

VIEWPOINT

Cascading Risks of COVID-19 Resurgence During an Active 2020 Atlantic Hurricane Season

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During the summer of 2020, resurging coronavirus disease 2019 (COVID-19) and climate-driven hurricanes are on a collision course, potentially creating double jeopardy for US coastal residents in the 8 contiguous hurricane coastal states from Texas to the Carolinas and for those who live in Puerto Rico and the US Virgin Islands.^{1,2} Hurricane coastal states generally remained open throughout the spring break weeks in March, imposed moderate mitigation restrictions during April and early May, and then moved early and aggressively to reopen. These same states are now on alert as an early developing active 2020 Atlantic hurricane season has already produced an unprecedented 9 named storms before the end of July.

Between May 1, 2020, when reopening of some states started in earnest, and July 24, 2020, when Hurricane Hanna made landfall, US COVID-19 cases increased by a factor of 3.7, with the addition of almost 3 million cases nationally. The 8 hurricane coastal states (Alabama, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina, and Texas; the residents of which account for approximately one-quarter of the US population) contributed 40% of these new COVID-19 cases, with case counts increasing 9-fold.

Population protection from hurricane hazards revolves around evacuation and sheltering (ie, transporting and gathering people together in groups).¹ In contrast, effective approaches to slow the spread of COVID-19 are physical distancing and stay-at-home orders (ie, separating and keeping people apart).^{1,2} The inherent incompatibility of these strategies can exacerbate harm in 2 ways. First, when COVID-19 is actively circulating in the community, citizens may fail to heed evacuation orders, increasing the risk of severe injuries and drowning from direct exposure to hurricane hazards that will require emergency rescues and care in already over-full health care facilities. Second, based on the evolving understanding of the transmissibility of COVID-19, asymptomatic persons who are infected and actively shedding virus may transmit COVID-19 to others during the course of evacuation and sheltering because community members are placed in close proximity in congregate or household settings, and may remain confined indoors for an extended duration.^{3,4}

A compelling cautionary tale for what to anticipate was provided in May 2020 when Cyclone Amphan strengthened to super cyclone status while moving northward along the funneling coastline of the Bay of Bengal that separates India from Bangladesh. Although both nations were strictly enforcing COVID-19 lockdowns at that time, they reportedly rapidly mobilized and evacuated more than 2.2 million citizens in Bangladesh and 4.3 million in the West Bengal and Odisha states of India from low-lying delta areas, and distributed these people to more than

15 000 shelters in the region, far more than ever before to allow shelter residents a degree of physical distancing.⁵ Although Bay of Bengal storms have accounted for 8 of the 10 deadliest tropical cyclones in history, timely mitigation limited Amphan-associated mortality to 80 deaths. However, the mass evacuation and sheltering process appears to have produced a spike in new COVID-19 cases in Kolkata, India, and other storm-affected regions, underscoring the near impossibility of neutralizing both the COVID-19 pandemic and natural hazard risks.⁶

Hurricane Hanna: Learning Lessons in Real Time

Hurricane Hanna was still strengthening when it came ashore with 85 mph winds just south of Corpus Christi, Texas, on Saturday, July 25, 2020. Hanna retained its cyclonic signature and tropical storm force as it moved through the Rio Grande Valley and dipped into Mexico. South Texas experienced tropical storm force winds, pelting rains, and flash flooding risks throughout the weekend. Texas is well equipped to manage a category 1 storm, but the state has never had to perform these emergency functions during a surging pandemic. On the day of landfall, Texas Governor Gregg Abbott declared that while responding to any hurricane is fundamentally challenging, the situation was complicated with Hanna poised to move directly through portions of the state that were most severely affected by the COVID-19 pandemic. During the week prior to Hanna, Corpus Christi and the Rio Grande Valley had the highest rates of COVID-19 hospitalizations in the US.

Given the tenacity of the storm and the extreme risks for flash floods, several shelters were opened throughout the Rio Grande Valley including at least one—the Mercedes Dome Safe Center in hard-hit Hidalgo County—that was specifically designated for families that had been exposed to COVID-19. Governor Abbott warned Texas citizens that traditional approaches to hurricane preparedness (eg, friends and family coming together) would need to change in the era of COVID-19. The governor's comments presaged the likelihood of Hanna-related COVID-19 cases developing among family members and friends who doubled up and sheltered together in homes during the storm. The experience of Hurricane Hanna, involving moderately severe hurricane hazards—and therefore requiring limited evacuation and sheltering operations, but affecting a region with proliferating COVID-19 transmission—will serve as an example when assessing capabilities for responding to much stronger storms anticipated in the upcoming months.

The 2020 Hurricane Threat

The National Hurricane Center predicts that 6 to 10 hurricanes will form during the 2020 hurricane season. La Niña conditions are likely to prevail during the most

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active hurricane months, creating conditions conducive for hurricane development. Climate change has been increasing Atlantic hurricane activity over recent decades, producing storms that collectively are stronger, wetter, and slower moving over populated coastlines.^{1,7} Within a span of less than 3 years (ie, from October 2016–September 2019), 5 category 5 Atlantic hurricanes made landfall in the US and Puerto Rico (Dorian, Irma, Maria, Matthew, and Michael), and 2 category 4 storms (Florence and Harvey) produced torrential rains and extreme flooding.

Coastal populations at risk for climate-driven Atlantic storms are already straining to contain the escalating spread of COVID-19. The predicted above-average hurricane season suggests that these states must also prepare for layered hurricane and pandemic disaster scenarios. Hurricane Hanna just underscored the urgency. During the week in late July when Hanna made landfall, hospitals in the 8 hurricane coastal states were dealing with increasing numbers of COVID-19 cases. Some hospitals attempted to deal with the surge by rapidly discharging medical patients and converting medical units to the care of patients with COVID-19. Intensive care unit capacity had been exceeded in some locales; for some health care systems, supplies of liquid oxygen were becoming scarce. In Miami-Dade County, Florida, and other large urban centers, mayors authorized hospitals to off-load noninfectious convalescent COVID-19 patients to area hotels to complete their period of quarantine. With increasing COVID-19 caseloads and growing numbers of ill staff members, health care professionals were being imported from other states to compensate for clinical personnel shortages. Hospitals throughout the region, working in tandem through their health care coalitions, are preparing for hurricane contingencies, such as widespread power outages while large numbers of COVID-19 patients require mechanical ventilation and high-flow oxygen, and the prospect of transferring patients among medical centers due to flooding or structural damage.

Best projections suggest that in the likely scenario that powerful Atlantic hurricanes make landfall along the hurricane coast during the months of August through November 2020, COVID-19 will still be actively circulating. This suggests that there is substantial risk for both serious injury and drowning during exposure to hurricane hazards among persons who refuse to evacuate, and COVID-19 transmission occurring due to exposure to infectious persons during evacuation and sheltering in public venues and households.

Strategies to Reduce Risks

Three steps could be taken to help diminish combined hurricane and COVID-19 pandemic risks during the coming months. First, reestablish the COVID-19 prevention lifestyle.¹ Steeply rising COVID-19 case numbers and death rates throughout the hurricane coast is sufficient justification for reinstating physical distancing and related mitigation strategies that have proven effective.⁸ As the peak of hurricane season approaches, measures that can prevent pandemic proliferation also diminish risks when convergent disaster events occur. What is unknowable is precisely if, when, and where Atlantic hurricanes may occur. What is perfectly knowable is that COVID-19 is currently putting populations throughout every hurricane coastal state in potential double jeopardy during hurricane season.

Second, improve communications to shape safer evacuation and sheltering. One of the major challenges faced at the moment is effectively crafting the complex messaging about the competing and compounding risks in a clear, concise, compelling manner.⁹ Communication strategies must activate and motivate populations to evacuate away from severe storm threats and shelter safely. Messaging must overcome fear-dominated and paralyzing COVID-19 inertia that might prompt many to remain in vulnerable households in the path of oncoming storms. Clear guidance must be provided regarding safer sheltering practices in settings away from coastlines, often with friends and family, that prioritizes wearing masks, physical distancing, maintaining ventilation, washing hands, and cleansing surfaces.

Third, learn from each 2020 storm and refine operations. The US has never experienced the twin risks of the COVID-19 pandemic overlaid upon climate-intensified hurricane threats. As such, much remains unknown. Emergency, public health, and health care professionals need to rapidly distill lessons learned from affected communities during Hurricane Hanna and with each 2020 storm and transmit best practices to their counterparts. This could be helpful to iteratively refine preparedness and response for storms arriving later in the season.

These 3 strategies, if implemented immediately and forthrightly, could improve response and possibly save lives during the uncertain coming months, and also could pave the way for more sophisticated disaster management in future years.

ARTICLE INFORMATION

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