Anatomy of an Outbreak: Part 3

The world digs in, suppliers step up, and clinicians answer the call

April 2, 2020

Presented by
Advisory Board Executive Insights

Today's Research Expert

Christopher Kerns
Vice President, Executive Insights

Christopher oversees all senior executive research at Advisory Board, and is responsible for developing the research perspective, official point of view, and overall Advisory Board message to executives from across the health care sector.
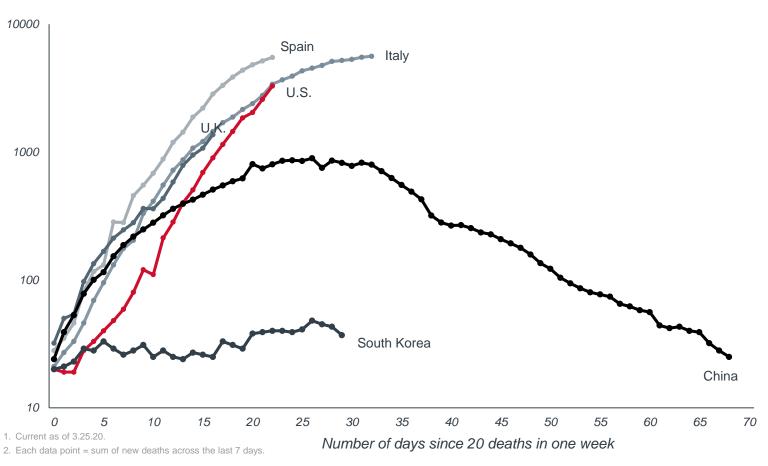
✉ KernsC@advisory.com   🐦 @CD_Kerns

Death rate grows in U.S., but China clearly over the hump

New deaths with coronavirus in the past week, by number of days since 20 deaths in one week[1,2]

Spain
Italy
U.K.
U.S.
South Korea
China

10000
1000
100
10

0 5 10 15 20 25 30 35 40 45 50 55 60 65 70

Number of days since 20 deaths in one week

1. Current as of 3.25.20.
2. Each data point = sum of new deaths across the last 7 days.

White House Press Conference
March 31, 2020

"I want every American to be prepared for the hard days that lie ahead. We're going to go through a very tough two weeks."

- PRESIDENT DONALD TRUMP

100-240K Projected COVID-19-related deaths in the U.S. WITH continued social distancing

1.5-2.2M Worst-case scenario of COVID-19-related deaths that would have happened in the U.S. WITHOUT any social distancing
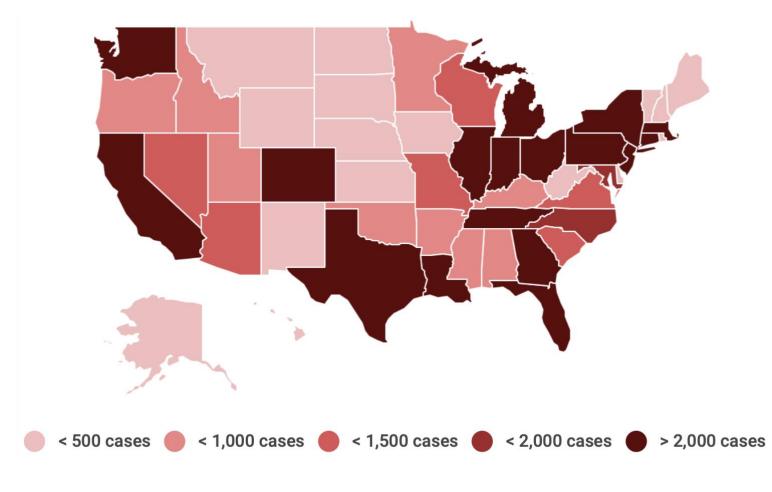
Source: Bernard S et al., "Coronavirus Tracked: The Latest Figures as the Pandemic Spreads," Financial Times, 2020; Roser M et al., "Coronavirus Disease (COVID-19) – Statistics and Research," Our World in Data, 2020; "White House projects 100,000-240,000 U.S. Deaths From Coronavirus," Al Jazeera, 2020.

Advisory Board interviews and analysis.

Coronavirus cases in the United States
Current as of April 1, 2020

Current COVID-19 cases

At least 188,247 cases

76,030 cases in New York

At least 3,921 deaths

Estimate of possible effects

96 million cases

4.8 million hospitalizations

480,000 deaths

< 500 cases   < 1,000 cases   < 1,500 cases   < 2,000 cases   > 2,000 cases
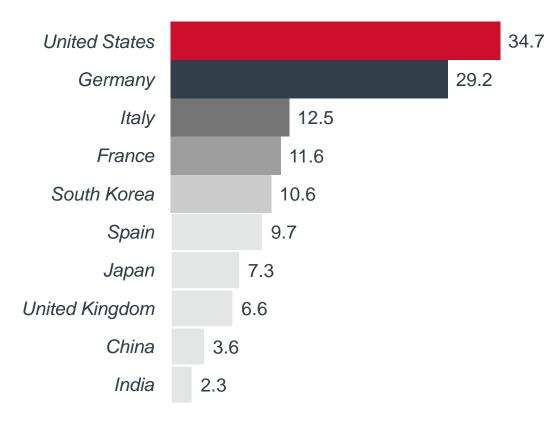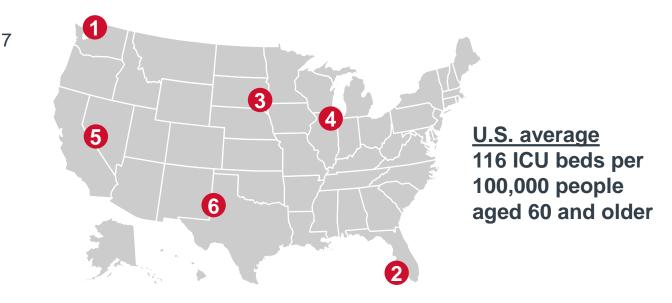
Overall U.S. ICU capacity greater than most countries

But geographic bed distribution leaves many areas with severe shortage

Total number of critical care beds per 100,000

Country	Beds
United States	34.7
Germany	29.2
Italy	12.5
France	11.6
South Korea	10.6
Spain	9.7
Japan	7.3
United Kingdom	6.6
China	3.6
India	2.3

ICU beds per 100,000 people aged 60 and older

U.S. average
116 ICU beds per 100,000 people aged 60 and older

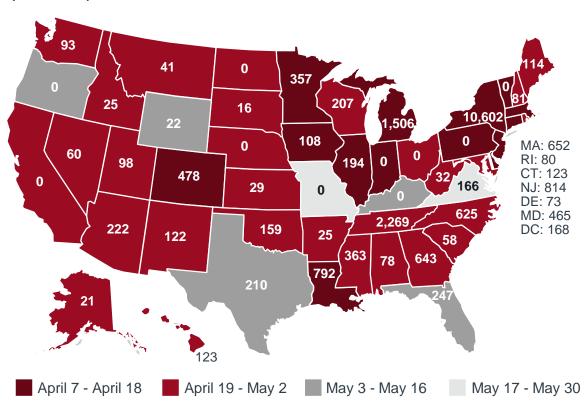|					
Less prepared	**1** Everett, WA 54 beds		**2** Fort Meyers, FL 57 beds		**3** Sioux Falls, SD 58 beds
More prepared	**4** Chicago, IL 211 beds		**5** Reno, NV 214 beds		**6** Lubbock, TX 242 beds

Source: McCarthy N, "The Countries With The Most Critical Care Beds Per Capita," Statista, March 12, 2020; McGinty M et al., "Older Coronavirus Patients Face Looming ICU Bed Shortage," The Wall Street Journal, March 24, 2020.

Some states entering tough period

Access to resources and capacity varies widely

Projected ICU bed shortage and dates of peak resource use by state

Updated April 1, 2020

Map values by state:
93, 41, 0, 357, 114, 0, 81, 207, 25, 16, 10,602, 22, 0, 108, 1,506, 0, 60, 98, 478, 0, 194, 0, 0, 32, 166, 0, 29, 159, 2,269, 625, 222, 122, 25, 58, 210, 363, 78, 643, 247, 21, 792, 123

MA: 652
RI: 80
CT: 123
NJ: 814
DE: 73
MD: 465
DC: 168

Legend:
- April 7 - April 18
- April 19 - May 2
- May 3 - May 16
- May 17 - May 30

States with greatest predicted peak ventilator demand

State	
New York	9,055
Tennessee	2,318
Texas	1,975
Michigan	1,798
Florida	1,594

States with least predicted peak ventilator demand

State	
Vermont	27
Wyoming	53
North Dakota	59
Alaska	60
South Dakota	72

Source: COVID-19 Projections, The Institute for Health Metrics, April 1, 2020.

Advisory Board
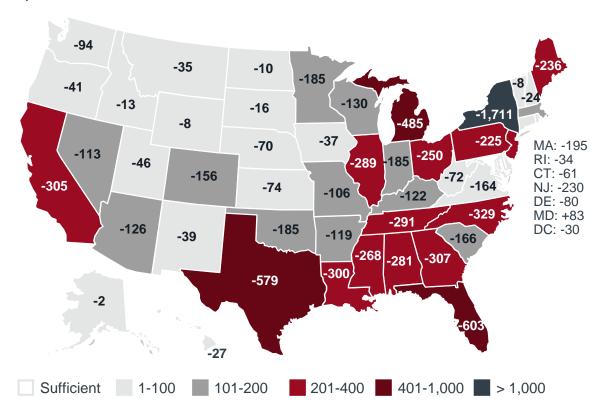
Advisory Board interviews and analysis.

Physician supply could be limiting factor for ICU care

Maryland is the only state with ample supply of critical care providers

Projected critical care physician shortage by state[1]

Updated March 31, 2020

MA: -195
RI: -34
CT: -61
NJ: -230
DE: -80
MD: +83
DC: -30

Legend:
Sufficient | 1-100 | 101-200 | 201-400 | 401-1,000 | > 1,000

Strategies to increase capacity of critical care physicians

- Allow physicians with active COVID-19 to provide care via tele-ICU

- Permit physicians who have only completed one year of critical care fellowship to work independently

- Waive U.S. licensing rules to allow additional international tele-ICU coverage

- Recruit retired critical care physicians to re-enter the workforce

- Consider alternate standards of care for patients with very poor prognoses

1. Based on peak demand for critical care physicians under stretch staffing ratios.

Advisory Board interviews and analysis.

Aggressive social distancing slowing the spread

New Rochelle and Seattle's early steps paying dividends

Initial steps to limit the spread of COVID-19

Early closures

New Rochelle
March 12th created "Containment Zone," shuts downs schools, places of worship, and large gatherings in 1 mile radius around epicenter

Washington State
Banned gatherings of 250+ and closed schools between March 11th and 13th

Comprehensive testing

New Rochelle
Quickly created a drive-through testing site and sent health care workers to test quarantined individuals in their homes

Washington State
State that has performed the second highest number of tests, after New York State

Virus spread slowing

38
Number of new cases in New Rochelle county in last four days combined

2.7 to 1.4
Drop in number of people that each COVID-19 positive patient infected in early March to April
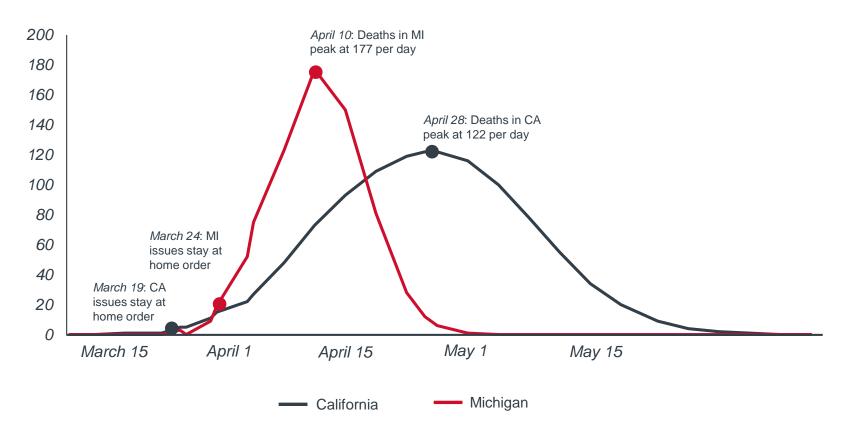
Advisory Board interviews and analysis.

Early social distancing vital to flattening the curve

New COVID-19 deaths per day in Michigan and California

April 10: Deaths in MI peak at 177 per day

April 28: Deaths in CA peak at 122 per day

March 24: MI issues stay at home order

March 19: CA issues stay at home order

— California   — Michigan

Death rate per 100,000 residents	
Michigan[1]	32
California [1]	13
New York City[2]	15.9
China[2]	0.2
Italy[2]	21.8
Spain[2]	20.8
South Korea[2]	0.3
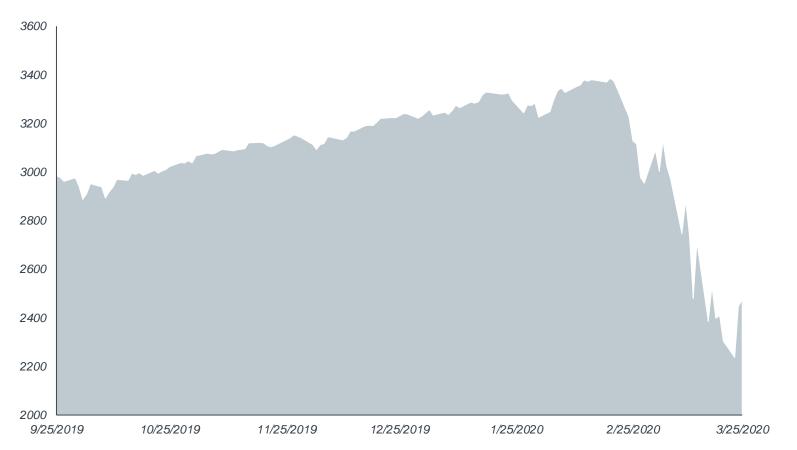
The economy responds to suppression strategies

An exceptionally rapid market reaction to locking down economic activity

S&P 500 performance

6.6 million

Record number of jobless claims in the first week following national social-distancing measures enacted following outbreak, up from previous record of 3.3 million the prior week

12%-24%

Estimated drop in U.S. GDP in second quarter of 2020

Source: "S&P 500 (^GSPC)," Yahoo Finance, 2020; : CNN, Goldman Sachs predicts 2.25 million Americans filed initial unemployment claims this week, the highest on record, March 2020.

Contact tracing a powerful measure to track spread of virus

But surveillance tactics raise concerns about personal privacy

Countries successful at containment used contact tracing

South Korea

▶ Government created map of coronavirus carriers using…

- Credit card transactions
- CCTV video
- Smartphone location
- Enhanced tool to track patients in real time

▶ South Koreans receive new geographically linked alerts about those who have been infected

Singapore

TraceTogether app uses Bluetooth signals between cell phones to see if potential carriers of virus have been in contact with other people

Will Western countries follow suit?

United Kingdom

Government considering creating its own tracing app, similar to Singaporean model

- App would record GPS location
- If patient starts feeling ill, they would use app to request home test
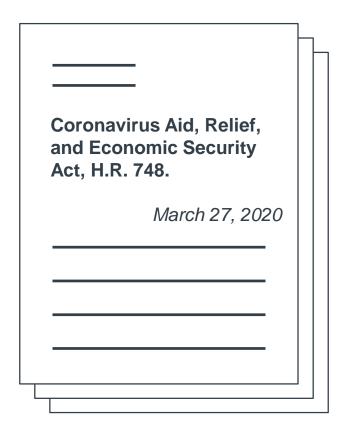- If test is positive, instant signal sent to everyone in recent contact

Privacy concerns currently present strongest barrier

Advisory Board interviews and analysis.

Outbreak prompts historic stimulus package

$2T CARES Act aims to address economic fallout associated with the pandemic

Coronavirus Aid, Relief, and Economic Security Act, H.R. 748.

March 27, 2020

Major provisions and funding allocations of CARES Act

Businesses

- ~$450B for corporate assistance
- ~$350B for small business loans (could include physician practices)

States

- ~$150B for aid to states
- Authorizes Treasury Secretary to make loans to states

Individuals

- ~$300B for household payments
- ~$250B for unemployment insurance

Health care industry

- ~$130B for providers and suppliers
- Regulatory relief and support

Source: McDermott+Consulting, CARES Act Offers Relief, Support for US Healthcare Sector During COVID-19 Response, March 2020; Coronavirus Aid, Relief, and Economic Security Act, H.R. 748.

Advisory Board interviews and analysis.

Health care provisions largely offer near-term direction, relief

Congress focuses on most pressing needs—and defers to HHS on many details

HOSPITALS

- $100B provider fund (shared)
- Medicare add-on payment
- Accelerated Medicare prepayments
- Relaxed telehealth requirements
- Suspension of Medicare sequestration[1]

PHYSICIANS

- $100B provider fund (shared)
- Expansion of small business loans
- Accelerated Medicare prepayments
- Relaxed telehealth requirements
- Suspension of Medicare sequestration[1]

POST-ACUTE CARE

- $100B provider fund (shared)
- Funding for infection control, construction, and telehealth expansion efforts
- Relaxed admissions requirements
- Suspension of Medicare sequestration[1]

PAYERS

- COVID-related coverage requirements
- Flexibilities for telehealth coverage
- Extended definition of "uninsured" to include those with plans w/o EHB

PHARMA & DEVICE

- Incentives for pharma to develop therapies for COVID-19
- Incentives for device manufacturers to increase production

HEALTH TECH

- $200M to support the expansion of telehealth
- Relaxed telehealth requirements
- Increased telehealth reimbursement

1. From May 1, 2020 through December 31, 2020.

Advisory Board interviews and analysis.

CARES Act pushes widespread adoption of telehealth

More restrictions lifted, but not much money invested

New policies to expand consumer access to telehealth

- New patients are eligible for telehealth services—**no existing relationship** with a provider required

- HDHPs and HSAs can cover telehealth visits **before members have met deductibles**

New initiatives to study broader applications of telehealth

- HHS Secretary directed to consider telehealth applications for **home health**

- Previous legislation amended to produce **evidence-based demonstration** of telehealth impact on access to care

$200 million available for telehealth investment—all of it going to the FCC

No direct financial support to providers for telehealth in CARES, but…

…FCC chairman proposes to use CARES funding to help eligible providers buy **telehealth equipment and services**

Source: McDermott+Consulting, CARES Act Offers Relief, Support for US Healthcare Sector During COVID-19 Response, March 2020; Coronavirus Aid, Relief, and Economic Security Act, H.R. 748.

Advisory Board interviews and analysis.

Three areas where AI is already adding value

And where it has promise but limitations (not enough data)

Identifying and protecting vulnerable populations

- **Medical Home Network** is using AI to identify at-risk Medicaid patients and conduct outreach
- Clinical AI vendor **Jvion** released a Community Vulnerability Map to estimate population risk of severe outcomes by census block

Chatbot screening and triage for simple cases

- **OSF HealthCare** added a COVID-19 feature to their existing chatbot "Clare" to screen patients and direct them to care settings
- **Providence St. Joseph Health** augmented their chatbot "Grace" with a COVID-19 tool in three days

Remote patient monitoring to expand capacity

- **Sheba Medical Center** in Israel converted staff dorms and a parking garage into COVID-19 care units; AI-powered sensors under pillows track vitals, predict complications (respiratory failure, sepsis), and notify providers

---

Where AI falls short

Early detection and diagnosis requires more COVID-19 imaging data. Current datasets are skewed towards severe cases.

Predicting the exact path of the disease is difficult as long as we lack sufficient testing resources to have accurate disease counts.

Source: Kent, J., "Artificial Intelligence Identifies High-Risk COVID-19 Patients", Health IT Analytics, March 2020; Park, A.,"OSF HealthCare Using AI Virtual Assistant to Improve COVID-19 Screenings, Care Navigation", Becker's Health IT, March 2020; "Clinical AI Leader Jvion Launches COVID Community Vulnerability Map", March 2020; Council, J., "Hospitals Tap AI to Help Manage Coronavirus Outbreak", WSJ, March 2020; Heaven, W., "AI Could Help with the Next Pandemic – But Not with This One", MIT Technology Review, March 2020.

Advisory Board interviews and analysis.

How far will $100 billion go?

CARES Act provides funding for COVID-19-related expenses and lost revenue

Public Health and Social Services Emergency Fund

- Includes $100 billion fund to reimburse "eligible providers" for health care expenses or lost revenue due to COVID-19

- Eligible providers include public entities, Medicare or Medicaid enrolled suppliers and providers, non-profit entities, and for-profit entities that provide diagnoses, testing, or care for individuals with possible or actual cases of COVID-19

- Funds can also be used to build temporary facilities, retrofit facilities, lease property, procure supplies, and increase workforce and trainings

- Providers can submit applications; HHS will review and distribute payment on a rolling basis

Providers set up to compete for available funds

Broad definition of eligible providers means that hospitals, physicians, ASCs, post-acute providers, and others will compete for funding

Unclear whether funds will be distributed based on relative need or on a first come, first served basis

DATA SPOTLIGHT

≈$100B Total hospital industry revenues per month

Source: J.P. Morgan, "The Stimulus Bill Isn't Enough: Hospital Revenues Are Declining Much Faster Than Anticipated," March, 26, 2020, https://markets.jpmorgan.com/research/email/-2kpqn02/pQkXdmsMoWg6SlyWWueoWA/GPS-3313255-0; McDermott+Consulting, CARES Act Offers Relief, Support for US Healthcare Sector During COVID-19 Response, March 2020; Coronavirus Aid, Relief, and Economic Security Act, H.R. 748.

Advisory Board interviews and analysis.

Health care industry will require additional support

CARES Act insufficient to mitigate long-term financial impact of pandemic

Provisions that are not included in the CARES Act

Guidance on how aid should be distributed across stakeholders	*Support beyond initial emergency period*	*Structural changes for long-standing challenges*
• Does not specify how to distribute funds between eligible providers • Does not specify how funds allocated to restocking the Strategic National Stockpile will be distributed across various drugs, devices, and markets	• Does not extend provisions to health plans to help with high claim expenses from the pandemic • Does not provide subsidies for COBRA coverage or other provisions to expand insurance coverage to the increasing number of unemployed individuals	• Does not address surprise billing and care from out-of-network providers • Does not address the cost of prescription drugs • Does not create a reimbursement model for remote patient monitoring

Advisory Board interviews and analysis.

CMS follows CARES Act with temporary regulatory relief

Changes aim to ensure ability to absorb surge of COVID-19 patients

1 *Unlocking capacity outside the hospital*

- Allows hospitals to transfer patients to non-hospital facilities and still receive hospital payments under Medicare
- Loosens regulations for ambulances to transfer patients under non-emergency conditions

2 *Expanding the healthcare workforce*

- Permits hospitals to provide additional benefits for staff (food, laundry, childcare)
- Eases process to enroll as Medicare provider
- Expands the use of verbal physician orders

3 *Removing documentation requirements*

- Eliminates paper work requirements that are not critical to patient care
- Suspends data collection from providers during emergency period

4 *Promoting telehealth in Medicare*

- Adds 80 reimbursable telehealth services
- Provides reimbursement telehealth visits with audio phones only
- Approves remote patient monitoring for COVID-19 and non-COVID-19 conditions

Advisory Board interviews and analysis.

"Do your planning now"

EvergreenHealth CNO's advice to hospitals bracing for COVID-19 surge

Lessons learned from EvergreenHealth's COVID-19 surge

Activate your incident command center

Clarify centralized decision making structures and processes to allow nimble organizational response

Invest in internal-external communication strategy

Ensure accurate, timely, and regular information to employees and external stakeholders, community

Create discharge support for COVID patients

Reach out to local post-acute providers to ensure readiness: access to PPE, staff skills, standardized transfer and care protocols

Support frontline, leader well-being

Develop guidelines for employee testing; support emotional needs and resilience of all staff, including managers

FOR FULL Q&A
see **advisory.com/daily-briefing**

Advisory Board interviews and analysis.

NY deploys variety of strategies to increase clinician supply

Sampling of strategies deployed by New York to increase clinician supply

Asking retired medical professionals to volunteer

Relaxing licensure requirements for out-of-state clinicians

Allowing NPs to practice without physician oversight

Allowing students to volunteer without a clinical affiliation agreements

Removing limits on working hours for physicians

Allowing foreign graduates[1] to provide care without licenses

Over 70,000 medical volunteers answer the call

30,000+
Registered Nurses

12,000+
Mental health professionals

8,000+
Physicians

6,000+
Licensed Practical Nurses

3,000+
Nurse Practitioners

1,000+
Physician Assistants

1. with at least one year of graduate medical education.

Source: 76,000 Healthcare Workers Have Volunteered to Help NY Hospitals Fight Coronavirus, Forbes, March 29, 2020.

Advisory Board interviews and analysis.

Emerging strategies to find capacity outside of hospital walls

Non-hospital health care facilities

Designate off-site screening and treatment centers: urgent care centers can absorb COVID testing responsibilities or serve as respiratory illness-only clinics

Transition specific patients or services to other care sites: ASCs can absorb specific urgent surgical and medical volumes

Lean on primary care providers for non-urgent issues: PCPs can manage ongoing primary care needs via telehealth

Non-health care facilities

Repurpose hotels, dorms to house patients: Facilities have existing private rooms, bathrooms, laundry, cleaning, food service capabilities

Build treatment space within convention centers, arenas, stadiums: Existing infrastructure, workforce allows for quick repurposing to large treatment facility

Create testing, treatment sites in large open spaces (parks, fields, parking lots): Allows hospitals to utilize open space close to existing facilities to streamline patient, staff transfer

To access a COVID-19 checklist to expand capacity, visit advisory.com/covid19

Advisory Board interviews and analysis.

Patient profile a key driver of alternative facility strategy

Clinical considerations

- Are they a COVID-19 or non-COVID-19 patient?

- If yes, are they mild to moderate, severe or critical?

- If mild, can they self manage or do they need home health support?

- If moderate, do they need a hospital bed?

- For severe/critical patients, do they require ICU or ventilator support?

- Are they recovering, but still contagious?

- Can they be stepped down to a less intense site of care?

- If non-COVID, what type of support is needed?

Patient profile

Facility considerations

- Where do we have capacity (e.g. ICUs, ACSs, or alternates)?

- Have we considered the airflow, gas, and suction needs?

- How are you organizing your critical care and support staff to care to manage the various patient groups?

- Where will patients present and do you have a way to transfer or triage to other sites?

- How will you manage your supply chain?

- What leadership is needed to help stand up and operationalize these sites?

Alternate sites of care

Advisory Board interviews and analysis.

Advisory Board

Creative strategies to combat PPE shortages

Health systems reuse—and replace—masks and shields

Strategies to **extend** PPE use

University of Nebraska Medical Center — Sterilizing respirators using ultraviolet irradiation

Duke Health — Using vaporized hydrogen peroxide to sanitize N95s

Atrium Health — Moved IV pumps and ventilator control panels out of COVID+ rooms to decrease PPE use by 70%

Create PPE **alternatives**

Boston Children's — Respirator mask made from an anesthesia mask, ventilator inline bacterial or viral filter, and elastic straps

Providence Health — Face shields made from military-grade vinyl, industrial tape, foam, and elastic

Prototype facemask made from surgical wrap material

Henry Ford Health System — Prototype mask made from moisture-wicking fabric, elastic bands, and air filter material

Face shields made from plastic sheets, elastic bands, and tongue depressors

Advisory Board interviews and analysis.

A closer look at two strategies for PPE reuse
Duke, UNMC deploy strategies to disinfect masks

Duke Health

The method:	Evidence:
Specialized equipment vaporizes hydrogen peroxide, which permeates the layers of the mask to eliminate the virus without degrading the mask material.	FDA-funded study demonstrated N95 respirators still met performance requirements after decontamination with hydrogen peroxide vapor in the laboratory setting over 50 times.

University of Nebraska Medical Center

The method:	Evidence:
UNMC staff hang N95 respirators on wires in a room with two UV light towers. UV lights are turned on for three to five minutes to decontaminate masks, which can be reused multiple times.	A literature review by UNMC showed ultraviolet germicidal irradiation (UVGI) inactivates human respiratory viruses, including coronaviruses, on N95 models without affecting fit and filtration.

Advisory Board interviews and analysis.

Light at the end of the tunnel?

Private companies, government primed to bring critical supplies to front lines

Making creative alternatives

Sea-Long Medical Systems increases production of FDA-approved, helmet-style ventilation devices for $162

Ramping up vent production

Ford and GE will produce 50,000 ventilators over the next 100 days, and 30,000/month more if necessary

Scaling N95 mask production

3M doubled production of N95 masks to 100M/month and plans to produce 2B in the next year

Receiving critical supplies

22 flights from China will bring millions of N95 masks, gowns, thermometers, and face masks to the US

Supply- and equipment-related concerns

Is the production timeline too little too late?

How can suppliers and the federal government appropriately allocate to communities?

How can we mitigate shortages of associated supplies?

Source: Swanson A, "White House airlifts medical supplies from China in coronavirus fight," New York Times, March 29, 2020; Gruley B, et al., "How 3M plans to make more than a billion masks by end of year," Bloomberg, March 25, 2020; Carey N, "Ford, GE to produce 50,000 ventilators in 100 days," Reuters, March 30, 2020; Cavazuti L, et al., "Texas 'mom and pop' business flooded with orders for helmet ventilators amid coronavirus crisis," NBC News, March 31, 2020.

Advisory Board interviews and analysis.

Race against the clock

Ventilator complexity could mean hospitals don't get items in time

Ventilator production process

Announce production		Train technicians		Test quality control	

Retool manufacturing plant

Acquire hundreds of parts

Distribute to providers

Production timeline reality

Ford plans on starting ventilator production the **week of April 20th**

University of Washington researchers project resource peak on **April 16th**

U.S. lacks clear guidance on allocation, distribution

Seeing increased competition for supplies and equipment at all levels

Supplier, distributor challenges

- No insight into areas, organizations with highest need

- Miscommunication *within* government agencies (e.g., DoD, FEMA, HHS) on how to allocate vents

> "It's really the allocation piece that's most important to us right now because we just cannot and never will have a window into what the most urgent need is."
>
> *Scott Whitaker, Chief Executive*
> *Advanced Medical Technology Association*

"Have" vs. "have-not" dilemma

"Haves"

- CA: Gov. Newsom worked with **Bloom Energy** to ramp up ventilator production; Newsom challenged **Elon Musk** to donate 1,200 ventilators

- NY/NJ/CT: Supplies from first Shanghai flight **allocated to tri-state area** including 12M gloves, 130,000 N95 masks, 1.7M surgical masks, 50,000 gowns, 130,000 hand sanitizer units, and 36,000 thermometers

"Have nots"

- LA: Received just **1.6% of the ventilators** it requested from various vendors and manufacturers

- MT: Received just **16% of the PPE** it requested from the national stockpile; competing with federal orders for supplies

- TX: Rural hospitals only have about **two ventilators per hospital**

- CA: Smaller counties' hospitals, like in San Mateo, can only acquire **20% of the needed PPE**

What's next on the shortage horizon?

Products in demand now create trickle down effects throughout supply chain

Ventilator demand

Downstream impact

Ventilator accessories shortages

Item in potential shortage	Potential solution
Tubing connectors	FDA EUA[1]
Valves	3D printing
Accessories	FDA EUA
Mobile carts	Increase production

Ventilator medication-related shortages

Drug category	Demand increase	Fill rate decrease
Sedatives, anesthetics (e.g., ketamine, propofol)	51%	63%
Analgesics (e.g., fentanyl, morphine)	67%	73%
Neuromuscular blockers (e.g., vecuronium)	39%	70%

1. U.S. Food and Drug Administration Emergency Use Authorization.
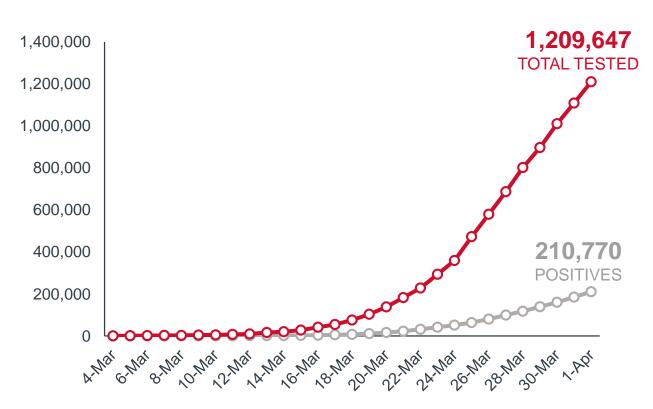
Advisory Board interviews and analysis.

Testing (finally) accelerates, surpassing 1M mark

Limiting factors include state variability and U.S. labs' processing capacity

COVID-19 tests performed in United States, by day[1]

1,209,647
TOTAL TESTED

210,770
POSITIVES

State COVID-19 testing rates per 1000 population[1]

HIGHEST			LOWEST		
NY	11.4		NE	2.0
LA	9.8		GA	1.9
WA	9.8		VA	1.8
MA	7.5		KY	1.8
HI	7.4		TX	1.7
VT	7.2		MS	1.6
AK	6.9		AL	1.6
NM	6.7		SC	1.2
UT	6.6		PR	0.8
ND	6.1		OK	0.5

⚠ CAUTION

Processing capacity bottleneck

Surge in test volumes has overwhelmed the lab industry, raising concerns about national processing capacity (for PCR[2]) as the latest rate-limiting factor to scale testing.

1. As of April 2, 2020, 8:45AM EST
2. Polymerase chain reaction, the predominant method for current COVID-19 tests

Test diversification is key to maintain testing capacity

But innovations under way are not currently positioned to meet needs

| *Expansion of **processing options for existing tests*** | *Introduction of **point-of-care testing** that doesn't require offsite lab processing* | *Development of **new testing options*** |

Companies that have already deployed tests are adapting them to run on additional processing systems or using additional specimens

Companies are deploying tests for use at common testing sites such as urgent care clinics, emergency departments, physicians offices, and temporary screening facilities

- **At-home tests** could allow for rapid scale, but are currently unfeasible to scale due to discomfort of collection process, instability of the virus

- **Antibody testing** is not right for diagnostic use: it shows whether the body has fought covid-19, but does not detect presence of the virus

Examples:

- Quidel Corporation
  - Three additional processing systems, two additional specimen sites
- Thermo Fisher Scientific

Examples:

- Mesa Biotech's Accula
- Abbott's ID NOW
  - Plans to deploy 50k tests/day

Source: "Quidel SARS-CoV-2 Test Receives Expanded FDA Emergency Use Authorization," 360Dx, March 25, 2020; "Abbott launches molecular point-of-care test to detect novel coronavirus in as little as five minutes," Abbott, March 27, 2020; Advisory Board research and analysis.

Hospitals finances starting to feel COVID effect

No organization or region is immune to margin impacts

Furlough non-COVID-19 staff

- Prisma Health
- Boston Medical Center
- Bon Secours Mercy Health
- Baptist Health

Cut physician salaries

- Mercy Health
- Intermountain Health
- UBMD Internal Medicine

Pare back employee benefits

- Beth Israel Deaconess Medical Center
- Alteon Health
- Tenet Health

Seeking relief in the CARES Act

► Health systems making immediate changes to remain sustainable may demonstrate acute need for part of $100 billion fund in CARES Act

► Health systems may qualify for $500 billion corporate relief fund that is available for organizations that have incurred losses that jeopardize their businesses, although requires executive pay limits

Advisory Board interviews and analysis.

Preemptive cancellations dig a big financial hole

Volume crash a necessary and painful consequence of distancing, preparation

Scenario (typical of experience observed to date)

- 1,000-bed health system with 2 ambulatory surgical centers and $1.2B in annual patient revenue

- All elective procedures prospectively cancelled over 3 months across all sites of care

- Outpatient revenue reduced by half

$145.3 M (51%) reduction in quarterly revenue

The short term financial situation will be **BETTER** in cases where:

- Elective shutdown is shorter than 3 months

- ASCs allowed and responsibly able to continue operations

- Lower initial mix of elective services (but would limit ability to treat COVID-19)

The short term financial situation will be **WORSE** in cases where:

- Initial case mix disproportionately weighted toward elective services

- Additional volume loss attributable to social distancing (e.g. less influenza, fewer car accidents or other trauma, missed diagnostics and subsequent treatment)

- Employment losses drive down utilization and payer mix in near term (virtually inevitable in longer term)

- Nonoperating income losses, reduced philanthropy play major roles

COVID-19 revenues *might* make up difference, but when?

Moderately severe COVID-19 scenario still entails immediate cash crunch

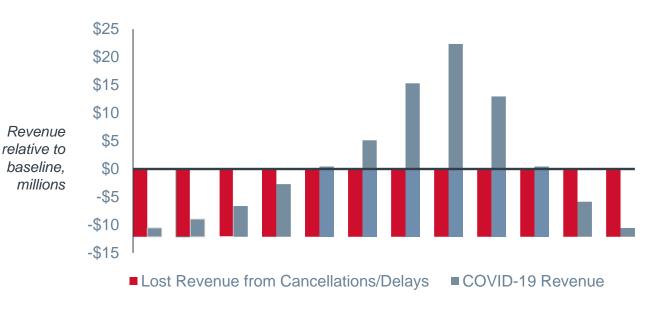**Severe, Concentrated COVID-19 Scenario**

- 1,000-bed system treats 10,000 hospitalized COVID-19 cases over 3 months

- Peak of 2,200 cases in week 8 (i.e. system is surging significantly beyond normal capacity)

- Average revenue per COVID-19 case: $15,664

$156.7 M in COVID-19 revenue

- Wild cards:
  - Actual DRG mix of IP cases
  - Further changes to payment rates, including by commercial payers

Weekly revenue impact, 3-month scenario

Revenue relative to baseline, millions

■ Lost Revenue from Cancellations/Delays ■ COVID-19 Revenue

! The COVID-19 caseload needed to make up for lost revenue from elective procedures and other reduced demand is well beyond system capacity—implying need for large surge expenditures

! Note the revenue shortfall in the first weeks of the scenario—if elective shutdowns and reduced demand precede significant COVID-19 caseload, even by a few weeks, cash flow challenge will be <u>immense</u> and <u>immediate</u>.

Things are not entirely out of health systems' control
Level-headed planning and sharp execution will minimize losses, set up for gains

Immediate: Cash crunch

Imminent: COVID-19 crunch

Looming: Competitive crunch

Challenge: Sudden evaporation of major revenue streams coupled with preparatory surge expenditures

Imperatives:

- Meet mission: public health and safety come first

- Activate alternative sites of care, e.g virtual channels, outlying facilities

- Establish/draw on credit as appropriate

- Minimize any unnecessary outflows

Challenge: Massive case mix shift to low- or negative-margin medical care overwhelming capacity

Imperatives:

- Configure to accept as much of COVID-19 demand surge as possible

- Minimize any unnecessary complications or inefficiencies (for all conditions) to preserve resources

- Code and document as well as possible given circumstances—payment will depend heavily on it

Challenge: Providers scrambling to capture pent-up demand and additional funding in aftermath of COVID-19

Imperatives (start now):

- Beat COVID-19! The first safe areas will get first dibs on pending surgeries

- Have a plan for identifying and recapturing delayed/cancelled cases

- Prioritize provider wellbeing—accommodating pent-up demand will take a healthy, engaged workforce—right when everyone needs a vacation.

- Keep your receipts--$100B in federal funding available to reimburse surge capacity expenses

COVID-19 poised to have lasting impact on industry

Beyond immediate financial impact, a long list of potential strategic implications

How will COVID-19 impact…

…the demographic makeup of the US—and future demand?

…the purchaser landscape and the nation's payer mix?

…the competitive landscape efforts to "disrupt" the industry?

…expectations about U.S. health care capacity?

…site-of-care shifts, including to virtual channels?

…perception of government's role in health care?

…public perception of industry stakeholders?

…the structure of the U.S. health care supply chain?

…demand for behavioral health services?

…employers' health benefits strategies?

…future fundraising and philanthropy efforts?

…the future of the clinical workforce?

…the U.S.' approach to post-acute and long-term care?

…the industry's transition to risk-based payment?

…perceptions of the value of systemness and scale?

…the pharma, device, and tech innovation pipelines?

Coronavirus scenario planning guide

12 situations hospital leaders should prepare for

FACILITY CAPACITY & SUPPLIES

1. Demand surge stresses capacity across inpatient units, with deepest strains in critical care.

2. Shortages of testing supplies impede ability to accurately diagnose patients and contain virus spread.

3. Local stores of prevention protection supplies are depleted, limiting the ability of hospitals to contain virus spread and protect workers.

STAFF CAPACITY & RESILIENCE

4. Pronounced staff shortages among both clinical and non-clinical personnel limit effective capacity.

5. Staff across the organization experience stress, anxiety, and burnout.

6. Rapidly changing conditions necessitate that staff receive essential training and frequent, accurate updates.

COMMUNITY COORDINATION

7. Emergent issues require swift coordination with other providers in the local health care ecosystem—especially primary care and post-acute care providers.

8. Facility access for visitors and suppliers must be carefully managed to prevent virus spread.

9. Concerned patients overwhelm access points across the system, limiting ability to identify and treat infected patients.

10. Uninfected yet vulnerable populations with chronic conditions will experience gaps in care management— and underestimate their virus risk.

FINANCIAL MANAGEMENT

11. A disruption in the supply of drugs and other non-virus-related medical supplies—combined with sudden labor shortages—rapidly increases operating expenses.

12. Sudden margin pressures and a broader economic downturn threaten medium-term financial sustainability.

To learn more about these scenarios and review questions for pressure testing your strategy, visit **advisory.com/covid-19**

Your top resources for COVID-19 readiness

CDC and WHO Guidelines

Compiles evidence-based information on hospital and personnel preparedness, COVID-19 infection control recommendations, clinical guidelines, and case trackers

Coronavirus scenario planning

Explores twelve situations hospital leaders should prepare for and helps hospital leadership teams pressure test the comprehensiveness of their preparedness planning efforts and check for blind spots

Managing clinical capacity

Examines best practices for creating flexible nursing capacity, maximizing hospital throughput in times of high demand, increasing access channels, deploying telehealth capabilities, and engaging clinicians as they deal with intense workloads

How COVID-19 is transforming telehealth—now and in the future

Explores how telehealth is being deployed against COVID-19 and essential next steps for telehealth implementation

To access the top COVID-19 resources, visit **advisory.com/covid-19**

Advisory Board interviews and analysis.