



Catastrophe & Climate Strategic Research Program

COVID-19 Visualizations of Interest to Actuaries





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October 2020

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SOA Catastrophe & Climate Strategic
Research Program Steering Committee

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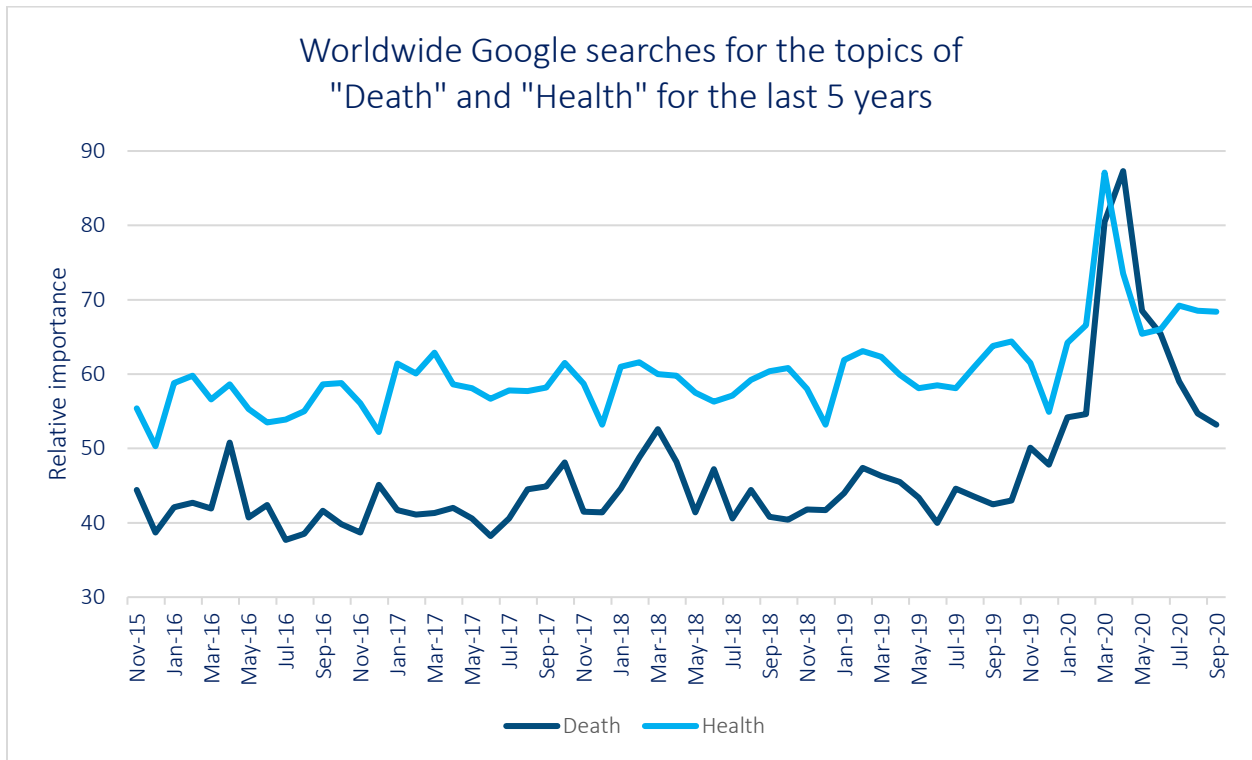
Introduction

The COVID-19 pandemic has had a wide-ranging impact in areas of interest to practicing actuaries. Correlations exist between the pandemic and many topics varying across a range of practice areas. The SOA Catastrophe & Climate Strategic Research Program Steering Committee has sponsored these visualizations exploring the correlation between the COVID-19 pandemic and a theme of choice of the individual contributing authors.

A Manifestation of the Public Concern Regarding COVID-19 – Gregory Whittaker

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The numbers above represent the search interest relative to the highest point on the chart for Google searches across the world on a monthly basis for the last 5 years. A value of 100 is the peak popularity for the topic. A value of 50 means that the term is half as popular. The peak popularity for the topic of “death” occurred in the week ending March 22, 2020; and the peak popularity for the topic of “health” occurred in the week ending March 15, 2020.

Searches for the topic of “death” tailed off more post-March 2020 compared to searches for the topic of “health”.

How New COVID-19 Cases are Tracking by US State – Natalie Mo

Submission by:

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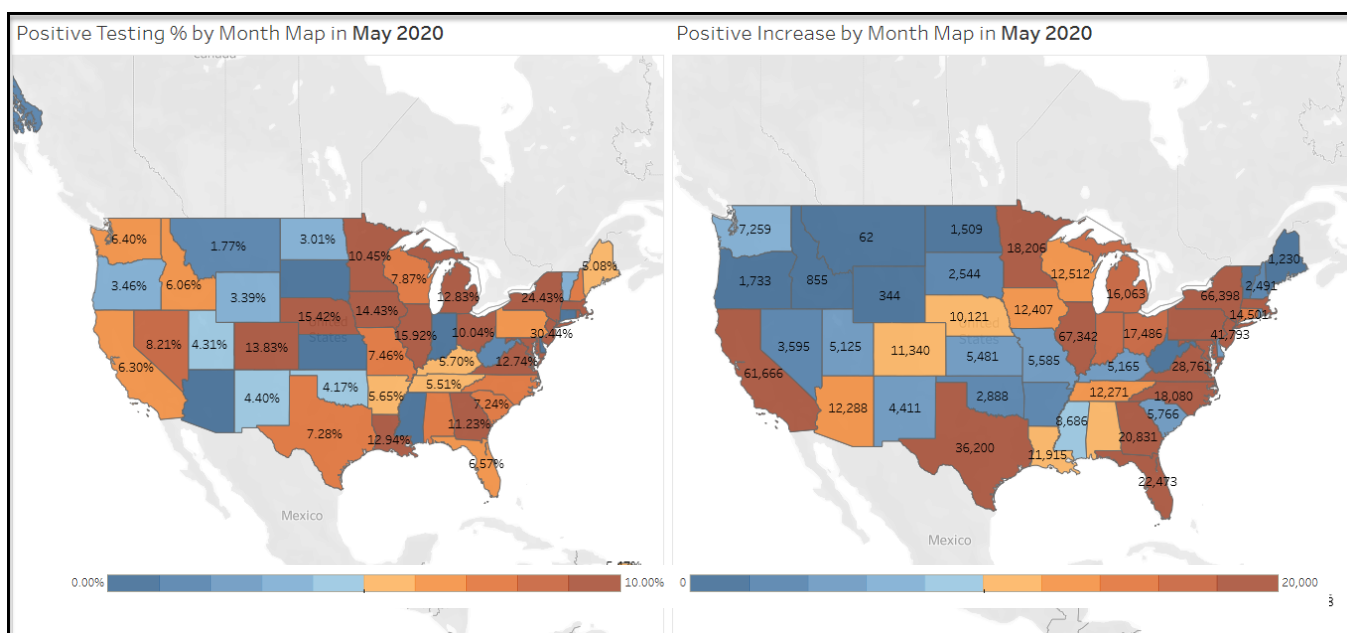
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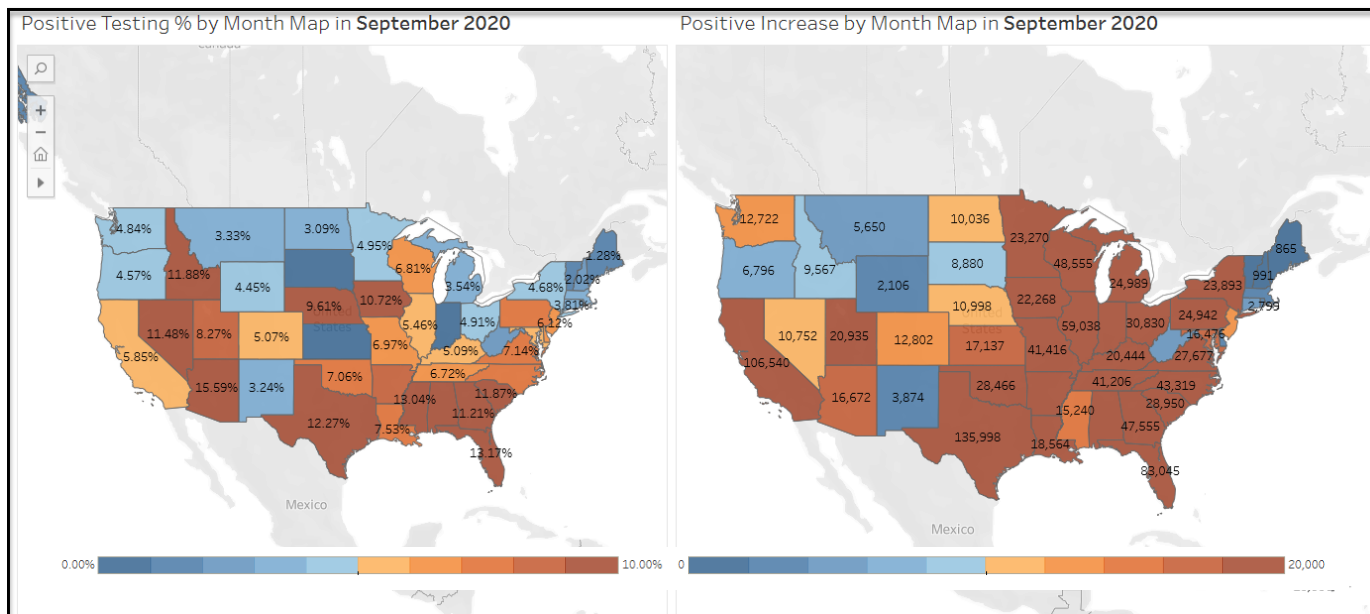
<https://public.tableau.com/profile/natalie.mo7563#!/vizhome/shared/8HR9Q37GH>

POSITIVE TESTING PERCENTAGE AND POSITIVE CASE COUNT INCREASE PER MONTH BY US STATE – MAY 2020

The map is interactive and can be found at the link above.



POSITIVE TESTING PERCENTAGE AND POSITIVE CASE COUNT INCREASE PER MONTH BY US STATE – SEPTEMBER 2020



Using the map, the reader can view sub-regions, individual states, and scroll through monthly time increments during 2020.

US Regional Analysis – EXL (Karl Canty, Sidharth Malhotra, Anuja Khanna)

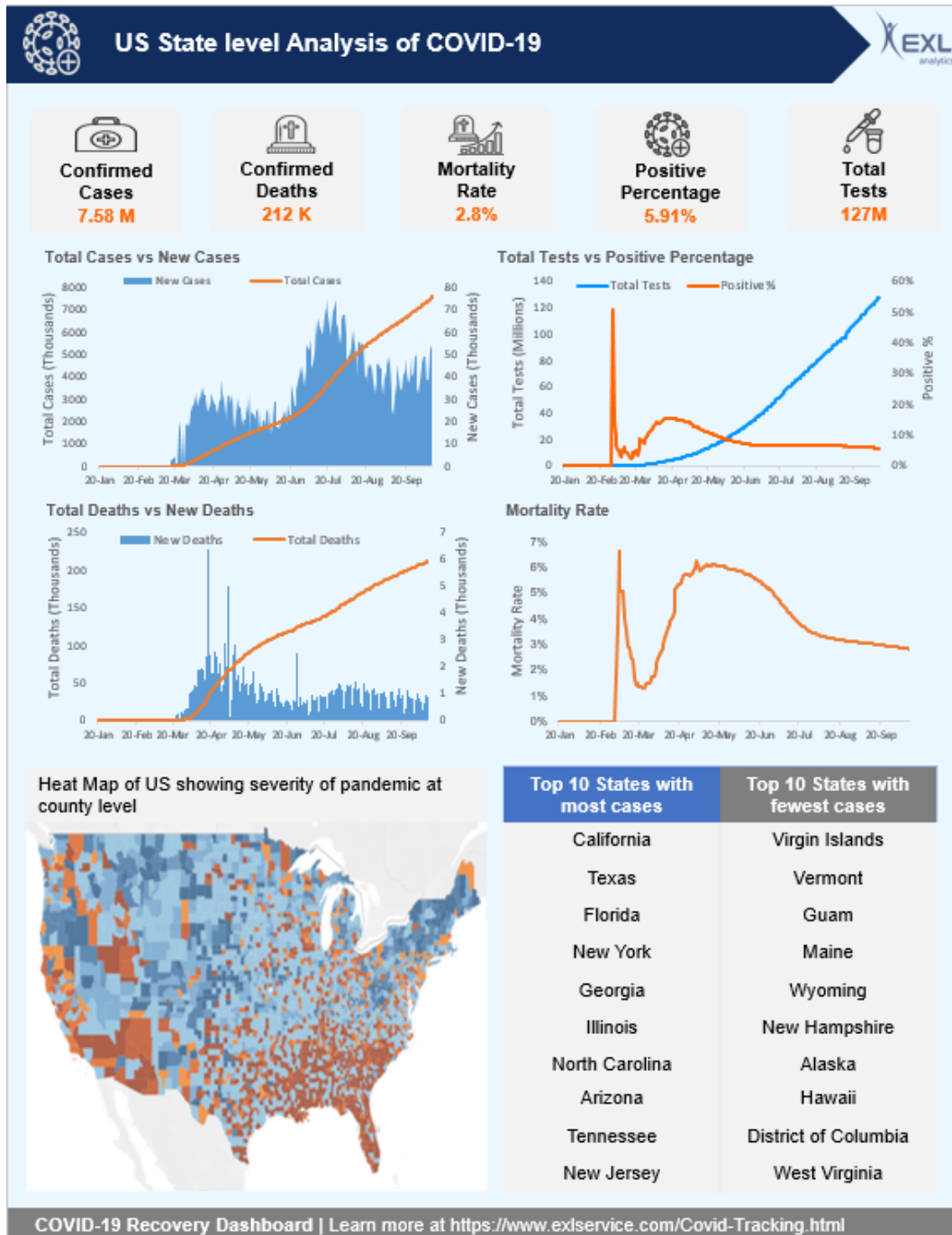
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TESTING PERCENTAGES, CASE LEVELS, MORTALITY RATES AND LEVELS

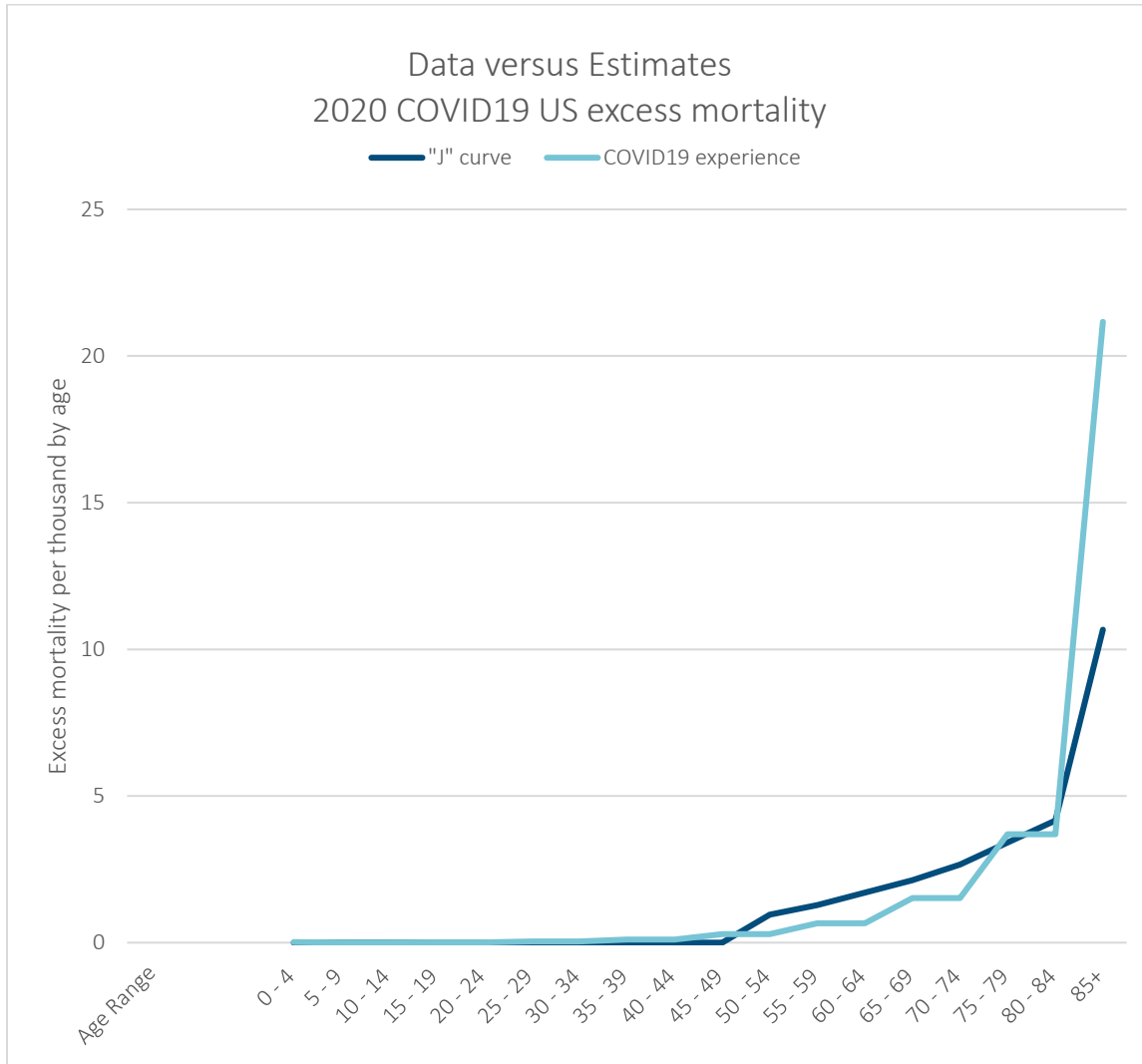


COVID-19 Excess Mortality vs Selected Benchmarks – Max Rudolph

Submission by:

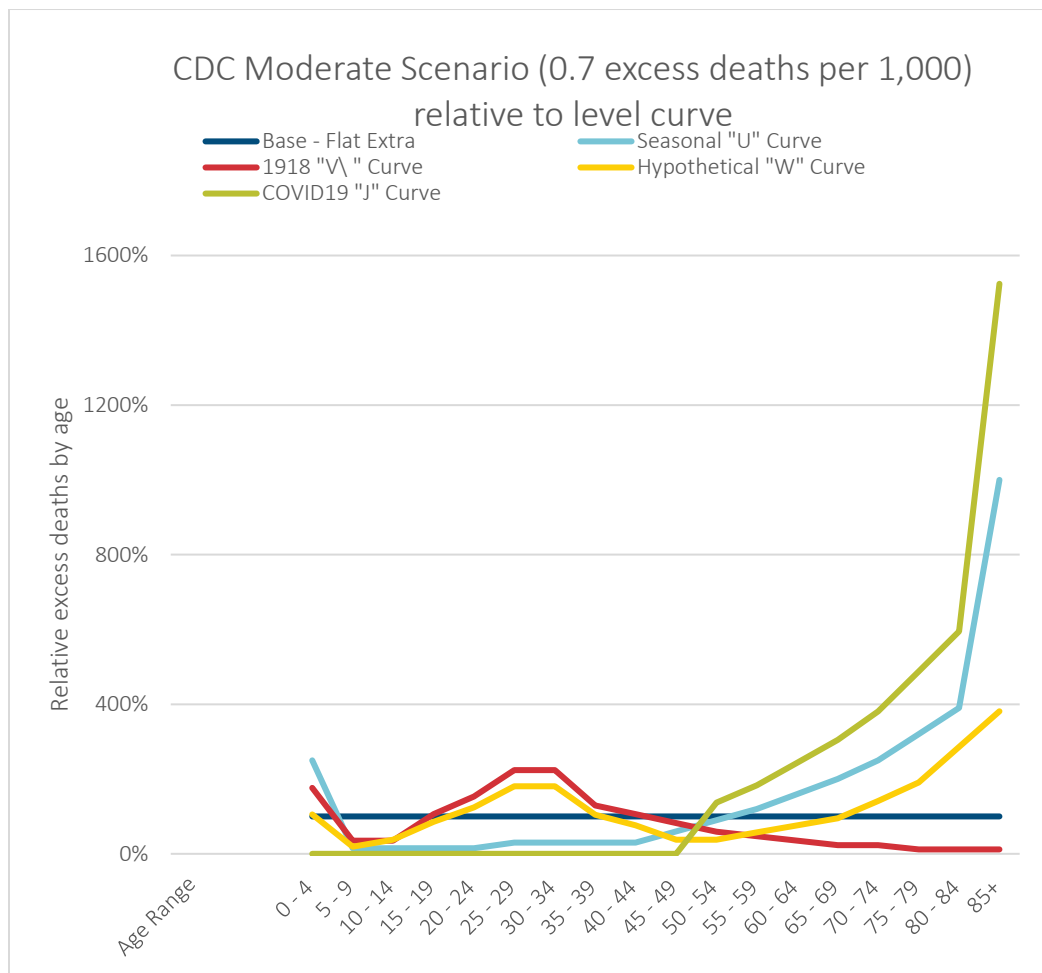
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EXCESS MORTALITY J-CURVE VS COVID-19



Each pandemic is unique and excess mortality by age can move as the disease evolves. The “J” curve estimate shown here was developed during first quarter 2020 and must continually be compared to actual experience for reasonableness. This chart shows how excess mortality from COVID19 in 2020 (as of September 2) compares to a hypothetical “J” shaped curve built using the older ages of a seasonal influenza curve. Each curve is built, in total, to match the CDC moderate scenario using 2004 U.S. population that is then applied to the 2019 U.S. population. This shows the extreme impact of COVID-19 on older ages relative to seasonal influenza, but also that the “J” curve continues to be a reasonable approximation of actual experience.

PANDEMIC CURVE SHAPES



Pandemic excess mortality tends to be additive, with each event uniquely varying by age. This chart builds on Jim Toole’s 2007 life pandemic report¹ that considered all 20th century pandemics in the U.S. The flat extra curve is presented as a base. The “U” curve is similar to 1957/68 and seasonal influenza experience, the “V” curve to 1918 Spanish flu and the “W” curve is 1918 experience with seasonal influenza impacts added at older ages. The “J” curve represents the 2020 experience from COVID19 through August.

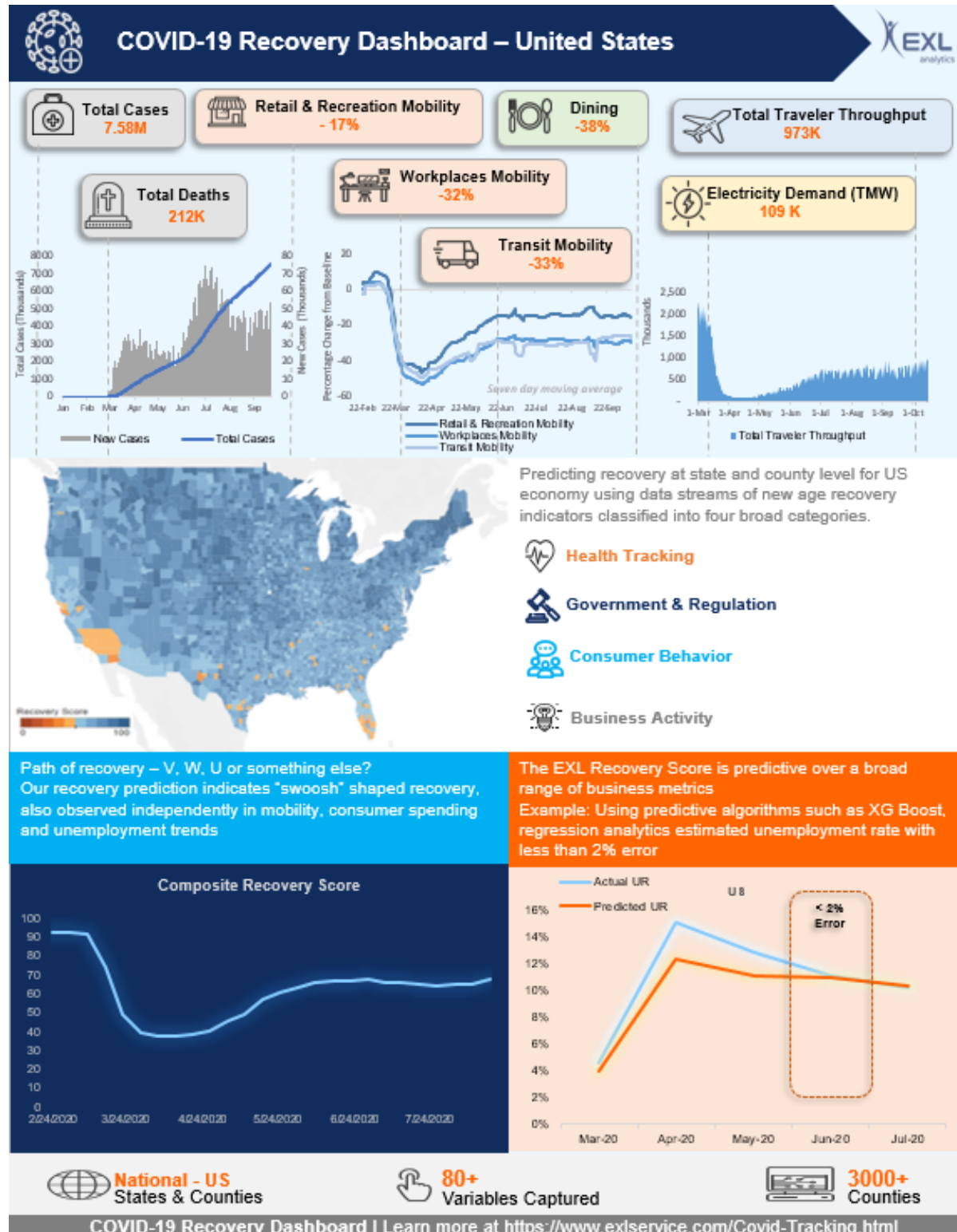
The area under each curve is the same, consistent with 0.7 excess deaths per 1,000 population (consistent with CDC moderate scenario and similar to 2020 results in mid-October). The shape of the “J” curve shows the extreme impact on older ages from COVID-19.

The implication for life insurers is that COVID19, while mortality experience will be negative, is unlikely to be a solvency event due to mortality since exposure to group term life will be low, the reserve is high relative to face amount and co-morbidities have been underwritten. Once the age distribution of excess deaths is apparent, scenarios can quickly be analyzed to identify if a company’s unique exposure puts it at risk.

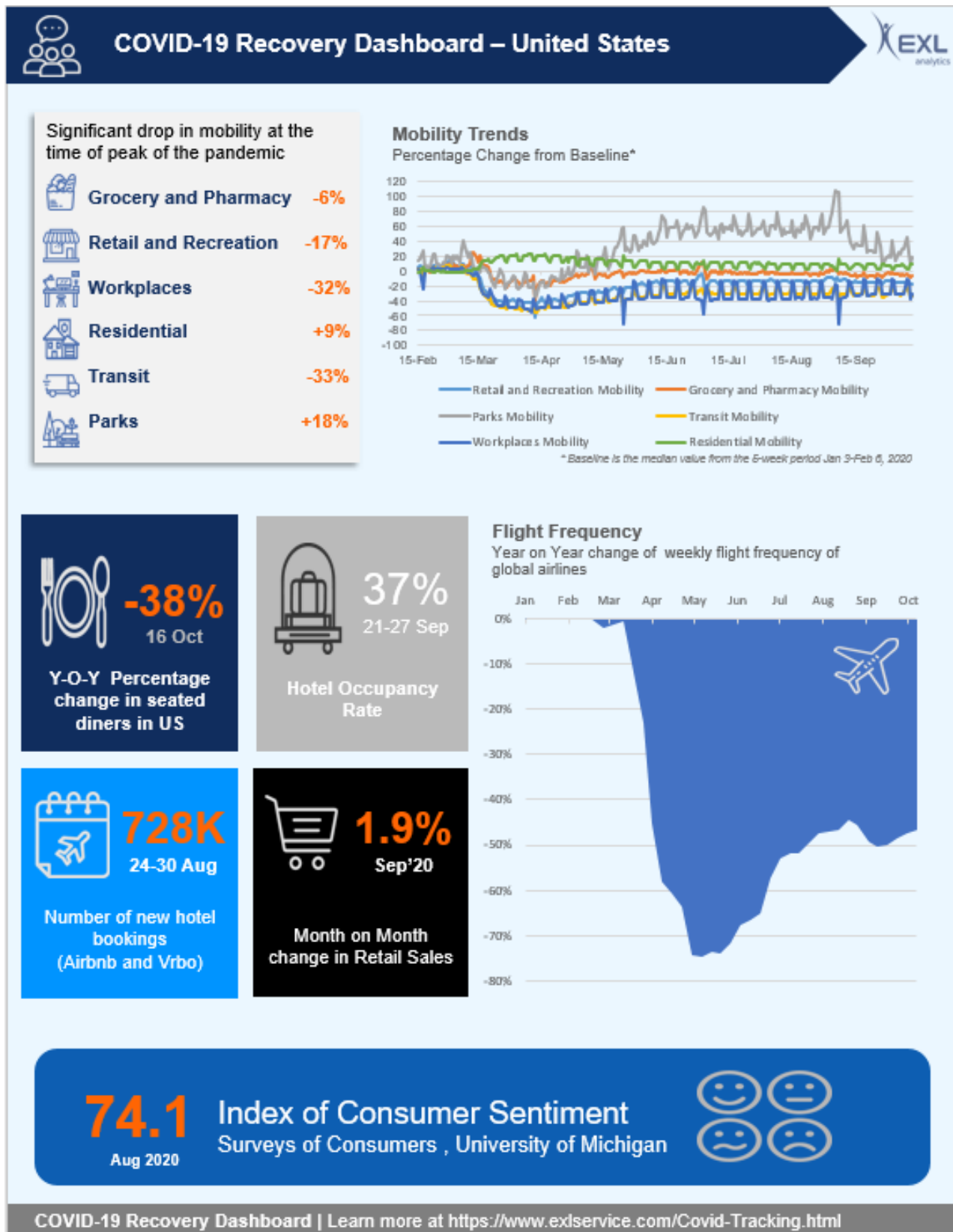
¹ <https://www.soa.org/resources/research-reports/2007/research-impact-pan-influ-life-ins/>

Business & Economic Impacts - EXL (Karl Canty, Sidharth Malhotra, Anuja Khanna)

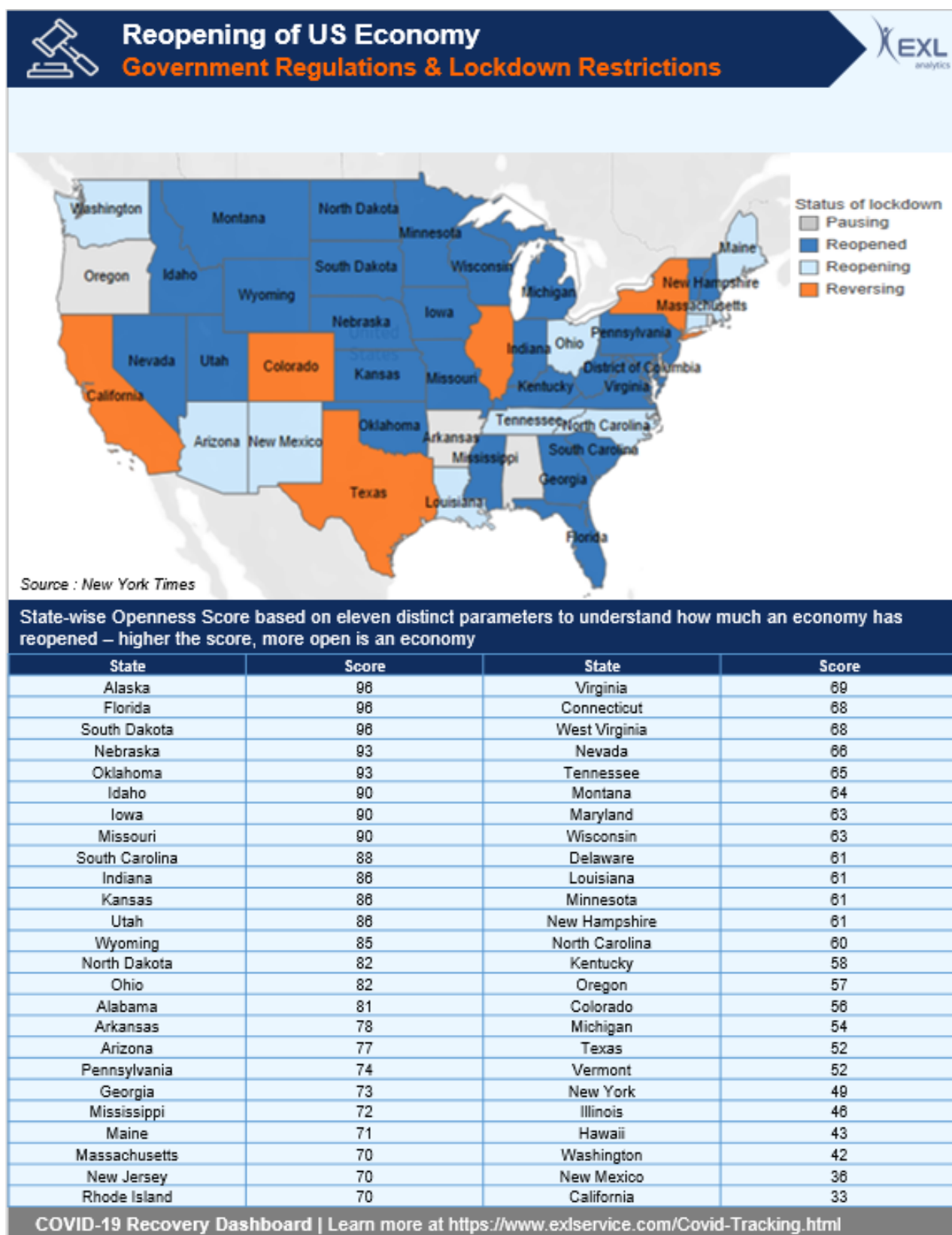
RECOVERY DASHBOARD PART 1



RECOVERY DASHBOARD PART 2



REOPENING THE US ECONOMY



About The Society of Actuaries

The Society of Actuaries (SOA), formed in 1949, is one of the largest actuarial professional organizations in the world dedicated to serving more than 31,000 actuarial members and the public in the United States, Canada and worldwide. In line with the SOA Vision Statement, actuaries act as business leaders who develop and use mathematical models to measure and manage risk in support of financial security for individuals, organizations and the public.

The SOA supports actuaries and advances knowledge through research and education. As part of its work, the SOA seeks to inform public policy development and public understanding through research. The SOA aspires to be a trusted source of objective, data-driven research and analysis with an actuarial perspective for its members, industry, policymakers and the public. This distinct perspective comes from the SOA as an association of actuaries, who have a rigorous formal education and direct experience as practitioners as they perform applied research. The SOA also welcomes the opportunity to partner with other organizations in our work where appropriate.

The SOA has a history of working with public policymakers and regulators in developing historical experience studies and projection techniques as well as individual reports on health care, retirement and other topics. The SOA's research is intended to aid the work of policymakers and regulators and follow certain core principles:

Objectivity: The SOA's research informs and provides analysis that can be relied upon by other individuals or organizations involved in public policy discussions. The SOA does not take advocacy positions or lobby specific policy proposals.

Quality: The SOA aspires to the highest ethical and quality standards in all of its research and analysis. Our research process is overseen by experienced actuaries and nonactuaries from a range of industry sectors and organizations. A rigorous peer-review process ensures the quality and integrity of our work.

Relevance: The SOA provides timely research on public policy issues. Our research advances actuarial knowledge while providing critical insights on key policy issues, and thereby provides value to stakeholders and decision makers.

Quantification: The SOA leverages the diverse skill sets of actuaries to provide research and findings that are driven by the best available data and methods. Actuaries use detailed modeling to analyze financial risk and provide distinct insight and quantification. Further, actuarial standards require transparency and the disclosure of the assumptions and analytic approach underlying the work.

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