



greenlink equity map

# Climate and Health Equity Challenges in Houston and Miami

**June 2021**

Prepared by Greenlink Analytics

## Hardly Coincidental: Climate and Health Equity Challenges in Houston and Miami

The most vulnerable communities affected by the impacts of climate change are often Black, Indigenous, and people of color (BIPOC). The impacts of harsh weather patterns will continue to hit the poorest and most marginalized communities first and worst unless action is taken to change this result. We hope to bring light to some of these climate and energy inequities, by creating a series of Greenlink Equity Map (GEM) reports looking at particular cities in the US and some of the biggest inequities faced by their residents.

Miami and Houston are two of the largest cities in the United States where the impacts of climate change strongly affect low-income communities. The Texas winter storm earlier this year caused a major power outage, leaving many in Houston without adequate food, water or shelter and resulting in many deaths. In Miami, forecasts show that residents will face the burden of higher energy costs and inadequate medical care due to the impacts of climate change and sea level rise. Healthcare inequities are especially poignant as the nation continues to respond to the COVID-19 global pandemic.

This June 2021 GEM report focuses on a snapshot of two health indicators in Miami and Houston, asthma rates and lack of health insurance, as well as their connections to race and energy burden<sup>1</sup>. Illustrating This type of health and energy data is crucial in identifying some of the most critical intervention points for progress on climate and equity. All data used in this report is taken from the Greenlink Equity Map.<sup>2</sup>

*Findings from this report include:*

- Neighborhoods experiencing the highest asthma rates in Miami and Houston are exclusively majority people of color and primarily Black.
- Disparities in health and energy burdens can be seen across income and race in Houston and Miami.
  - In Houston, over 150,000 highly energy burdened, low income households experience asthma rates above the city-wide average of 8.6%.
- ¼ of the neighborhoods in both Miami and Houston have the lowest rates of health insurance in the entire country.

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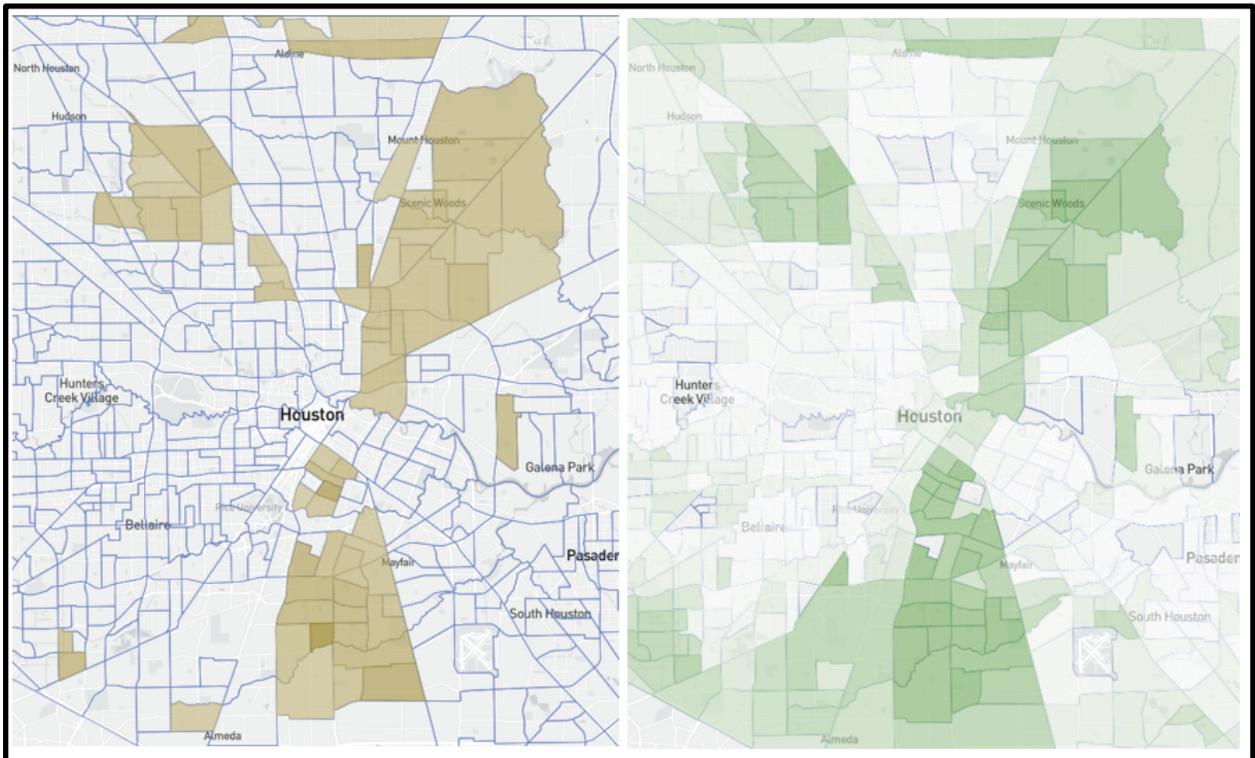
<sup>1</sup> Energy Burden is the percentage of household income spent on energy bills and helps identify inequities in communities related to energy costs. Access to health care (or healthcare stress) is the percentage of people who report having no health insurance. Asthma rates refers to the percentage of people reporting asthma in each area.

<sup>2</sup> gem.equitymap.org

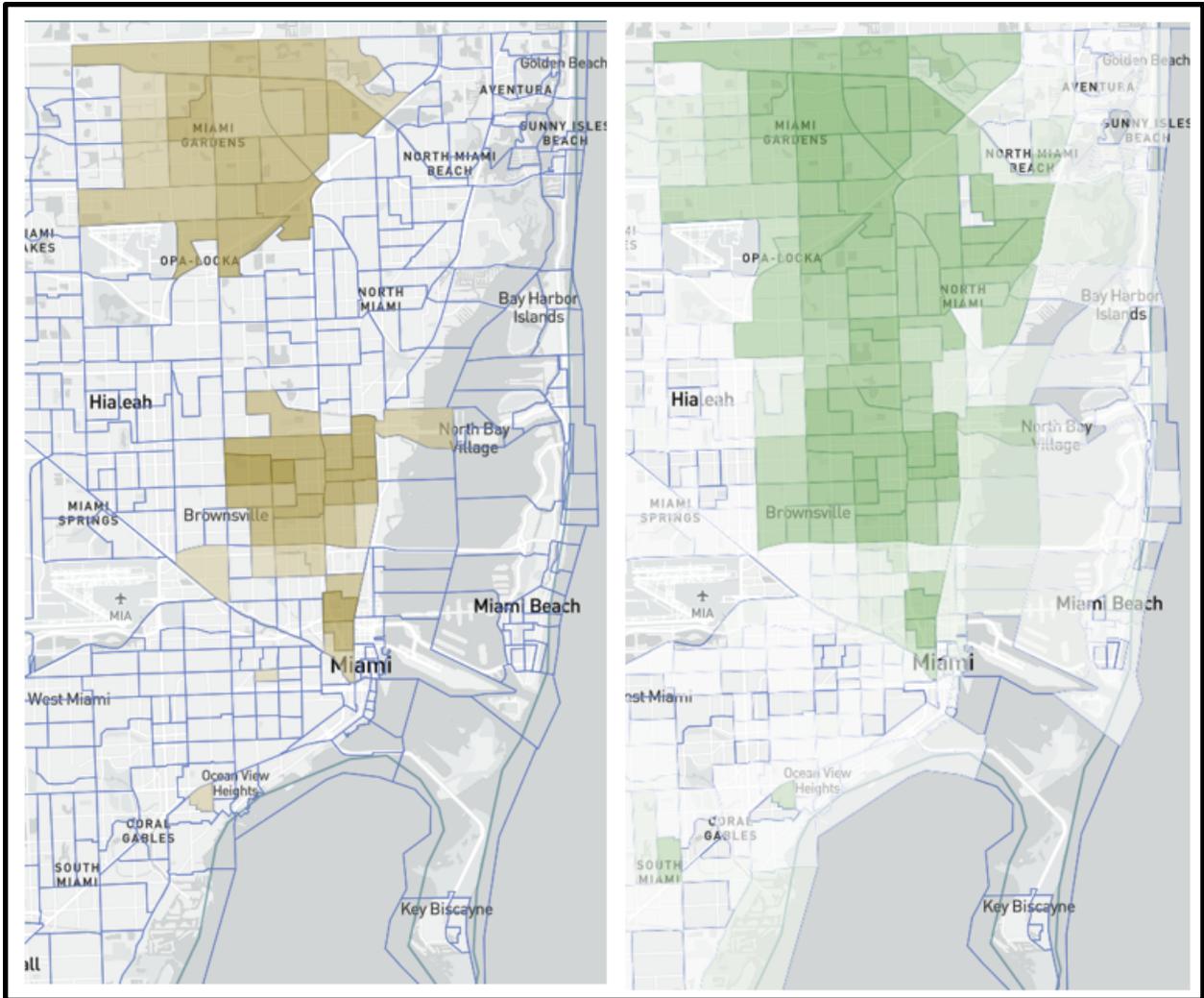
- Policy-driven investments in weatherization and energy efficiency are capable of improving health and quality of life outcomes while also reducing energy burdens.

## Black Populations Experience the Highest Rates of Asthma in Miami and Houston

Although average asthma rates for both Miami and Houston are about the same as the United States average of 8.0%, these averages don't tell the full story. Miami and Houston's highest neighborhood asthma rate is 14%. The neighborhoods with the highest asthma rates in these cities have some of the highest asthma rates in the entire country and are populated by predominantly Black residents (as shown below in Map 1 and 2). These GEM maps clearly show how the predominantly Black neighborhoods (right maps) almost perfectly align with the areas experiencing the highest asthma rates in both cities (left maps).



**Map 1: Highest Asthma Rates in Houston Found in the Neighborhoods with Predominantly Black Residents.** *Left: Houston Neighborhoods with Worst Adult Asthma Rates (~75 neighborhoods in the 90th percentile with rates over over 9.7%) Right: Share of Black Residents in Houston Neighborhoods*



**Map 2: Highest Asthma Rates in Miami Found in the Neighborhoods with Predominantly Black Residents** *Left: Miami Neighborhoods with Worst Adult Asthma Rates (~49 neighborhoods in the 90th percentile with rates over 8.1%) Right: Share of Black Residents in Miami Neighborhoods*

## Extreme Health Inequities Do Not Operate Within a Vacuum

Solely focusing on the relationship between two indicators can miss the bigger picture that inequitable burdens are often stacked on top of the same communities. Exploring energy burdens and incomes, which have been linked to health indicators in other communities, may paint a more complete picture of the health disparities in Houston and Miami.<sup>3</sup> Figures 1 and 2 show that the lowest income, highest energy burdened neighborhoods are often the same neighborhoods struggling with high asthma rates and a lack of health insurance coverage.

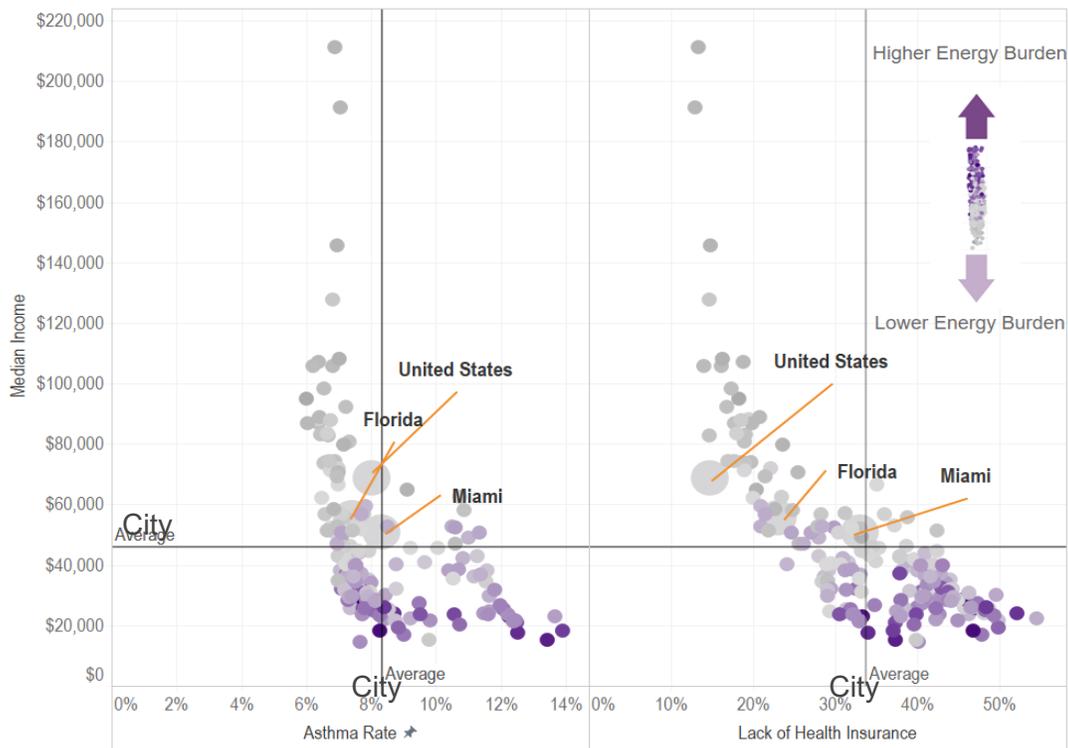
<sup>3</sup> Norton, Ruth Ann, et al. 2016. Non-Energy Benefits, the Clean Power Plan, and Policy Implications for Multifamily Housing. ACEEE Summer Study on Energy Efficiency in Buildings.

The darker color purple indicates a higher energy burden, while a lighter-grey color indicates a lower energy burden. Lower-income households in Houston bear some of the highest energy burdens and an increased risk of health issues such as asthma - in Houston, over 150,000 highly energy burdened, low income households experience asthma rates above the city-wide average of 8.6%. This quality of life issue is further compounded by a lack of health insurance coverage that is twice the national average (Figure 1).



**Figure 1: Houston’s Low-Income Neighborhoods Experience Higher Asthma Rates and A Lack of Health Insurance.** *Asthma Rate (Left) and Lack of Health Insurance (Right) compared to Income. Higher Levels of Energy Burden shown in Purple (2017 data)*

These relationships are not as strong in Miami. Similar to Houston, though, households in Miami with below-average income are also experiencing the worst energy burdens and high asthma rates (Figure 2). Miami is also generally poorer; the city-wide median income is almost 50% lower in Miami than in Houston. Health insurance access is a city-wide problem in both Houston and Miami, with uninsured rates more than twice the national average. However, averages can hide the fact that some communities are suffering more than others. A quarter of the neighborhoods in both Miami and Houston have uninsured rates that are 300% to 400% worse than the national average. These rates are among the highest levels in the country, from 42% to 61% of households lacking.



**Figure 2: Miami’s Low-Income Neighborhoods Experience the Worst Asthma Rates and A Pronounced Lack of Health Insurance. Asthma Rate (Left) and Lack of Health Insurance (Right) compared to Income. Higher levels of Energy Burden shown in Purple (2017 data)**

## Opportunities to Overcome Systemic Inequities

There is nothing uncommon about having varied health outcomes, income levels, energy burden, and racial demographics across neighborhoods. It is a telltale sign of systemic inequity when these variations become significant explainers of outcomes, especially when the same neighborhoods are consistently bearing greater burdens than others.

The cities of Houston and Miami are not unique in that their race, health, and energy disparities disproportionately affect low-income and BIPOC households. Oftentimes, these households face the highest risk when it comes to natural disasters, as experienced recently with floods, hurricanes, and severe weather in Houston and Miami.

The most valuable insights from this data are the severe disparities found in already vulnerable communities. Consider that:

- Black Americans are five times more likely to require an emergency room visit due to asthma than their white counterparts.<sup>4</sup>
- The high costs of emergency room medical care and a lack of health insurance for low-income people of color can cause severe economic stress on top of existing inequitable burdens.<sup>5</sup>
- Housing conditions are a fundamental driver of asthma attacks.<sup>6</sup>

Without increased action, these outcomes are likely to persist and grow worse as climate change impacts these communities. But energy efficiency and weatherization programs that improve housing conditions can reduce these health incidents, producing healthcare and energy savings that far exceed the investment costs. The Weatherization Assistance Program Retrospective Evaluation showed that the healthcare benefits from these investments exceed \$14,000 per home, while costs average \$4,000. In fact, the asthma benefits *alone* exceed \$2,000 per home.<sup>7</sup> Other programs and studies demonstrate significant improvements in asthma and other health conditions through energy investments as well.<sup>8, 9, 10</sup> The health outcomes in Miami and Houston are not a research or technology problem; they are indicative of problems related to the distribution of resources.

Knowing the severity of their burdens is only the tip of the iceberg but essential in the push for change through more community-driven engagement, collaboration, and policy development. The issues highlighted in this report give clear insight into the communities in Houston and Miami in need of the most attention for resources, health programs, and policy reforms. GEM data and maps highlight which communities are dealing with what levels of inequitable burdens across these two cities. These can serve as the basis for expanding efforts between governments and communities to engage in a joint meaning-making process to develop solutions to these challenges and produce a more equitable distribution of resources on their way to producing more equitable cities.

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<sup>4</sup> National Center for Health Statistics. (2019). National Hospital Ambulatory Medical Care Survey (2010-2018). U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. Retrieved from: <https://www.cdc.gov/asthma/national-surveillance-data/healthcare-use.htm>

<sup>5</sup> Norton, Ruth Ann, et al. 2016. Non-Energy Benefits, the Clean Power Plan, and Policy Implications for Multifamily Housing. ACEEE Summer Study on Energy Efficiency in Buildings.

<sup>6</sup> Robert Wood Johnson Foundation. 2009. Beyond Health Care: New Directions To A Healthier America. Princeton, NJ: Robert Wood Johnson Foundation.

<sup>7</sup> Tonn, B., E. Rose, B. Hawkins, and B. Conlon. 2014. "Health and Household-Related Benefits Attributable to the Weatherization Assistance Program." ORNL/TM-2014/345, Oak Ridge, TN: Oak Ridge National Laboratory. [https://weatherization.ornl.gov/wp-content/uploads/pdf/WAPRetroEvalFinalReports/ORNL\\_TM-2014\\_345.pdf](https://weatherization.ornl.gov/wp-content/uploads/pdf/WAPRetroEvalFinalReports/ORNL_TM-2014_345.pdf)

<sup>8</sup> WegoWise and the Green and Healthy Homes Initiative reported a 67% reduction in asthma hospitalizations from their joint program efforts. <https://www.zdnet.com/article/home-energy-retrofits-reducing-healthcare-costs/>

<sup>9</sup> Brysse, Jill, et al. 2011. Health Outcomes and Green Renovation of Affordable Housing. *Public Health Reports*. <https://journals.sagepub.com/doi/pdf/10.1177/00333549111260S110>

<sup>10</sup> Ahrentzen, S., J. Erickson, and E. Fonseca. 2016. Thermal and health outcomes of energy efficiency retrofits of homes of older adults. *Indoor Air: The International Journal of Indoor Environment and Health*. <https://onlinelibrary.wiley.com/doi/abs/10.1111/ina.12239>

## About this Report and GEM

The distributional equity issues in Miami and Houston present three common issues found in cities and communities across the United States:

- Averages don't tell the whole story - they can "smooth over" deeper equity issues (see page 2)
- Inequitable burdens are often stacked on top of the same communities - a narrow data focus on a single indicator will frequently miss the bigger picture (see pages 3-5)
- It is a telltale sign of systemic inequity when distributional differences become significant explainers of outcomes (see pages 5-6)

As climate change has become one of the biggest public health threats today, looking at cities with a health equity focus is crucial in preparing cities with community engagement, education, and intersectional collaboration.

The GEM maps in this report provide a digestible visual with neighborhood granularity of the intersection between climate change, health, and energy disparities. The maps and data found in GEM may be most valuable for certain stakeholders or for context setting to identify disparities across neighborhoods, while a more detailed analysis may be most appropriate for someone interested in calibrating what sort of interventions cities and communities should prioritize. Having performed similar solutions-focused and energy burden analysis in various cities across the United States, Greenlink Analytics is well positioned to assist in more detailed analysis of climate change and equity visualizations similar to Figures 1 and 2.

The ability to combine external data with our GEM data gives urgency to the resources needed in certain communities in the near future. This type of data can help governments, businesses, citizens, and community-based organizations work together to pave the path forward for huge leaps in clean energy technologies, equitable policies, and city health preparedness.

The GEM platform was launched in October 2020 and is used by over 300 city, community, and non-profit leaders. The purpose of GEM is to guide governments and communities toward understanding how resources and burdens are spread across communities in order to help them make informed, data driven decisions and collectively design community-centered solutions. The GEM platform offers data and insights into how different communities within a city may be more or less stressed than others along a variety of health, financial, environmental, and demographic metrics. In order to get beyond anecdotal evidence and create well targeted interventions, GEM can help illuminate the extent of these inequities and where they exist.

The creation of this tool and these reports would not have been possible without the support of our generous funders: The Kresge Foundation, Bloomberg Philanthropies, and Energy Foundation. These reports serve to highlight different equity and energy issues using our GEM data in order for users to understand how to conduct their own research in the platform for their energy and equity advancements. Addressing some of our nation's largest disparities is no easy feat, but with good data and good policy processes, communities and their governments across the country will be better prepared to achieve a cleaner, healthier, and more equitable future.