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How COVID-19 is Changing our Relationship with Data

by Taymour | April 12, 2020

An increasing proportion of businesses use scientific methods to analyze data. Yet, because some key decision-makers don't believe in data-driven methods, a sizable number of them don't turn their data into actionable information. Instead, these individuals rely on their instincts to drive decisions. If prioritized over data, this hunch-based mindset leads to inefficiencies and wasted opportunities. In March of 2015, I wrote an article on the prevalence of such decision-making practices in corporate America. More broadly, I discussed how people continue to discredit the data and science that support climatologists' claims that human actions are the root cause of climate change.

New Data in a New World

Five years later, we find ourselves in a world consumed by a viral pandemic, observing the same phenomenon from a new angle. The novel coronavirus and the insidious illnesses and fatalities the resulting COVID-19 infections cause have given the population (as involuntary participants of a natural history case study) the opportunity to witness the power science has over a non-empirical approach. The latest Quinnipiac University survey found that approximately 80 percent of U.S. adults back a national stay-at-home order, while less than 20 percent oppose the idea. The overwhelming international scientific consensus is that mitigation is worth the consequential economic upheaval. Yet, even with the clear cause-and-effect relationship between data-driven actions and less-destructive outcomes we have realized around the world, science critics still openly take issue with the data, analysis, interpretation, and most importantly, the corresponding safety actions the nation's top healthcare experts recommend.

Uncertain Times

As we watched the infection spread weeks before it hit us, we viewed the coronavirus pandemic as a public health nightmare no one could have predicted. Or was it? Years before this novel strain surfaced, government strategists warned that a viral pandemic similar to the 1918 Spanish flu was inevitable. At the time of this writing, more than 3.5 million cases have been confirmed, and over 250,000 deaths have resulted worldwide, with roughly a third of those located within the U.S. Even with those indisputable figures, both the cause of the pandemic and theories about what would happen next were highly emotional topics and a matter of relentless political and social debate.

Data vs. Gut Instinct?

Regarding this pandemic, politics and science are closely intertwined, as they always are whenever stakes are high. We now have the opportunity—and quite frankly, the responsibility—to use a scientific approach to inform political decisions rather than distorting its validity to yield a different outcome. Gut feelings and intuition don't always have to contravene a data-driven approach; however, when the data reveals an uncomfortable truth, we must be prepared to take actions that are less than ideal. Based on the experts' consensus, we should also engage in constructive debates on how to prepare for future outbreaks using the lessons learned from this and other occurrences.

The Rise of a Global Pandemic

While the origin of the novel coronavirus's transmission to humans is controversial, the first reported case came from Wuhan, China, on November 17, 2019. A few weeks later, the viral spread became impossible to contain, and the order to lock down more than 11 million Wuhan residents clearly came too late. The proverbial horse was already out of the barn as COVID spread swiftly across mainland China and then almost instantaneously to most countries across the globe. The world saw a local Chinese outbreak transform into an epidemic, and then in just a matter of weeks, a worldwide pandemic. We obsessively watched news network reports of large and small communities alike succumbing to the stealthy, highly-contagious, indiscriminate, and too-often deadly novel

coronavirus.

January 21, 2020 marked the first reported case of coronavirus in the United States. However, we now know that it was more likely introduced weeks prior and circulated via asymptomatic and misdiagnosed propagators. By March, we were experiencing a shrinking supply of hospital beds, ventilators, and hospital staff. We also learned to use a new acronym in casual conversation ("PPE" for "personal protective equipment") because we understood through simple predictions that we had nowhere near enough of it to protect our hospital and frontline workers, not to mention ourselves. By the end of March, most states were on stay-at-home orders and bracing for thousands of deaths in a matter of weeks.

The First COVID 19 Stay At Home Order

As local government authorities gave orders to stay home, the masses unwittingly sat through a crash course in data analysis. Concepts covered included data sufficiency, randomization in data collection and sampling, weighted results, moving averages, various measurement biases and issues, data outliers, statistical distributions, forecasting, and margins of error. Simulations showed how the insights could be made actionable, as a distribution's slope, peaks, and tails could be altered to simulate different outcome scenarios approximately two weeks after the order had been put into effect.

COVID Data Put To The Test

Laypeople learned what it means to "flatten the curve" because they had a vested interest to do so. As the ramifications of statistical distributions' changing shapes were contemplated, many relied on tables and graphs to help project the virus's propagation and its impact on their local communities and loved ones. As we've seen, fear can be a powerful motivator for learning. This contagion, with its pernicious and boundaryless global reach, has fast-tracked the learning curve for the average data-savvy person and "right-brained" among us. My hope—bolstered by favorable reactions to the mitigation efforts—is that it has also converted some traditional science debunkers into believers. The unconvinced argue that the data insights are inaccurate, blown out of proportion, or just downright lies or scams. For most of us, however, the exponential slope's interpretation was made crystal clear. The thought of COVID-19 cases doubling every three to four days without enough ICU

beds, doctors, ventilators, test kits, and PPE was scary and easy enough to comprehend: Our lives were at risk.

Data and the Layperson

Not only did people want to understand the disease's spread, recovery, and death rates, but they were also motivated to find its causes and what they could do to mitigate its impact. Relevant information about how to "dodge the bullet" when the scourge hit their neck of the woods was a real-world and scalable example of how to make analytical insights actionable. While the predictions themselves were impressive (at least to the geeks among us), action was and always will be what is most important. People recognized that changing the statistical distribution's shape was, quite literally, a matter of life and death. Simple actions like washing hands and sneezing into an elbow gave way to more socially impactful actions like ceasing to shake hands or gather at bars, beaches, and restaurants. Eventually, COVID-19 testing began in earnest, and most of us were asked and then told to stay home. Businesses deemed "non-essential" shut down within weeks of the first confirmed case in the U.S.

Data Skeptics Dig In Their Heels

Because of the devastating impact this unprecedented shutdown had on the economy in the weeks that followed, many began to question whether mitigation and suppression measures "made the cure worse than the disease." A sales executive I know distrusted the reported figures: "Wouldn't the death rate be lower if the denominator was deflated due to inadequate testing?" Any respectable analyst would consider this question; however, I didn't expect him to ask it because hunches, not data, usually drive the sales industry. To me, this query was another sign that analytical principles were infiltrating society at a much deeper level than before the pandemic.

He was correct, by the way. We don't know precisely how many people have or have recovered from COVID-19 because the U.S. was extremely slow to begin and then ramp up testing. An inaccurate denominator distorts the key metrics used to measure the threat: the number of confirmed cases, those who recovered, and those who died from COVID-19 infections or related complications. Even so, the data we have is the best available to us, and we don't have enough reason to discredit the insights we could glean from it.

Experts and Politicians Use Data to Educate the Public

Epidemiologists', virologists', and other healthcare professionals' projections delivered the answers we so desperately sought. Some politicians not only used their data and scientific projections to issue drastic measures in an effort to "flatten the curve," but they also used them to educate the public on how to interpret the various metrics and charts. Their purpose was not only to inform, but also to justify and prepare the government's future actions.

Governor Andrew Cuomo of New York, for example, used data supplied by Johns Hopkins University and other sources to teach daily statistics courses. Although these daily briefings were intended for New York citizens, people throughout the U.S. and even worldwide eagerly watched them. Cuomo's approach was simple, measured, and consistent—qualities data scientists should attempt to emulate. He warned New Yorkers (and many of us watching from elsewhere) of the horrible consequences that lay ahead and continued calmly to interpret the information as projections solidified into new realities unfolding before our eyes. The mortality rates increased proportionally to the exponential rate of newly-confirmed COVID-19 cases. Dr. Anthony Fauci, director of the National Institute of Allergy and Infectious Diseases, shared similar projections during his daily briefings with President Trump at the White House.

The Data Skeptics Are Not Convinced

However, some of the evidence was not sufficient for the science skeptics, whether their doubts were politically motivated or not. For example, some constituents refused to believe the data's veracity, claiming that unrelated medical conditions artificially inflated the U.S.'s COVID-19 death toll. While questioning data and the science behind analysis and predictions is always reasonable, the slope becomes slippery when one rejects the data based on non-scientific motives. Given the pandemic's scale, it's no surprise that conspiracy theories abound. According to Dr. Fauci, "I think it falls under the category of something that's very unfortunate—these conspiracy theories that we hear about. Any time we have a crisis of any sort there is always this popping up of conspiracy theories." For your entertainment, you may want to Google "Cornell University's Alliance for Science COVID: Top 10 current conspiracy theories."

Using Data to Justify Stay at Home Order

Nearly every state in the union eventually issued “stay at home” orders, as did most of the world. This action clearly curbed the spread of the virus and saved millions of lives. However, some of the same people who ignored the impact social distancing had on saving lives, may also be discounting the possible emergence of a new and more pernicious viral strain in the future that could wreak an even greater toll on the economy. Without a doubt, economic ramifications of this caliber haven’t been seen since the Great Depression.

At present, we sit at a crossroads between what the data tells us and our desire to “get back to normal” (whatever “normal” looks like) in the future. Many resent being confined to their homes. They want to return to work, shop, enjoy entertainment, and socialize with their friends, which is understandable. Unemployment can be debilitating or even socially humiliating. Additionally, the sudden global economic shutdown’s other consequences are becoming obvious. For instance, it has caused and will continue to cause major supply chain disruptions, food shortages, and hunger, as well as significant increases in domestic violence and deaths related to substance abuse and suicide. Many other such “butterfly effects” are also related to the novel coronavirus.

Federal guidelines recommended states wait to begin a phased reopening until they could document 14 consecutive days of declining cases. Governors in most states simply ignored the data (or interpreted it in a way one might expect from a politician) and began to loosen state restrictions even as their confirmed case numbers and deaths continued to rise. In the few states where restrictions remained in place, people took to the streets—some armed with assault-style weapons—to protest the stay-home order and aggressively complain that it was unconstitutional.

The restriction’s economic impact on people’s livelihood cannot be minimized, so their frustration with the politicians who bar commerce is understandable. However, baseless science and data repudiations should never be acceptable. Still, the blatant dismissal of facts is to be expected, even if some justifications are not. For example, as reported on NBC’s *Today Show* on April 29, 2020, a protester was simultaneously parading two signs: “END THE SHUTDOWN NOW!” and “Data Over Dictators!” My question for the protester: Do you have alternative data that isn’t driven by politics? Great. Please show us!

As I mention in my 2015 article, “By its very nature, science is based on debunking science with better science.” Unfortunately, alternative data sources that refute the admittedly less-than-perfect coronavirus data from the World Health Organization (WHO), Johns Hopkins University, and other reputable institutions have either not been shared for evaluation, or more likely, simply do not exist.

On the same *Today Show* episode, co-host Savannah Guthrie asked California governor Gavin Newsom, “Do you feel in your gut that the worst is behind you in California?” Governor Newsom responded, “I love the way you asked that question…‘in my gut’…I’m not sure if I’m driven by gut in this respect; I’m driven by data.” A few days later, on May 3, 2020, Governor Cuomo warned in his daily briefing (where data analysis is always a central theme), “Go back to your old behavior, and the numbers are going to go up.” He added, “It is fine to use your gut as long as it is an educated gut.” He implored his constituents to rely on insights derived from the best publicly-available data, claiming, “In New York, we follow the facts, data, and science to make our decisions.” Like these governors, we should follow science-backed directives, not dictators, especially as we face increasing uncertainties.

Long-Term Impact Unknown

At the time of this writing, it’s too early to know the impact of reopening too soon. According to public health officials, relaxing our guard before a vaccine becomes available will probably result in a new and possibly larger outbreak in the future. On the other hand, since testing has been limited, we still don’t know how prevalent the novel coronavirus exposure has been, nor our corresponding antibody response. The hope is that eventually enough people will develop antibodies to create a desired “herd effect” that will ward off future outbreaks. As we prepare for the outbreak’s second and third waves, we must carefully analyze and objectively debate such scientifically-grounded factors.

No One-Size Fits All Here

The best answer for society may be the one that does the best job of simultaneously minimizing both the human and the economic impact of an impending new outbreak. In the long-term, these seemingly opposing forces may not even be at odds with one another. Regardless, we have no alternative but to rely on the best data available as well as scientific principles that are both inclusive and multidisciplinary. Government officials must be transparent and should not censor government institutions like the Centers for Disease Control and Prevention (CDC) or the National Institutes for Health (NIH). We can find ways to slowly, carefully, and responsibly reopen, taking into consideration our “new normal;” it must be an orchestrated balancing act.

As they were during the 1918 Spanish Flu pandemic (which shares eerily similar aspects with our current global scene, changes to our lives will be inconvenient and uncomfortable. But if we let it,

science can help us make decisions wisely to minimize suffering. Multiple vaccine trials are underway, and agencies are hopeful that an inoculation will be available to the public by early 2021. Until then, it is encouraging to see the many creative ways people are finding to safely begin emerging back into the world, from drive-through veterinary clinics to meeting friends around the world on Zoom. After all, we must get back to living our lives. As I recently overheard a friend say, "I'm all about the science … but I just want to get my hair colored!"

1. Countries that have not reported any case of coronavirus: Kiribati, Lesotho, Marshall Islands, Micronesia, Nauru, North Korea, Palau, Samoa, Solomon Islands, Tonga, Turkmenistan, Tuvalu, Vanuatu
2. CDC barred from using the phrases 'evidence-based,' and 'science-based' in reports. President Trump rejects CDC's 17-page draft recommendation for reopening the United States.
