From Neighborhood Heat Disparities to the Healthy Homes Ordinance: Community and Hyper-local Data Driving Cooling Policy in New Orleans

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ABSTRACT

Extreme heat is the leading cause of weather-related mortality in the United States, yet indoor residential environments — where residents spend the majority of their time — remain poorly characterized in heat policy discussions. In 2020, the City of New Orleans Public Health Department funded a preliminary heat field campaign to examine neighborhood-level outdoor temperature disparities during a severe heat wave, while simultaneously mobilizing community residents to document heat conditions through personal narratives, thermal imagery, and low-cost instruments. Although the resulting indoor temperature data were anecdotal and lacked the statistical power to draw strong scientific conclusions about the indoor heat environment, the combination of community storytelling, photographic documentation, and outdoor sensor evidence proved powerful in policy advocacy. Alongside legal and housing advocates and mainstream media coverage, these findings contributed to the development and codification of New Orleans' Healthy Homes Ordinance (2022), which established an 80°F indoor cooling standard — the first such standard in the city's history. This paper documents how, in the absence of robust numerical indoor heat data, imagery and first-person testimony drove an important public health policy. We reflect on the limitations of the 2020 study and briefly introduce a subsequent rigorous quantitative study of indoor residential temperatures during the summers of 2023–2024, whose findings are reported in full elsewhere (Easton-Calabria et al., 2026).

Introduction

Extreme heat kills more Americans than any other weather hazard (NOAA, 2016). Vulnerability is not evenly distributed: low-income residents of urban neighborhoods, particularly communities of color historically excluded from tree canopy, green space, and well-maintained housing, face disproportionate heat exposure (Madrigano et al., 2015; Gronland, 2014; Hoffman et al., 2020). Within a single city, temperature discrepancies of up to 10 degrees C can exist between neighborhoods, driven largely by differences in impervious surface coverage and tree canopy (Rizwan et al., 2008; Shandas et al., 2019).

While outdoor urban heat has been well-documented, far less attention has been paid to the indoor residential environment — where individuals spend the majority of their time (Klepeis et al., 2001) and where the most severe health consequences of heat occur. Indoor temperatures during heat waves are shaped by building characteristics, insulation, window orientation, AC availability, and outdoor conditions (Mavrogianni et al., 2012; Zuurbier et al., 2021). Yet at the time of New Orleans' initial heat advocacy work in 2020, there was no local data-based evidence quantifying the indoor heat burden on vulnerable residents.

New Orleans presents a particularly acute case: the city's high humidity, dense urban development, aging housing stock, and significant socioeconomic disparities combine to amplify heat vulnerability. At the same time, the city lacked any regulatory standard for indoor residential cooling. The sections that follow trace this process in detail: we first describe the 2020 campaign and the limitations of its qualitative methods, then examine how community advocacy and media coverage shaped the policy response, and finally situate these early findings within the more rigorous quantitative research that followed.

Background: The 2020 New Orleans Heat Wave and the Policy Context

The summer of 2020 brought a severe heat wave to New Orleans, with heat indices reaching 105 degrees F and 108 degrees F. The City of New Orleans Public Health Department commissioned a field campaign with the explicit goal of highlighting the most salient aspects of the urban heat environment — not to produce a comprehensive scientific database, but to generate timely and accessible information for community and policy audiences.

The 2020 campaign coincided with a moment of heightened policy attention. The COVID-19 pandemic had focused public and governmental attention on housing quality and renter protections. Advocacy organizations and legal aid groups were already mobilized around housing conditions. This context made the findings from the heat campaign unusually legible to policymakers and the public.

Methods: The 2020 Field Campaign

The 2020 field campaign deployed 11 outdoor environmental sensors (MCCI model 4832, accuracy +/-0.2 degrees C) using LoRaWAN communications in two neighborhoods: the St. Bernard neighborhood (6 sensors) and the 7th Ward (5 sensors). Sensors were housed in Stevenson screens and mounted away from buildings. Sensor readings were averaged into 24-hour bins and compared against airport weather station data from the New Orleans Louis Armstrong International Airport — the station typically used to represent citywide conditions.

For heat documentation, the campaign recruited residents citywide through the ISeeChange platform alongside nonprofit housing advocacy organizations. Neighborhoods were selected based on low income, high impervious surface cover, low tree canopy, and the presence of an anchor community organization. Residents submitted over 130 heat stories via the ISeeChange journaling phone app, documenting heat impacts across both outdoor and indoor conditions. Both FLIR thermal cameras and low-cost hygrometers were deployed to provide additional data documentation. While these were not scientific-grade instruments, the hygrometers were calibrated to provide a delta temperature difference between indoors and outdoors.

The indoor data collection in 2020 was self-reported and self-prompted. Residents and advocates submitted observations when conditions felt extreme to them. This approach was effective for gathering vivid and compelling documentation, but was not designed to produce a systematic or statistically representative sample of indoor residential temperatures. The 7 indoor observations captured during the campaign — showing cases of inadequate or failing AC, indoor temperatures meeting or exceeding outdoor temperatures, or dangerously high heat index values — are powerful illustrations of real conditions, but do not constitute a rigorous dataset from which population-level conclusions could be drawn. There was, at this stage, no strong quantitative evidence of the scale or prevalence of indoor heat waves across the city's housing stock.

Results: Outdoor Heat Disparities and Community Indoor Accounts

Outdoor sensor findings. Neighborhood sensors recorded temperatures nearly all hotter than the airport by an average of approximately 5 degrees F. The airport weather station — located in a large grassy field surrounded by swampland — consistently underrepresented the heat experienced in dense, low-canopy neighborhoods. This finding directly challenged the use of airport data as a proxy for citywide conditions and provided a credible, quantitative foundation for policy arguments about neighborhood heat disparities. Subsequently, the City of New Orleans installed a network of Weatherstem weather stations to better account for neighborhood level measurements (see discussion).

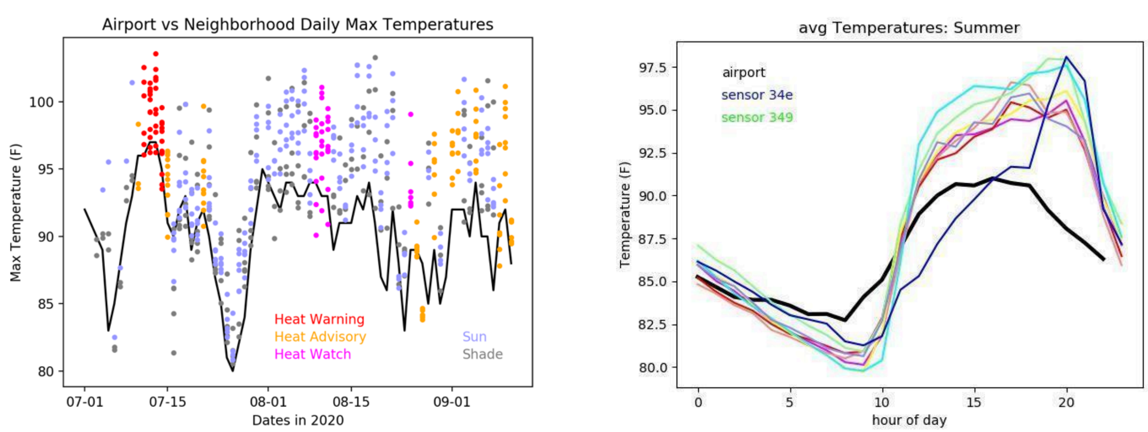

Figure 1. a) Daily maximum temperatures recorded by the New Orleans airport (dark black) and by outdoor neighborhood sensors, colored according to heat alerts in effect (left). b) Diurnal hourly temperature averages of the same dataset (right).

Figure 1a shows daily maximum temperatures for the airport weather station and all outdoor sensors placed in neighborhoods by ISeeChange. Heat warnings and advisories were triggered by heat indices above 105 and 108, respectively, rather than by temperature alone. The neighborhood temperatures were nearly all hotter than the airport by an average of about 5 degrees F. We attribute this to two reasons: the airport sensor is placed in a large grassy field according to World Meteorological Organization protocols (WMO, 2016), while the neighborhood sensors were placed in smaller yards or near driveways and sidewalks. The airport is also surrounded by swampland on two sides and Lake Pontchartrain on another, while city neighborhoods have been drained and covered with impermeable surfaces. Support for this supposition of water content driving the difference is seen in Figure 1b, showing average temperatures for each hour of the day throughout the summer. The higher neighborhood temperatures during the day can be attributed to less evaporative cooling, while at night, the somewhat higher heat capacity of water compared to concrete/asphalt leads to less cooling of the airport and higher temperatures. Sensor 34e in Figure 1b was underneath a shelter shaded by trees to the east and west, moderating the temperature until afternoon sun irradiates the sensor location directly. Lack of open sky exposure also keeps it warmer at night.

The maximum neighborhood temperatures reported vary over a range of about 10 degrees F on the same day. This could be due to sub neighborhood differences, but we must also examine the possibility that mounting directly against large poles could have an effect. The pole surfaces could heat up significantly more than air temperature, and the Stevenson screens will absorb thermal infrared radiation, biasing the measurements taken inside. If this were the case, the temperatures would be biased strongly based on sun/shade location, but the coloring shown in Figure 1a does not support this interpretation. Sensors in the sun (blue dots) and sensors in the shade (grey dots) that don't correspond to heat warnings, watches, or advisories are evenly distributed and we can accept that most of the variability is attributed to the larger surrounding.

Community indoor accounts. Thirty individual residents documented indoor heat impacts, ten renters and housing advocates specifically narrated and photographed dilapidated indoor conditions in rental apartments. Thirteen posts documented unhealthy heat and housing conditions for renters, with 6 detailing indoor-versus-outdoor conditions via text or data entry. An additional 2 posts document their indoor thermostats with photographs (See Table 1). Most posts accompanied documentation of other housing health risks and neglect ranging from holes in roofs, mold, algae matted outdoor pools, and inadequate window shades (See Figure 2). Observations included: houses that would not cool below 80 degrees F at night despite AC set at 74 degrees F; residents unable to maintain comfort despite large AC units described as essential service; indoor temperatures matching or exceeding outdoor temperatures; and tenants forced outdoors during peak heat to escape interior conditions.

Table 1. Six Indoor vs. Outdoor Heat Conditions in Rentals, New Orleans, LA (July - September, 2020)

Obs.	Date	Observation Summary	Outdoor Temp (°F)	Indoor Temp (°F)	Outdoor Humidity (%)	Indoor Humidity (%)	Temp Diff Indoor−Outdoor (°F)
1	July 11, 2020	House not cooling below 80°F at 9 PM; AC set at 74°F	95.5	—	53	—	—
2	August 09, 2020	No window AC unit in second room of shotgun house; occupants spread out to avoid body heat	92.3	84.2	60	46	−8.1
3	August 10, 2020	AC unable to maintain comfort despite large unit; heat index 104° F; AC described as essential service	91.1	77.0	63	—	−14.1
4	August 14, 2020	Rain event dropped outdoor temp 15°F; indoor temp dropped below AC cool setting	82.7	74.0	79	—	−8.7
5	September 06, 2020	Inadequate AC at apartment complex; indoor temp (91.2°F) exceeded outdoor (90°F); tenants forced outdoors to cool off	90.0	91.2	51	56	+1.2
6	September 18, 2020	AC blowing hot air for 2 months; resident sits outdoors during peak heat; indoor nearly as hot as outdoor before noon	80.4	79.5	75	—	−0.9
7	September 24, 2020	8-year AC dispute with landlord; upstairs temps exceed 100°F; veteran on fixed income; no running water downstairs	83.6	82.2	58	61	−1.4

Source: https://www.iseechange.com/sightings

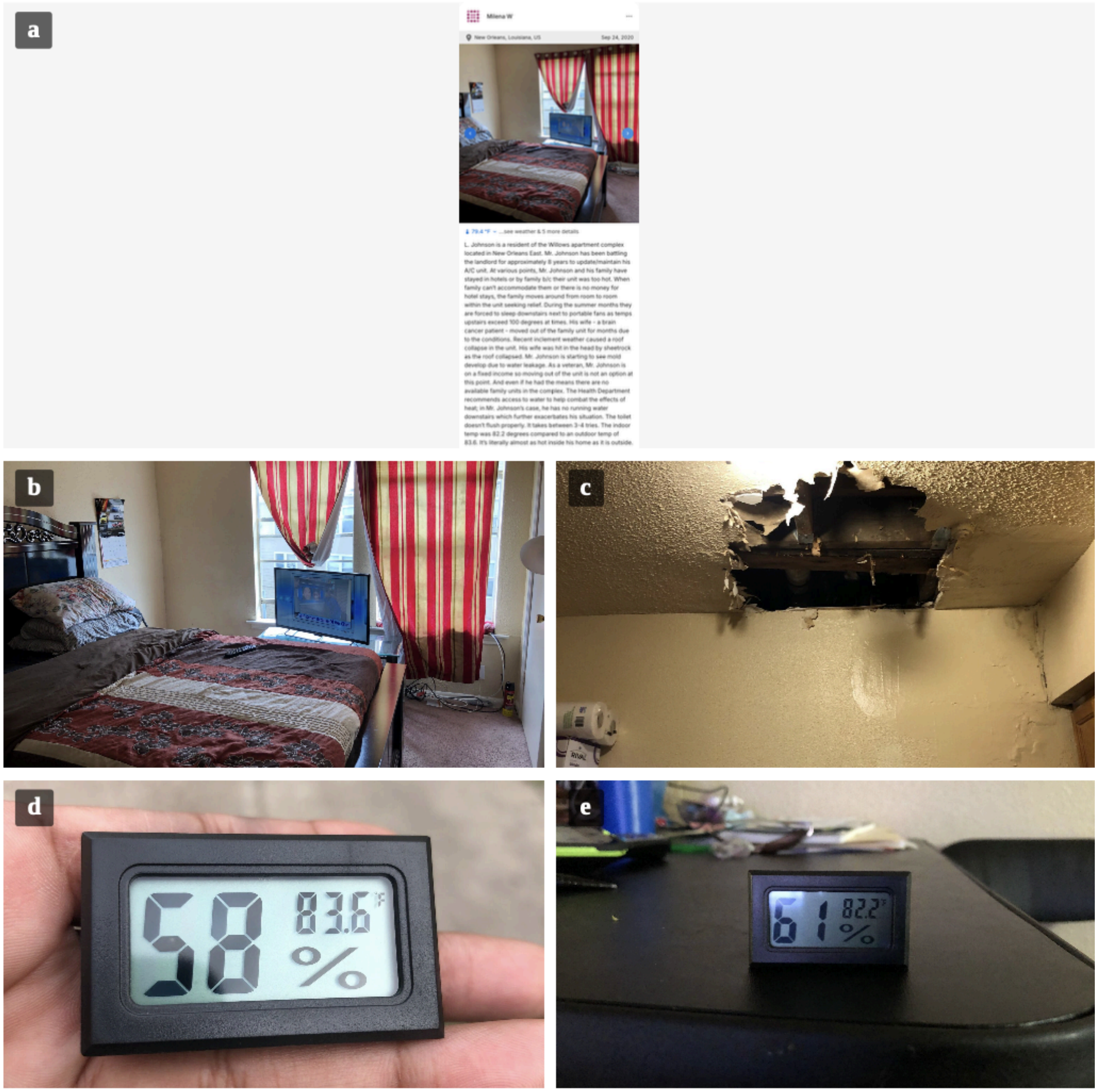

Figure 2a-e. Community-documented heat exposure at the Willow apartment complex, New Orleans East, Louisiana, September 24, 2020. a) Observation as posted on ISeeChange, illustrating how residents contribute geolocated time stamped narrative accounts alongside photographic evidence and sensor data. b) Interior of the housing unit where the resident's family sleeps during summer months; temperatures upstairs reported to exceed 100 degrees F. c) Ceiling collapse from recent weather, with visible water infiltration and early mold growth, underscoring maintenance needs in rental. d) Outdoor temperature and humidity measured with a portable sensor (83.6 degrees F, 58% RH, Feels like 87 degrees). e) Indoor temperature and humidity measured with a portable sensor (82.2 degrees F, 61% RH, Feels like 87F), a differential of only -1.4 degrees F - indicating effectively no cooling from the building envelope or mechanical systems. Full narrative text in Figure 2f.. *Source*: ISeeChange observation posted September 24, 2020. https://www.iseechange.com/sightings

> VERBATIM TEXT FROM ISEECHANGE POST — SEPTEMBER 24, 2020
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> L. Johnson is a resident of the Willows apartment complex located in New Orleans East. Mr. Johnson has been battling the landlord for approximately 8 years to update/maintain his A/C unit. At various points, Mr. Johnson and his family have stayed in hotels or by family b/c their unit was too hot. When family can't accommodate them or there is no money for hotel stays, the family moves around from room to room within the unit seeking relief. During the summer months they are forced to sleep downstairs next to portable fans as temps upstairs exceed 100 degrees at times. His wife — a brain cancer patient — moved out of the family unit for months due to the conditions. Recent inclement weather caused a roof collapse in the unit. His wife was hit in the head by sheetrock as the roof collapsed. Mr. Johnson is starting to see mold develop due to water leakage. As a veteran, Mr. Johnson is on a fixed income so moving out of the unit is not an option at this point. And even if he had the means there are no available family units in the complex. The Health Department recommends access to water to help combat the effects of heat; in Mr. Johnson's case, he has no running water downstairs which further exacerbates his situation. The toilet doesn't flush properly. It takes between 3–4 tries. The indoor temp was 82.2 degrees compared to an outdoor temp of 83.6. It's literally almost as hot inside his home as it is outside.

Figure 2f. Community observation narrative. *Source*: ISeeChange observation posted September, 24, 2020. https://www.iseechange.com/sightings

Collectively the measurements demonstrate inadequate air conditioning access for the renters, many of which detail households containing young children, elderly, and/or residents with chronic health conditions. Specifically these stories, photos, and temperature readings document highly unsafe and dangerous conditions for residents. Although there was no specific evaluation of additional conditions contributing to inadequate AC access, photographic evidence of holes in ceilings and poorly maintained windows underscore unhealthy conditions of poorly maintained rental units contributing to indoor heat. This initial study and data alongside housing advocacy organization testimonials and media stories helped incite the addition of a cooling standard to the Healthy Homes Ordinance and were included in City Council hearings on the ordinance.

These accounts were not accompanied by systematic measurements. Outdoor temperatures at the time of each report ranged from 80.4 to 95.5 degrees F; indoor temperatures ranged from 74 to 91.2 degrees F in the cases where data were provided, with indoor-outdoor differences ranging from -14.1 degrees F (well-cooled) to +1.2 degrees F (indoor hotter than outdoor). While these indoor temperatures illustrate the range of conditions, the non-systematic nature of the data means they cannot support claims about the typical or average indoor heat burden experienced by the broader renter population. The significance of these accounts lay not in their statistical weight but in their narrative power: they made visible hidden dimensions of urban heat vulnerability.

Discussion: From Preliminary Evidence to Policy

Despite the methodological limitations of the 2020 study, its findings proved unusually influential in shaping local policy. This is in part attributed to timing, framing, media coverage, and coalition-building in a politically receptive moment.

The 2020 campaign unfolded at a moment when renter protections, COVID-19, and housing quality had become urgent political priorities in New Orleans. Elevated indoor temperatures — documented through thermal images of sweltering apartments, photographs of residents sleeping outdoors, and first-person testimonies submitted through the ISeeChange platform — became powerful evidence in a political arena where advocates, community voices, and lived experience carried weight alongside formal data. The visual and personal narrative documentation created an emotional and visceral argument that numerical summaries alone could not convey.

ISeeChange data and stories were presented in City Council hearings alongside legal and housing advocate testimonials and mainstream media coverage (Flynn & Bakalar, 2021; Baurick, 2021; Winfrey, 2022). Community advocates played an essential role in translating these observations into political pressure and maintaining momentum through the legislative process. The outdoor sensor data — demonstrating that neighborhood temperatures exceeded the airport station by an average of 5 degrees F — provided a credible quantitative anchor that lent scientific legitimacy to advocacy claims about unequal heat exposure. Further validating the need for local weather data, in the wake of Hurricane Ida, in 2022, New Orleans Office of Homeland Security and Emergency Preparedness launched a partnership with Weatherstem to install 20 high-resolution weather stations across the city.

As the 2020 study was preliminary, advocates worked with ISeeChange and heat experts nationwide to develop a threshold for a New Orleans' cooling standard. Together they suggested a maximum indoor temperature of 80 degrees F, the threshold when persistent humidity in New Orleans begins to generate unhealthy heat indices. The threshold was additionally limited to bedrooms to ensure enforceability:

> " *Each rental housing unit shall have a cooling system in good working order that can safely maintain a maximum temperature of 80 degrees Fahrenheit in all bedrooms, measured at a point three feet above the floor and two feet from exterior walls.*" (City of New Orleans, 2022)

The adoption of the Healthy Homes Ordinance in 2022 established, for the first time, a municipal standard requiring indoor residential temperatures not to exceed 80 degrees F — a significant policy achievement reached largely in the absence of local numerical evidence about indoor heat exposure at the population level.

This gap — between the policy standard that was adopted and the evidentiary foundation that supported it — created both an obligation and an opportunity: the need for rigorous quantitative study of indoor residential heat in the city's most vulnerable neighborhoods. The ordinance itself created a new accountability mechanism, but measuring its efficacy required the kind of systematic indoor temperature data that the 2020 campaign had not produced. This gap is not unique to New Orleans; while municipalities around the country are moving toward policy to regulate indoor temperatures during the warm season, the empirical evidence establishing maximum "safe" indoor temperature thresholds is limited (Edwards et. al, 2025).

Limitations and Transition to Quantitative Study

The 2020 campaign was explicitly designed as a preliminary, community-engaged data collection effort rather than a scientific study. Its limitations include: self-selected and self-prompted indoor reporting; non-scientific-grade indoor instruments; a small, non-representative sample of residents; and no systematic protocol for indoor measurement timing or placement. The outdoor sensor data, while more systematic, was deployed in only two neighborhoods over a single summer, limiting its generalizability to the city as a whole. These limitations do not diminish the importance of the 2020 work — on the contrary, the community-centered, qualitative approach was precisely suited to the policy moment. But they underscore the necessity of follow-on research with more rigorous methods.

The 2020 campaign and the resulting policy roll-out prompted further investigation, in partnership with additional academic and nonprofit partners, to characterize indoor temperature environments and determine their implications for health. The subsequent study, conducted during the summers of 2023 and 2024, was designed in part to test and measure the efficacy of the 80°F cooling standard as well as its health impacts. Using Verizon Critical Asset sensors deployed in the bedrooms of 114 households across two heat-vulnerable New Orleans wards, combined with WeatherStem outdoor station data and satellite-derived solar radiation estimates, the 2023/24 campaign produced the first rigorous quantitative dataset on indoor residential temperatures in New Orleans. The findings of this study — including analysis of the role of AC type, use, and building characteristics in shaping indoor heat exposure — are reported in full in Easton-Calabria et al. (2026) and summarized below with respect to initial evaluation of the New Orleans cooling standard.

Significant predictors of maximum overnight indoor temperature include the preceding day's maximum outdoor temperature, the type of air conditioning (AC) used, and how consistently that AC is operated. Households without AC, those using window units, or those failing to run central AC consistently struggled to maintain bedroom temperatures below 80°F - a threshold defined by the local ordinance - once outdoor temperatures exceeded 90°F.

Homeowners, in contrast to renters, were more likely to be in the highest quartile of overnight indoor temperatures. Homeowners also exhibited greater variability in AC usage and higher sensitivity in summer energy expenditures regarding AC usage, potentially indicating energy-limiting behaviors.

Discussion of Quantitative Study on Cooling Standard

With increased costs to the City for additional inspection requirements, the Healthy Homes Ordinance was designed for enforceability. References to “wet bulb” temperatures or specific humidity thresholds were purposefully left out in order for inspectors to be able to simply assess access to adequate cooling in rental homes. The limitation of the standard to bedrooms, where residents sleep and require cooling to protect human health, further ensured the feasibility of the standard in New Orleans homes, which are notoriously inefficient due to its historic housing stock.

The more recent study’s quantitative assessment that many residences in heat-vulnerable neighborhoods were not maintaining adequate cooling to the threshold when outdoor temperatures exceed 90°F suggests there are specific temperature windows for inspections to assess cooling capability and optimize efficiency of resources.

Moreover, New Orleans is projected to see a significant increase in the number of days per year with highs above 90°F by 2075, running from 25 to 50 additional days depending on emissions scenarios. While access to AC is a critical adaptation tool, policies should look beyond simply providing AC to specifying which kinds of AC, structural home improvements (e.g. insulation), and comprehensive energy assistance for both renters and low-income homeowners.

Future studies are required to better understand healthy indoor temperature thresholds and to address the equity and feasibility challenges of implementing indoor cooling standards.

Conclusion

The adoption of New Orleans’ Healthy Homes Ordinance in 2022 represents a meaningful advance in urban heat policy. Importantly, it was achieved not through a traditional scientific evidence pathway, but through the strategic combination of community observation, thermal and photographic imagery, outdoor sensor data demonstrating neighborhood heat disparities, and sustained advocacy by housing and legal organizations. The 2020 heat campaign demonstrated that, under the right conditions, qualitative and community-generated evidence can catalyze policy change — even in the absence of comprehensive numerical data about the specific problem being addressed.

At the same time, the experience highlights a tension that urban climate science must grapple with: policy often must move faster than rigorous data collection allows. The indoor cooling standard of 80 degrees F was set without a local empirical basis for that specific threshold as it relates to actual indoor residential conditions across the city’s housing stock. The rigorous quantitative study that followed (Easton-Calabria et al., 2026) now provides the evidence needed to evaluate whether the standard is adequate and to guide future adaptation efforts in New Orleans and cities facing similar challenges.

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