NYU | STERN

MANAGING ORGANIZATIONS IN A TIME OF CRISIS

Covid-19: Lessons from Hurricanes about Reopening the Economy

Date: May13, 2020
Authors: J.P. Eggers and Zur Shapira, Department of Management & Organizations, NYU Stern School of Business

> **Key Takeaways:** Considering when to reopen a regional economy comes down to how the decision maker(s) worries about the tradeoff between the costs of opening too early and staying closed too long, which are due to the difficulty in predicting behavior of the virus. Since different stakeholders differentially bear those costs, the influence of those stakeholders can affect which mistake the decision maker views as less costly. In addition, we recommend that the decisions to reopen be made by experts, scientists or by mayors and governors who seek the advice of scientists.

**Decision-making During Natural Disasters**

As policy makers feel increased pressure to reopen the economy after the initial wave of Covid-19, the effect of uncertainty on decision making around how to return to "normal" has come front-and-center. At the core, governors and mayors face a difficult tradeoff between medical safety and economic health. While global pandemics like Covid-19 don't happen frequently, this tradeoff between social and economic health manifests for decision makers frequently in a different disaster context – the decision to order evacuations for a hurricane. In this research brief, we build on our research on hurricane evacuation decision making to offer insights for the era of Covid-19 (Dye, Eggers, and Shapira, 2014).

Hurricanes arrive regularly between June 1 and November 30th in southeastern U.S. and the Gulf of Mexico. While decision makers (typically mayors and county managers) have forecasts on which to base decisions on whether to evacuate (from the National Hurricane Center, https://www.nhc.noaa.gov/), there is enough uncertainty that it is largely impossible to predict where the hurricane will make landfall until 24 hours before landing (Berger, 2010). At the same time, evacuating large coastal cities like Miami (Florida) can take three days (South Florida Regional Planning Council, 2010), meaning that evacuation orders have to be issued with imperfect information. The cost of evacuation is more than $1 million per coastal mile, meaning that the cost of evacuating a city like Miami is estimated as $20 million or more (Whitehead, 2003).

The decision maker's dilemma is described in the figure below (which comes from Dye, Eggers, and Shapira, 2014), where the *ex-ante* expected threat is shown on the x-axis (including forecast direction, wind speed, temperature, and other variables), and the *ex post* actual damage is shown on the y-axis. The decision maker has a threshold above which she will issue an evacuation order, and below which she will choose to ride out the hurricane. The football shape that recognizes the imperfect correlation between *ex ante* expectations and realized damage therefore defines 4

quadrants: true positives (or hits), true noise, false alarms (unnecessary evacuations) and unpredicted hits (which carry immense risk to the population). Ideally, decision makers would like to decrease their error rate through better forecasts (which would manifest in the figure as a narrower football shape, with a strong correlation between expectations and reality). But improving forecasts usually requires significant new information (e.g., far better testing). So most decision makers have to decide where to place their threshold.

Figure 2   The Relations Between Severity of Signal, Threshold Level, and Storm Damage
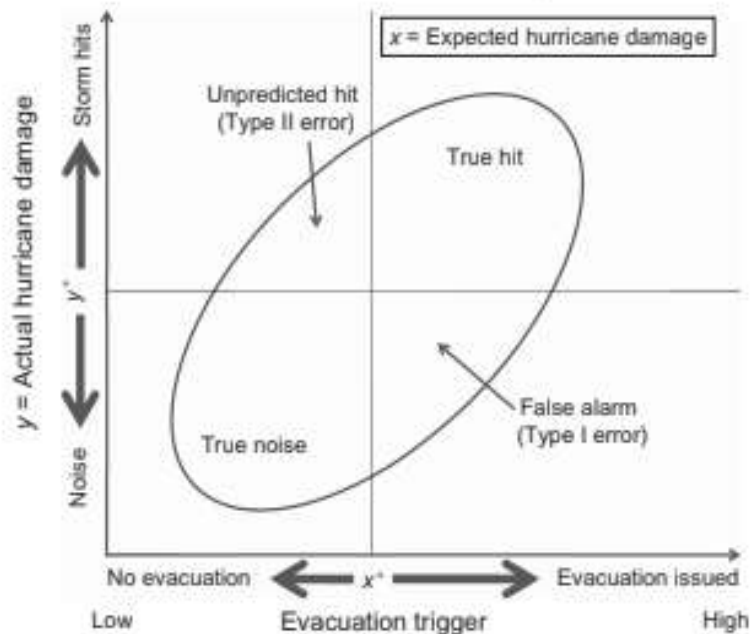
One of the core points of our research is that – because of the nature of politics, the media, and human judgment – decision makers typically don't get credit for making good decisions. Instead, the focus is on placing blame for errors (both false alarms and unpredicted hits). This means the two most salient outcomes for the decision-making process are usually the two errors. And because varied stakeholders differentially bear the cost of the errors, stakeholders have enormous influence on the decision-making process. For example, local businesses are particularly hard hit by unnecessary evacuations (false alarms), while citizens in the most at-risk neighborhoods bear the risk of unpredicted hits. Decision makers then weigh the needs and wants of those stakeholders and their own personal reliance on those stakeholders for their political authority when choosing how to set their evacuation threshold to minimize the type of error that is most undesirable.

This hurricane dilemma has a clear analogy to decisions on reopening the economy in the wake of Covid-19. Here, local businesses bear the costs of remaining closed if a lockdown is not actually necessary, while older citizens, those with heightened risk factors, and those with reduced access to healthcare all bear the risks of reopening too early. We argue that, based on the impossibility of having perfect data and the way that typical decisions are evaluated, mayors and governors won't be rewarded for either reopening exactly when they should (true positives) or staying closed

when they should (true negatives). Instead, they will be more concerned with the potential for errors in opening too early (false alarms) or staying shut too long (false negatives).

Further complicating the decision-making process for Covid-19 beyond the lack of useful data, it will likely be impossible to know if a region stayed closed too long or for the right amount of time – both cases reduce the likelihood of a second wave versus reopening too early, making it hard to tell if the region stayed closed for "too long" or just the right amount of time. This combination of poor feedback on the efficacy of decision making and the cognitive focus on the costs of errors suggests it is possible that any decision to reopen that *doesn't* result in a painful second wave will be publicly viewed as "having stayed closed too long." This heightens the pressure on politicians to open earlier, which then increases the risk of the second wave.

There are however some differences between the decision to reopen and calling for evacuation from approaching hurricanes. There is no way control the destructive power of a hurricane, but there are ways of mitigating the spread of the coronavirus by following social distancing meticulously and by extensive testing.

Implications for Decision Makers

What does this then suggest about the decisions facing governors and mayors about reopening their local economies? Reopening too early will particularly hit healthcare organizations and older citizens the hardest. Thus, we'd expect that local politicians with a strong support base from older voters and healthcare organizations will prefer to minimize the chance of opening too early, which correspondingly increases the likelihood that they remain closed too long. By contrast, reopening too late will primarily hit small businesses (especially entertainment and other non-essential businesses) the hardest, as well as the local workers who rely on such jobs for their income. Thus, we'd expect that local politicians with a strong business orientation will prefer to take the chance of reopening too soon.

Interestingly, this puts President Trump in a particularly challenging position. He wants to support the hotel industry (including Trump branded hotels and resorts), and so wants to reopen the economy soon, but his core constituency (older voters) is the one that would be hit the hardest. Potentially the fact that his core voters are more rural, where the outbreaks have been slower, becomes a deciding factor in his push to reopen.

The stakeholders' pressure suggests that the decision of when to reopen should stay with the scientists who are the experts in this domain. However, the political system puts the authority with elected officials. It is worth pointing out that despite the focus on types of stakeholders, several governors and mayors seem to listen to the scientists, and a majority of Americans prefer to not reopen too early, but those who push for early opening have so far been much more vocal.

Managing Organizations in a Time of Crisis is a series of research briefs produced by the Department of Management & Organizations at NYU Stern School of Business.

References

Berger, E. (2010). "One aspect of a storm keeps them guessing: Forecasters improve tacking hurricane paths, but not strengths." *Houston Chronicle* (April 1) Available: http://www.chron.com/news/houston-texas/article/Forecasters-improve-tracking-storm-paths-but-not-1696074.php

Dye, K., Eggers, J., and Z. Shapira (2014). "Trade-offs in a Tempest: Stakeholder Influence on Hurricane Evacuation Decisions." *Organization Science*, 25:4, pp. 1009-1025.

South Florida Regional Planning Council (2010). "Florida Statewide Regional Evacuation Survey." Available: www.sfrpc.com/SRESP Web/Vol1-11_ChVI.pdf

Whitehead, J. (2003). One million dollars per mile? The opportunity costs of Hurricane evacuation. *Ocean and Coastal Management*, 46, 1069-1083.