Rescue from the Tiger King and Viral King

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April 28th 2020
- What does it mean to peak and why is it important?
- How will we know when we peak, is it possible to peak again if we move too quickly?
- How long does it take to resume to some form of normalcy?
- Will guidelines move to 25 people, then 50, then 100 and so on?
- What is summer going to look like?
COVID-19 in the United States

COVID-19 Dashboard by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University (JHU)

Total Confirmed: 957,016

Confirmed Cases by Country/Region/Sovereignty:
- US: 957,016
- Spain: 226,629
- Italy: 197,675
- France: 161,665
- Germany: 157,120
- United Kingdom: 154,032
- Turkey: 110,130
- Iran: 90,481
- China: 83,909
- Russia: 80,949

Total Deaths: 54,435
- New York: 17,280
- Nassau, New York: 1,587
- Wayne, Michigan: 1,560
- Cook, Illinois: 1,267
- Massachusetts: 1,070

Total Tests Conducted in US: 5,184,635
- New York: 777,568
- California: 506,035
- Florida: 333,097
- Texas: 262,816
- Massachusetts: 226,845

Lancet Inf Dis Article: [Here](#), Mobile Version: [Here](#), Lead by JHU CSSE, Automation Support: Esri Living Atlas team and JHU APL, Contact US, FAQ.
Daily confirmed new cases in U.S

Source: https://coronavirus.jhu.edu/data/new-cases

January 22\textsuperscript{nd} (first case identified)

March 25\textsuperscript{th}: 12,000 cases

April 1\textsuperscript{st}: 25,000 cases

April 24\textsuperscript{th}: 36,000 cases

April 25\textsuperscript{th}: 32,000 cases
Daily cases in Nebraska

- April 26th: 299
- April 25th: 306
- April 19th: 197
- April 18th: 155
- April 16th: 94
- April 1st: 38
Super spreading events

Tyson Foods suspends its largest pork plant amid Iowa outbreak

The plant can process about 19,500 hogs per day, accounting for nearly 4% of U.S. pork processing capacity, according to the National Pork Board.

12 outbreaks reported at Iowa’s long-term care facilities

10 Workers at Nebraska Beef Plant Test Positive for COVID-19

Ten workers at a central Nebraska beef plant have tested positive for the new coronavirus as the number of confirmed cases continues to rise.

92 percent of inmates tested for COVID-19 at Indiana prison receive positive results
Escape Plans

- Elimination/Eradication
- Vaccine
- Drug
- Herd Immunity
- Containment & a New Better Normal
SARS 2003 Eradication

Pathogen features also helped
• No presymptomatic transmission – mainly healthcare
• Did not spread widely to developing countries
$R_0 = 2.0$:

- $R_p = 0.9$ from pre-symptomatic
- $R_s = 0.8$ from symptomatic
- $R_e = 0.2$ from environmental
- $R_a = 0.1$ from asymptomatic
Mitigation or Suppression or Containment

## Opening Up America Again

### WHO 6 steps

1. Disease under control  
2. Able to detect, test, isolate & trace  
3. Hot spot risks minimized  
4. Prevention at schools & other essential places  
5. Manage imported cases  
6. Educated, engaged communities

### President 3-phases

<table>
<thead>
<tr>
<th>Phase 1</th>
<th>Phase 2</th>
<th>Phase 3</th>
</tr>
</thead>
</table>
| • ALL **VULNERABLE INDIVIDUALS** should continue to shelter in place.  
• **MINIMIZE NON-ESSENTIAL TRAVEL**  
• **ENCOURAGE TELEWORK** | • ALL **VULNERABLE INDIVIDUALS** should continue to shelter in place.  
• **NON-ESSENTIAL TRAVEL** can resume.  
• **ENCOURAGE TELEWORK** | • **VULNERABLE INDIVIDUALS** can resume public interaction  
• Resume **UNRESTRICTED STAFFING** of worksites. |
When will COVID-19 End?

Data-Driven Estimation of end dates (As of April 25, 2020)
Source: https://ddi.sutd.edu.sg/
CoVID-2019 Model Projections for Nebraska (Hospital resources use)

18 days until peak resource use on

May 9, 2020
(April 15 - May 16) ①

Resources needed for COVID-19 patients on May 9

- All beds needed: 210 beds
- ICU beds needed: 53 beds
- Invasive ventilators needed: 47 ventilators

Resources available:
- All beds available: 3,130 beds
- ICU beds available: 233 beds
- ICU bed shortage: 0 beds

Graph showing resource availability from Feb 1 to Aug 1:
- All beds available: 3,130
- ICU beds available: 233
- Invasive ventilators needed: 47 (projected)

Legend:
- All beds needed (projected)
- ICU beds needed (projected)
- Invasive ventilators needed (projected)
CoVID-2019 Model Projections for Nebraska (total deaths)

347 COVID-19 deaths projected by August 4, 2020
### US Daily Cumulative Totals - 4 pm ET

<table>
<thead>
<tr>
<th>Date</th>
<th>States Tracked</th>
<th>New Tests</th>
<th>Positive</th>
<th>Negative</th>
<th>Pos + Neg</th>
<th>Pending</th>
</tr>
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<tbody>
<tr>
<td>Sun Apr 26 2020</td>
<td>56</td>
<td>256,444</td>
<td>959,056</td>
<td>4,482,023</td>
<td>5,441,079</td>
<td>4,445</td>
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<tr>
<td>Sat Apr 25 2020</td>
<td>56</td>
<td>298,284</td>
<td>931,698</td>
<td>4,252,937</td>
<td>5,184,635</td>
<td>5,315</td>
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<tr>
<td>Fri Apr 24 2020</td>
<td>56</td>
<td>226,101</td>
<td>890,816</td>
<td>3,995,535</td>
<td>4,886,351</td>
<td>4,396</td>
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<tr>
<td>Thu Apr 23 2020</td>
<td>56</td>
<td>191,055</td>
<td>859,318</td>
<td>3,800,932</td>
<td>4,660,250</td>
<td>4,258</td>
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<tr>
<td>Wed Apr 22 2020</td>
<td>56</td>
<td>313,608</td>
<td>827,963</td>
<td>3,641,232</td>
<td>4,469,195</td>
<td>4,191</td>
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<tr>
<td>Tue Apr 21 2020</td>
<td>56</td>
<td>151,540</td>
<td>800,305</td>
<td>3,355,282</td>
<td>4,155,587</td>
<td>3,956</td>
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<tr>
<td>Mon Apr 20 2020</td>
<td>56</td>
<td>137,900</td>
<td>773,020</td>
<td>3,231,027</td>
<td>4,004,047</td>
<td>4,037</td>
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</table>

Source: [https://covidtracking.com/data/us-daily](https://covidtracking.com/data/us-daily)
Nebraska expanding testing

- On its first day (April 21st), over 20,000 registered for testing.

- Governor Ricketts; “the state will be able to conduct 3,000 tests a day with federal funding paying for the cost”.
The history could repeat itself!!

Evidence from the 1918 flu pandemic

St. Louis and San Francisco had double curve (2nd wave) after social distancing, face masks, and public gathering restrictions were relaxed.

The New BETTER Normal post COVID-19