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Emergency Sheltering & Cooling Center Practices in Connecticut

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I. Introduction

Future climate scenarios for Connecticut predict that extreme precipitation and extreme heat events will occur more frequently and that sea levels will rise.[1,2] Additionally, regional projections for the entire Northeast forecast severe hurricanes and coastal storms happening more often.[3]

One strategy to protect human health and safety against these threats includes provision of facilities that offer safety from exposure to direct and indirect impacts of extreme weather conditions and events.

Temporary emergency shelters are the most common shelter facilities that provide temporary refuge to people displaced by emergency events such as floods, hurricanes, and extended power outages. They can offer on-site services such as reliable electricity and running water, beds, and heating or cooling to support a safe and secure living environment for the duration of an emergency and its aftermath to individuals and families.

Another type of shelter, cooling centers, are air-conditioned or cooled buildings that are available to the public and designated as safe spaces specifically from extreme heat. The Centers for Disease Control and Prevention (CDC) recommends designation of cooling centers, along with extreme heat response plans, to help prevent heat-related illness and death among vulnerable populations, including those without access to air conditioning.[4] Populations vulnerable to poor health outcomes associated with extreme heat exposure also include people with chronic conditions (e.g. kidney disease, diabetes, and heart disease), as well as senior citizens and very young children, due to reduced thermoregulatory function.[4]

Recognizing the value of shelters and cooling centers to increasing resilience of Connecticut's populations to the negative health impacts of climate change, the Connecticut Department of Public Health (DPH) identified a need for a baseline assessment of Connecticut practices. DPH staff worked with staff from the UConn Connecticut Institute for Resilience and Climate Adaptation (UConn CIRCA) and a Yale School of Public Health graduate student, whose participation was funded by the Yale Center on Climate Change and Health, developing and distributing a survey to gather data on temporary emergency shelters and cooling centers in Connecticut. The approach followed those used in both New York and California for obtaining municipality-level shelter information.[6,7] The primary survey objective was to organize and analyze information to inform public health officials and climate resilience planners in the development of best management practices of cooling centers and temporary emergency shelters, as first recommended by the Governor's Council on Climate Change.[8]

Details of survey content, distribution, and results are presented here as the first publicly available inventory of shelters and cooling centers and analysis of sheltering practices in Connecticut. As the response rate for the survey ranged from 36% (60 towns providing completed surveys) to 59% (99 towns with completed and incomplete surveys), the results of

this survey are preliminary. Findings presented here are thus considered preliminary assessments of shelter and cooling center practices in Connecticut and are intended to encourage more robust information exchange in the future among shelter management, emergency response, and public health stakeholders.

II. Survey Content and Distribution

The survey was created and distributed in 2020 using Qualtrics, an online survey platform. Content and questions were informed by a similar survey.[6] In total, it was comprised of 27 multiple choice-type and short answer-type questions divided among four main sections focused on respondent contact information and affiliation, temporary emergency shelters, cooling centers, and general information about local emergency management and emergency preparedness within municipalities. Respondents were instructed to complete the survey based on shelter operations during the previous year, 2019, as the COVID-19 pandemic and response likely altered the sheltering operations in 2020. The survey was initially piloted by colleagues and professionals for feedback prior to official distribution and was estimated to take 20-30 minutes to complete.

The target population for survey completion was professionals with knowledge of or direct experience with shelter and cooling center management and operations throughout the state and within all 169 local municipalities of Connecticut. Accordingly, the survey was distributed to 257 local health directors, local emergency management directors and regional Councils of Governments (COGs) throughout the state. The method of distribution was via an email that included introductory information and a link to the survey that remained active from September 2 to October 2, 2020. A copy of the survey is currently available at CIRCA's website.

We received 68 completed survey responses and an additional 49 partially completed responses which varied from 25% to 97% completion. As a result, survey questions varied in the number of total responses. Overall, we received responses from all nine COGs, however, with unequal town-specific response rates that varied from 36.8% to 100% across the COGs. One possible explanation for the low response rate is that the survey was distributed during September 2020 when the number of COVID-19 cases were increasing and attention of potential respondents in the target population was diverted to pandemic response.

III. Temporary Emergency Shelters

Connecticut temporary emergency shelters are operated with assistance from local, regional, and state partners, according to the survey results, with predominant management from emergency management and local chief elected officials (see Table 1). Nationally, and as described in the Connecticut State Response Framework, equipment allocation and food or water provisioning at shelters beyond immediate provisions often is based on similar levels of coordination.[9,10]

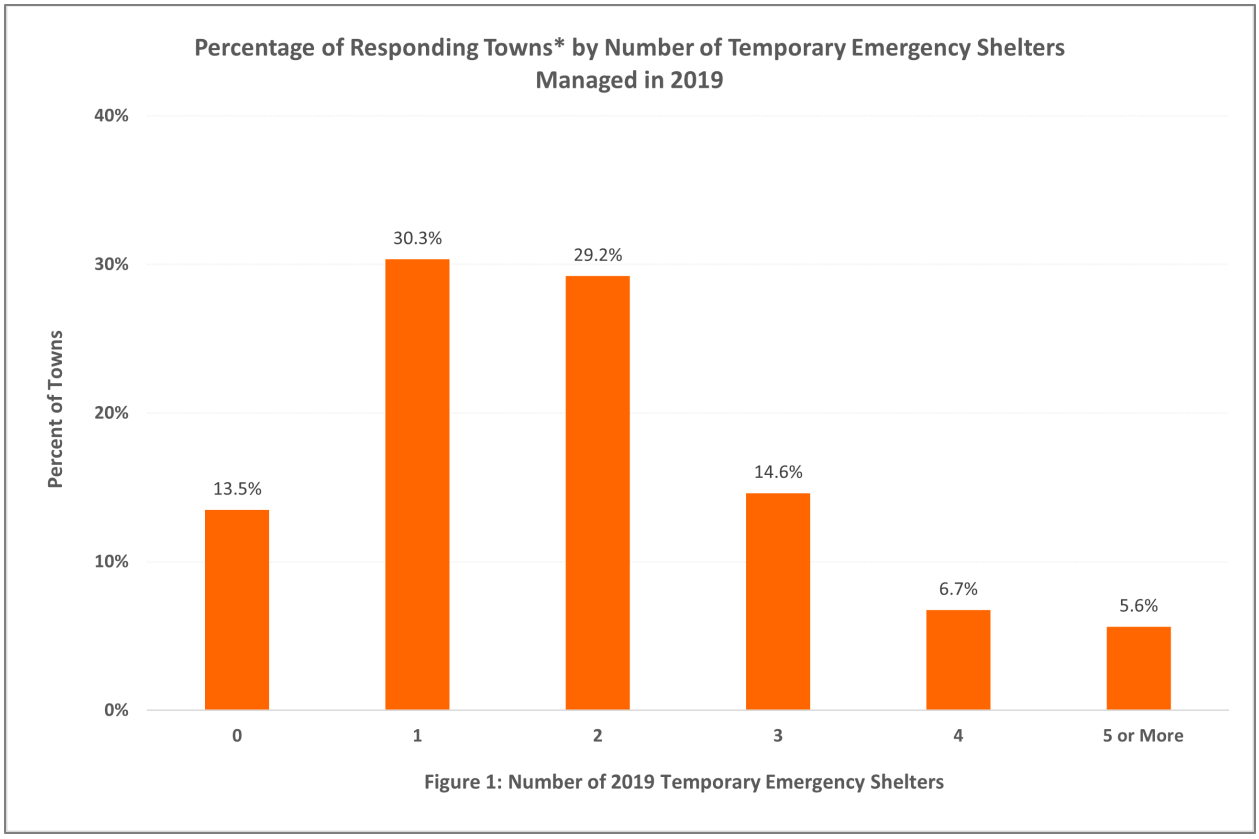

Figure 1: Number of 2019 Temporary Emergency Shelters

Provisional survey results also indicated that temporary emergency shelters are locally available and almost always based in public buildings. Among the 89 Connecticut towns that responded, counts of the total number of emergency shelters in their jurisdictions in 2019 ranged from zero to ten. Most frequently, one shelter per town was reported to be available, but overall, the majority (>50%) of towns indicated that at least two shelters were available locally (see Figure 1). Most shelters were public schools, senior centers, and other community/hospitality centers. Among these building types, most often, shelters were located at public schools, including elementary, middle, and high schools. Fire stations/departments, libraries, churches, municipal offices, homeless shelters, and a mall were also all named as shelter facility types.

Table 1: Support, Advertisement, and Amenities (Emergency Shelters)

Organizational Support Types	Methods of Advertisement	Amenities
Local Emergency Management Director	Social Media	Bathrooms
First Selectman/Mayor	Online	Electrical outlets
Local Health Department	News/media/press release	ADA access
Volunteers	Text-based service	Back-up power
		Seating area
		Cold clean drinking water

Entries provided here represent a cumulative 50% of responses after reordering from greatest frequency of responses to lowest. This also included the response that surpassed 50% cumulatively.

Table 1 provides information on common communication strategies about shelter availability, as well as amenities at shelters in 2019, as provided by survey respondent towns. Only two towns indicated that shelters were advertised in multiple languages. Limited variety of communication types can limit certain populations during an emergency event, particularly those without access to WiFi, phone services, or translation services. Provided transportation was seldom listed among the survey responses, which may indicate limited physical accessibility to shelters for at-risk populations.[11] Additionally, the amenities and operating processes are similar important elements for shelter planning.[12] Proper amenities are important to provide a respectful environment and reduce mental health issues among displaced individuals.

Organizational support in shelter operations was predominantly provided by the local emergency management director, the chief elected official, local health department, and volunteers. The frequency of health department involvement was around 10%.

IV. Cooling Centers

Of the 89 towns that responded, almost a third reported that they did not offer cooling centers in 2019 (see Figure 2). Towns with cooling centers most frequently had one available per town. The remaining approximate one-third of towns reported availability of between two and six cooling centers in 2019.

Cooling centers frequently overlapped temporary emergency shelters, with 43% of cooling centers of described as being based in the same facility/location as shelters. The majority of cooling centers were offered in public libraries, senior centers, and government and municipal

office buildings. Availability of temporary cooling spaces, as well as planning around heat response plans, was also reported by respondent towns. While 29 towns reported having a heat response plan, only 5 of the 29 towns had a publicly available heat response plan. Heat response plans, in addition to heat watch/warning systems and education, are a useful public health measure to reduce the health effects due to extreme heat.[18,19]

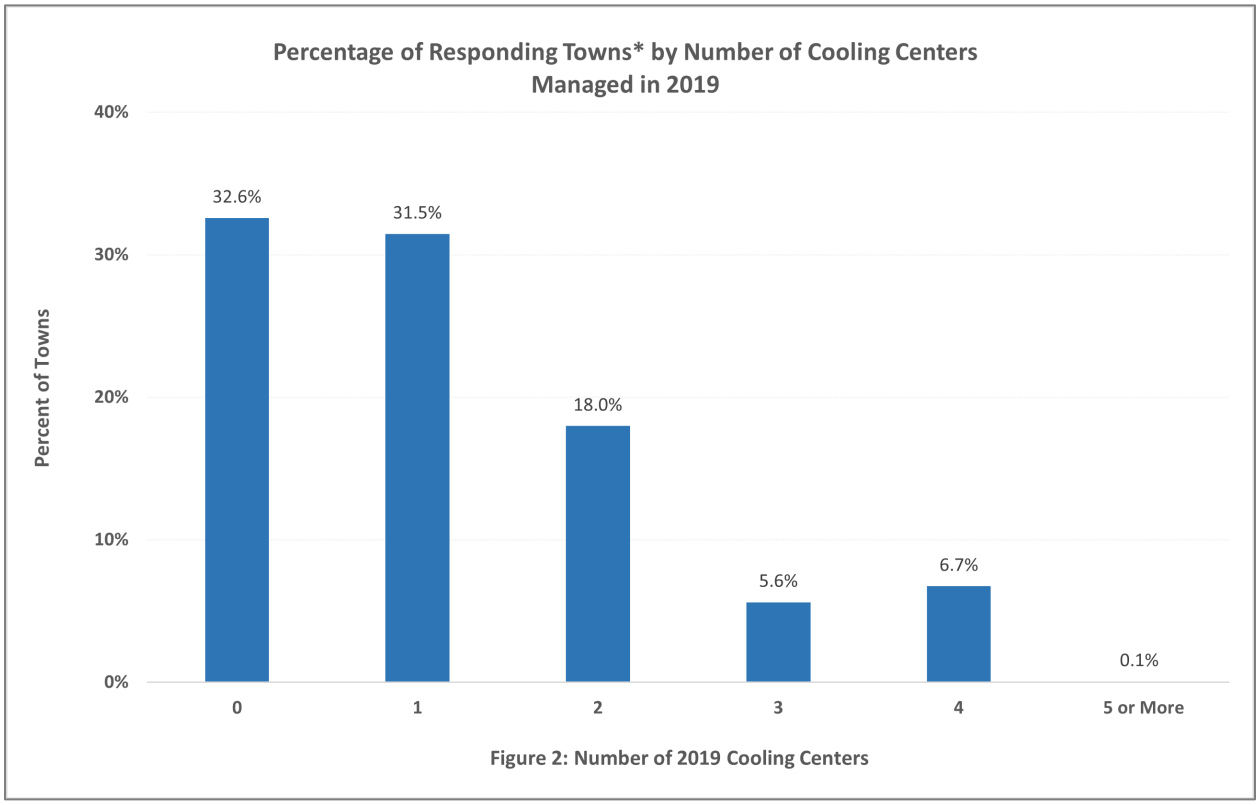

Figure 2: Number of 2019 Cooling Centers

In Connecticut, cooling centers are operated and managed, according to preliminary survey results, predominantly by the local emergency management director and the chief elected official, with less frequent support from employees at the planned shelter and the fire department. The frequency of health department involvement was slightly less than 10%. (Table 2).

Table 2: Support, Advertisement, and Amenities (Cooling Centers)

Organizational Support Types	Methods of Advertisement	Amenities
Local Emergency Management Director	Online	Air-conditioning
First Selectman/Mayor	Social Media	Seating area
Employees at the planned shelter	News/media/press release	Bathrooms
Fire Department		Cold clean drinking water
		Electrical outlets
Entries provided here represent a cumulative 50% of responses after reordering from greatest frequency of responses to lowest. This also included the response that surpassed 50% cumulatively.		

Like emergency shelters, knowledge of types of communication strategies and available amenities can identify how the primary threat (in this case, heat) is being mitigated and how comfortable a cooling center might be to the general public. Often, more amenities will appeal to more people, which can help prevent more heat-related illnesses during an extreme heat event. Greater amenity access at cooling centers can also foster a greater sense of community and social cohesion.[5,13] Social capital and social networks were protective of the elderly during the 1995 Chicago heat wave.[17] Common amenities and types of advertisement/communication for Connecticut cooling centers described by respondent towns are provided in Table 2.

V. Key Considerations

In future efforts to collect this information, the team will consider dissemination of initial survey results via formal presentation to stakeholder groups, which should be helpful to increase the response rate for future similarly focused surveys. This has shown to be an effective strategy in a cooling center survey performed in New York State.[6] With the preliminary results, the following recommendations are provided to aid future stakeholder collaboration and resilience planning:

- With a higher response rate, spatial analysis of the locations of cooling centers and emergency shelters could be used to assess access to these sheltering services by vulnerable populations to inform future resilience planning, such as availability along existing transit routes and walkability from affordable and/or senior housing. Such information can inform key statewide assessments and plans, including updates to the 2019 State Hazard Mitigation Plan. The GC3 Public Health and Safety Working Group offered the following recommendation: "PHS – 17: Create an updated Hurricane and

Storm Evacuation Plan for Connecticut...An updated plan is needed to identify and communicate evacuation routes, inland shelters (particularly those for large-scale evacuation events from the coast), critical facilities and housing in flood zones, and to develop a coordinated strategy for safe evacuation of vulnerable populations in flood-prone areas."[14] Regional and state coordination would be necessary to identify inland locations that would be of sufficient size and amenities to serve as regional shelters especially through an accessibility lens. With new flooding and climate vulnerability mapping, evacuation routes in Connecticut could be improved by identifying other places at risk of flood (especially those not already mapped by FEMA), incorporating sea level rise projections, and making them broadly available.

- With a higher response rate, the presence or absence of particular amenities could inform policy or programmatic needs to increase accessibility and address immediate needs for shelter attendees. For example, evacuating pets has been reported as a barrier to Connecticut residents.[15]
- Given the significant usage of public buildings for emergency sheltering and cooling centers, state agencies responsible for capital expenditures such as Department of Administrative Services, Office of Policy and Management, and the Department of Education can collaborate on meeting the multiple purposes that these buildings serve and rectify service challenges such as a lack of air conditioning in a cooling center.
- Future review could articulate the impacts of access barriers such as transportation, language, methods of advertisement and shelter features.
- Given the low prevalence of heat response plans among respondents and the predicted doubling of heat waves by 2050[1], the support of heat response plans under DPH's newly established Office of Climate and Public Health, supported by the CDC BRACE grant will meet an important gap. This action may also address the reduced involvement of health departments in cooling center operations.

Endnotes

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