported 3.7K deaths, its highest yet

REUTERS® April 24, 2021



US ends 10-day J&J vaccine pause over rare blood clots; shots to resume immediately

The New York Times April 17, 2021



COVID death toll surpasses 3M worldwide as new hotspots emerge in Asia, Eastern Europe, and LatAm

Bloomberg April 15, 2021



New waves of COVID infections could derail economic recovery in sub-Saharan Africa

FINANCIAL TIMES April 26, 2021



US plans to share up to 60M doses of AstraZeneca's COVID vaccine with other countries (India likely to be 1)

KFF April 20, 2021



If no change in current vaccine enthusiasm in US, shift from excess demand to supply is in ~15 days

STAT April 15, 2021



Merck to continue tests of anti-COVID pill, but stop trial in hospitalized patients

AP April 22, 2021



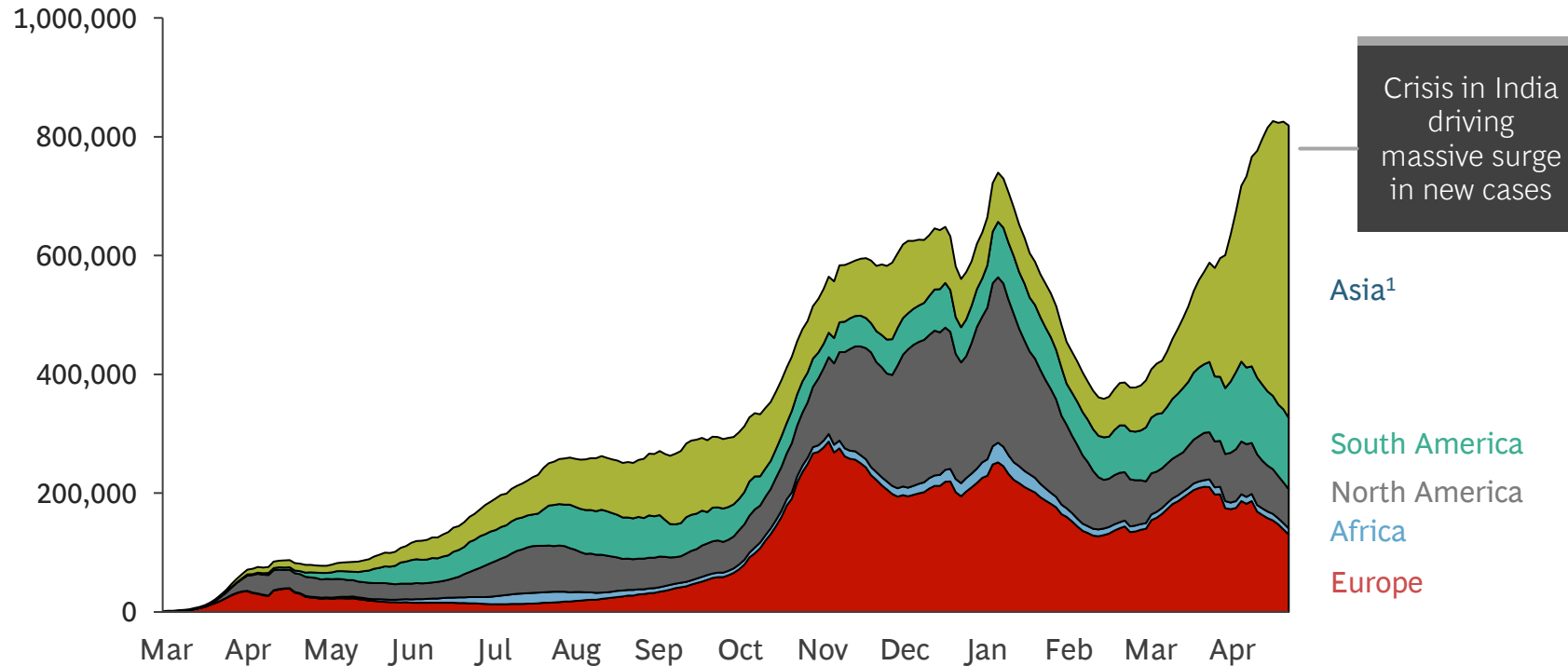
China administers 200M vaccine doses domestically, ramping up efforts

Resurgence of COVID in India has led to a new peak in recorded cases since the onset of the global pandemic

As of 02 May 2021

Epidemic Progression

Daily new cases (7-day rolling average)



Month-on-month growth of new cases ²	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
		~215%	~15%	~50%	~60%	~10%	~10%	~40%	~45%	~10%	~0%	~(40%)	~20%	

Key observations

154M
of confirmed cases

19.5M
of active cases

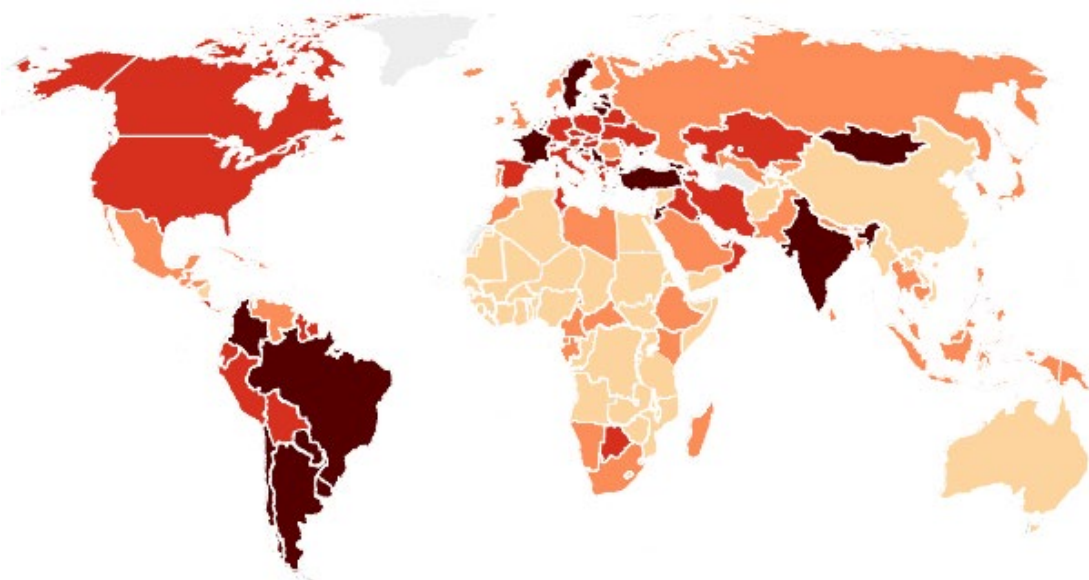
3.2M
of fatalities

1. Includes Oceania (Australia, New Zealand, Papua New Guinea and surrounding island nations of the Pacific ocean); 2. Calculated as monthly as average of daily as compared To previous month; Source: Johns Hopkins CSSE; Our World in Data; press search; BCG

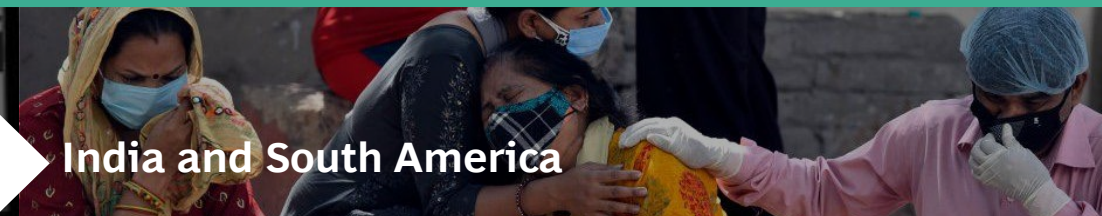
Cases are still high around the world even as vaccine rollout is underway; resurgences in countries like India have had devastating impacts

1.1 Daily new confirmed COVID-19 cases per million people^{1,2}

As of 02 May 2021



Cases per million



India and South America

India: Record cases and shortage of critical supplies

Record² of ~**402,000**³ daily COVID-cases, bringing total cases to **19 million**. New variant B.1.617 and variant B.1.1.7 from the UK are spreading quickly and causing concern. Hospitals have shortage of **beds and oxygen**, leading to wave of **deaths**

South America: New surges and vaccination difficulties

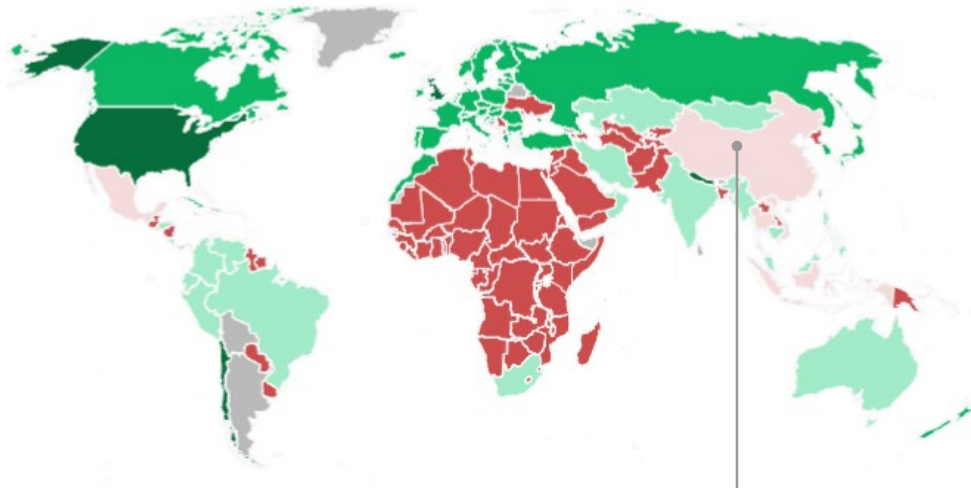
Record spikes across Latin America. **Vaccine shortages** and throughput issues, as COVAX⁴ has faced delays. P.1 variant found to reduce vaccine **efficacy**. Countries like Honduras have vaccinated **<1%** of the population

1. 1. 7-day rolling average shown. 2. The number of confirmed cases is lower than the number of actual cases due to limited testing; 3. As of 1 May 2021. 4. COVAX is led by UNICEF, Gavi, the Vaccine Alliance, WHO, and others
Source: Press search, Our World in Data

Based on current plans, it will take until 2024 to emerge from the pandemic, as some lower-income countries are severely behind in vaccination

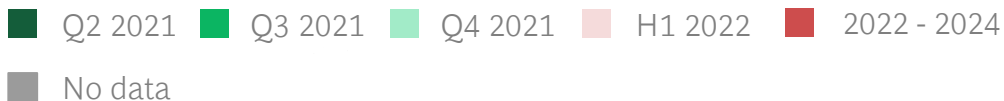
1.2 Current projection of timing to vaccinate population¹

5 vaccine rollout archetypes



China is considered a "Crush & Contain" country, but due to the size and spread of population, it is expected to complete vaccination by H1 2022

Rollout Leaders can likely begin redistribution in Q2 2021 and High-income Laggards and Crush & Contain Countries can follow in Q3 & Q4 2021



- Q2 '21**
 - 1 Rollout Leaders – 6% of global population (0.5B)**
Early success in vaccine rollout
 - E.g., Israel, US, UK, Chile
 - Q3 '21**
 - 2 High-income Laggards – 6% (0.5B)**
Sufficient contracts, face manufacturing delays
 - E.g., European Union², Canada
 - Q3 - Q4 '21**
 - 3 Crush & Contain Countries – 21% (1.6B)**
Successfully contained COVID, conservative approach to rollout
 - E.g., Australia, Japan, South Korea
 - Q3 '21 - H1 '22**
 - 4 Leading LMICs² – 32% (2.5B)**
Combination of self-reliant manufacturers or countries that have contracted doses by end of year
 - E.g., Brazil, Russia, Mexico, India³
 - '22 - '24**
 - 5 Supply-starved LMICs² – 35% (2.7B)**
Reliant upon COVAX and African Union distributions
 - E.g., Pakistan, Kenya, Paraguay

1. Based on country reported plans, where vaccination completion threshold can vary from ~60-80% vaccination of either the adult or full population. Earlier timelines likely do not include children. 2. Low- and middle-income countries, defined as countries with a GNI per capita of <\$12,536 per year (World Bank). 3. Includes support from COVAX
Source: COVAX, World Bank 2021 population, press search, BCG

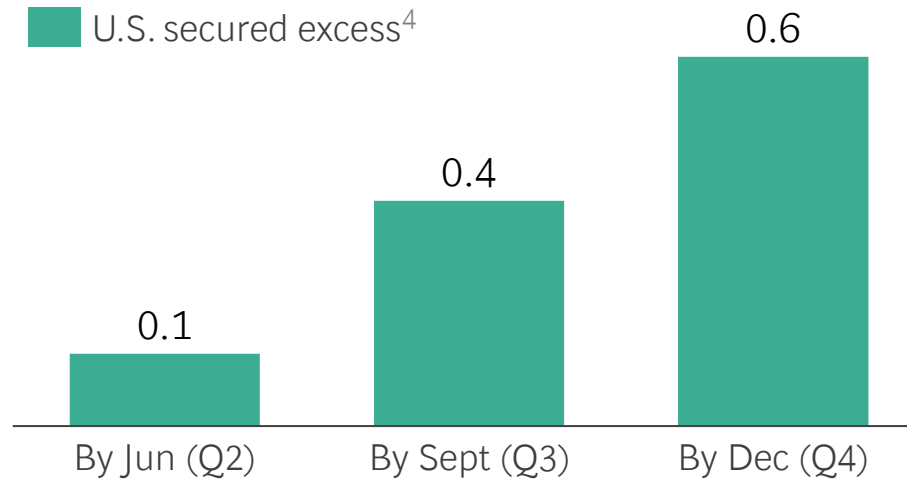
US can donate doses as early as June 2021 to help bolster COVAX supply or directly support global hot spots

Key takeaways

Forecast cumulative doses in 2021 (B)

US will be the first high-income country with **excess** vaccine supply. Redistribution from US can start in **June 2021**, on top of **60 million** AstraZeneca doses already committed¹

Donations can help COVAX reach goal to cover vulnerable groups and health care workers in LMICs² (~20% of population) earlier in **Q4 2021**³ or bilaterally vaccinate in global **hot spots**



US can help COVAX, expedite year-end vaccination goal by **~one to two months**

India crisis will restrict donated doses to COVAX as it needs to keep doses for domestic populations

What is COVAX and why use it?

Ambition of COVAX, partnership among CEPI⁵, Gavi⁶, UNICEF, and WHO, is to create a **platform to redistribute donated excess vaccine doses, accelerating equity goals**



Benefits of redistribution via COVAX

- Established legal frameworks for **indemnity** for donors and manufacturers
- Multi-country donations and **equitable** allocation
- Coordinated** shipping on vaccines and ancillary supplies

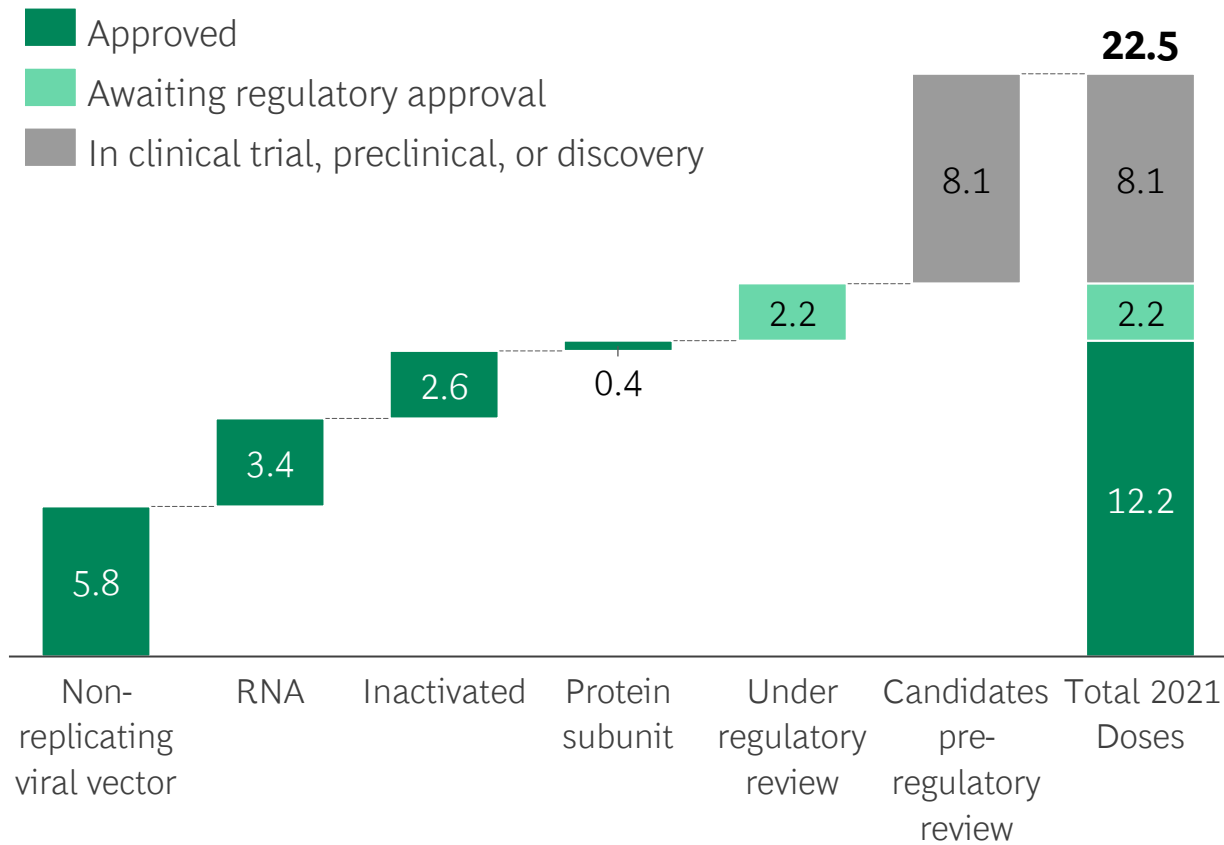
COVAX can help **redistribute donated** doses through its established effective mechanisms

1. AstraZeneca not yet approved for use in US. 2. Low- and middle-income countries, defined as countries with a GNI per capita of <\$12,536 per year (World Bank). 3. Based on ~20% COVAX target to cover the most vulnerable populations within LMICs by December 2021, assuming COVAX supply under negotiation becomes secured (~2B doses total); 4. Not part of COVAX secured supply; secured excess doses beyond doses needed for US 12+ population (285M), assuming 2 doses per person. 5. Coalition for Epidemic Preparedness Innovations. 6. Vaccine alliance, a public-private global health partnership
Source: UNICEF COVID-19 vaccine supply agreements (April 2021), Gavi (COVAX), World Bank, AP, press search, BCG analysis

Vaccine supply expected to surpass global population in 2021, but critical to ensure equitable distribution

Key takeaways

Vaccine production forecasts in 2021 show the world will have a supply excess¹ (B doses)



Will be enough supply in 2021 to cover world population with **two doses²** and vast majority with another **one-dose booster**

As countries accumulate excess supply, opportunity to **immediately redistribute doses** to lower-income nations

Removing vaccine IP³ protections will likely slow down process due to **quality risks, delayed production** from necessary startup time, and **distractions** from the current sufficient production plan

Total global vaccine production

1. Based on manufacturer capacity. 2. Assuming all vaccine candidates require 2-doses. 3. Intellectual property, such as patents
Source: UNICEF Reported Global COVID-19 Vaccine Production Capacity 4/30/2021, press search

Private sector and external organizations are needed to accelerate throughput in LMICs

Examples:
Private sector

While both LMICs¹ and HICs² face throughput challenges, LMICs may need additional **external and private sector** support to bolster resources

- 1** Poor coordination causing delays and eroding public trust
- 2** Lack of ancillary supplies (e.g., needles) and waste disposal
- 3** Spoilage from inadequate cold chain or unprepared providers
- 4** Lack of health infrastructure, including trained providers
- 5** Absence of vaccine data systems, especially for two-dose series
- 6** Unanticipated complications (e.g., mix-ups, safety)

Private sector in Indonesia can run its own COVID-19 vaccination programs in **parallel** to public

Philippines planning to use private sector **cold chain, sites, and vaccinators**

Vaccine throughput in India has ramped up significantly in 2021. **~25-30%** of total doses have been administered in the private sector

For LMICs	Cost per dose
Vaccine	~\$4-7 ³
International delivery	~\$0.9
Domestic delivery	~\$1.7
Total cost	~\$6.6-9.6

(~\$13-19 for 2 doses)



Estimated **~\$14B⁴** in support needed for domestic delivery (e.g., direct administration costs, cold chain, training and hiring) to vaccinate LMICs

Combination of funding from **COVAX**, major global **financial institutions** (e.g., World Bank), and **private sector** will be needed to meet urgent need

1. Low- and middle-income countries, defined as countries with a GNI per capita of <\$12,536 per year (World Bank). 2. High-income countries that exceed the LMIC threshold. 3. Based on low-end ranges of ~\$3-4 per dose and higher-end range of standard UNICEF cost estimate for all LMICs. 4. Based on vaccination of ~80% of LMIC populations, assuming 2 doses each (~8.4B doses); Source: WHO, Gavi, UNICEF, press search, BCG

Vaccine hesitancy drives further inequity, especially among disadvantaged groups; education is the best tool

Key takeaways

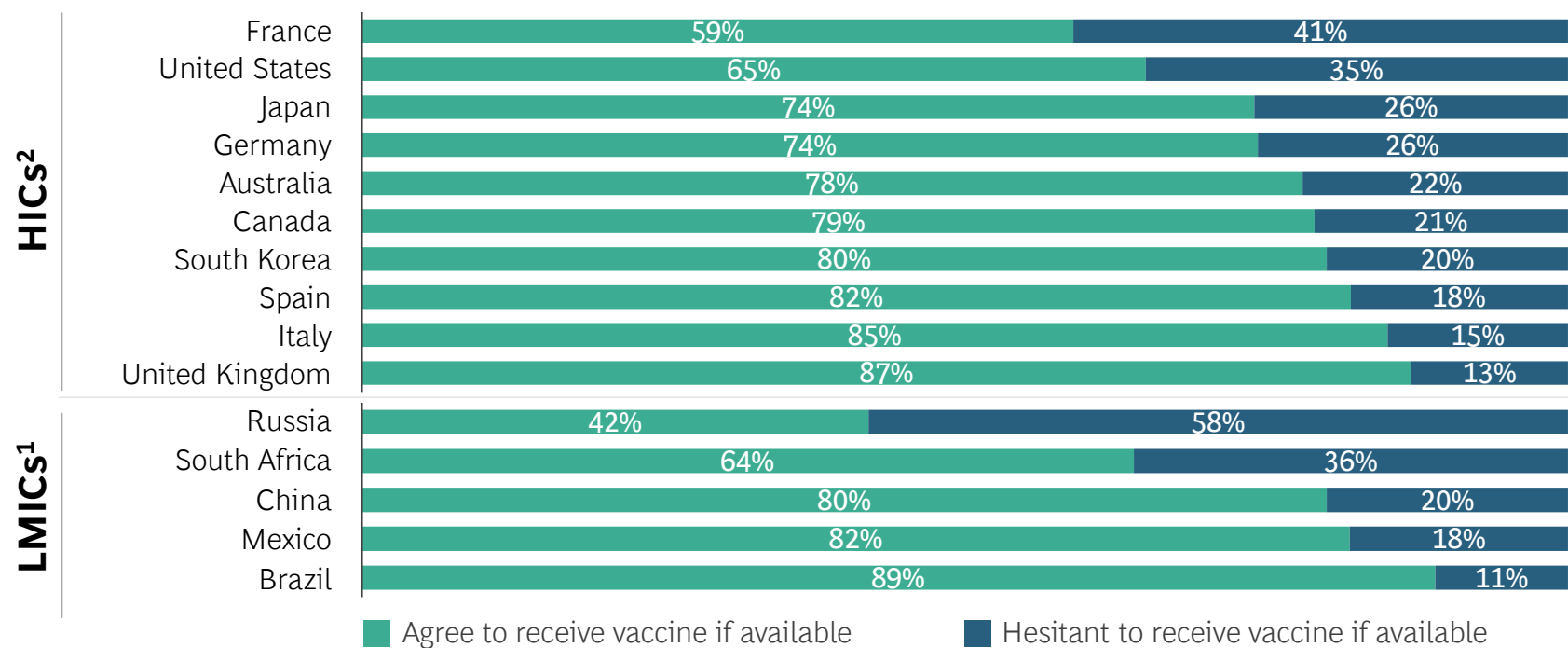
Top two drivers for vaccine hesitancy are **vaccine side effects/safety** and concerns over **speed of regulatory approvals**

Hesitancy drives further vaccine inequity. Top three hesitant groups across countries are **minority, low-income, and rural populations**

Coordinated and swift global messaging is necessary as EU and US regulators investigate rare cases of blood clotting after taking vaccines³

Educating the public against misinformation is the best tool to **combat hesitancy**, especially through **targeted outreach to trusted members** of specific communities at higher risk

Vaccine hesitancy exists across all countries, independent of national income level



Note: Question asked was "If a vaccine for COVID-19 were available to me, I would get it?"
 1. Low- and middle-income countries, defined as countries with a GNI per capita of <\$12,536 per year (World Bank). 2. High-income countries that exceed the LMIC threshold.
 3. Distribution and administration for AstraZeneca in EU was paused in March 2021 and Johnson & Johnson in US was paused in April 2021
 Source: Ipsos and World Economic Forum survey, Feb 2021; press search; BCG analysis

Vaccine equity must be an urgent global priority to suppress variants, which can worsen global pandemic

Key takeaways

Variants caused by mutations may lower vaccine effectiveness...

- Variants have emerged **around the world** with varying impacts¹ on **vaccine effectiveness** and antibody resistance
- Examples include **B.1.351** first detected in South Africa, **P.1** in Brazil, and **B.1427** in California

Variants that escape immunity will continue to emerge and **threaten the globe** anywhere there are high volumes of cases, such as amid current surge in India

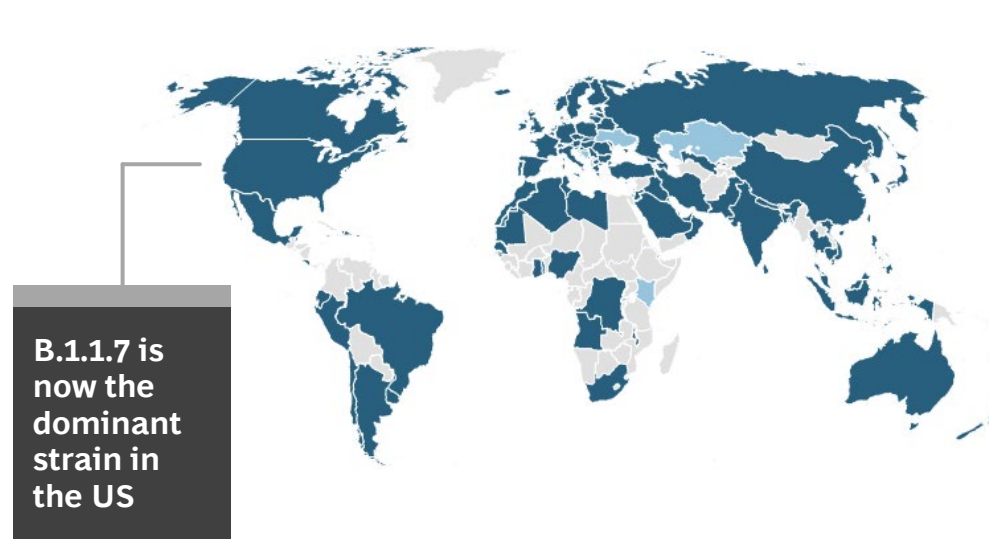
... and can spread rapidly across the globe

B.1.1.7 variant in Sept. 2020



Found to be **70% more transmissible** than existing variants at the time

B.1.1.7 variant in March 2021 (120 countries)



Vaccine equity must also be a global priority to keep variants from **spreading**. B.1.1.7 rapidly spread to world in **<6 months**

1. Trials of Novavax, Janssen, and AstraZeneca in South Africa suggest the B.1.351 variant can escape some immunity and may not stop infections but should still offer protection against severe and life-threatening COVID-19 illness. In April 2021, Pfizer reported 91% efficacy against B.1.351 variant versus 95% in its original trial. Source: CDC, BBC, CNBC, The Wire, Reuters

COVID-19 will likely stay longer term, requiring sustained global changes to strengthen health care infrastructure and protect vulnerable

Seven "no-regrets" moves for all countries to build an equitable vaccine future

- 1 Aggressively vaccinate now** to crush COVID and slow the proliferation of variants
- 2 Keep mitigation measures** on to ramp up and down rapidly, especially for non-vaccinated populations
- 3 Unlock capacity** for immediate and ongoing vaccine development and manufacturing; **create options to buy doses and ancillaries** for future campaigns
- 4 Invest in ongoing vaccine innovation** and **establish accelerated regulatory approvals** for upcoming modified or booster vaccines
- 5 Ensure vaccine delivery infrastructure is ready for future campaigns** and maintain prioritization by health risk
- 6 Build out genomic monitoring** of variants for rapid identification and response to new variants
- 7 Continue global sharing** of information and resources while **activating local communities** with education on virus and treatments

BCG Executive Perspectives

AGENDA

Ending the global pandemic by 2022

- Current COVID trends and trajectory
- Actions needed to end pandemic next year and manage longer term

Updated analyses and impact

- Epidemic progression and virus monitoring
- Economic and business impact

Summary dashboard

As of 02 May 2021

To be updated in forthcoming editions

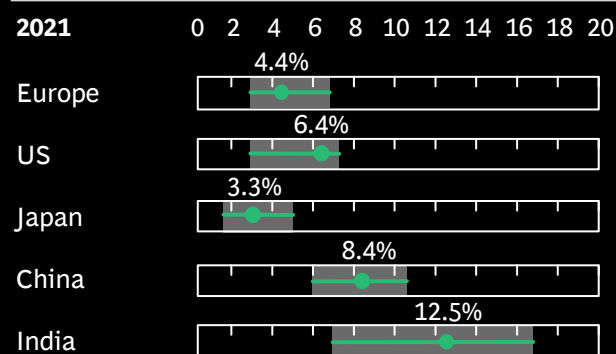
Epidemic Progression

Global epidemic snapshot

		154M	19.5M	3.2M	1.2B
	# of cases		# of active cases	# of fatalities	Vaccine doses administered
				Dec	Jan
Month-on-month growth of new cases ²	Americas	1.4x	1.1x	0.6x	1.0x
	Europe	0.8x	1.0x	0.7x	1.3x
	Asia ³	1.0x	0.8x	0.9x	1.7x

Economic Impact

GDP forecasts (YoY%)



Consumer Activity

Mobility

		Jan	Feb	Mar
Mobility ⁶ (month vs. Jan '20)	US	-27%	-26%	-18%
	Europe	-37%	-31%	-26%
	Japan	-22%	-17%	-12%
Domestic air travel tickets booking ^{7,8} (YoY)	US	-54%	-37%	17%
	UK	-78%	-78%	-47%
	China	-37%	15%	127%

Sales

Retail goods sales ⁹ (excl. auto & fuel, YoY)	US	10%	6%	
	Europe ¹⁰	-3%	-1%	
	China		34%	34%
Passenger vehicle sales ¹¹ (YoY)	US	-3%	-13%	61%
	Germany	-31%	-19%	36%
	China	28%	397%	75%

Business Impact

Stock market performance

Month end vs. 02 Jan '20	Jan	Feb	Mar
S&P500	14%	17%	22%
FTSE100	-16%	-15%	-12%
CHN SSE	13%	14%	12%
Volatility Index (S&P500) ¹²	2.7x	2.2x	1.6x

International trade

Trade value ¹³ (YoY)	US	France	China
	2%	2%	
	0%	3%	
	56%	26%	34%

Industrial production

Purchasing manager's index ¹⁴ (base = 50)	US	59	59	59
	Germany	57	61	67
	China	51	51	52
Steel production (YoY) ¹⁵	8%	5%	15%	

1. Calculated as 7-day rolling average; 2. Calculated as monthly average of daily cases vs. previous month; 3. Includes Middle East and Oceania; 4. IMF Apr 2021 forecast; 5. For India, forecast is for financial year; for others, it is for calendar year; YoY forecasts; range from forecasts (where available) of World Bank, International Monetary Fund, JP Morgan Chase; Morgan Stanley; Bank of America; Fitch Solutions; Credit Suisse; Danske Bank; ING Group; HSBC; As of reports dated 08 June 2020 to Mar 01 2021; For India's GDP forecast, World Bank's 2020 forecast from 08 June provides the upper bound of the forecast range; 6. Mobility values are calculated as the average of mean monthly mobilities in workplace, public transit, retail & recreation, and grocery & pharmacy and compared to a baseline from 03 Jan - 06 Feb 2020; Europe mobility values are calculated as the average of Germany, France, UK, Spain, and Italy; 7. Calculated as change in last 14 days rolling average value as compared to same period last year; 8. As of 01 Mar 2021; 9. Retail goods sales include online & offline sales and comprise food & beverages, apparel, cosmetics & personal care, home appliances, general merchandise, building materials, do not include auto, fuel & food services; 10. Europe includes 27 countries currently in EU; 11. Figures represent passenger vehicle (including sedan, hatchback, SUV, MPV, van and pickup) sales data for over same month in previous year; Europe value calculated as cumulative sales in Germany, France, UK, Spain, and Italy; 12. Underlying data is from Chicago Board Options Exchange Volatility Index (VIX); Volatility Index is a real-time market index that represents the market's expectation of 30-day forward-looking volatility and provides a measure of market risk and investors' sentiments; 13. Calculated as sum of imports and exports, measured in USD and compared to previous year periods; EU trade values between EU and all outside countries; 14. PMI (Purchasing Manager's Index) is a diffusion index that summarizes whether market conditions, as viewed by purchasing managers, are expanding (>50), staying the same (50), or contracting (<50); 15. Data corresponds to G-20 countries (minus Indonesia). Source: JHU CSSE, Our World in Data, WHO, World Bank, IMF, Bloomberg, Google Mobility, US Census Bureau, Eurostat, PRC National Bureau of Statistics, ACEA actuals, Marklines, ARC ticketing data, STR, Statista, CBOE, OECD, BEA, GACC (customs) China, ONS, BCG

COVID-19 has broad geographic reach today with countries at different stages in their fight

As of 19 Apr 2021

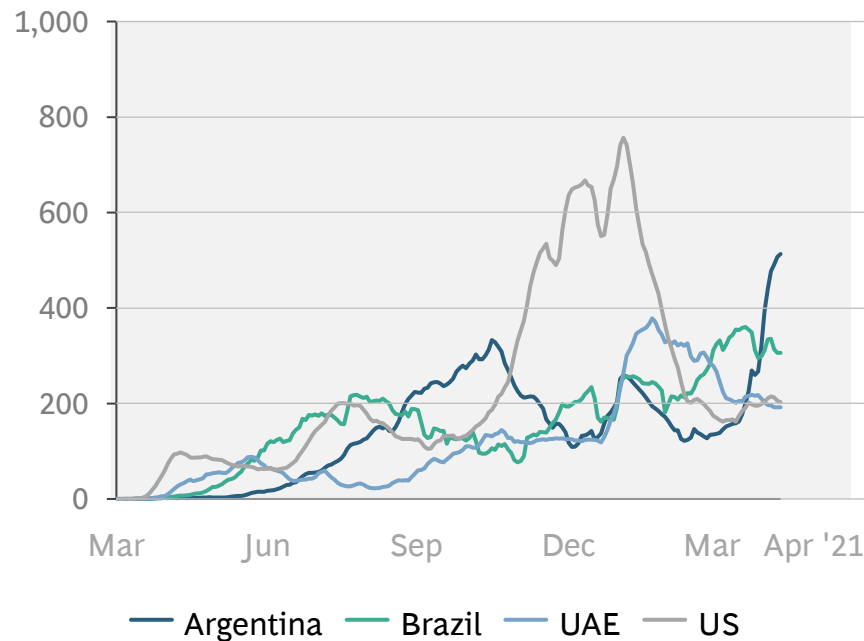
Non-exhaustive

Epidemic Progression

Continuation

Curve was never quite flattened; ongoing battle

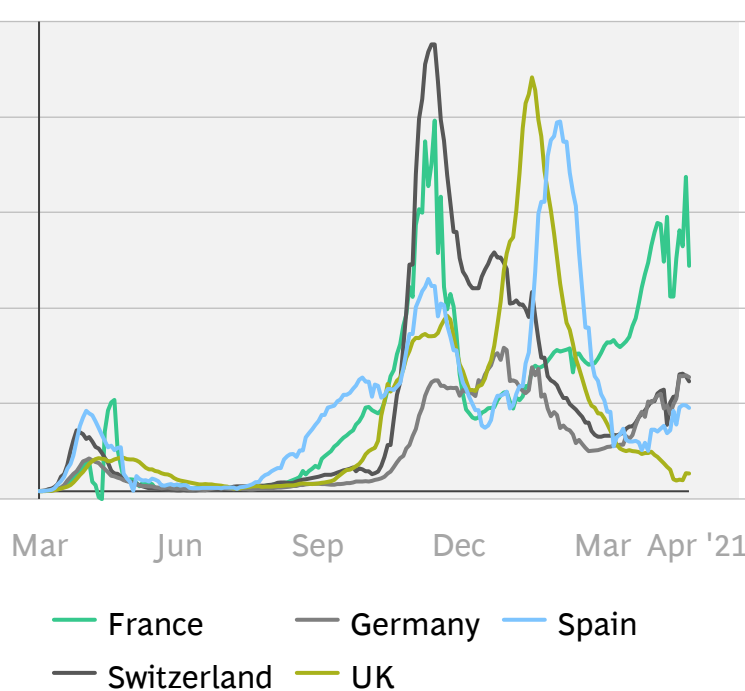
Daily new confirmed cases per million¹



Resurgence

Curve was flattened, but saw one or more resurgences

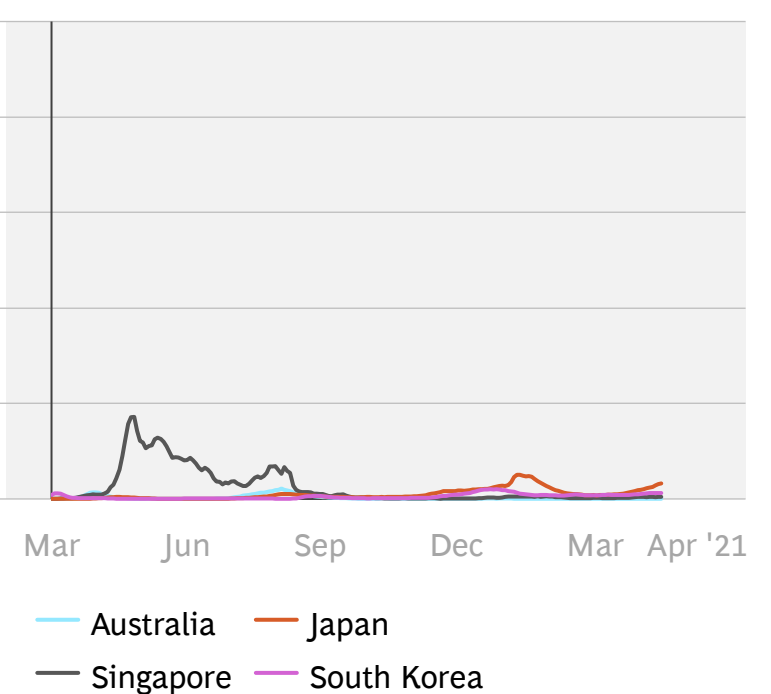
Daily new confirmed cases per million¹



Crush and contain

Curve was flattened and case counts continue to remain low

Daily new confirmed cases per million¹



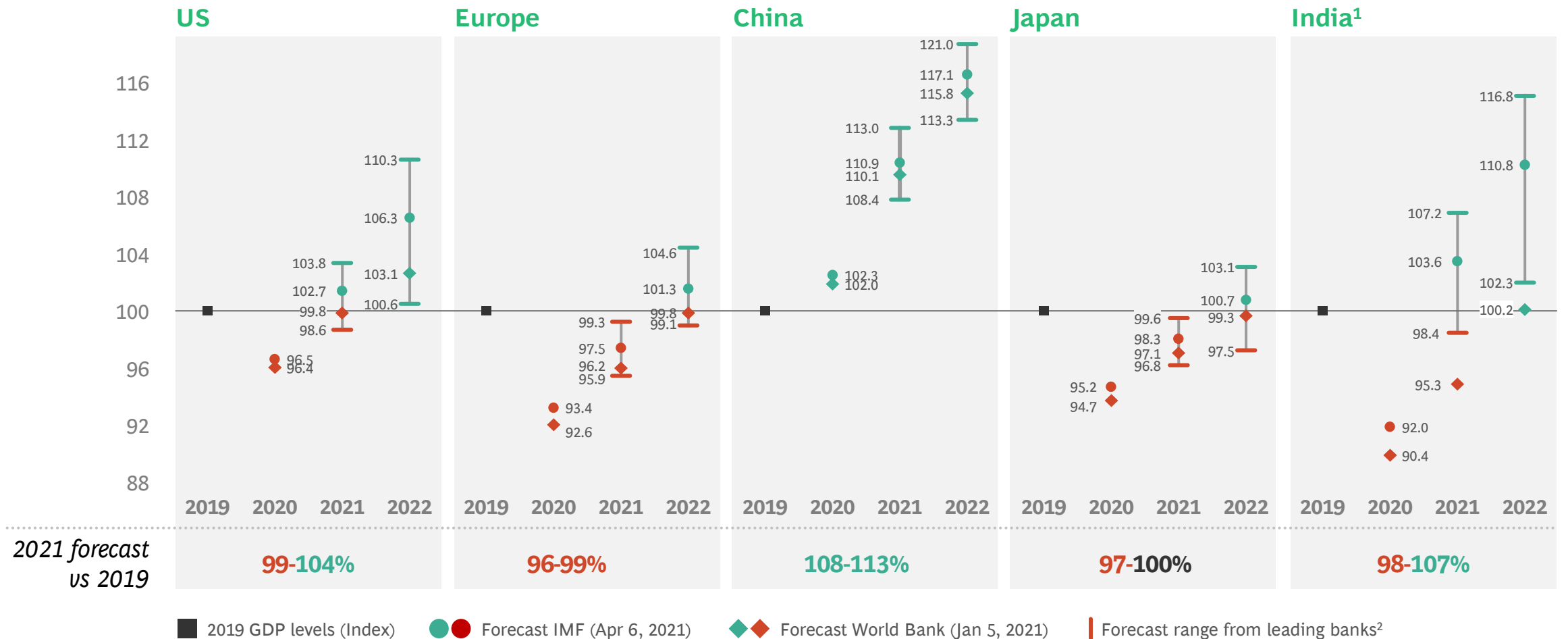
1. Data shown as 7 day rolling average of daily new cases per million
Source: Our World in Data; BCG

Many large economies expected to continue recovery, and reach 2019 GDP levels between 2021 and 2022

As of 22 Apr 2021

Economic Impact

GDP forecast levels indexed to 2019 value (Base: 100)



Note: As of reports dated 08 June 2020 to 01 Mar 2021, YoY forecasts 2020 values are estimated actual GDP; 1. For India, forecast is for financial year; for other countries, the forecast is for calendar year; 2. Range from forecasts (where available) of JPMorgan Chase; Morgan Stanley; Bank of America; Fitch Solutions; Credit Suisse; Danske Bank; ING Group; HSBC; Source: Bloomberg; World Bank; IMF; BCG

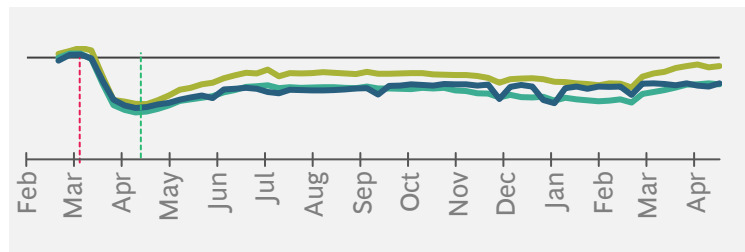
Retail and recreation mobility recovered fastest; public transit mobility remains lower in most countries

As of 22 Apr 2021

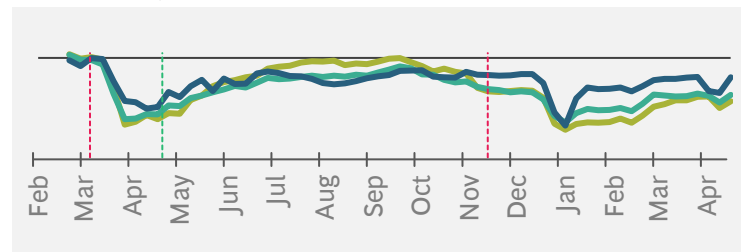
Economic Impact

Workplace¹, public transit², and retail and recreation³ mobility compared with baseline of January 2020 to February 2020

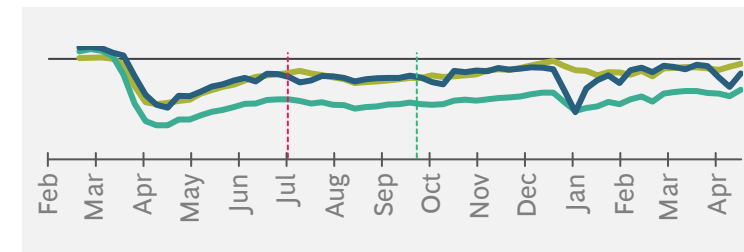
US



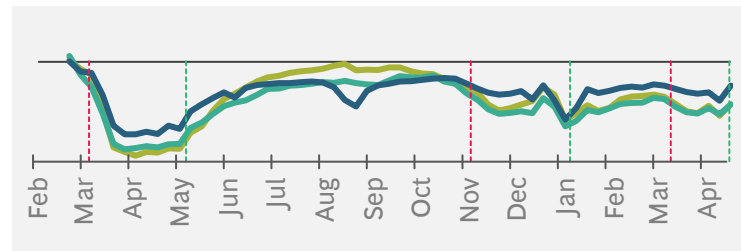
Germany



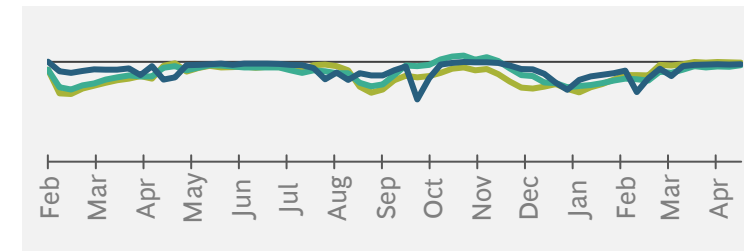
Australia



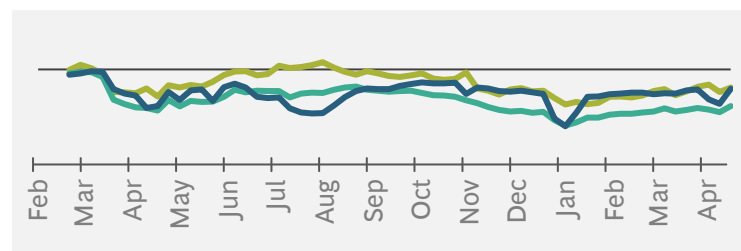
Italy



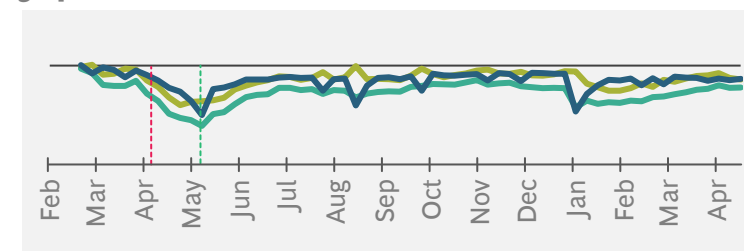
South Korea



Sweden



Japan



- Public transit mobility
- Workplace mobility
- Retail and recreation
- - - Lockdown easing⁴
- - - Lockdown started⁴

1. Tracked as changes in visits to workplaces; 2. Tracked as changes in visits to public transport hubs, such as underground, bus and train stations; 3. Tracked as changes for restaurants, cafés, shopping centers, theme parks, museums, libraries and cinemas; 4. Refers to average lockdown start and easing dates for larger lockdowns; Note: Data taken as weekly average compared with baseline (average of all daily values of respective weeks during Feb 15 2020–Feb 28 2021); Source: Google LLC "Google COVID-19 Community Mobility Reports". <https://www.google.com/covid19/mobility/> Accessed: 01 Mar 2020; Press search; BCG

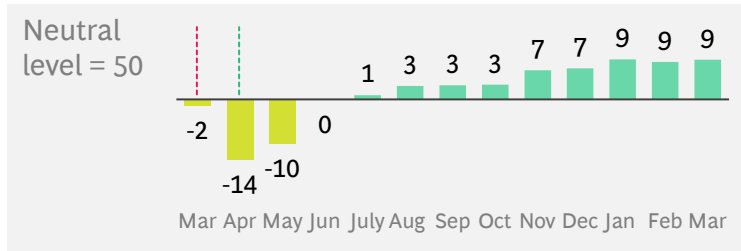
Manufacturing PMI recovery globally indicates continued positive momentum

As of 23 Apr 2021

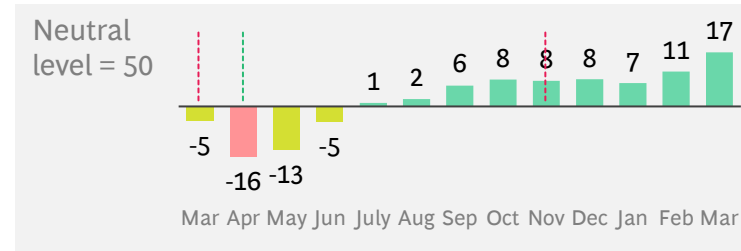
Economic Impact

Manufacturing PMI before, during, and after the crisis

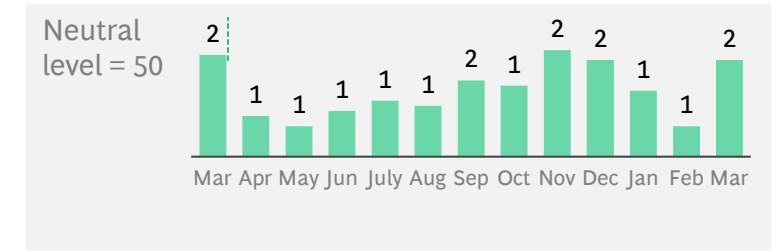
US



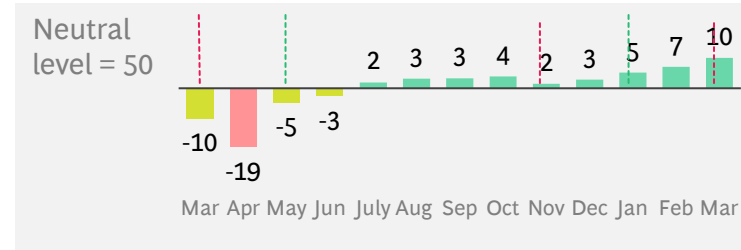
Germany



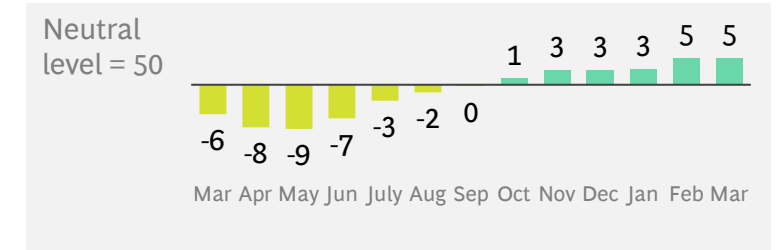
China¹



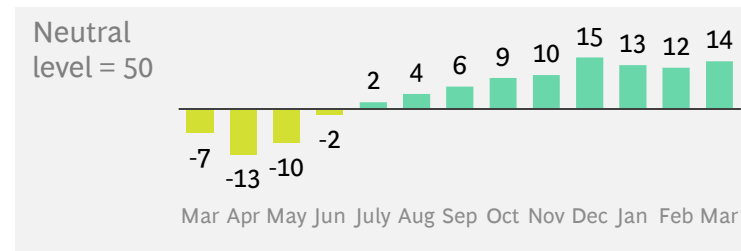
Italy



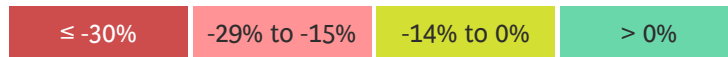
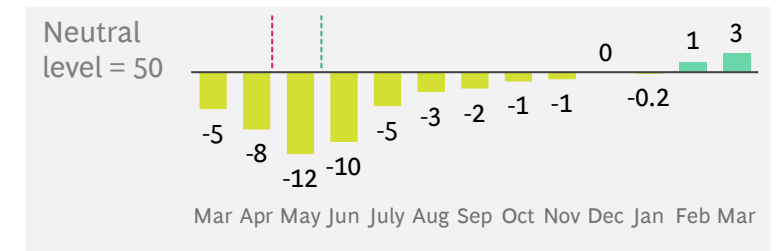
South Korea



Sweden



Japan



Lockdown started Lockdown easing

1. Lockdown dates are only pertaining to Hubei province; Note: PMI (Purchasing Manager's Index) is a diffusion index that summarizes whether market conditions, as viewed by purchasing managers, are expanding, staying the same, or contracting. 50 is neutral, >50 is considered to be positive sentiment and <50 is considered to be negative sentiment; Source: Markit South Korea Manufacturing PMI SA; Jibun Bank Japan Manufacturing PMI SA; China Manufacturing PMI SA; Swedbank Sweden PMI SA; Markit/BME Germany Manufacturing PMI SA; Markit Italy Manufacturing PMI SA; Markit US Manufacturing PMI SA; EIKON

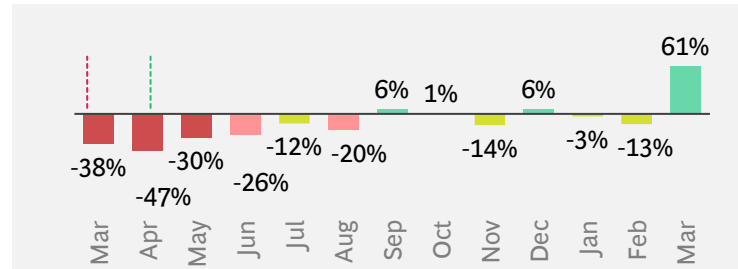
Monthly passenger vehicle sales show promising upward trends

As of 22 Apr 2021

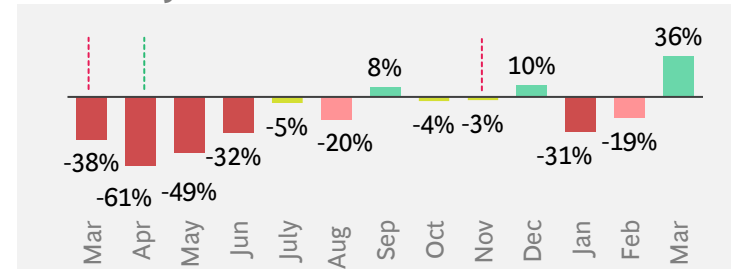
Economic Impact

Monthly passenger vehicle¹ sales, YOY % change vs. past year

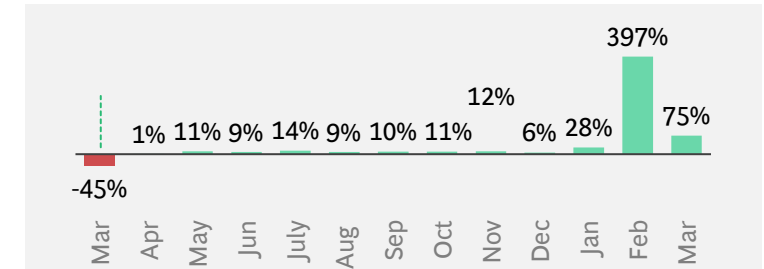
US



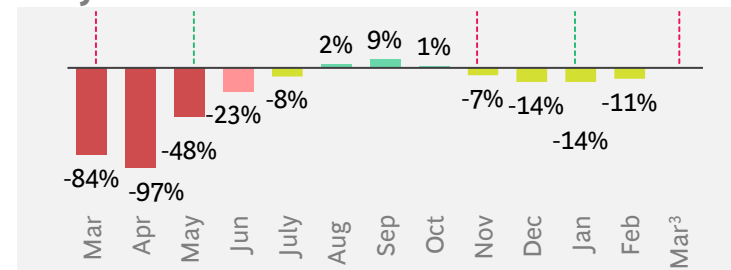
Germany



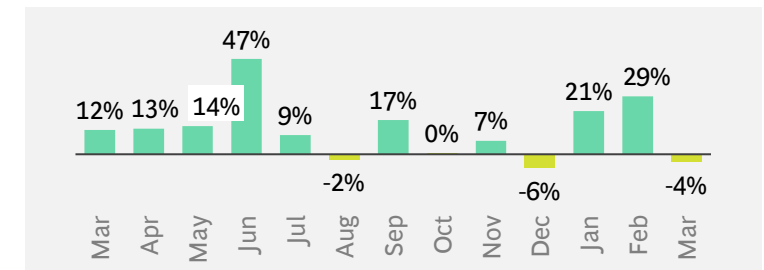
China²



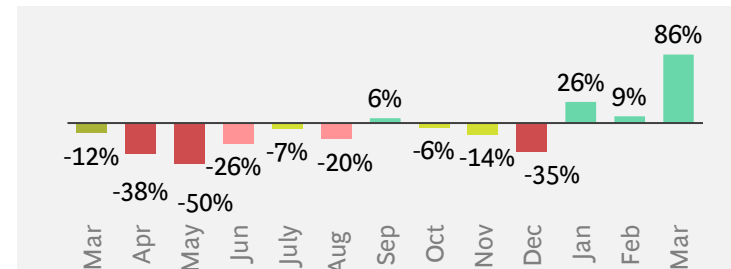
Italy



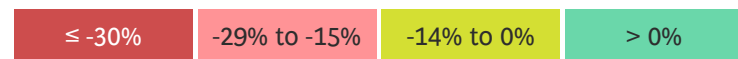
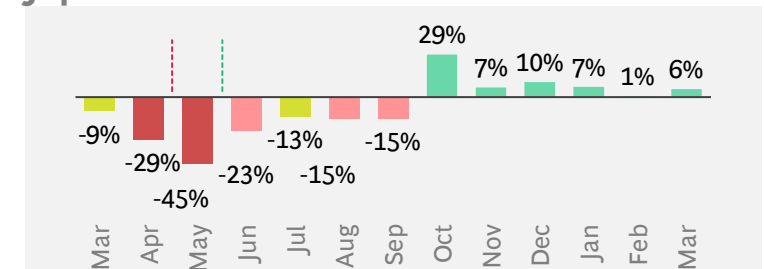
South Korea⁴



Sweden



Japan



Lockdown started Lockdown easing

1. Passenger vehicle sales includes data on, where available, hatchback, MPV, pickup, sedan, SUV, mini trucks, light trucks, and vans; 2. Stimulus policies: Launched subsidies for car purchases in 10 cities, lessened purchase restriction in high tier cities and extended NEV subsidies; 3. Not yet available. 4. South Korea's growth in auto sales from Mar through June 2020 is supported by recent tax cuts for individual consumption goods (e.g., cars), several carmakers (e.g. Audi, VW) launching new models and the increased appreciation by the Koreans of cars as a safe mode of transport and as a travel alternative for camping during COVID-19, supported by recently passed legislation to allow a variety of different cars to be modified into 'camping cars'. Source: Marklines; BCG

Retail goods sales (excluding auto and fuel) have grown compared to pre-COVID-19 levels in most countries

As of 26 Apr 2021

Growth of retail goods sales (excluding auto and fuel)¹, YOY % change vs same month past year

Retail goods sales include online and offline sales and comprise food and beverages, apparel, cosmetics and personal care, home appliances, general merchandise, building material; do not include auto, fuel, and food services

	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Jan '21	Feb '21	Mar '21 ³
US	1%	-15%	-4%	3%	4%	5%	7%	6%	5%	2%	10%	6%	-
UK ²	-4%	-18%	-10%	1%	3%	4%	6%	8%	5%	6%	-4%	-2%	8%
Italy	-18%	-27%	-11%	-1%	-11%	1%	0%	1%	-7%	-6%	-8%	-3%	-
Sweden	2%	-3%	2%	3%	2%	2%	3%	3%	5%	0%	3%	4%	-
Belgium	-1%	-8%	5%	7%	1%	14%	5%	8%	-3%	5%	7%	11%	-
China ³	-12%	-6%	-1%	2%	-2%	-1%	2%	1%	4%	4%	34%		34%
Japan	1%	-6%	-2%	9%	7%	7%	-1%	12%	8%	6%	3%	5%	-

-29% to -15%

-14% to 0%

> 0%

1. Retail goods sales categorization may be different across countries; seasonally adjusted values taken; country-specific categorization; 2. UK figures includes total retail sales excluding automotive fuels sourced from Office for National Statistics United Kingdom as data is no longer reported in Eurostat after Brexit 3. For China, combined value of Jan & Feb is available; 3. Only China data is currently available for March 2021
Source: US Census Bureau; PRC National Bureau of Statistics; Eurostat; Office for National Statistics United Kingdom; Ministry of Economy Japan

Economic Impact

Retail goods sales have **rebounded** with YoY growth seen in most countries

US has seen **consistent retail sales growth** since mid 2020

China has seen very strong retail growth in 2021 when comparing with YoY early months of 2020 when it had strict lockdowns

Some European countries have seen retail sales dips coinciding with second waves of cases/lockdown

Retail store sales in China have rebounded across categories; apparel sales continue to be impacted in other countries

As of 26 Apr 2021

Economic Impact

Retail store sales breakdown by category, YoY % change vs. same month in past year

Food and beverage stores

	May	June	Jul	Aug	Sep	Oct	Nov	Dec	Jan '21	Feb '21	Mar '21
US	15%	12%	11%	10%	10%	10%	11%	9%	11%	11%	-
UK	8%	7%	4%	3%	4%	4%	7%	4%	5%	7%	0%
Italy	1%	-1%	-2%	2%	1%	2%	3%	3%	2%	0%	-
Sweden	0%	1%	0%	2%	3%	2%	2%	2%	2%	2%	-
Belgium	12%	5%	6%	6%	4%	6%	2%	5%	6%	6%	-
China ¹	11%	11%	7%	2%	5%	5%	9%	9%	13%	13%	9%
Japan	2%	3%	1%	2%	2%	4%	0%	-1%	0%	2%	-

Personal care and cosmetics stores

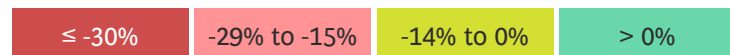
	May	June	Jul	Aug	Sep	Oct	Nov	Dec	Jan '21	Feb '21	Mar '21
US	-8%	-1%	4%	4%	5%	4%	4%	5%	6%	5%	-
UK ²	-30%	-5%	-1%	1%	15%	14%	3%	-	-	-	-
Italy	-13%	-9%	-5%	-1%	-2%	-2%	-2%	-12%	-12%	-11%	-
Sweden	-5%	3%	1%	2%	3%	0%	1%	0%	-3%	2%	-
Belgium	-12%	-4%	2%	2%	2%	9%	-2%	-3%	-3%	-1%	-
China ¹	13%	21%	9%	22%	16%	20%	32%	9%	41%	41%	43%
Japan	-3%	3%	1%	2%	-7%	3%	-1%	1%	-1%	-5%	-

Apparel stores³

	May	June	Jul	Aug	Sep	Oct	Nov	Dec	Jan '21	Feb '21	Mar '21
US	-62%	-24%	-23%	-20%	-9%	-11%	-16%	-16%	-9%	-13%	-
UK	-62%	-35%	-24%	-16%	-14%	-13%	-32%	-15%	-47%	-53%	-12%
Italy	-44%	-18%	-41%	-3%	-5%	-7%	-44%	-26%	-41%	-12%	-
Sweden	-31%	-22%	-22%	-18%	-14%	-14%	-25%	-30%	-25%	-19%	-
Belgium	-28%	-11%	-25%	-16%	-7%	-8%	-48%	-4%	-6%	-4%	-
China ¹	-1%	0%	-3%	2%	6%	10%	5%	4%	48%	48%	69%
Japan	-35%	-6%	-19%	-18%	-24%	-4%	-8%	-5%	-18%	-17%	-

Home appliance stores⁴

	May	June	Jul	Aug	Sep	Oct	Nov	Dec	Jan '21	Feb '21	Mar '21
US	-42%	-20%	-6%	-4%	-7%	-5%	-10%	-16%	-3%	-4%	-
UK	-31%	-1%	10%	12%	10%	16%	15%	14%	-7%	7%	23%
Italy	-15%	2%	0%	2%	2%	2%	-12%	-11%	0%	1%	-
Sweden	15%	15%	15%	7%	10%	9%	17%	4%	10%	13%	-
Belgium	2%	14%	2%	23%	19%	16%	-18%	11%	-	-	-
China ¹	4%	10%	-2%	4%	-3%	1%	5%	11%	43%	43%	39%
Japan	9%	26%	12%	10%	-29%	29%	25%	15%	11%	7%	-



China's sales has seen even stronger rebounds in 2021 when compared to early months of 2020 (except Food & Beverage which maintains similar growth rate)

Retail store sales recovery driven by F&B across all countries

Personal care & cosmetics category sales have rebounded to 2019 levels except in Italy

Apparel category saw the largest decline; continued fluctuations and far from recovery across countries except China

Home appliances sales have mixed development; US sales continue to struggle

1. For China, Jan & Feb are reported together due to National Holidays, Food & beverages category only includes food & grains; 2. UK personal care and cosmetics still based on Eurostat 3. Includes clothing accessories, shoes, etc.; 4. Includes audio video & home appliances stores; Note: For US, share in retail store sales in Q4 2019: F&B ~25%, personal care & cosmetics ~12%, apparel ~6%, home appliances ~3%, general merchandising ~25% and building material & gardening equipment ~13%. Sector classification & mix may be different across countries; Source: US Census Bureau; PRC National Bureau of Statistics; Eurostat; Office for National Statistics United Kingdom, Ministry of Economy Japan

Stock markets continue to have an optimistic outlook: 17 out of 24 sectors currently above pre-crisis TSR levels

As of 01 Apr 2021

Based on top S&P
Global 1200 companies

Economic Impact

	TSR ¹		Companies ² with default probability >15% ³	
	21 Feb 2020– 20 Mar 2020	21 Feb 2020– 31 Mar 2021	21 Feb 2020	31 Mar 2021
Semiconductors	-30%	57%	0%	0%
Tech Hardware	-26%	33%	0%	0%
Retailing	-40%	31%	0%	12%
Materials	-32%	29%	5%	4%
Media	-36%	28%	0%	0%
Durable Goods	-39%	24%	0%	0%
Capital Goods	-35%	22%	2%	2%
Auto	-41%	19%	0%	5%
Health Equipment	-31%	12%	0%	0%
Software	-30%	12%	0%	0%
Financials	-35%	11%	0%	0%
Prof. Services	-30%	5%	0%	0%
Pharma	-20%	5%	0%	5%
Food/staples Retail	-10%	4%	0%	0%
Household Products	-16%	4%	0%	0%
Banks	-39%	2%	0%	4%
Hospitality	-44%	2%	8%	23%
Insurance	-39%	0%	0%	0%
Food & Beverage	-23%	-3%	0%	0%
Utilities	-30%	-8%	0%	0%
Telecom	-17%	-8%	0%	4%
Real Estate	-39%	-9%	0%	0%
Transport	-34%	-11%	0%	24%
Energy	-52%	-11%	0%	12%

1. Performance is tracked for two periods, first from 21 February 2020 (before international acceleration of outbreak) to 20 March 2020 (trough of the market) and from 21 February 2020 through 28 Feb 2021; 2. Retailing, Hospitality, Transport and Energy are sectors with > 10% of companies with a probability of default > 15%; 3. Implied by 5-year credit default swap based on median; Note: Based on top S&P Global 1200 companies; Sectors are based on GICS definitions; Source: S&P Capital IQ; BCG ValueScience Center; BCG

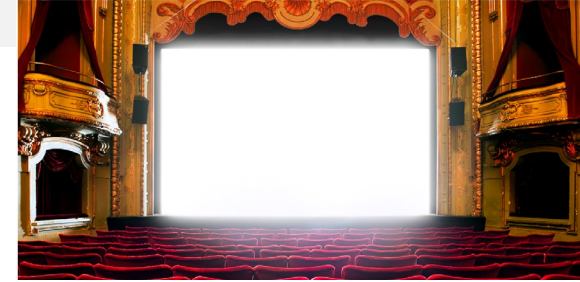
Additional perspectives on COVID-19



US vaccine sentiment



How the U.S. can quickly prevent half a million COVID deaths around the world



Getting to the COVID-19 finish line: A drama in 3 acts



Lessons learned from the frontline of the global COVID-19 vaccine rollout



Leading through the big transition to the new reality



As vaccines roll out, testing still matters

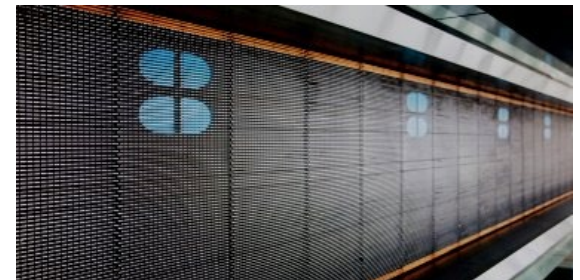


A vaccination strategy to save lives and livelihoods

Source: BCG



How to care for your workforce in a crisis



Reimagining global health after the coronavirus

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