CORONAVIRUS (COVID-19)

The Unexpected, Abrupt End to the Longest Expansion on U.S. Record

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Today's Figures Are Incomplete

COVID-19 CASES AND DEATHS
REPORTED NUMBER OF CASES AND DEATHS GLOBALLY

Sources: Bloomberg, Vining Sparks

Total Cases Globally
Total Deaths Globally

Today’s Figures Are Incomplete
COVID EXPLODES
COVID OUTBREAK HAS BEEN, IS, AND WILL CONTINUE TO BE DOMINANT THEME IN ECONOMIC DISCUSSIONS

Confirmed Cases Daily by Country and Region
7-Day Moving Average

Largest Reported Outbreaks: Cases and Fatality Rates

Sources: Bloomberg, Vining Sparks (*Other includes countries not listed in top 100 outbreaks)
COVID-19 DAILY GROWTH
DAILY INCREASE IN NUMBER OF CASES AND DEATHS GLOBALLY

Sources: Bloomberg, Vining Sparks

Total Cases Globally (Daily)
Total Deaths Globally (Daily)
7 per. Mov. Avg. (Total Cases Globally (Daily))
7 per. Mov. Avg. (Total Deaths Globally (Daily))

Today's Figures Are Incomplete
COVID-19 DAILY GROWTH U.S.

DAILY INCREASE IN NUMBER OF CASES AND DAILY GROWTH RATE IN U.S.

Sources: Bloomberg, Vining Sparks

Today’s Figures Are Incomplete
U.S. OUTBREAK

**U.S. Cases Daily**

**U.S. Current Hospitalizations**

**U.S. Tests**

**U.S. Fatalities Daily**

Sources: Bloomberg, Covid Tracking Project, Vining Sparks
U.S. CONFIRMED CASES

Sources: Bloomberg, Vining Sparks
**U.S. Fatalities**

**U.S. Fatalities Daily**

- Sources: Bloomberg, Vining Sparks

**Total Fatalities Per Capita**

- Deaths Per Capita (Per 100k)
  - 179.43
  - 91.94
  - 4.45

**7-Day Fatalities per Capita**

- Deaths Per Capita (7D Change Per 100k)
  - 0.93
  - 0.46
  - 0.01

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U.S. HOSPITALIZATIONS

U.S. Total Current Hospitalizations

Current Hospitalizations Per Capita

14-Day Change in Hospitalizations Per Capita

Sources: Bloomberg, Covid Tracking Project, Vining Sparks
# U.S. State-Level Data

**Sources:** Bloomberg (Reported with one-day lag due to slower reporting states), Hospitalizations from Covid Tracking Project Data, Vining Sparks

<table>
<thead>
<tr>
<th>U.S. State</th>
<th>Confirmed Cases</th>
<th>Hospitalizations</th>
<th>Deaths Reported</th>
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<tr>
<td><strong>Conformed Cases</strong></td>
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<tr>
<td></td>
<td>Pop. (000s)</td>
<td>Total Cases</td>
<td>New</td>
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<td>Pop. (000s)</td>
<td>Total</td>
<td>New</td>
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<tr>
<td><strong>Deaths Reported</strong></td>
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<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

| **Confirmed Cases** | | | |
| | Pop. (000s) | Total Cases | New | 7D Avg | 14D Avg | Pop. 100k | 7D Pop. 100k | Change in 7D vs 14D | Change in 14D vs 7D | Rate | |
| **Hospitalizations** | | | | |
| | Pop. (000s) | Total | New | 7D Avg | 14D Avg | Pop. 100k | 7D Pop. 100k | Change in 7D vs 14D | Change in 14D vs 7D | Rate | |
| **Deaths Reported** | | | | | | | | | | | |
| | | | | | | | | | | |

| **Confirmed Cases** | | | |
| | Pop. (000s) | Total Cases | New | 7D Avg | 14D Avg | Pop. 100k | 7D Pop. 100k | Change in 7D vs 14D | Change in 14D vs 7D | Rate | |
| **Hospitalizations** | | | | |
| | Pop. (000s) | Total | New | 7D Avg | 14D Avg | Pop. 100k | 7D Pop. 100k | Change in 7D vs 14D | Change in 14D vs 7D | Rate | |
| **Deaths Reported** | | | | | | | | | | | |
| | | | | | | | | | | |

| **Confirmed Cases** | | | |
| | Pop. (000s) | Total Cases | New | 7D Avg | 14D Avg | Pop. 100k | 7D Pop. 100k | Change in 7D vs 14D | Change in 14D vs 7D | Rate | |
| **Hospitalizations** | | | | |
| | Pop. (000s) | Total | New | 7D Avg | 14D Avg | Pop. 100k | 7D Pop. 100k | Change in 7D vs 14D | Change in 14D vs 7D | Rate | |
| **Deaths Reported** | | | | | | | | | | | |
| | | | | | | | | | | |

| **Confirmed Cases** | | | |
| | Pop. (000s) | Total Cases | New | 7D Avg | 14D Avg | Pop. 100k | 7D Pop. 100k | Change in 7D vs 14D | Change in 14D vs 7D | Rate | |
| **Hospitalizations** | | | | |
| | Pop. (000s) | Total | New | 7D Avg | 14D Avg | Pop. 100k | 7D Pop. 100k | Change in 7D vs 14D | Change in 14D vs 7D | Rate | |
| **Deaths Reported** | | | | | | | | | | | |
| | | | | | | | | | | |
U.S. STATE-LEVEL DATA

Confirmed Cases per 100,000 Population

- Cases per 100,000 Population by State
- 7-Day Average Growth in Cases Per 100,000 Pop. (R-Axis)
- 14-Day Average Growth in Cases per 100,000 Pop. (R-Axis)

Reported Deaths per 100,000 Population and Fatality Rates

- Deaths per 100,000 by State
- Fatality Rate (Reported Deaths / Reported Cases) (R-Axis)

Sources: Bloomberg, Vining Sparks
7-DAY VERSUS 14-DAY GROWTH RATES PER CAPITA: IS OUTBREAK SPREADING OR SLOWING IN EACH STATE

Sources: Bloomberg, Vining Sparks; Darkest bars represent 7-day averages within 3% of peak 7-day growth rate
U.S. STATE-LEVEL DATA

BREADTH AND RATE OF SPREAD

Outbreak Slowing (7D Avg Less than 14D Avg)

Outbreak Accelerating (7D Avg Exceeds 14D Avg)

Confirmed Cases Per 100,000 Population

7-Day Minus 14-Day Growth of Cases Per 100,000

Sources: Bloomberg, Vining Sparks
GROWTH RATES BY STATE
QUINTILE 1: RANKED BY SLOWEST RATES OF GROWTH (7D AVERAGE) VERSUS PEAK GROWTH (7D AVERAGE)

Confirmed Cases (Daily, 7D Average)

Sources: Bloomberg, Vining Sparks
GROWTH RATES BY STATE
QUINTILE 1: RANKED BY SLOWEST RATES OF GROWTH (7D AVERAGE) VERSUS PEAK GROWTH (7D AVERAGE)

Daily Growth (7-Day Average, Scaled by State Outbreak Levels)
- Statewide Lockdown Implemented (Varying Degrees of Lockdowns by State)
- Easing of Lockdowns (Varying Degrees of Easing by State)

Sources: Bloomberg, Vining Sparks
GROWTH RATES BY STATE

QUINTILE 2: RANKED BY SLOWEST RATES OF GROWTH (7D AVERAGE) VERSUS PEAK GROWTH (7D AVERAGE)

Confirmed Cases (Daily, 7D Average)

- LA
- NM
- PA
- NV
- SC
- WA
- TX
- MD
- ME
- CO

Sources: Bloomberg, Vining Sparks
GROWTH RATES BY STATE
QUINTILE 2: RANKED BY SLOWEST RATES OF GROWTH (7D AVERAGE) VERSUS PEAK GROWTH (7D AVERAGE)

Daily Growth (7-Day Average, Scaled by State Outbreak Levels)
- Statewide Lockdown Implemented (Varying Degrees of Lockdowns by State)
- Easing of Lockdowns (Varying Degrees of Easing by State)

Sources: Bloomberg, Vining Sparks
GROWTH RATES BY STATE

QUINTILE 3: RANKED BY SLOWEST RATES OF GROWTH (7D AVERAGE) VERSUS PEAK GROWTH (7D AVERAGE)

Confirmed Cases (Daily, 7D Average)

Sources: Bloomberg, Vining Sparks
GROWTH RATES BY STATE
QUINTILE 3: RANKED BY SLOWEST RATES OF GROWTH (7D AVERAGE) VERSUS PEAK GROWTH (7D AVERAGE)

Daily Growth (7-Day Average, Scaled by State Outbreak Levels)
- Statewide Lockdown Implemented (Varying Degrees of Lockdowns by State)
- Easing of Lockdowns (Varying Degrees of Easing by State)

Sources: Bloomberg, Vining Sparks
GROWTH RATES BY STATE

QUINTILE 4: RANKED BY SLOWEST RATES OF GROWTH (7D AVERAGE) VERSUS PEAK GROWTH (7D AVERAGE)

Confirmed Cases (Daily, 7D Average)

Sources: Bloomberg, Vining Sparks
GROWTH RATES BY STATE

QUINTILE 4: RANKED BY SLOWEST RATES OF GROWTH (7D AVERAGE) VERSUS PEAK GROWTH (7D AVERAGE)

Daily Growth (7-Day Average, Scaled by State Outbreak Levels)
- Statewide Lockdown Implemented (Varying Degrees of Lockdowns by State)
- Easing of Lockdowns (Varying Degrees of Easing by State)

Sources: Bloomberg, Vining Sparks
GROWTH RATES BY STATE

QUINTILE 5: RANKED BY SLOWEST RATES OF GROWTH (7D AVERAGE) VERSUS PEAK GROWTH (7D AVERAGE)

Confirmed Cases (Daily, 7D Average)

Sources: Bloomberg, Vining Sparks
GROWTH RATES BY STATE
QUINTILE 5: RANKED BY SLOWEST RATES OF GROWTH (7D AVERAGE) VERSUS PEAK GROWTH (7D AVERAGE)

Daily Growth (7-Day Average, Scaled by State Outbreak Levels)

- Statewide Lockdown Implemented (Varying Degrees of Lockdowns by State)
- Easing of Lockdowns (Varying Degrees of Easing by State)

Sources: Bloomberg, Vining Sparks
U.S. TESTING AND RESULTS

DAILY TESTING HAS INCREASED BUT CONFIRMED CASES APPEAR TO HAVE PLATEAUED

Sources: Covid Tracking Project (as Reported by State and Local Agencies), Vining Sparks
U.S. MEDICAL SITUATION
CURRENT DISPOSITION OF CASES

Sources: Covid Tracking Project (as Reported by State and Local Agencies), Vining Sparks
HOSPITALIZATIONS BY STATE

Current Per Capita Hospitalizations
Week Ago Per Capita Hospitalizations
Peak Per Capita Hospitalizations

Sources: Covid Tracking Project, Bloomberg, Vining Sparks (FL, HI, KS Not Reporting Hospitalizations)
## SITUATION BY COUNTRY

### Confirmed Cases

<table>
<thead>
<tr>
<th>Country</th>
<th>Total</th>
<th>New</th>
<th>TD Average</th>
<th>Peak TD Growth</th>
<th>Case Fatality Rate</th>
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</thead>
<tbody>
<tr>
<td>Total</td>
<td>25,248,595</td>
<td>226,023</td>
<td>257,418</td>
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<td>42,005</td>
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<td>2,645</td>
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<td>249</td>
<td>430</td>
<td>1,922</td>
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### Deaths Reported

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<tr>
<th>Country</th>
<th>Total</th>
<th>New</th>
<th>TD Average</th>
<th>Peak TD Growth</th>
<th>Case Fatality Rate</th>
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<tr>
<td>Total</td>
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<td>889</td>
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<tr>
<td>India</td>
<td>64,669</td>
<td>971</td>
<td>990</td>
<td>990</td>
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<tr>
<td>Russia</td>
<td>17,128</td>
<td>68</td>
<td>101</td>
<td>177</td>
<td>1.7%</td>
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<td>Peru</td>
<td>28,607</td>
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<td>44</td>
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<td>123</td>
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<tr>
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<td>4</td>
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<td>9,164</td>
<td>3</td>
<td>6</td>
<td>176</td>
<td>7.1%</td>
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</tbody>
</table>

### Sources: Bloomberg, Vining Sparks
SITUATION BY COUNTRY
NUMBER OF CONFIRMED CASES AND REPORTED DEATHS PER 100,000 POPULATION

Sources: Bloomberg, Census Bureau, Vining Sparks
**RATE OF PER CAPITA GROWTH**

COUNTRIES BY CURRENT GROWTH RATE (7D AVG) VERSUS LONGER RUN GROWTH RATE (14D AVG)

**7-Day Average Growth Per Capita Minus 14-Day Average Growth Per Capita**

- *Accelerating*: 7D Growth Rate Higher Than 14D Growth Rate
- *Decelerating*: 7D Growth Rate Lower Than 14D Growth Rate

**Confirmed Cases Over Last 7 Days**

*Sources: Bloomberg, Vining Sparks*
LARGEST OUTBREAKS

OUTBREAKS HAVE MOVED FROM EUROPE TO THE U.S. AND NOW TO LATIN AMERICA, RUSSIA, AND INDIA

Current Growth (7D Avg.) as Percent of Peak Growth (7D Avg.)

Sources: Bloomberg, Vining Sparks
CASE GROWTH BY COUNTRY

Sources: Bloomberg, Vining Sparks

Cases by Country - 20 Largest Outbreaks

Logarithmic Scale (Base 10)

Sources: Bloomberg, Vining Sparks
Includes metrics on school closings, workplace closings, canceling public events, restrictions on gathering size, closing public transportation, issuing stay-at-home requirements, restrictions on internal movement, restrictions on international travel

Sources: Oxford COVID-19 Government Response Tracker, Blavatnik School of Government, Vining Sparks
PER CAPITA GROWTH (7-DAY)

Sources: Bloomberg, Vining Sparks
Includes metrics on school closings, workplace closings, canceling public events, restrictions on gathering size, closing public transportation, issuing stay-at-home requirements, restrictions on internal movement, restrictions on international travel.

Sources: Oxford COVID-19 Government Response Tracker, Blavatnik School of Government, Vining Sparks
GOVERNMENT STRINGENCY

OXFORD STRINGENCY INDEX – QUANTIFYING STRINGENCY OF GOVERNMENT RESPONSES VS CASE GROWTH

Sources: Oxford COVID-19 Government Response Tracker, Blavatnik School of Government, Vining Sparks
CASE FATALITY RATE

CASE FATALITY RATE OF COVID-19 HAS BEGUN TO DECLINE AS TESTING HAS INCREASED

Sources: Bloomberg, Vining Sparks
FATALITIES BY COUNTRY

Sources: Bloomberg, Vining Sparks
FATALITY RATES BY COUNTRY

Fatality Rate of Confirmed Cases

Highest 25
Lowest 25
FISCAL RESPONSE

CONGRESS CONTINUES WORKING TO CONTAIN, TEST, AND TREAT VIRUS; AND OFFSET ECONOMIC IMPACT

Phase One (Mar. 4) - $8.3 Billion
- Funding to Help Contain Virus and Develop Treatments

Phase Two (Mar. 19) - $100 Billion
- Provides for free testing for COVID-19
- Increases Medicaid Funding, Expands Unemployment Insurance, More Funds for Food Stamp Program
- Requires employers with <500 employees to provide paid leave, refundable with tax credit
  - 2 weeks of paid leave to those in quarantine, infected, caretakers for family members
  - Additional 10 weeks at 2/3rds pay for those who have lost childcare due to school or day-care closures

Phase Three: (CARES Act) Coronavirus Relief, Aid, and Economic Security Act (Mar. 25) - $2.2 Trillion

Individuals:
- $300 Billion in Payments direct to individuals ($1,200 per adult, $500 per child)
  - Phase-out begins at $75k single / $150k married; ineligible at $99k and $198k, respectively
- $250 Billion for Expansion of Unemployment Insurance
  - Includes Traditional Beneficiaries Plus Self-Employed and Workers in Gig Economy
  - Max Benefit Increased $600 / Month, Extended from 3 Months to 4 Months
Phase Three: (CARES Act) Coronavirus Relief, Aid, and Economic Security Act (Mar. 25) - $2.2 Trillion (Cont.)

**Businesses:**
- $500 Billion for Loans to Large Businesses and Governments
  - $454 Billion for Loans through Treasury with Federal Reserve
  - $46 Billion for Airlines and Businesses Critical to National Security
- $280 Billion for Business Tax Breaks Including Deferral of Social Insurance Payments to ’21
- $349 Billion for Small Business Loans (Paycheck Protection Program)

**Health Care:**
- $180 Billion Direct to Health Care Investment (Hospitals, Research, Treatment)

**State and Local:**
- $150 Billion to Cover Spending Shortages Related to Fighting Virus

**Oversight:**
- Special Inspector General for Pandemic Recovery to Oversee Lending to Businesses
- Prohibits Stock Buybacks from Companies Receiving Loans for Loan Term Plus One Year
Phase Three Expansion: Paycheck Protection Program Increase Act (Congress - April 24) - $484 Billion

**Businesses:**
- $310 Billion Increase to Paycheck Protection Program ($660 Billion Total)
  - $60 Billion Set Aside for Smaller Lending Institutions – Community Development Financial Institutions
    - $30 Billion for Lenders with $10 to $50 Billion in Total Assets
    - $30 Billion for Lenders with Less than $10 Billion in Total Assets
  - $60 Billion to Replenish Economic Injury Disaster Loan Fund

**Health Care:**
- $75 Billion New Funding for Hospitals ($175 Billion Total)
- $25 Billion for Testing – Manufacturing and Purchasing Test Kits
  - $11 Billion to State and Local Governments for Testing and Contact Tracing
  - $1 Billion for Covering Tests for Uninsured Persons
  - $1 Billion in Funding for C.D.C. to Perform Contact Tracing
### FISCAL RESPONSE – PHASE 4

**CONGRESS CONTINUES WORKING TO CONTAIN, TEST, AND TREAT VIRUS; AND OFFSET ECONOMIC IMPACT**

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**House Plan: HEROES ACT (Est. $3.5 Trillion)**

**Health and Economic Recovery Omnibus Emergency Solutions Act**

**Individuals:**
- Payments direct to individuals ($1,200 per adult, $1,200 per dependent – up to $6,000 per household) (Est. total $300 billion)
  - Phase-out begins at $75k single / $150k married
- Extends $600/week boost in unemployment insurance through January 2021
- $200 billion for Heroes Fund to pay essential workers hazard pay for next three months
- $100 Billion Rent Assistance
- $75 Billion Mortgage relief
- Up to $10,000 per borrower in student loan relief
- $430 Billion total committed to education, $50 billion for childcare facilities
- Suspend the SALT deduction limit

**Businesses:**
- $10 Billion for Small Businesses which have not received funds from PPP
- Employer tax credit covering up to $12,000 per employee per quarter
- Allows businesses to deduct payroll, rent and other costs associated with forgivable PPP loans

**Government**
- $500 Billion for State Governments
- $375 Billion for Local Government
- $25 Billion for U.S. Postal Service
- $20 Billion for U.S. Territories and Tribal Nations, each

**Health Care:**
- $75 Billion for Testing and Contract Tracing

**Republican Proposal: HEALS ACT (Est. $1.0 Trillion)**

**Health, Economic Assistance, Liability Protection, and Schools Act**

**Individuals:**
- Payments direct to individuals ($1,200 per adult, $500 per dependent (expanded to include adult dependents))
  - Phase-out begins at $75k single / $150k married
- Increased unemployment insurance cut from $600 per week to $200 per week through September
  - After September, will cover gap in state benefits to equal 70% of lost worker wages (up to state-level cap)
  - If state unable to calculate worker wages, may apply for waiver to receive $200 per week increase
- Extends protections from evictions
- Provides $100 for education fund to help schools re-open

**Businesses:**
- Small business (<300 employees) with lost revenue of 50%+ eligible for second, forgivable PPP loan
- Expand forgivable costs under PPP to include costs to protect workers or employees, costs of implementing outdoor seating
- Liability protection for re-opening given to businesses, churches, charities, schools, and healthcare providers

**Government**
- Provides state and local government easier access to federal programs

**Health Care:**
- $16 Billion for Testing

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**House Approved May 15**

**Proposed July 27**
President Trump: Executive Orders

$300 Federal Increase in U.I., Calls for Additional $100 from States

Through December 6

Directs Treasury to Defer 6.2% Social Security Tax on Wages <$100,000

Through December 31

Directs Treasury and HUD to Help Renters and Homeowners Avoid Eviction

Extends Student Loan Payment Moratorium on Federal Student Loans

Through End of Coronavirus Crisis
FED MONETARY RESPONSE
FED CUTS RATES TO NEAR-ZERO, RESTARTS QUANTITATIVE EASING, ENCOURAGES BANKS TO USE CAPITAL

Emergency 50 basis point cut (Mar. 3)

Emergency 100 basis point cut – Overnight Rate to 0.00-0.25% (Mar. 15)
  - Cut Rate for Required and Excess Reserves to 0.10%
  - Cut Primary Credit Rate at Discount Window 150 basis points to 0.25%
  - Announced Discount Window Loans up to 90-Days, Prepayable

Restarted Quantitative Easing
  - “At Least” $500 billion in Treasury Securities (Mar. 15)
  - “At Least” $200 billion in Mortgage-Back Securities (Mar. 15)
  - Purchases to Be Made over the “Coming Months” (Mar. 15)
  - Whatever Quantity Is Needed to Facilitate Smooth Functioning of Markets (Mar. 23)
  - Added CMBS Securities (Mar. 23)

Encouraged Banks to Use Liquidity and Capital Buffers to Lend to Households/Businesses

Lowered Required Reserve Rate to Zero

Implemented Nine Liquidity / Funding Facilities to Ensure Smooth Functioning of Markets

April 29 Policy Decision: Uncertain outlook, Slow recovery, In no hurry to liftoff
April 29 FOMC Policy Decision

Stand Ready to Use All Tools

Policy Rates Unchanged
- Overnight Target Rate Range: 0.00% – 0.25%
- Interest on Excess Reserves Rate: 0.10%

Economic Assessment: Dour
- “Outbreak is causing tremendous human and economic hardship across the United States and around the world”
- Health crisis is weighing “heavily on economic activity … and poses considerable risks to the economic outlook over the medium term”

Forward Guidance
- Maintain current policies until “confident … economy has weathered recent events”

Fed Chair Powell Press Conference
- Recovery: Spending will not go right back to where it was … “it will take some time…for us to get back to anything that resembles maximum employment”
- Quantitative Easing: Will use asset purchases for purchase of easing financial conditions if needed
- Liquidity Facilities: “if demand for our facilities is greater than we’ve estimated, then we’ll expand them. … won’t run out of money”
- Forward Guidance: “not be in any hurry to withdraw these measures, or to liftoff. We’re going to wait until we’re quite confident that the economy is well on the road to recovery
- Massive Debt Build-up: Now is not the time to worry about the deficit
**FED BALANCE SHEET**

**Sources:** Federal Reserve, Vining Sparks
FED LIQUIDITY FACILITIES
FED REVIVES FINANCIAL CRISIS-ERA PROGRAMS AND ADDS LENDING PROGRAMS

CPFF - Commercial Paper Funding Facility (Mar. 17)
Expiration Date: March 17, 2021
- Capacity to Purchase up to $1 T in A1/P1 Rated Commercial Paper (Unsecured or Asset-Backed)
- Special Purpose Vehicle Will Buy Direct from Companies
- High-Quality Tax-Exempt Commercial Paper Added as Eligible Security (Mar. 23)

Primary Dealer Credit Facility (Mar. 17)
Extended to Dec. 31 (July 28)
- Allows 24 Primary Dealers to Exchange Collateral for up to 90-Day Funding
- Program Scheduled to Last at Least Six Months
- Eligible Collateral Includes: Investment Grade Debt, Commercial Paper, Municipal Bonds, and Equities

MMLF - Money Market Mutual Fund Liquidity Facility (Mar. 18)
Extended to Dec. 31 (July 28)
- Loans to Prime Money Funds
- Collateralized by Treasuries, Agencies, and GSE Securities: Offered at Discount Rate of 0.25%
- Collateralized by Secured or Unsecured Commercial Paper: Offered at Discount Rate + 1.00%
FED LIQUIDITY FACILITIES

FED REVIVES FINANCIAL CRISIS-ERA PROGRAMS AND ADDS LENDING PROGRAMS

PMCCF - Primary Corporate Credit Facility (Mar. 23) (*Revised June 15)

- Provide Four-Year Bridge Financing Loans for Investment Grade Companies
- Principal and Interest Payments May Be Deferred for the First Six Months
- Allow Companies Access to Credit to Maintain Business Operations During Period of Dislocation
- Will Buy Bonds Following Diversified Market Index Made up of All Corporates in Secondary Market Which Meet Criteria

SMCCF - Secondary Market Corporate Credit Facility (Mar. 23)

- Purchase Corporate Bonds and Bond ETFs from Secondary Market through Special Purpose Vehicle (SPV)
- Corporate Bonds Must Be Investment Grade / ETFs with Primary Exposure to I.G. Corporate Bond Market
- Designed to Provide Liquidity for Outstanding Corporate Bonds

TALF – Term Asset-Backed Securities Loan Facility (Mar. 23) (*Revised May 13)

- Provide Non-Recourse Loans to Holders of Certain Asset-Backed Securities through SPV
- ABS Must Be AAA-Rated and Newly or Recently Originated; *Originations back to Jan. 2019 for CMBS, SBA, and DCPC
- Enable the Issuance of ABS Backed by Student Loans, Auto Loans, Credit Card Loans, SBA Loans

Extended to Dec. 31 (July 28)

Extended to Dec. 31 (July 28)

Extended to Dec. 31 (July 28)
FED LIQUIDITY FACILITIES

FED REVIVES FINANCIAL CRISIS-ERA PROGRAMS, ADDS LENDING PROGRAMS; PREPARED TO DO MORE

PPPLF – Paycheck Protection Program Lending Facility - $349 Billion (April 9) (*Revised April 30)
*Extended to Dec. 31 (July 28)*
- Up to $2.3 trillion in funding for depositories (*and non-depository qualified lenders) originating PPP loans
- Term funding to match maturity of PPP loans at a rate of 0.35%
- Program to run through September 30, 2020

MSLP – Main Street Lending Program - $600 Billion / $75 Billion Equity (April 9) (*Revised April 30, **June 8 ***July 17)
*Extended to Dec. 31 (July 28)*
- Provide funding through SPV to companies affected by virus
- Lending bank retains 5% equity / *15% **5% in expanded criteria
- Four **Five-year term loans with principal and interest deferred for one **two years, no prepayment penalty
- Eligible companies include those with up to 10,000 *15,000 workers and less than $2.5 billion *$5.0 billion in revenues
- Minimum loan size of $1 million *$500,000 **$250,000
- Maximum loan size of 4x EBITDA (*Increased to 6x EBITDA - banks must retain 15% **only 5% equity)
- Borrowers must follow compensation, stock repurchase, and dividend restrictions
- ***Expanded program to include nonprofits: educational organizations, hospitals, social service organizations, etc... 
  - New nonprofit loan program: Loan min. $250k, Loan max $35MM or average 2019 quarterly income
  - Expansion of existing nonprofit loan: Loan min. $10MM, Loan max: $300MM or average 2019 quarterly income
  - Loan rate Libor +3%
  - Endowment cap of $3 billion

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*Note: Figures and dates are subject to change as of the latest updates provided.*
EXPANSION OF MLF

MLF – Municipal Liquidity Facility - $500 Billion / $35 Billion Equity (April 9) (*Revised April 27, ** June 3)

- Purchase short-term notes up to 24 *36 months in maturity through SPV; Pricing based on issuer rating
- Will purchase directly from U.S. states, counties (pop. > *500K), and cities (pop. > *250K) (1 issue limit)
- **Allows at least two cities or counties from each state to access facility regardless of population, designated by Governor
- **Allows Governors to also designate two issuers “whose revenues are generally derived from operating government activities (such as public transit, airports, toll facilities, and utilities) to be eligible”
- State-level issuers may use proceeds to support additional counties and cities

States which had no cities or counties eligible for the Facility based on population prior to revised terms

States which had only one city or county eligible for the Facility based on population prior to revised terms

Sources: Federal Reserve Press Release, Census Bureau Population Estimates 2019, Vining Sparks
Massive Increase in Repurchase Operations

- Increased overnight repo from $100 to $150 billion, 2-week term from $20 to $45 billion (Mar. 9)
- Announced three new $50 billion 1-month term repo operations (Mar. 11)
- Increased overnight repo from $150 to $175 billion (Mar. 11)
- Announced new $500 billion 1-month repo and $500 billion 3-month repo operations weekly (Mar. 12)
- Cumulative of $5.4 trillion in new repo offerings
- Announced $500 billion overnight repo operation in addition to morning’s $175 billion (Mar. 16)
- Announced $500 billion overnight repo operation in addition to morning’s $175 billion (Mar. 17)
- Announced two $500 billion repo operations per day to last through remainder of week (Mar. 17)
- Announced two $500 billion repo operations per day to last through mid-April (Mar. 20)
European Central Bank
- Launch new Quantitative Easing program to purchase €750 billion in public and private securities (Mar. 18)
- Loosens rules of existing corporate purchase program to include non-financial commercial paper (Mar. 18)

Bank of England
- Announce new COVID Commercial Financing Facility to ease funding pressure in C.P. market (Mar. 18)
- Cut rates by 0.15% to 0.10% (Mar. 19)
- Increase Quantitative Easing program from £445 billion to £645 billion (Mar. 19)
- Increase size of funding program available to small businesses (Mar. 19)

Bank of Japan
- Performed unscheduled bond purchases (Mar. 19)
- Made record ETF purchases (Mar. 19)
- Offered trillions in new repo liquidity (Mar. 19)
- Significantly increased amounts of C.P. and corporate bonds they can purchase (Apr. 27)
- Created new lending facility using corporate bonds as collateral (Apr. 27)
- Committed to unlimited bond purchases if necessary (Apr. 27)
FORECAST UNCERTAINTY

ECONOMISTS CONTINUE TRYING TO GET HANDLE ON DEGREE OF CONTRACTION AND REBOUND

Sources: JPMorgan, Goldman Sachs, Vining Sparks
Economic Conditions Deteriorated Much More Quickly and Significantly Than Expected

- COVID-19 outbreak has persisted for longer than anticipated, remains unresolved as of mid-July
- Job loss has been greater than expected but the labor market is showing signs of rebounding, long road ahead for job restoration
- Loss of economic activity has been larger and more abrupt than expected, likely to result in prolonged weakness

Fiscal and Monetary Policy Responses Have Been More Comprehensive, Larger than Expected

- Fiscal stimulus has been larger than expected (>2.8 trillion), and may be increased further in coming months
- Fed’s emergency actions have been more comprehensive than anticipated

Future Outlook: Lasting Damage Likely Already Occurred, Key to Future Outlook Is Containment

- Length of time to recover lost economic activity is now expected to be longer than twelve to eighteen months
  - Uncertainty remains: will be delayed further as outbreak re-accelerates, some regions appear to not be through the worst yet
- More business failures now likely given prolonged interruption in cashflow
  - Business deaths now expected to exceed births limiting recovery in labor market
- Household income expected to be weak once stimulus measures work way through system
- Household balance sheets stable at this point thanks to low interest rates fueling housing and equity markets
- Consumer behavior expected to be altered in ways that reduce future economic activity
  - Most acute concern is for industries providing non-essential services which require high employee-consumer interaction
- Healthier banking sector than during previous cycle expected to help limit damage, allow monetary easing to flow to real economy

Outlook Cumulatively Points to Prolonged Period of Low Interest Rates
ECONOMIC DISRUPTION NOW EXPECTED TO RESULT IN SHARP CONTRACTION, SLOWER RECOVERY

**GDP (QoQ, SAAR)**

Sources: BEA, Bloomberg Survey of Economists, Vining Sparks Projections
SHARP PAYROLL DECLINE

ECONOMIC DISRUPTION NOW EXPECTED TO RESULT IN SHARP CONTRACTION, SLOWER RECOVERY

Sources: BLS, Bloomberg Survey of Economists, Vining Sparks Projections

Monthly Nonfarm Payroll Growth
JUMP IN UNEMPLOYMENT

ECONOMIC DISRUPTION NOW EXPECTED TO RESULT IN SHARP CONTRACTION, SLOWER RECOVERY

Unemployment Rate

Sources: BLS, Bloomberg Survey of Economists, Vining Sparks Projections
**Fed Funds Target Rate (Midpoint)**

ECONOMIC DISRUPTION NOW EXPECTED TO RESULT IN SHARP CONTRACTION, SLOWER RECOVERY

Sources: Bloomberg, Bloomberg Survey of Economists, Vining Sparks Projections
ECONOMIC DISRUPTION NOW EXPECTED TO RESULT IN SHARP CONTRACTION, SLOWER RECOVERY

Sources: Bloomberg, Bloomberg Survey of Economists, Vining Sparks Projections
A heightened amount of uncertainty continues to attend our forecast. Our outlook revision now takes into account a longer-than-expected period of containment, a larger-than-expected impact to the labor market, and a longer-than-expected recovery period. Going forward, the key to the outlook will be the ability to contain the virus sufficiently to prevent future lockdowns. Given the more-persistent-than-expected nature of the virus, risks appear to be tilted to the downside.

ECONOMIC DISRUPTION NOW EXPECTED TO RESULT IN SHARP CONTRACTION, MODEST REBOUND
According to guidance from the N.H.C. dated February 6, China will begin classifying coronavirus results into four categories: “suspected cases,” “clinically diagnosed cases,” “positive tests,” and “confirmed cases.” Only patients who test positive for the virus AND who have symptoms will be included in the count of “confirmed cases.” If someone tests positive but shows no symptoms, they will be classified in the “positive tests” category and excluded from the “confirmed cases” count going forward. [Link to N.H.C. Statement]

The N.H.C. begins reporting “clinically diagnosed cases,” those which test positive but without the confirmation of a nucleic acid test, as “confirmed cases.”

Johns Hopkins CSSE data used beginning March 18 due to lagged reporting from C.D.C. and W.H.O.
VIRULENCE OF COVID-19
CHINA LIKELY UNDER-TESTED FOR COVID-19, BUT CASE FATALITY RATE CONCERNING FOR OLDER PERSONS

Case Fatality Rate by Age (Seasonal Flu)
Sources: U.S. Center for Disease Control, Vining Sparks

Case Fatality Rate by Age (COVID-19)
Sources: U.S. CDC, Chinese Center for Disease Control, Vining Sparks

INITIAL STUDY RESULTS FROM CHINESE CDC

0% 2% 4% 6% 8% 10% 12% 14%
0-4 5-17 18-49 50-64 65+

0.0% 0.0% 0.0% 0.1% 0.8%

0% 2% 4% 6% 8% 10% 12% 14%
10-19 20-29 30-39 40-49 50-59 60-69 70-79 80+

0.2% 0.2% 0.2% 0.4% 1.3% 3.6% 8.0% 14.8%

Sources: U.S. CDC, Chinese CDC, Vining Sparks
VIRULENCE OF COVID-19
PERSONS WITH PRE-EXISTING CONDITIONS PARTICULARLY SUSCEPTIBLE ACCORDING TO CHINESE DATA

Sources: Chinese CDC, Vining Sparks

### Case Fatality Rate by Age (COVID-19)

- Cardiovascular Disease
- Diabetes
- Respiratory Disease
- Hypertension
- Cancer
- No Pre-Existing Conditions

### Case Fatality Rate by Age (COVID-19)

- Male
- Female

Sources: Chinese Center for Disease Control, Vining Sparks