CASE STUDY

Compounding Crises of Our Time During Hurricane Laura

Climate Change, COVID-19, and Environmental Injustice

On August 27, 2020, Hurricane Laura hit the coast of Louisiana, one of the strongest hurricanes to ever affect the state. The storm caused at least 28 deaths in Louisiana[1] and at least $12 billion in economic damage.[2] Climate change is intensifying hurricanes and other extreme weather events (**see Box 1**).[3,4]

BOX 1

Climate change, extreme weather, and health

Human-caused climate change is driving an increase in stronger, more rapidly intensifying, slower moving, and wetter hurricanes. Tropical storms have higher storm surges and more flooding, and the areas vulnerable to these weather events have been shifting.[3–9] Climate change is also increasing the frequency, length, and intensity of extreme heat days, leading to compound hurricane-heat events.[10,11] A research methodology called "detection and attribution" allows researchers to determine how much of an influence climate change had on the severity of an extreme weather event.[12,13] While it is too early to determine to what extent climate change contributed to Hurricane Laura, climate change has been shown to intensify other hurricane events through detection and attribution studies.[14,15] These intense storms and compound weather events impact health in numerous ways, including physical injury and death, loss of essential services such as electricity and shelter, acute and long-term mental health impacts, destruction of social and healthcare services, financial hardship, displacement, exacerbation of chronic diseases, and more.[16,17]

Hurricane Laura deeply affected Black and low-income communities that were already struggling with health and economic devastation resulting from decades of targeted industrial development and from the more recent impacts of the COVID-19 pandemic.[1,18] The hurricane hindered the pandemic response and exacerbated environmental pollution. This event highlights how the crises of climate change, COVID-19, and environmental injustice intersect to disproportionately impact communities of color and low-income communities, compounding health risks and deepening existing health inequities.

A legacy of environmental racism and pollution in Louisiana

Hurricane Laura's impacts were centered in southwest Louisiana, around the City of Lake Charles in Calcasieu Parish, a region affected by high levels of racial residential segregation, poverty, and unemployment (**see Table 1**).[19–21] The region has some of the highest levels of toxic industrial emissions in the country,[22] stemming from the hundreds of oil, gas, and chemical facilities situated along the Louisiana coast, including a dozen new petrochemical facilities approved in the parish in recent years.[23]

Data on racial and economic disparities in exposure to toxic air and water pollution show Lake Charles is among the worst cities in the U.S. for multiple Environmental Justice Index indicators.[24] One result of this environmental racism (**see Box 2**) is the region's disproportionately high rates of cancer, asthma, chronic obstructive lung disease, premature death, low birthweight infants, and depression.[25–27]

TABLE 1.

Selected socio-demographic characteristics of Calcasieu Parish.

Race/Ethnicity	Percent of Parish Population	Percent Living Below Poverty Level	Percent Unemployed
Non-Hispanic White	70.2%	12.1%	4.2%
Black	24.9%	29.2%	9.9%
Two or more races	2.3%	24%	9%
Hispanic or Latino	3.4%	20.5%	6.9%

Source: 2018 American Community Survey 5-year Estimates (Tables S1701, S2301, DP05)

BOX 2

Environmental racism

Environmental racism is racial discrimination in environmental policymaking and the enforcement of regulations and laws that deliberately target communities of color for toxic waste disposal and polluting industries, sanction the life-threatening presence of poisons and pollutants in communities of color, and exclude people of color from mainstream environmental groups, decision-making boards, commissions, and regulatory bodies.

Adapted from Benjamin F. Chavis in the Foreword to "Confronting Environmental Racism, Voices from the Grassroots."

COVID-19 pandemic is deepening health risks and inequities

Mirroring national patterns, COVID-19 is disproportionately impacting Black communities in Calcasieu Parish (**see Table 2**).[28] The legacy of unequal environmental risk exposure may be contributing to this. Early research suggests that chronic exposure to hazardous air pollutants, such as those from the petrochemical industry, may be associated with increased COVID-19 morbidity and mortality rates.[29,30]

TABLE 2.

COVID-19 cases and deaths for Blacks and Whites in the Calcasieu Parish.

Race	Cases per 100,000	Deaths per 100,000
Black	4680	138
White	2670	138

Source: Louisiana Department of Health, 10/14/2020

The economic collapse caused by the pandemic is further exacerbating factors that harm health and create inequity. Louisiana lost over 200,000 jobs — an 11% drop — in the early months of the pandemic, and the unemployment rate rose to 13% — its highest since the mid-1980s.[31] Calcasieu Parish suffered one of the highest levels of COVID-19-related job losses in Louisiana, due in part to its reliance on the gambling and gaming industry, which predominantly employs people of color.[32,33] The parish also has a high level of households at risk of eviction due to severely high rent burden and COVID-related job losses.[32] Food insecurity in the parish is expected to increase to nearly 20% this year as a result of the pandemic (**see the Case Study**).[34]

Hurricane Laura and its immediate aftermath

Heavy winds, storm surge, and inland flooding led to catastrophic impacts, destroying houses and infrastructure, disrupting water systems, necessitating a near total rebuild of the electric grid, and severely damaging nearly all of Calcasieu Parish's school buildings.[35–37] Hundreds of thousands of residents were left without power or access to safe drinking water. Three weeks after the hurricane, mandatory evacuation orders remained in place, half of all residents remained without electricity, and the majority remained under a boil water advisory.[38,39] The lack of electricity was deadly – nine people in Louisiana died from carbon monoxide poisoning associated with generator use.[40] Essential social infrastructure also suffered, as the parish's public schools remained closed for weeks following Laura, senior living centers and low-income housing units were unable to provide adequate services for residents, and many people were threatened with eviction as a result of storm damage to their rental housing.[41]

Healthcare services, already stressed by COVID-19, were heavily impacted. Sixteen hospitals in the state were forced to evacuate, and the largest hospital in Lake Charles severely curtailed services for several weeks because of a lack of electricity and water.[42]

A heatwave immediately followed the hurricane in Louisiana, part of a nationwide heat event, and the heat index rose to 110°F (43°C) in some areas.[43] This heatwave worsened health risks for many, particularly those who lost electricity and outdoor workers removing debris and repairing power lines. At least eight Louisianans died of heat-related illnesses.[40]

A series of cascading failures

The region has faced multiple industrial disasters during prior hurricanes,[44] and Laura was no exception. Many industrial facilities in the state released millions of pounds of toxic emissions during shut-down procedures in the days prior to the storm, with more emissions following as a result of storm damage and power outages.[45] In one notable example, the BioLab chemical plant just outside of Lake Charles caught fire due to hurricane damage, releasing chlorine gas and other hazardous pollutants (**see Figure 1**).[46] Residents were told to shelter-in-place, close their doors and windows, and turn off their air conditioning units to protect themselves from exposure, despite the heatwave.

FIGURE 1.

BioLab chemical plant fire outside of Lake Charles in Louisiana due to damage from Hurricane Laura.

Source: Associated Press, David J. Phillip (rights purchased).

The full extent of hurricane-related toxic pollution is unknown, in part due to inadequate environmental monitoring and reporting standards and infrastructure in Louisiana. Five of the seven regional air monitors were offline following the storm, further limiting the ability to understand air quality impacts. Climate-related industrial disasters are likely to increase over time unless updated construction and emergency planning requirements are put into place to address industrial facilities, the safety of the surrounding "fenceline" communities, and other climate change-related hazards.

Response to Hurricane Laura hampered by COVID-19

The COVID-19 pandemic hindered the hurricane response.[47] Many of the 1.5 million people under evacuation orders were reluctant or unable to evacuate, likely due to a variety of reasons including concerns about increasing their infection risk and existing economic hardships. These concerns were even further compounded because emergency shelter options were already limited due to COVID-19. The pandemic also weakened essential disaster response infrastructure by, for example, interrupting critical supply chains, taxing healthcare workers, and straining healthcare facilities.

At the same time, the hurricane increased the risk of COVID-19 transmission in both evacuation and destination communities as people sheltered in other people's homes or at emergency shelters.[48–50] Laura also interrupted Louisiana's COVID-19 response; all testing facilities were temporarily shut down, and only a small fraction of evacuees in shelters were tested for COVID-19.[51]

What the future holds

The full health damages of Hurricane Laura will not be known for some time. In addition, an understanding of how climate change contributed to the storm will also lag, but it is clear that the intensity of hurricanes is likely to increase as climate change worsens. Hurricane Laura came just hours after evacuation orders for Hurricane Marco were lifted. Hurricanes Sally and Delta followed, prompting new evacuation orders and causing further devastation in regions still early in recovery from Hurricane Laura.

Protecting health and well-being in the face of the multiple interacting challenges of racial, environmental, and health inequities requires a holistic set of solutions. Prioritizing the voices of residents and community advocates in designing solutions is essential to protecting communities made most vulnerable by environmental racism, COVID-19, and climate change. Many local environmental justice organizations are leading such advocacy efforts across Louisiana, and these efforts should receive further investment. At a policy level, it is critical to address systemic racism by strengthening environmental and zoning regulations to protect health, ensuring equitable access to safe and quality housing and healthcare, and building the climate resilience of health and social infrastructure through investments that prioritize equity.