Anatomy of an Outbreak: Part 6
As cases (hopefully) peak nationwide, the epidemic moves to rural America

April 23, 2020
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
Coronavirus cases in the United States
Current as of April 22, 2020

Current Covid-19 cases
- At least 805,772 cases
- 251,720 cases in New York
- At least 40,316 deaths

Original estimates of possible effects
- 96 million cases
- 4.8 million hospitalizations
- 480,000 deaths

U.S. death tolls reach their peak, or just a pause?

Daily coronavirus deaths (rolling 3-day average), by number of days since 3 daily deaths first recorded

<table>
<thead>
<tr>
<th>Country</th>
<th>Total deaths per million</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spain</td>
<td>453</td>
</tr>
<tr>
<td>Italy</td>
<td>408</td>
</tr>
<tr>
<td>France</td>
<td>310</td>
</tr>
<tr>
<td>U.K.</td>
<td>260</td>
</tr>
<tr>
<td>U.S.</td>
<td>138</td>
</tr>
<tr>
<td>Germany</td>
<td>59</td>
</tr>
<tr>
<td>South Korea</td>
<td>5</td>
</tr>
</tbody>
</table>


Social distancing seems to be paying off
But some states are still seeing spikes in mortality rates

Daily coronavirus deaths (rolling 3-day average), by number of days since 10 total deaths first recorded\(^1\)

<table>
<thead>
<tr>
<th>Metro Area</th>
<th>Total deaths per 100,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Detroit</td>
<td>338</td>
</tr>
<tr>
<td>New Orleans</td>
<td>225</td>
</tr>
<tr>
<td>NYC</td>
<td>223</td>
</tr>
<tr>
<td>Boston</td>
<td>201</td>
</tr>
<tr>
<td>Miami</td>
<td>104</td>
</tr>
<tr>
<td>Seattle</td>
<td>54</td>
</tr>
<tr>
<td>Chicago</td>
<td>53</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>17</td>
</tr>
</tbody>
</table>


Early projections painted a grim picture
Resource and capacity expectations three weeks ago

Projected ICU bed shortage and dates of peak resource use by state
Updated April 1, 2020

States with greatest predicted peak ventilator demand
- New York: 9,055
- Tennessee: 2,318
- Texas: 1,975
- Michigan: 1,798
- Florida: 1,594

States with least predicted peak ventilator demand
- Vermont: 27
- Wyoming: 53
- North Dakota: 59
- Alaska: 60
- South Dakota: 72

An extraordinary mobilization of resources
Resource and capacity expectations two weeks ago

Projected ICU bed shortage and dates of peak resource use by state
Updated April 8, 2020

States with greatest predicted peak ventilator demand
- New York: 5,008
- New Jersey: 2,189
- Massachusetts: 1,592
- Florida: 1,323
- Connecticut: 1,153

States with least predicted peak ventilator demand
- Vermont: 13
- Delaware: 14
- Idaho: 20
- New Hampshire: 24
- Wyoming: 26

Projections looking much more optimistic
Resource and capacity expectations a week ago

Projected ICU bed shortage and dates of peak resource use by state
*Updated April 13, 2020*

States with greatest predicted peak ventilator demand
- New York: 5,246
- Massachusetts: 1,671
- New Jersey: 1,665
- Connecticut: 1,290
- Florida: 968

States with least predicted peak ventilator demand
- Wyoming: 13
- Vermont: 12
- Alaska: 7
- Montana: 7
- North Dakota: 5

Enter the latter half of the curve
Predicted resource peaks inch closer and Covid starts to enter rural America

Projected ICU bed shortage and dates of peak resource use by state
Updated April 21, 2020

States with greatest predicted peak ventilator demand
- New York: 6,454
- New Jersey: 2,372
- Michigan: 1,068
- Pennsylvania: 961
- Connecticut: 802

States with least predicted peak ventilator demand
- Maine: 17
- Hawaii: 13
- Vermont: 13
- Montana: 7
- Alaska: 6

Lower density not fully protecting rural America from Covid
Rural areas particularly vulnerable to future Covid outbreaks

Vulnerable population
- Older individuals with high rates of chronic disease
- Essential workers that cannot work from home

\[
\text{~900} \quad \text{Workers at the Smithfield Foods pork plant in Sioux Falls, S.D. are positive for Covid-19, now considered the largest hotspot in the nation}
\]

Struggling hospitals
- Razor thin or negative margins with little cash on hand to weather revenue dip
- Few neighboring health systems that can offer support
- 1 in 4 Number of rural hospitals that were already at risk of closure at the beginning of 2020

Shortage of resources
- Physicians and clinical staff
- Little buying power for PPE and supplies

\[
\text{13.1} \quad \text{Number of physicians per 10,000 people in rural areas, compared to 31.2 per 10,000 people in urban areas}
\]

Lack of community infrastructure
- Transportation for health care access
- Public health and food security
- Broadband for telehealth services

\[
\text{25\%} \quad \text{Of rural Americans lack access to broadband internet service}
\]

Is social distancing finally coming to an end?
Despite protests and Presidential pressure, most states hesitant to re-open

Some Americans voice their discontent, but most still favor social distancing

Protests have broken out in several states—including Ohio, Michigan, and California—against continued social distancing requirements

66% Percent of Americans who are more concerned that state governments will lift restrictions too soon, rather than too early

Experts say the consequences of loosening too soon could be dire

300K Number of Covid-19 deaths predicted by HHS in their internal “best guess” scenario model, should all social distancing measures be lifted

Most scientists and governors agree that testing remains the primary barrier to easing restrictions—and it’s unclear when testing capacity will be sufficient

States starting to reopen across next several weeks
When states are starting to lift their first restrictions, current as of April 22

States form coalitions to coordinate reopening

Northeast: New Jersey, New York, Delaware, Pennsylvania, Rhode Island and Massachusetts

Midwest: Kentucky, Ohio, Wisconsin, Indiana, Illinois, and Michigan

Western: California, Washington, and Oregon

DATA SPOTLIGHT

IHME\(^1\) suggests reopening dates

4 States could begin to ease restrictions by May 4, with most others doing so in mid to late May

8 States who should wait until late June or early July

Source: “When will we return to normal? Top coronavirus computer model says some US states can start re-opening by May 4,” The Hill, “This is where all 50 states stand on reopening,” CNN, April 20, “Here’s when all 50 states plan to reopen after coronavirus restrictions,” The Hill, April 20

\(^1\) Institute for Health Metrics Evaluation

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Trump issues re-opening guidelines
But will governors follow his lead?

White House says states can progress to first phase of opening with…

1. **Sustained downward trend in cases/ symptoms**
   - Downward trajectory of documented cases within a 14-day period OR downward trajectory of positive tests as a % of total tests within a 14-day period (with a flat or increasing test volume)
   - Downward trajectory of influenza-like illnesses (ILI) reported within a 14-day period AND downward trajectory of Covid-like syndromic cases reported within 14 days

2. **Adequate hospital capacity and worker testing**
   - Ability to treat all patients without crisis care AND robust testing program in place for at-risk health care workers, including antibody testing

Governor responses are (predictably) mixed

“...we cannot put the cart before the horse”
- New Mexico Gov. Michelle Lujan Grisham (D)

“We are still in dire need of critical resources from the federal government, including sufficient personal protective equipment (PPE) and increased testing capacity”
- Oregon Gov. Kate Brown (D)

“I think the president and his team are headed in a very good direction”
- Tennessee Gov. Bill Lee (R)

Long-awaited guidance to reopen emerges
A few states meet criteria to open; considerable variation among states persists

DATA SPOTLIGHT

Guidance: Requirements to safely reopen

**WHO**
- Positivity rate should be no higher than 10% for countries to reopen

**White House Covid-19 task force**
- Positivity should decrease for 14 days while rate of testing increases or stays flat

### U.S. positivity rate, testing changes this week:

<table>
<thead>
<tr>
<th>State</th>
<th>Positivity Rate (%)</th>
<th>Change in positivity rate</th>
<th>% Change in tests run</th>
</tr>
</thead>
<tbody>
<tr>
<td>AK</td>
<td>2.8</td>
<td>119%</td>
<td></td>
</tr>
<tr>
<td>AL</td>
<td>11.2</td>
<td>-2%</td>
<td></td>
</tr>
<tr>
<td>AR</td>
<td>7.7</td>
<td>8%</td>
<td></td>
</tr>
<tr>
<td>AZ</td>
<td>9.6</td>
<td>5%</td>
<td></td>
</tr>
<tr>
<td>CA</td>
<td>7.6</td>
<td>245%</td>
<td></td>
</tr>
<tr>
<td>CO</td>
<td>21.4</td>
<td>-21%</td>
<td></td>
</tr>
<tr>
<td>CT</td>
<td>32.1</td>
<td>-6%</td>
<td></td>
</tr>
<tr>
<td>DC</td>
<td>20.7</td>
<td>23%</td>
<td></td>
</tr>
<tr>
<td>DE</td>
<td>19.3</td>
<td>-24%</td>
<td></td>
</tr>
<tr>
<td>FL</td>
<td>9.8</td>
<td>7%</td>
<td></td>
</tr>
<tr>
<td>GA</td>
<td>22.0</td>
<td>18%</td>
<td></td>
</tr>
<tr>
<td>HI</td>
<td>2.3</td>
<td>19%</td>
<td></td>
</tr>
<tr>
<td>IA</td>
<td>13.3</td>
<td>42%</td>
<td></td>
</tr>
<tr>
<td>ID</td>
<td>10.0</td>
<td>-33%</td>
<td></td>
</tr>
<tr>
<td>IL</td>
<td>21.4</td>
<td>13%</td>
<td></td>
</tr>
<tr>
<td>IN</td>
<td>17.9</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>KS</td>
<td>10.9</td>
<td>7%</td>
<td></td>
</tr>
</tbody>
</table>

Arrows indicate directionality change from last week; change in testing rate compares new tests run last week versus this week.

### Trends in Covid-19 positivity and testing rates

<table>
<thead>
<tr>
<th>State</th>
<th>Positivity Rate (%)</th>
<th>Change in positivity rate</th>
<th>% Change in tests run</th>
</tr>
</thead>
<tbody>
<tr>
<td>KY</td>
<td>9.6</td>
<td>-8%</td>
<td></td>
</tr>
<tr>
<td>LA</td>
<td>17.7</td>
<td>-48%</td>
<td></td>
</tr>
<tr>
<td>MA</td>
<td>23.8</td>
<td>9%</td>
<td></td>
</tr>
<tr>
<td>MD</td>
<td>19.3</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>ME</td>
<td>5.1</td>
<td>-65%</td>
<td></td>
</tr>
<tr>
<td>MI</td>
<td>28.7</td>
<td>21%</td>
<td></td>
</tr>
<tr>
<td>MN</td>
<td>5.5</td>
<td>-4%</td>
<td></td>
</tr>
<tr>
<td>MO</td>
<td>10.6</td>
<td>-39%</td>
<td></td>
</tr>
<tr>
<td>MS</td>
<td>9.1</td>
<td>-10%</td>
<td></td>
</tr>
<tr>
<td>MT</td>
<td>3.8</td>
<td>-8%</td>
<td></td>
</tr>
<tr>
<td>NC</td>
<td>8.0</td>
<td>-9%</td>
<td></td>
</tr>
<tr>
<td>ND</td>
<td>4.4</td>
<td>55%</td>
<td></td>
</tr>
<tr>
<td>NE</td>
<td>10.3</td>
<td>31%</td>
<td></td>
</tr>
<tr>
<td>NH</td>
<td>9.9</td>
<td>-4%</td>
<td></td>
</tr>
<tr>
<td>NJ</td>
<td>50.0</td>
<td>9%</td>
<td></td>
</tr>
<tr>
<td>NM</td>
<td>5.1</td>
<td>-24%</td>
<td></td>
</tr>
<tr>
<td>NV</td>
<td>12.0</td>
<td>-12%</td>
<td></td>
</tr>
</tbody>
</table>

### Data Sources:
- **The COVID Tracking Project**: updated Apr 21, 2020
- **Collins, Keith**: "Coronavirus Testing Needs to Triple Before the US Can Reopen, Experts Say". New York Times, Apr 17, 2020
- **Opening Up America Again**: The White House, Apr 17, 2020

1. “Last week” data includes April 9-15, “this week” data includes April 16-22.
No magic target for testing, but directionality clear: More. Country, states are inching closer to adequate testing

**DATA SPOTLIGHT**

**Expert opinions on testing rate needed to safely reopen and stay open**

- 500-700k tests per day by mid-May (Harvard Global Health Institute)
- 5M test per day by June, 20M tests per day by July (Harvard’s Safra Center for Ethics)
- Ability to test all symptomatic individuals, those with influenza-like illnesses (White House task force)

**Change in testing rate this week vs last week¹, by state**

<table>
<thead>
<tr>
<th>HIGHEST</th>
<th>CA 245%</th>
<th>UT 151%</th>
<th>AK 119%</th>
<th>WV 60%</th>
<th>ND 55%</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOWEST²</td>
<td>ME -65%</td>
<td>LA -48%</td>
<td>VT -29%</td>
<td>SC -17%</td>
<td>PA -14%</td>
</tr>
</tbody>
</table>

¹ “Last week” data includes April 9-15, “this week” data includes April 16-22.
² Not all states submitted data for 4/22 by the time of publication. States that had not submitted data were excluded from analysis of lowest testing states.


Advisory Board interviews and analysis.
Efforts to expand testing reinvigorated at every level

Doubts remain over patchwork approach, though funding should ease the burden

"Trump says he will use DPA\textsuperscript{1} to increase swabs for testing"
- Act may be used to direct an unnamed company to increase production of nasopharyngeal swabs by over 20 million swabs per month

"Maryland buys 500,000 coronavirus test kits from South Korea"
- Gov. Larry Hogan purchased half-a-million test kits from South Korea in a deal spearheaded by his wife, First Lady Yumi Hogan

"LabCorp receives EUA for self-collection of Covid-19 PCR\textsuperscript{2} test samples"
- First EUA issued by FDA for a test using at-home self-collection via nasal swab
- Available to first responders and health care workers initially and to consumers in coming weeks in most states with a doctor’s order

\textit{Relieve supply shortages}
\textit{Improve testing capacity}
\textit{Diversify testing options}

Source: Sullivan P., “Trump says he will use Defense Production Act to increase swabs for testing”, The Hill, April 19; Nirapalli F., Cox E., Schneider G., “With focus on testing, Maryland buys 500,000 coronavirus test kits from South Korea”, The Washington Post, April 20; “LabCorp Receives EUA for Self-Collection of COVID-19 PCR Test Samples”, 360Dx, April 21.
Early treatment results show promise
Despite excitement over new data, too early to declare success

<table>
<thead>
<tr>
<th>Remdesivir (Gilead)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leaked results from University of Chicago hospital trial show quick recoveries in fever and respiratory symptoms for patients with severe Covid-19; nearly all patients discharged in under a week</td>
</tr>
</tbody>
</table>

Key limitations of early findings

1. Results are from only one trial site
2. Data readout is incomplete (results expected in April)
3. Study does not have placebo arm

Convalescent plasma

Initial data from study protocol indicates that “a single dose of 200 milliliters showed benefit for some patients, leading to improvement.”

Access quickly expanding

- 1,600+ sites registered for National Covid-19 Convalescent Plasma Project
- 600 patients have already started treatment

Update on hydroxychloroquine: Novartis launching Phase III randomized control trial to assess safety and efficacy

1. Led by Mayo Clinic

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Hospitals pivot to planning for reopening

Checklist of considerations for resuming elective procedures

Confirm that you can safely manage elective procedures

- Assess position on disease curve
- Understand supply and demand of Covid-19 testing supplies, PPE, staff, and other critical supplies

Determine how to prioritize procedural volumes

- Estimate demand of procedures by service line and procedural type
- Define prioritization schema (clinical acuity, strategic plan alignment, contribution margin, competitive advantage)

Implement new policies and procedures

- Establish Covid-19 safety protocols
- Revise policies for patient processes (i.e. scheduling, registration, patient visitation)

Re-engage staff and attend to needs

- Solidify communication channels to staff
- Expand staff support channels for emotional and logistical needs (i.e. availability of housing options and access to meals)

Establish external communication plan

- Designate processes for public-facing communications
- Provide answers to frequently asked questions

Coming soon on advisory.com, a full checklist of resuming elective procedures
When do you know if you can safely do procedures?

Region past top of Covid-19 curve
- New Covid-19 cases on rolling 3-day average
- New confirmed deaths on rolling 3-day average

State, county, local government approval
- Guidelines for region allow for elective procedures
- Follow social distancing guidelines

Sufficient supply of beds and staff
- Covid-19 cases not close to max
- Staff and ORs should not be redeployed to Covid-19 cases

Sufficient supply of PPE
- PPE to handle Covid-19 related volumes, new surgery volumes, and ambulatory volumes

Capability to do pre-procedure testing
- Screen patients and staff for Covid-19 symptoms
- Use laboratory testing when available

Common procedures for initial reopening phase
- Inpatient joint replacement
- Elective EP and angioplasty
- GI surgery for stable patients
- Outpatient ortho procedures

Advisory Board interviews and analysis.
How will you prioritize volumes?

1. **Clinical urgency**
   - Critical for system goals
   - Margin per case
   - Pre-crisis market share
   - Competitive advantage from earlier restart

2. **Strategic importance**
   - Volumes
   - Average length of stay
   - OR time
   - Surgeon / proceduralist and anesthesiologist availability
   - Nurses available for post-op care
   - PPE available

3. **Feasibility**

**CMS tiers of clinical urgency**

- **Tier 1: Low acuity treatment or service**
  - Consider postponing service or follow-up with virtual care
  - Routine primary care and preventive visit or annual wellness visits

- **Tier 2: Intermediate acuity treatment or service**
  - Not providing service has potential for increasing morbidity and mortality
  - Evaluation of new symptoms or follow-up care in established patient

- **Tier 3: High acuity treatment or service**
  - Lack of in-person treatment or service would result in patient harm
  - Symptoms consistent with Covid-19 or other emergency conditions

Source: Non-Emergent, Elective Medical Services, and Treatment Recommendations, CMS, April 7, 2020.
## Service line considerations for opening

<table>
<thead>
<tr>
<th>Service Line</th>
<th>Limiting Factors for Clearing Backlog</th>
<th>Changes to Future Demand</th>
</tr>
</thead>
</table>
| Cardiovascular | • Added time per case due to increased complexity  
• Complex cases will reduce bed availability  
• Ancillary service availability a further limitation as needed anesthesiologists and pulmonology providers tasked with ongoing Covid-19 response | - Shift from acute care settings: outpatient interventions, remote monitoring/telehealth, and increased use of medical management  
+ Increased demand from CV complications among Covid-19 patients  
- CV patients more complex due to delays in care |
| Orthopedics | • Working through backlog will require expanded OR hours, including weekends  
• Willingness of surgeons and other staff to flex capacity beyond standard operating hours | - Sports medicine demand decreased in the short term amid sporting event cancellations  
- Orthopedic trauma suppressed during stay-at-home period  
- ASCs may attract more elective, commercially insured orthopedic patients |
| OB/GYN | • Backlog for gynecology office visits and gynecologic surgeries dependent on physicians’ willingness to extend hours  
• Restart date for screenings will lag more urgent services | - Continued shift to virtual visits for gynecology and prenatal visits  
- Shift to ASCs for gynecologic surgeries  
- Minor shift to out-of-hospital births |
| General Surgery | • Anesthesiologist and ventilator requirements for all major procedures | - Availability of upstream lab, imaging, and PCP services will limit ramp up  
+ Potential increase in emergent, complex cases as delayed care and later diagnoses worsen conditions |
<table>
<thead>
<tr>
<th>Service Line</th>
<th>Limiting Factors for Clearing Backlog</th>
<th>Changes to Future Demand</th>
</tr>
</thead>
<tbody>
<tr>
<td>GI</td>
<td>More complex surgeries dependent on upstream screening services/referrals and ventilator availability</td>
<td>Colonoscopy/EGD demand may decrease as patients delay tests in the immediate future and potentially use at-home stool tests over the next few years</td>
</tr>
<tr>
<td></td>
<td>Restart date for outpatient screenings like EGD and colonoscopies will lag behind surgical services</td>
<td>Decline in medium term screening outlook due to fewer “self-referred” exams (namely screening mammography and lung screening) as people have lingering fear</td>
</tr>
<tr>
<td></td>
<td></td>
<td>If unemployment remains high across next year and/or HDHPs for patients who remain employed either remain at current levels or increase, imaging volumes will drop</td>
</tr>
<tr>
<td>Imaging</td>
<td>Added time per case due to new cleaning and distancing protocols will limit scanner productivity</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Working through backlog will require expanded hours</td>
<td></td>
</tr>
<tr>
<td>Oncology</td>
<td>Most cancer programs maintained treatment services during COVID surge</td>
<td>Potential increase in more complex diagnoses due to delayed screenings</td>
</tr>
<tr>
<td></td>
<td>Some low-risk cancer surgeries were delayed. Those procedures will need to integrate with ongoing schedule</td>
<td>Shift to virtual for select patient management services</td>
</tr>
<tr>
<td></td>
<td>Delayed pre-treatment consults should be able to resume without major barriers</td>
<td>Ramp up of screening services and PCP visits required for treatment volumes to return to pre-COVID levels</td>
</tr>
</tbody>
</table>
## What is not happening during Covid-19

Future demand relies on safety perception and screening utilization

<table>
<thead>
<tr>
<th>Elective procedures</th>
<th>Non-elective, fear-impacted procedures</th>
<th>Non-elective, behavior-impacted procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canceled in an effort to save limited health care capacity and supplies</td>
<td>Still indicated but declining due to fear of contracting Covid-19</td>
<td>No longer indicated as social distancing reduces prevalence</td>
</tr>
<tr>
<td>Likelihood to return moderate</td>
<td>Likelihood to return high</td>
<td>Likelihood to return low</td>
</tr>
<tr>
<td>Examples: joint replacements, soft tissue procedures, certain bariatric surgeries</td>
<td>Examples: MI, stroke, vascular surgeries, oncology services</td>
<td>Examples: influenza, trauma surgeries</td>
</tr>
</tbody>
</table>

### Metrics that indicate downstream utilization changes

- Public perception of hospital safety
- Number of PCP screening consults
- Confidence of referring physicians in hospital safety
- Increase in patients treated conservatively with medication
- Change in diagnostic imaging volumes
- Number of visits shifted to virtual care rather than canceled
Congress coalesces around next round of support
$484B funding added to health care and small business lifelines

Major provisions and funding allocations of the Senate bill

<table>
<thead>
<tr>
<th>Hospitals</th>
<th>Businesses</th>
<th>Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>• ~$75B for providers through the CARES Act</td>
<td>• ~$350B for the PPP(^1)</td>
<td>• ~$25B for expanding capacity of Covid-19 tests</td>
</tr>
<tr>
<td>• No new policy changes</td>
<td>• Increases EIDL(^2) authorization level from $10B to $20B</td>
<td>• ~$11B of which is for states, localities, territories, and tribes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• ~4.25B of which is based on relative number of Covid-19 cases</td>
</tr>
</tbody>
</table>

Testing
• ~$1B for BARDA\(^3\)
• ~$825 for community health centers and rural clinics
• ~$1B for testing uninsured


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1. Paycheck Protection Program.
2. Economic Injury Disaster Loan.
3. Biomedical Advanced Research and Development Authority.
HHS outlines CARES Act funding distribution
Azar announces how the additional $70B will be spent

$100B
funds allocated to provider relief by CARES Act

$30B
Distributed on April 10th to providers based on Medicare FFS revenue

$20B
For providers based on all-patient 2018 revenue, distributions begin April 24th

$10B
For hospitals in hardest hit regions, such as NYC, distribution dates not yet clarified

$10B
For rural health clinics and rural hospitals, distributions begin as early as April 27th

$400M
For Indian Health Service facilities, distributions begin as early as April 27th

$29.6B
For SNFs, providers with high Medicaid volumes, future Covid-19 hotspots, covering treatment for uninsured Covid-19 patients, distribution dates not yet clarified

How will Covid-19 impact health system finances?
Four main variables dictate how hospitals margins will fare during the crisis

<table>
<thead>
<tr>
<th>Variables</th>
<th>Primary determinants</th>
<th>Wild cards</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong> Cost of Covid-19 treatment</td>
<td>Covid-19 case load, surge expenses, general productivity loss</td>
<td>Additional changes to payment rates</td>
</tr>
<tr>
<td><strong>2</strong> Vanishing volumes</td>
<td>Length of elective delays, ability to flex down expenses, extent of social distancing</td>
<td>Consumer perception of non-elective services</td>
</tr>
<tr>
<td><strong>3</strong> Battle for the backlog</td>
<td>Excess supply, patient loyalty, sustained site-of-care shifts</td>
<td>Asymmetric competition</td>
</tr>
<tr>
<td><strong>4</strong> Economic erosion</td>
<td>Sustained unemployment rates, employer benefit strategy</td>
<td>Further coverage expansion</td>
</tr>
</tbody>
</table>

Initial estimate of overall impact on health system finances for a 1,000-bed system during a moderate Covid-19 scenario

<table>
<thead>
<tr>
<th>Reduction in quarterly revenue</th>
<th>Amount of quarterly Covid-19 revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>153M</strong></td>
<td><strong>31.0M</strong></td>
</tr>
</tbody>
</table>

Advisory Board interviews and analysis.
Frontline frustration over practice environment bubbles over
With more difficult messages likely to come from employers

Frontline clinicians organize to protest pandemic practice environment

National Nurses United union organizes RN protest, demands the federal government use the Defense Production Act to produce PPE

New York State Nurses Association sues New York State Department of Health, New York hospitals over alleged failure to protect nurses from contracting Covid-19

## Prepare yourself for the next round of labor cuts

<table>
<thead>
<tr>
<th>Workforce segments</th>
<th>Workforce priorities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sidelined and under-employed</td>
<td>Reduce labor costs (again)</td>
</tr>
<tr>
<td>In the trenches and exhausted</td>
<td>Push to reopen</td>
</tr>
<tr>
<td>Retain if possible</td>
<td>Phase transition back to work</td>
</tr>
<tr>
<td>Minimize financial hardship + recognize contribution</td>
<td>Address safety concerns + bolster resilience</td>
</tr>
</tbody>
</table>

Need to focus immediate attention on how to execute next round of potential labor cuts while minimizing staff disruption and frustration.
Don’t turn a difficult situation into a toxic one
The danger of a one-off approach to labor savings

System unable to re-capture anticipated elective surgery volume, forces executive team to implement additional cost savings measures

Frontline staff lose faith in executive promises; staff engagement, productivity plummet

CEO reduces travel spending, eliminates merit increase, announces soft hiring freeze; emphasizes minimal impact on staff

Despite prior promise, CEO forced to eliminate bonuses, close underperforming service lines, and layoff 50 FTEs

Source: Labor Savings Playbook, HR Advancement Center, Advisory Board.
Craft your labor contingency plan now

**Build principled scenarios**
- Model future financial performance for best-, middle- and worst-case revenue declines
- Use the Covid-19 elective surgery cancelation impact estimator to estimate losses

**Create tiers of action**
- Map a subset of labor savings tactics to each scenario
- To determine which labor savings tactics to implement in which scenario, score them on factors including: difficulty to implement, amount of savings, patient impact, staff impact, horizon to savings and efficacy

**Set action triggers**
- Select leading metrics that indicate when to enact each tier of tactics
- Metrics to consider may include: unemployment rate, days cash on hand, volumes decline

**Communicate carefully**
- Don’t make promises to staff that you can’t keep

See Memorial Health’s best practice labor contingency plan in the Labor Savings Playbook on advisory.com

Source: Labor Savings Playbook, HR Advancement Center, Advisory Board.
Emerging tension in early planning for telehealth’s future
Provider organizations getting ready to pivot despite lack of clarity from payers

Providers and systems making plans for expanded telehealth

- Early efforts to model medium- and long-term consumer demand for telehealth
- Considering implications of broad use of telehealth on physician hiring, retention, and contracting
- Re-evaluating physical assets and “brick and mortar” footprint

Payers not showing their hand beyond public health emergency

- Current Medicare reimbursement parity for virtual and in-person visits is not permanent
- Plans worry that post-Covid telehealth will be a complement to care, not an alternative

NEXT STEPS

Making the case for reimbursement parity

- Provide data on telehealth visits as a viable care delivery channel in their own right
- Demonstrate how telehealth reimbursement parity can help meet payers’ and purchasers’ business objectives
The crisis in long-term care isn’t slowing down
America’s elderly population remains among the most vulnerable to the disease

DATA SPOTLIGHT

Nursing homes and Covid-19

<table>
<thead>
<tr>
<th>State</th>
<th>Cases/Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Washington</td>
<td>128 cases and 43 deaths</td>
</tr>
<tr>
<td>New Jersey</td>
<td>106 cases and 68 deaths</td>
</tr>
<tr>
<td>Georgia</td>
<td>154 cases and 16 deaths</td>
</tr>
</tbody>
</table>

Magnitude of nursing home outbreaks is intensifying

Nursing home in Albany has reported 154 cases and 16 deaths associated with it.

State-level resources attempt to go beyond oversight

Federal response: Oversight

Improving transparency around outbreaks

Nursing homes are now required to report Covid-19 cases to CDC, other residents, and caregivers.

- Proposed $1000 weekly fine if cases are not reported

Protecting against fraud and abuse

DOJ launched the National Nursing Home Initiative to target nursing homes that provide “grossly substandard care to their residents.”

- DOJ will pursue criminal and civil enforcement actions against the facilities

State response: Operational support

Expanding testing access and capacity

- West Virginia is mandating that every long-term care resident and employee gets tested
- Florida, Massachusetts, and other states are deploying the National Guard to help test at facilities

Bolstering staffing models and clinical capabilities

- Maryland has a clinical care “strike team” that is deployed to help stabilize patients and assist with triage
- Michigan formed a new task force that will provide staff education and help implement infection control protocols

Addressing existing operational inefficiencies

- Georgia National Guard teams help sanitize facilities
- Virginia is focused on sourcing funding for additional staff

Source: United States Department of Justice, Department of Justice Launches a National Nursing Home Initiative; McKnights Long-Term Care News; Providers to report COVID infections in 12 hours or face $1k fines, CMS says; Richmond Times-Dispatch; Northam’s new task force promises action to help long term care facilities in Virginia battle the coronavirus; Skilled Nursing News; States Call in National Guard to Help with Infection Control, COVID-19 Testing in Nursing Homes; Michigan.gov; MDHHS Implementing Strategies in Long-term Care Facilities to Help Slow the Spread of COVID-19 and Protect Residents and Staff.
The top 16 open questions we’re looking at now

How will Covid-19 impact…

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

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

…demand for behavioral health services?

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

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

…perception of government's role in health care?

…employers’ health benefits strategies?

…the future of value-based care and risk-based payment?

…the competitive landscape efforts to “disrupt” the industry?

…public perception of industry stakeholders?

…future fundraising and philanthropy efforts?

…perceptions of the value of systemness and scale?

…expectations about U.S. health care capacity?

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

…the future of the clinical workforce?

…the pharma, device, and tech innovation pipelines?
Today’s focus

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 and 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 future of value-based care and risk-based payment?

...perceptions of the value of systemness and scale?

...the pharma, device, and tech innovation pipelines?
How will Covid-19 impact future fundraising and philanthropy efforts?

Large scale philanthropic mobilization happening now
U.S. may be on track to defy historical precedent

Economic downturns usually depress giving, but...

Total U.S. charitable giving, 2000-2018

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<tbody>
<tr>
<td>Change in total giving highlighted for recession years</td>
<td>$-1.8%</td>
<td>$-7.2%</td>
<td>$-8.0%</td>
<td>$-1.8%</td>
<td>$-4.5%</td>
<td>$-2.9%</td>
<td>$-2.1%</td>
<td>$-2.6%</td>
<td>$-2.9%</td>
<td>$-3.2%</td>
<td>$-3.5%</td>
<td>$-2.1%</td>
<td>$-2.8%</td>
<td>$-2.5%</td>
<td>$-3.0%</td>
<td>$-2.4%</td>
<td>$-2.7%</td>
<td>$-2.9%</td>
</tr>
</tbody>
</table>

...early signs indicate 2020 may become an exception

In Covid-related grants originating from U.S. funders year-to-date¹

$4.9B

Of individual donors surveyed in late March 2020 say they plan to give more, or at the same level, as last year

79%

U.S. foundations signed a pledge committing themselves to provide funding to emergency response efforts and ease restrictions on funding for grantees

677

Untold sums of money being contributed to individuals or for-profit businesses through acts of charity that will never be “counted” in our assessment of 2020 philanthropy


1) As of April 20, 2020.
## Will donors rally behind hospitals once crisis wanes?

Public opinion and post-emergency narrative will shape financial impact

<table>
<thead>
<tr>
<th>Public perception of the crisis response</th>
<th>Shifts in the charity paradigm</th>
<th>Health system donor compact</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Positive impact on hospital giving</strong></td>
<td>Hospitals emerge as heroic and empathetic actors in the final post-crisis narrative, despite broader failures in the systemic response</td>
<td>Americans double down on their preference to use philanthropy to fund gaps in the social safety net and see hospitals as urgently-in-need</td>
</tr>
<tr>
<td><strong>Negative impact on hospital giving</strong></td>
<td>Hospitals are blamed – deservedly or not – for failures in the systemic response to Covid-19 and further struggle to capture interest among health-focused donors</td>
<td>Americans further shift their preference toward government-funded health care, in turn demoting hospitals' standing as charitable recipients</td>
</tr>
</tbody>
</table>

Advisory Board interviews and analysis.
Remembering our pre-pandemic workforce

Workforce trends we were tracking in early 2020

**Physicians** experiencing a steady pace of change and consolidation

**Nursing** facing a shortage of experience

**Advanced practice providers** gaining increased autonomy

**Medical assistant** demand and turnover on the rise

Struggling to get clinicians to embrace new ways of providing care
A tale of two workforces

**In the trenches**
- On frontlines in surge markets
- Burned out due to high volumes, emotional stress
- Feelings of distrust stemming from PPE shortages, risk of exposure

**Sample impacted roles:**
- Critical care providers
- Inpatient nurses

**On the sidelines**
- Seeing lower volumes or lack of work altogether
- Financially vulnerable due to furloughs, pay cuts
- Feelings of distrust stemming from financial insecurity

**Sample impacted roles:**
- Unlicensed staff
- Ambulatory clinicians
## An early take on longer-term workforce implications

<table>
<thead>
<tr>
<th>Segment of the workforce</th>
<th>Emerging trends to watch</th>
<th>Our (far too early) take</th>
</tr>
</thead>
</table>
| Physicians               | • Financial vulnerability reenergizes physicians looking for shelter from the financial storm  
                             • Increasing openness to telehealth and team-based care | Now may be the time to acquire physician talent, but the market will still be competitive; employers need to know what physician talent they need to advance strategy and their budget |
| Advanced practice providers | • Relaxing of practice restrictions  
                               • Increasing acceptance of autonomy by patients and physicians | Preserve APP autonomy as much as possible and hire where possible to meet patient demand and fill in physician shortage gaps |
| Nursing                  | • New grads pushed into practice early  
                             • Experienced nurses may delay retirement due to financial pressure | Temporary pressure release from our projected staffing shortages and the experience gap; must assess longer-term strategy as nursing ratios could become more inflexible, limiting creative staffing models |
| Medical assistants       | • Potential influx due to job seekers amidst recession  
                             • Increase in turnover due to newly-perceived risk and low pay | Financial downturn provides temporary relief from MA shortage, still have to tackle how to reduce turnover in this role or how to craft a MA pipeline strategy that can tolerate high turnover |

These trends all depend on how well we rebuild staff trust and resilience.
How will Covid-19 impact the pharma, device, and tech innovation pipelines?

Fast-tracking supplies, tests, treatments, and vaccines
Regulators temporarily reduce barriers to go from innovation to appropriate use

Industry responses to urgency of Covid-19 crisis

- **Re-prioritization of R&D and manufacturing capacity**
  - Diagnostic firms and many others focus on scalable testing options
  - Biopharma pipelines focus on Covid-19 treatment and vaccines
  - Device and supply companies shift production to ventilators, PPE

- **Loosened regulations for testing and approval of medical products**
  - FDA enables accelerated vaccine development and approval
  - Leveraging real-world data and real-time trial reporting to show efficacy of repurposed treatments

- **Relaxed guidelines on acceptable use of technology**
  - Manufacturers and providers collaborate on ventilator refurbishment
  - Sleep apnea machines repurposed to address ventilator shortages
  - Regulators allow Skype, FaceTime for telehealth visits

Advisory Board interviews and analysis.
All sectors will have to adapt to emerging unmet needs
Innovation directly addressing Covid-19 seeing spikes—but stickiness is unclear

<table>
<thead>
<tr>
<th>Biopharma</th>
<th>Medical Device</th>
<th>Digital &amp; IT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical trials become slower</td>
<td>Provider purchasers de-prioritize ‘bells-and-whistles’ device purchases</td>
<td>Providers favor optimization of existing technology (e.g. EHRs) over net-new products</td>
</tr>
<tr>
<td>and more expensive</td>
<td>Demand for innovation in monitoring, surveillance, diagnostic, and care-at-home</td>
<td>Tech giants ‘earn their healthcare stripes’ by deploying solutions quickly, at a national scale and gain health care B2B market share</td>
</tr>
<tr>
<td>Manufacturers experiment with real-world evidence (RWE) and digital trials</td>
<td>Spike in demand for extended-use products (e.g., beds, monitors, ventilators) leads to significant drop long-term</td>
<td>Data aggregators become more critical in health care ecosystem as demand for AI and predictive analytics spikes</td>
</tr>
<tr>
<td>Increased time-to-market for backlogged Phase 3 products causes re-prioritization of early-stage pipeline</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Near-term**

**Long-term (2021+)**
Data sharing accelerates research and innovation
Renewed focus on public-private collaboration could have lasting impact

Covid-19 sparks unprecedented levels of collaboration and data sharing

Collaboration between the White House and IBM, Amazon, Google, and Microsoft for treatment and vaccine development

Deterioration of competition among industry and academics as researchers prioritize finding a vaccine over claiming credit

Early signs of growing public trust in tech giants as they swiftly take action to address the crisis

Google and Apple team up on contact tracing
Two rival technology giants form an unlikely partnership to develop app-based tracing tool

Key privacy and security features address concerns:
- Identities of infection users are not revealed
- Data is decentralized, anonymized, and refreshed every 15 minutes
- Relies on proximity detection rather than location data
- Program is entirely opt-in

Lack of redundancy across the supply chain prevents flexibility in times of crisis

Factors that limit flexibility across the supply chain

**Downstream**

**Provider contracting**
Providers often contract with a limited number of vendors to secure preferential pricing

**Distribution**
Providers favor just-in-time inventory management as opposed to stockpiling or holding reserves

**Manufacturing**
Manufacturers centralize production (often in far-away, lower-cost markets) to gain economies of scale

**Regulatory**
FDA limits provider use of certain items by classifying certain versions as "medical grade"; can limit manufacturers’ ability to flex production

**Upstream**

**Component parts**
Suppliers often rely on the same limited set of vendors to source component parts

**Raw materials**
Manufacturers may rely on very few sources (often abroad) for complex or harvested raw materials

How will Covid-19 impact the structure of the U.S. health care supply chain?

Why not just make more PPE?
Industry-wide changes needed to bolster supply chain

Potential responses from stakeholders

Providers
- Revisit sole-sourcing strategies
- Assess supply chain risk during purchasing process
- Include contingency guarantees in contracts
- Stockpile critical supplies
- Invest in data infrastructure that provides greater supply chain visibility

Suppliers
- Build redundancies and contingency plans into manufacturing capabilities
- Consider local sourcing and manufacturing options
- Invest in data infrastructure that expands supply chain visibility

Government
- Stockpile critical supplies
- Mandate manufacturer contingency plan reporting
- Encourage domestic manufacturing
- Remove regulatory barriers to innovation and flexibility in times of crisis
How will Covid-19 impact the demographic makeup of the US—and future demand?

Deaths unlikely to radically shift demand patterns
But impact of Covid-19 deaths worse among elderly and in dense urban areas

**Original projections:** 4.8 million hospitalizations  
480,000 deaths

**Current estimates (IHME):**  
~430,000 hospitalizations  
~60,300 deaths

Impact of Covid-19 deaths on elderly will vary greatly by region

**NATIONAL BASELINE**

- Absent virus, baseline death rate of 65+ population over 3-month period: 0.16%

U.S.

- Projected percent reduction in U.S.’ 65+ population due to Covid-19 by August 4th: 0.08%

New York City

- Projected percent reduction in NYC’s 65+ population due to Covid-19 by August 4th: 0.87%

1. Calculated based on national average of 7.12 hospitalizations per death.
2. Calculations based on IHME projections, and fact that 73% of current deaths in NYC have happened in 65+ population.

Mortality rate not the only factor that could influence demand
Reduced utilization from deceased patients likely outweighed by upticks elsewhere

Lingering care needs among Covid survivors
Covid-19 may not only damage lungs, but also heart, brain and kidneys

- Percent of hospitalized patients in China study with signs of heart damage: 19%
- Percent of hospitalized patients in Wuhan study with neurologic symptoms: 37%

Exacerbations of pre-Covid care needs due to treatment delays

- According to The Washington Post, patients with heart attacks, strokes and even appendicitis vanish from hospitals.
- Majority of patients put off elective procedures for duration of pandemic.

New care needs due to Covid-related stress and isolation

- Stress, unhealthy behaviors during quarantine could increase new diagnoses like diabetes, mental health.
- Increase in calls to Georgia substance abuse hotline amid pandemic.
- Increase in prescriptions for antidepressants, anti-anxiety, anti-insomnia post-Covid-19.


1. Symptoms include dizziness, headaches, impaired consciousness, loss of taste and smell, and skeletal-muscle injuries.
Pandemic exacerbating health inequity
Impacts on demand will be most pronounced among marginalized groups

Structural inequity contributes to worse Covid-19 health outcomes among minorities

Marginalized groups often…
- More likely to hold “essential jobs”
- Live in poorer areas with less access to care
- Less able to social distance
- Have higher rates of chronic illness

<table>
<thead>
<tr>
<th>34%</th>
<th>National Covid-19 cases made up by Black Americans</th>
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<tbody>
<tr>
<td>vs.</td>
<td>Percentage of Americans who are Black American</td>
</tr>
<tr>
<td>13%</td>
<td></td>
</tr>
</tbody>
</table>

Steps hospital leaders can take to mitigate racial disparities

- Collect and share race-specific data from your Covid-19 cases
- Leverage community partnerships and care management to target prevention
- Double down on patient-centered principles to overcome implicit bias in provider interactions

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
Meet our experts

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