The Rhode Island Climate Change and Health Program: Building Knowledge and Community Resilience

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ABSTRACT

Climate change acts as a risk multiplier, meaning vulnerable populations bear a disproportionate burden of its effects. Improving climate resiliency is a key strategy to help the Rhode Island Department of Health meet its overarching goals of addressing the socio-economic and environmental determinants of health for all Rhode Islanders. The Climate Change and Health Program focuses on both the immediate health impacts of climate change and building resiliency. Part of the US Centers for Disease Control and Prevention's Climate Ready States and Cities Initiative, the Program has partnered with community groups and other state and local agencies to bring technical assistance, educational resources, and funding to support community resilience to the challenges presented by the already changing climate. Specific projects discussed include the extreme heat communications plan and outdoor worker campaign; community-driven resiliency projects in response to flooding and natural hazards, and improving resilience in senior citizen housing.

KEYWORDS: climate change, resilience, public health, extreme heat, climate mitigation

INTRODUCTION

Climate change, health, and equity are inherently intertwined.[1] The impact of race and socio-economic status on health has been evident in the disparate outcomes seen across populations during the COVID-19 pandemic.[2] These same communities bear a disproportionate burden of the effects of climate change.[1] Because climate change is a risk multiplier, improving climate resiliency is a key strategy to help the Rhode Island Department of Health (RIDOH) meet its overarching goals of addressing the socio-economic and environmental determinants of health for all Rhode Islanders, especially those from the most vulnerable demographics. As incidences of heatwaves and flooding increase, RIDOH focuses on addressing immediate health impacts and building resiliency among Rhode Islanders.[3]

MAKING RHODE ISLAND A CLIMATE READY STATE

The RIDOH Climate Change and Health Program began as part of the US Centers for Disease Control and Prevention's (CDC) Climate Ready States and Cities Initiative. This initiative is part of the CDC's efforts to train medical and public health professionals to better understand the impact of climate change on health.[4] The CDC provides resources for the professional community that include research papers, maps, and links to webinars from the American Public Health Association covering climate-related topics such as heart and lung health, children's health, mental health, and allergies and asthma.

Two notable data resources include the Heat and Health Tracker and localized climate change and health data. The Heat and Health Tracker is an online tool to help emergency and public health planners prepare for and respond to extreme heat events by providing local-level heat and health data.[5] Localized data for climate change and health, including future scenarios for heat and precipitation to the year 2099, can be found on the CDC's National Environmental Public Health Tracking Network portal.[6]

The Rhode Island Climate Change and Health Program began in 2013 and continues to focus on health effects from urban heat, flooding, severe weather and sea level rise, food and water borne diseases, vector-borne diseases, and poor air quality. (See **Figure 1** for more information about the health effects of climate change.) The program has partnered with community groups and other state and local agencies to bring technical assistance, educational resources, and funding to support community resilience to these challenges.

ADDRESSING EXTREME HEAT IN RHODE ISLAND

Extreme heat has become an increasing threat across Rhode Island as the average temperature has already risen three degrees in the last century.[3] During the climate normal period (1981 to 2010), there was an average of 9.3 days equal to or above 90 degrees Fahrenheit (F) in the Providence Metro Area each year.[7] There is variability in this number year-to-year. While there was an average of 11 such days each year from 2010 to 2014, there were 19 such days in 2021 (see **Figure 2**). It could increase to as many as 27 days at or above 90 degrees F per year by mid-century with slow action to reduce greenhouse gas emissions.[8]

Figure 1. Climate change causes a range of direct and indirect impacts on human health. This figure depicts the most significant climate change impacts (rising temperatures, more extreme weather, rising sea levels, and increasing carbon dioxide levels), their effect on exposures, and the subsequent health outcomes that can result from these changes. (US Centers for Disease Control and Prevention, 2021.)

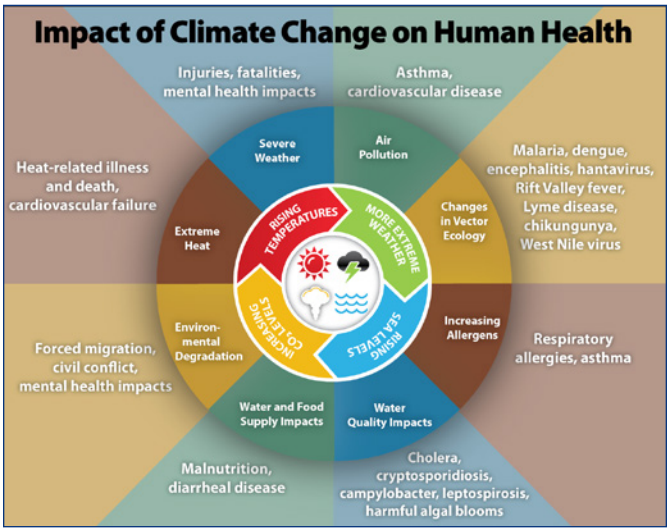
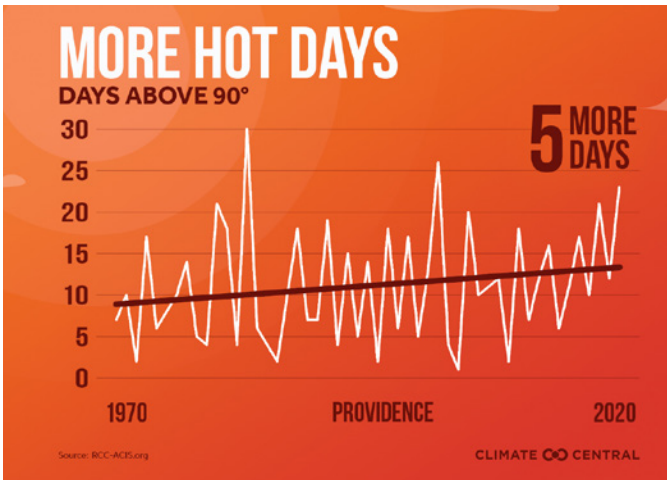


Figure 2. In the Providence Metro Area, there are an average of five more days per year above 90 degrees than there were in 1970. (Image provided by Climate Central.)



Extreme heat events are a leading cause of weather-related injury and can result in the worsening of existing illnesses. Extreme heat can cause increases in cardiovascular events leading to hospitalization.[9] When Rhode Island sees multiple days of temperatures above 80 degrees F, emergency room visits begin to rise.[10]

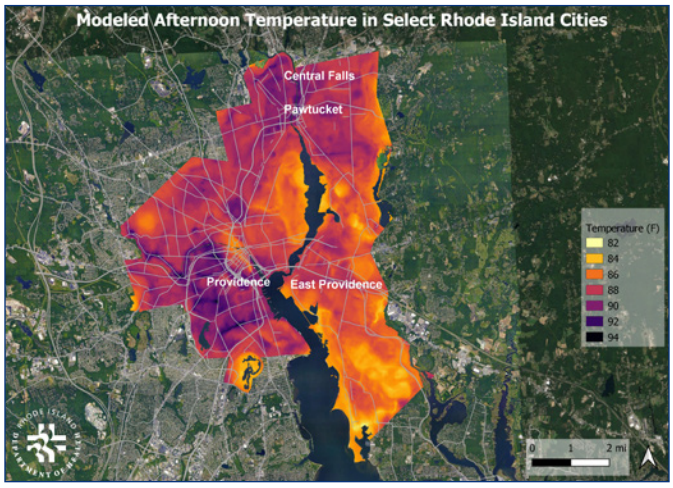
Alarmingly, a recent study shows that one quarter of the US population had heat-related symptoms during the summer 2020.[11] This was largely due to a lack of cooling resources and the social isolation that was part of the COVID-19 pandemic. The interaction between the two health crises expanded the scope and range of vulnerability to heat across the country. This research showed that when COVID-19 disrupted social networks, people were less able to seek comfort and suffered more from the symptoms of heat stress.

The effects of heat are not felt evenly across communities. Evidence shows that low-income communities with little tree cover and those that were formerly redlined are up to 12.6 degrees F hotter than surrounding neighborhoods.[12] Redlined areas are those that were coded as "high risk" by the Federal Housing Administration starting in the 1930s. Often based on race, these neighborhoods were denied government loans and services due to land use and other concerns. In Rhode Island, we see similar disparities across neighborhoods in Providence and surrounding urban areas, especially when it comes to heat and tree cover.

To create and implement more effective interventions, the neighborhoods and communities with the highest vulnerability and exposure need to be identified. Collaborating with researchers at CAPA Strategies, based at Portland State University, the Program in partnership with the Department of Environmental Management's Division of Forest Environment and American Forests mapped ambient air temperatures and humidity in Providence, Pawtucket, Central Falls, and East Providence in July 2020.[13] **See Figure 3.** The results showed that many Providence neighborhoods warmed by 10 degrees F more than others, indicating substantially higher exposure to heat. Many areas also stayed warm at night, maintaining temperatures above 70 degrees F and depriving residents of critically important time for the body to recover from heat stress experienced during the day.

To combat the effects of extreme heat in Rhode Island, the Program developed a heat communications plan and outreach for specific vulnerable populations. Implementation

Figure 3. Modeled afternoon temperatures in Providence, Pawtucket, Central Falls, and East Providence, based on data from CAPA Strategies Heat Watch Rhode Island Program, July 29, 2020.



of the extreme heat communications plan includes sending email notices to primary care providers before heat events and using social media to inform the public about heat safety and heat alerts issued by the National Weather Service. Other interventions have included trainings for outdoor workers about the dangers of heat exposure and a *Beat the Heat* campaign with both television and radio advertisements. Grants have been provided to local emergency management officials for portable misting stations; to the Providence Housing Authority and the Town of Barrington for educating seniors about the dangers of heat and natural disasters, and to youth groups for heat-related outreach campaigns.

COMMUNITY-DRIVEN RESILIENCE FRAMEWORK

One way that the Program works to build overall resilience in a community is by building up program supports and social networks. These networks help to create social cohesion and places for residents to turn during an emergency.[14,15] It is important to empower the communities most affected by climate change to design resiliency programs that address the realities of their lived experience. One way that RIDOH builds community support is through the Health Equity Zone (HEZ) initiative. The HEZ initiative is a place-based approach that brings communities together to address systemic changes at the local level. Each HEZ identifies the unique social, economic, and environmental factors that are preventing people from being as healthy as possible.[16]

The Climate Change and Health Program worked with HEZs in Providence, Pawtucket, Central Falls, and Newport to support community resilience to the effects of climate change. Through community workshops, the Program helped residents assess their strengths and vulnerabilities associated with climate change and identify strategies to reduce climate hazards. After the workshops, each team surveyed their own communities to identify strategies and develop a community-led intervention.

The HEZ in the Olneyville neighborhood of Providence chose to create a film about the historic 2010 floods. (The film is available to view at: https://vimeo.com/359888817/6c75fdddfe). The film aims to raise awareness of the dangers presented by the increasing frequency of natural disasters. It works to transform the threat of a major disaster into a tangible reality so that residents feel a greater sense of urgency regarding emergency preparation. The film was screened at multiple events and will continue to be used in schools and with community groups.

BUILDING RESILIENCE IN RESPONSE TO NATURAL GAS OUTAGE

During a gas outage in January 2019, National Grid was forced to shut down a portion of its gas distribution system to over 7,000 customers in Newport for more than one week. Evacuations forced people from their homes, and information was limited and inconsistent. This led to a feeling within the community that their needs were not being met by the established emergency management procedures and was fueled by underlying inequities that are often revealed in times of crisis.

During this time, the Newport HEZ became an important part of the effort to share information and reach vulnerable community members. The HEZ leaders realized that there was not a well-defined emergency response plan, nor was there the capacity locally to carry a plan out.

After the event, community conversations about climate change provided opportunities for residents to receive disaster-preparedness training and supplies and to establish relationships with public officials. Creating connections between agencies, officials, and communities increased cohesion and will hopefully lead, both directly and indirectly, to better health outcomes by ensuring that local needs are addressed and plans are in place before disaster strikes.

EMPOWERING COMMUNITY PARTNERS FOR RESILIENT CLIMATE MITIGATION

In Pawtucket and Central Falls, the nonprofit group Groundwork RI partnered with Southside Community Land Trust and Farm Fresh RI's Harvest Kitchen for a six-week summer youth program. These community partners employed and trained 24 youth on how to grow, process, and cook their own local produce. The youth also worked to engage residents and gather data regarding resilient climate mitigation strategies. By the end of the summer, they completed 25 green home assessments, planted 21 trees at Baldwin Elementary school in Pawtucket, installed nine raised garden beds at resident homes, and collaborated with the City of Pawtucket to install and deliver seven residential rain barrels to reduce flooding and utility bills.

IMPROVING EXTREME WEATHER RESILIENCY IN SENIOR HOUSING

Older adults are vulnerable to extreme weather because they often have limited mobility and must shelter in place. This is especially true for those who live in independent senior housing or assisted living. To help make these spaces more resilient to natural disasters and other emergencies such as power loss, the Program partnered with the Yale New Haven Health System Center for Emergency Preparedness and Disaster Response to support long-term care, assisted living, and independent living senior housing facilities in preparing for climate-related disasters through energy resiliency audits and the development of all-hazards emergency plans that emphasize sheltering in place. These important emergency preparedness actions reduce risk to senior citizens

by limiting disruptions like power outages or flooding that can force the evacuation of medically vulnerable people. By increasing the overall emergency preparedness levels of the facilities that serve them and allowing them to shelter in place, seniors are safer. Resources from the project include a facility self-assessment tool, shelter-in-place plan templates, staff trainings, and webinars.[17]

PROGRAM RESOURCES AND WEBSITE

Resources are available from the Program for a variety of topics, including extreme heat, air quality, and climate literacy. Partnerships with other RIDOH programs such as the Center for Acute and Infectious Disease Epidemiology have allowed the development of educational tools related to vector-borne diseases like Lyme disease, Eastern equine encephalitis (EEE), and West Nile virus, along with emerging diseases like Zika virus. Links to our reports, brochures, and videos are available on the Program webpage.

The Program has also focused on providing resources to help teachers bring environmental health and climate change into their classrooms. Partnering with school nurse teachers, the two programs have provided thousands of copies of the *Tick Workbook for Kids* to classrooms across the state.

CONCLUSION

The effects of the changing climate in Rhode Island are far-reaching in terms of the scope of the systems impacted, types of impacts, and people who are impacted. At RIDOH, we are continuing these efforts and remain committed to supporting climate change mitigation strategies, preparing for the human health effects, and working closely with community partners to help improve the resilience of all Rhode Islanders.

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Disclosure

The content, proposals, and opinions within this document are those of the authors and do not necessarily represent the official position of or endorsement by the Centers for Disease Control and Prevention.

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