PCS Covicane Impact Score: Measuring the Resurgence in Catastrophe and COVID-19 Clash

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Tropical storm and COVID-19 risks clearly are converging in several key states. Historical storm activity and vaccination rates suggest that tropical storm-prone states could fall victim to a major weather event that could also increase COVID-19 transmission, as a result of a catastrophe bringing large numbers of unvaccinated people into close proximity. PCS, a Verisk business, developed a tool for gauging the extent of the tropical storm/COVID-19 clash risk. The PCS Covicane Impact Score uses both historical storm activity and recent COVID-19 trends to show that the situation could be far riskier than it even looks. A major hurricane affecting states with elevated COVID-19 risks could exacerbate both the industrywide insured loss associated with such a catastrophe and the further transmission of the virus, resulting in a situation where each threat feeds off the other.

The PCS Covicane Impact Score uses large event frequency and aggregate claims, rate of full vaccination, population density, and new COVID-19 cases reported in the last seven days to provide a composite view of state vulnerability. States that have a history of getting hit hard by big hurricanes where vaccination rates are low and new cases are high, essentially, are at disproportionate risk of increased transmission and post-event reconstruction time and expense. The PCS Covicane Score starts at zero and can increase to a level ultimately constrained by population size and density, with the highest level of risk requiring a zero percent vaccination rate with as high a population as possible in as small an area as possible. Practically, the upper limit to the PCS Covicane Score is limited by the largest population by state or territory in the United States paired with the lowest vaccination rate.

Historical Context

We got lucky in 2020 – well, as lucky as one could get given how difficult a year it was. In a nightmare scenario, a major hurricane (or series of them) would have battered the Gulf of Mexico, driving people into shelters, and vastly increasing the transmission of COVID-19. The result would have been even greater strain on the healthcare system, more pressure on all levels of government, and an elongation of the time and effort needed to rebuild after a disaster. Last year was the busiest catastrophe year on record of PCS. Thankfully, the large number of events didn't result in commensurate social or economic strain.

Of the 10 tropical storms designated as catastrophe events by PCS in 2020, the only one to cause more than US$5 billion in industrywide insured losses was Hurricane Laura. We've adopted US$5 billion as a threshold for "very large," suggesting that such events have a higher likelihood of displacing people. In the age of COVID-19, that becomes particularly important, as displacement implies gatherings – whether at shelters or with family or friend – that bring large numbers of people together unexpectedly, increasing the risk of virus transmission.

Since 1998, when PCS increased the granularity of our catastrophe tracking, we've seen 19 tropical storms with at least US$5 billion in industrywide insured losses. Three years have had at least two tropical storms above that threshold: 2004, 2005, and 2017. The most recent, of course, was 2017's Hurricanes Harvey, Irma, and Maria which, in rapid succession, caused profound insured and economic loss. So, it's easy to imagine a tropical storm scenario that would be severely exacerbated by the pandemic.

We're now in the middle of hurricane season, which stretches until the end of November, and the peak comes in September. A recent reduction in forecasted activity [LINK: https://www.artemis.bm/news/hurricane-forecasts-reduced-by-both-colorado-state-tropical-storm-risk/] may provide some sense of relief, but it's important to remember that damaging storms don't have to be intense (Superstorm Sandy is a great example), and it only takes one landfalling event to significantly impact the insurance industry and its customers. The resurgence of COVID-19 across the United States and low rates of vaccination in parts of the country particularly exposed to tropical storms mean that one major hurricane could turn into a long super-spreader event that could also translate to a slow, uneven, and costly post-event rebuilding process.

Tropical Storm and COVID-19 Risk Factors

In focusing on a map of the United States independently from both the viewpoint of the impact of COVID-19 and of hurricane season, we wind up studying the same collection of states. The pandemic perspective shows states where vaccination rates are low, and the number of new cases is increasing. The hurricane perspective focuses the eye on coastal states, particularly those that are most often hit by large storms. The two views mostly overlap.

As of August 5, 2021, the five states with the highest levels of new cases reported over the last seven days per 100,000 population are: Louisiana, Florida, Mississippi, Arkansas, and Georgia. Also in the top ten are perennially hurricane-affected spots: Alabama, U.S. Virgin Islands, Georgia, South Carolina, and Tennessee. Excluding Micronesia and the Marshall Islands, the following have the lowest rates of full vaccination: Alabama, Mississippi, the U.S. Virgin Islands, Wyoming (not hurricane exposed), and Louisiana. Georgia, Florida, Texas, and several other tropical storm-exposed states have vaccination rates below 50 percent.

Although home to almost 40 percent of the U.S. population, according to NOAA, coastal areas account for less than 10 percent of the total land in the contiguous United States. When you look at the states with tropical storm vulnerability, a lot of familiar names pop up. Florida, Alabama, Louisiana, Texas, and Tennessee are among the most affected by number of tropical storms with industrywide insured losses of at least US$5 billion. Two of the most populous counties in the United States have been hit by two of the largest hurricanes in recent decades and are located in states where COVID-19 is currently surging: Harris County, Texas (with Houston showing nearly 5 million residents) and Miami-Dade County, Florida, (with nearly 3 million residents). Using aggregate claims from events of that magnitude as a proxy for people affected, the states of Florida, Texas, and Louisiana each top 1 million, with Mississippi, New York, and New Jersey as well as the territory of Puerto Rico over half a million since 1998.

The overlap may not be perfect, in that the most tropical storm-exposed states may not be exactly the same as those with the lowest vaccination rates or the highest rates of reported new cases. However, pulling together these variables into a vulnerability index – namely the PCS Covicane Impact score shows the collection of conditions that could indicate which states are at disproportionate risk of a "covicane" event.

To give you a sense of the range and scale involved, West Virginia, was lightly impacted by one of the storms covered in this study. Despite a low level of vaccination (39.2 percent), the state has a low PCS

Covicane Impact Score because of its low population density and a relatively low rate of new cases, along with the light historical effect of large tropical storm events. Contrast West Virginia's PCS Covicane Impact Score of .3 on August 11, 2021, with 12,577 for Florida, 2,129 for Louisiana, 501 for Texas, and 322 for Georgia.

PCS Covicane Impact Score								
State	**8/1/2021**	**8/3/2021**	**8/4/2021**	**8/5/2021**	**8/6/2021**	**8/8/2021**	**8/9/2021**	**8/10/2021**
Alabama	188.04	190.50	203.33	221.81	244.01	274.19	315.71	321.80
Arkansas	6.02	6.26	6.33	6.82	6.77	6.94	7.23	7.30
Connecticut	5.80	7.45	7.68	8.03	8.40	8.98	6.90	9.06
Delaware	1.60	2.05	2.05	2.17	2.35	2.54	3.01	3.19
Districut of Columbia	7.42	9.64	9.87	10.17	11.10	12.03	8.46	14.67
Florida	10,037.83	11,188.63	11,245.56	11,453.53	11,943.22	12,093.60	12,173.14	12,577.12
Georgia	113.97	114.14	143.41	147.67	153.51	165.96	126.25	173.12
Illinois	1.35	1.55	1.67	1.70	1.85	1.92	1.49	2.18
Indiana	2.83	3.20	3.41	3.61	3.86	4.08	3.32	4.95
Kentucky	6.23	7.23	7.61	7.06	7.49	8.34	6.77	9.33
Louisiana	1,656.91	1,858.85	1,735.57	1,740.10	1,795.75	1,827.01	1,407.16	2,129.46
Maine	0.01	0.01	0.01	0.02	0.02	0.02	0.01	0.02
Maryland	11.06	12.92	13.96	14.78	16.13	17.24	18.38	19.85
Massachusetts	3.14	3.71	3.90	4.14	4.32	4.50	3.54	4.86
Mississippi	152.37	200.29	214.23	235.03	242.52	212.53	158.06	302.52
Missouri	0.95	0.99	1.07	1.11	1.06	1.05	1.05	1.03
New Hampshire	0.08	0.11	0.12	0.13	0.15	0.16	0.12	0.17
New Jersey	156.38	183.15	196.10	203.24	213.16	218.62	234.05	233.19
New York	50.97	61.87	67.52	71.99	76.01	79.70	92.36	98.08
North Carolina	39.57	52.35	54.04	64.70	67.85	71.62	53.77	93.89
Ohio	36.67	44.64	46.97	50.76	54.68	57.10	64.39	66.37
Pennsylvania	15.22	18.84	20.07	22.35	24.06	25.54	23.97	28.43
Puerto Rico	142.12	183.03	193.56	229.20	253.07	239.42	252.23	259.50
Rhode Island	4.04	4.98	5.34	5.86	6.07	6.48	4.95	4.47
South Carolina	10.25	12.91	14.80	12.82	13.32	14.46	12.55	18.96
Tennessee	13.90	19.63	20.29	22.15	23.02	24.97	24.06	24.34
Texas	327.18	380.52	412.39	354.93	478.99	451.39	512.08	500.65
US Virgin Islands	53.20	51.24	47.09	54.57	66.08	58.17	60.70	71.14
Vermont	0.01	0.03	0.03	0.03	0.05	0.05	0.03	0.07
Virginia	7.43	9.44	10.14	10.88	11.61	12.15	9.38	13.19
West Virginia	0.16	0.17	0.20	0.22	0.24	0.26	0.21	0.30

Source: PCS, a Verisk business

Florida shows what happens when a history of significant catastrophes is paired with high rates of new cases. The state has been affected by seven large tropical storms since 1998 and has more than twice the aggregate claims from these events as the next most affected states (Texas and Louisiana). While Florida's population density of around 400 people per square mile is below the cohort's average, it's seven-day rate of new COVID-19 cases reported is the second highest (behind Louisiana), and its vaccination rate, while average, is low enough to be problematic. Louisiana's high PCS Covicane Impact Score follows a similar pattern, although the state's much lower score results from a much lower population density and lower aggregate claims from large events. The same is true of Texas, which also benefits from having a seven-day case rate that's only a third of what Florida and Louisiana are experiencing.

The states in the Southeast are the most exposed to both COVID-19 and tropical storms, so the model's results may not be as surprising. They're expected to be exposed. Lower-level vulnerabilities, however, may show pockets of exposure that many wouldn't expect. New Jersey, New York, North Carolina, and Ohio require a deeper dive.

New Jersey's PCS Covicane Impact Score of 233 is higher than Georgia's 173 and much higher than North Carolina's 94. New Jersey's rate of full vaccination (59.2%) and relatively low rate of new cases per 100,000 population over the last seven days (100.5) make the high score seem counterintuitive. Further, it's only been affected by two large tropical storms since 1998. One of those storms, though, was Superstorm Sandy. That one event, in conjunction with the state's high population density (1,263 people per square mile), reveal a significant, if occasional, tropical storm threat. So, if another Sandy were to strike this hurricane season, the consequences would be profound.

The same dynamics in play for New Jersey have a similar impact on New York. The state's low population density (429) bring its PCS Covicane Impact Score down to 98, much lower than that of its neighbor to the south. The state is most exposed to tropical storm risk in its most populated areas, though, which means the functional threat could be much higher. North Carolina's score of 94 is largely driven by the high number of large events the state has experienced and a high and increasing seven-day new case rate of almost 300, while Ohio's score of 66 comes down mostly to its high aggregate number of catastrophe claims and low vaccination rate.

Preparing for the Worst

Last year, insurers and independent adjusting companies prepared for a busy hurricane season that would test their ability to serve claimants while exercising social distance and other precautionary measures. Ten tropical storm events allowed them to test tools such as remote adjusting and claimant collaboration (such as ClaimXperience [LINK:https://www.xactware.com/en-us/solutions/policyholder-self-serve/claimxperience/overview/]), drones, and advanced analytics for determining which claims could be addressed without sending someone out for an in-person visit. And while the advances were largely effective, they have yet to be tested by an intense series of events, of the impact we saw in 2017. With this in mind, the catastrophe claims community can review and refine the tools and practices put to good use in 2020 to further protect claimants from elongated claim lifecycles and delays in claim closure.

As PCS noted last year, one of the most important preparatory measures the claims community can implement today involves personal protective equipment (PPE). The reason we reviewed tropical storms with at least US$5 billion in industrywide insured loss is because events of that magnitude have a stronger possibility of displacing individuals (e.g., to shelters) and generate enough claims to drive more person-to-person interaction (such as through site interactions and more extensive post-event rebuilding). While remote adjusting capabilities should mitigate the risk of transmission that could come with the displacement of affected people, there's no substitute for having enough PPE on hand.

A newer approach to scenario planning for major event response has also become particularly important--the availability of talent. If there are superspreader events in catastrophe-affected states – or simultaneously with other high-population states – insurers could face a shortage of healthy adjusters. While the problem may seem remote, it's one that the marine industry is facing right now (shortage of qualified crew due to COVID-19, which you can read about here [LINK:

https://www.claimsjournal.com/news/international/2021/08/04/305180.htm]). If infection reduces the number of available adjusters, the risk of claim lifecycle elongation increases.

Additionally, insurers and independent adjusters should prepare for impediments to the movement of talent (and materials). High rates of transmission can disrupt supply chains, resulting in the types of scarcity we saw last year. For example, difficulties in moving materials could result in shortages in areas impacted by tropical storms, slowing the repair process. The access issues normally encountered following a major event could be made worse by socially distanced crews involved in manufacture, loading, and transportation – not to mention the potential impact of the virus on the number of people available to do those jobs. Further, high rates of transmission could make it hard for people to move around easily. That would include the ability of adjusters to get to catastrophe sites.

In addition to the shortage of adjuster talent, the finite pool of qualified contractors and repair professionals could become acute. Sending an insured an actual cash value (ACV) check in many cases is only part of the goal of fulfilling the needs of insureds, with replacement cash value (RCV) payments typically coming after repairs are performed. Insureds without qualified contractors to perform temporary or permanent remediation may incur additional damage, ultimately leading the insurer to have to make supplemental payments. Again, an elongated claim lifecycle increases the potential for higher insured losses. Preparation now can increase claimant satisfaction after a major event while also protecting insurer capital.