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Feeling the Heat: How Households Manage High Air Conditioning Bills

When the weather heats up in summer months, budget-constrained households may have to choose between air conditioning and their usual consumer spending. Measuring how much these households adapt their finances to hot weather can tell policymakers how significant inequality due to rising temperatures will be. Knowing how they make this choice is also important for making policy adaptions to climate change more equitable and effective.

In this report, we find that **low income households mostly maintain their usual spending and instead cool their houses significantly less than high income households do.**

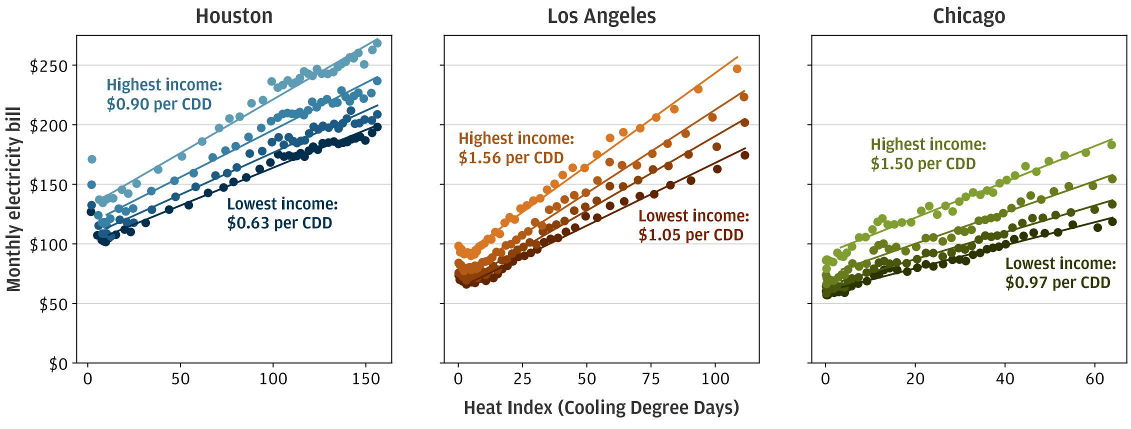
Our findings suggest that low-income households will disproportionately live in hotter homes as summertime temperatures continue to increase in future years. Moreover, the amount households would save on their electricity bills by using less air conditioning is unlikely to offset the negative health impacts of increased heat exposure.

These facts suggest that policies used to counteract inequality in heat exposure will be most effective if they change the relative price of air conditioning faced by lower-income households. Policies that provide smaller, lump-sum payments may help households with the greatest needs, but may not be effective at reducing the widespread inequality in heat exposure that we document here. And because the money saved by under-cooling is less than costs, a policy that addresses under-cooling would likely be cost-effective for low-income households and society as a whole.

We use administrative banking data from three metro areas—Houston, Los Angeles, and Chicago—to measure how households manage their electricity bills and other spending when faced with hot weather.

We Find

1 On hot days, low income households spend **37–45%** less on air conditioning that high-income households do, even after accounting for differences in house sizes. This suggests that low-income households choose to go without cooling for financial reasons.



Note: Each point denotes the average electricity bill within a Cooling Degree Day (CDD) bin in the given within-city income quartile. We use CDDs to measure the total deviation from 25°C within a billing cycle: a day with an average temperature of 26 °C is one CDD, and two such days constitute two CDDs, while a day with an average temperature of 27 °C also constitutes two CDDs. We calculate 50 quantile bins of the total number of CDDs in a 30-day billing cycle corresponding to the bill payment. Each bin is represented by its average CDD. The best-fit line is estimated using OLS regression. Sample is restricted to summer months (May to October).

Source: JPMorgan Chase Institute

2 High electricity bills appear to have limited effects on other spending for most households. An extra 95 °F day leads to less than $1 in forgone spending for the average family in Houston, with no statistically detectable effect in Los Angeles and Chicago.

Read the Full Report

JPMorganChase Institute

Data Explanation

Electricity Payments vs Heat, Split by Income Quartile

Three plots in a row, the right-most labeled Houston, the middle one labeled, Los Angeles, and the right-most labeled Chicago. The y-axis label for each plot is “Monthly electricity bill” and the x-axis label is “Heat Index (Cooling Degree Days)”. Each plot has one set of dots for each income quartile in the labeled city that shows a positive correlation between monthly electricity bills and cooling degree days. The set of dots for each income quartile are arranged in order, with the highest income quartile at the top, followed by the 3rd quartile, the 2nd quartile, and then the lowest quartile, showing that higher income people have higher electricity bills at any heat index. There is also a best fit line through each set of dots that show the slope of electricity bills per cooling degree day increases with income. Each plot has labels giving the slope for the lowest and highest income groups in each city. In Houston, these read “highest income: $0.90 per CDD” and “lowest income: $0.63 per CDD”. In Los Angeles, “highest income: $1.56 per CDD” and “lowest income: $1.05 per CDD”. In Chicago, “highest income: $1.50 per CDD” and “lowest income: $0.97 per CDD”.

Figure note: Each point denotes the average electricity bill within a Cooling Degree Day (CDD) bin in the given within-city income quartile. We use CDDs to measure the total deviation from 25°C within a billing cycle: a day with an average temperature of 26 °C is one CDD, and two such days constitute two CDDs, while a day with an average temperature of 27 °C also constitutes two CDDs. We calculate 50 quantile bins of the total number of CDDs in a 30-day billing cycle corresponding to the bill payment. Each bin is represented by its average CDD. The best-fit line is estimated using OLS regression. Sample is restricted to summer months (May to October).

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