

Distributional Patterns in Household Consumption and Prices: High-Frequency Evidence from U.S. Retail Data

University of Wisconsin-Madison, IRP Webinar

Sinem Hacıoğlu-Hoke (Federal Reserve Board and CEPR)

April 29, 2026

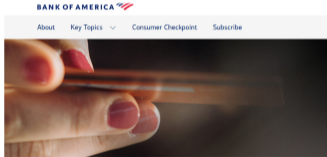
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THE WALL STREET JOURNAL.

ECONOMY | CONSUMERS

The U.S. Economy Depends More Than Ever on Rich People

The highest-earning 10% of Americans have increased their spending far beyond inflation. Everyone else hasn't.



Consumer Checkpoint: No underlying leaps in February

Consumer spending momentum is soft but stable, though there are signs **lower-income households' spending growth is slowing.**

FitchRatings

PEOPLE PRODUCT SECTORS INSIGHTS

NON-RATING ACTION COMMENTARY

High-Income Consumers Drive Strong U.S. Spending by Tapping Savings

Wed 25 Sep, 2024 - 2:02 PM ET

America's wealthiest households driving nearly half of consumer spending: Moody's

Combination of some of the work I have been doing in the last 3 years on exploring:

- **Sentiment** by income changes
- **Spending** by income
- **Prices** by income
- **Tariff effects** by income

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Data

Numerator: Data Collection, Household Attributes, Surveys

- Numerator static panel of 200K **demographically representative** panelists, anonymized
- Complete spending data collection is via an **online app**, Receipt Hog (1million+ users)
 - scan paper receipts
 - link their loyalty accounts
 - give consent for the app to scrape their emails
- We can observe **prices and quantities = spending**.
- **Households attributes**: zip code, income, employment status, age, hh size, education, marital status...
- **Surveys** to understand consumer behavior better



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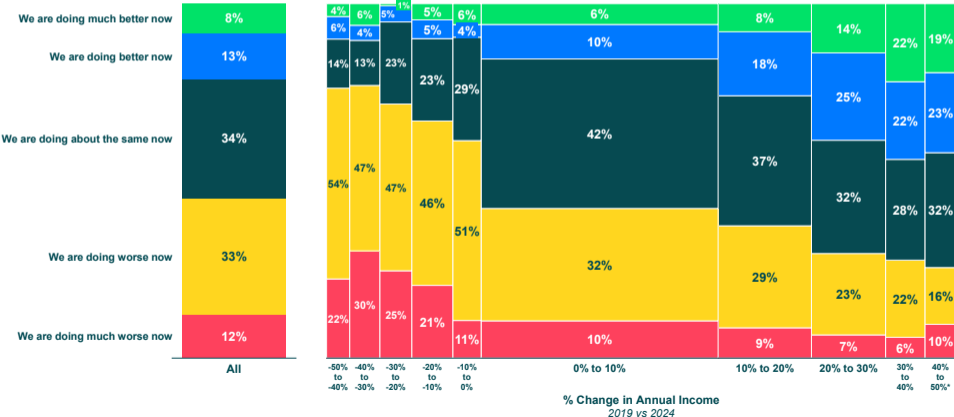
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Sentiment

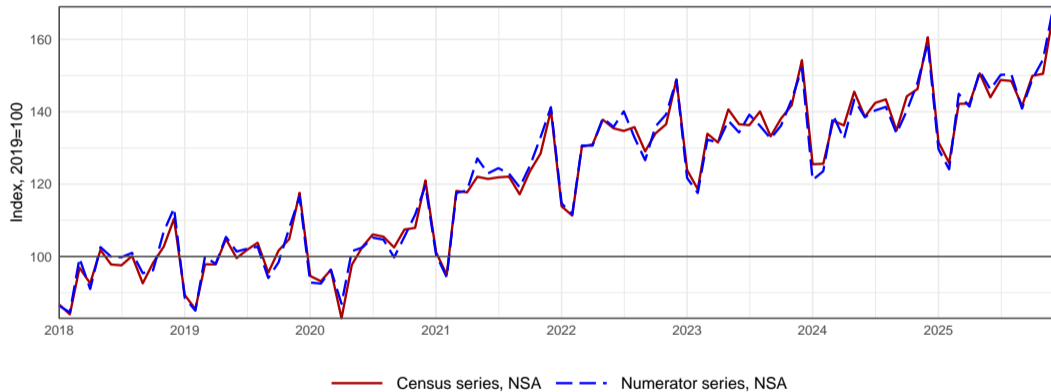
How are you and your household doing in today's economy relative to how you were doing in 2019, before the pandemic?

Source: Numerator Surveys (N=7600)



Spending

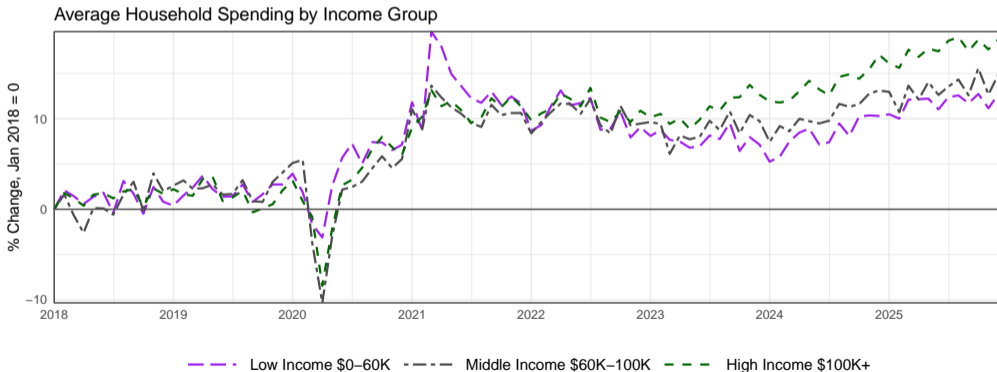
Retail sales, total excluding motor vehicles and parts constructed using Census Bureau estimates and Numerator panel data



Correlation between red and blue: 0.94 in levels and 0.83 in monthly percent changes.

Growth of average retail spending decomposed by **reported household income**, adjusted for inflation and seasonality

High-income households with income more than \$100K have been driving the strong retail spending growth post-2021.



Robust finding: spending by education and simulated income shifts using a hh survey

Prices

Price indices

A top line inflation index using item-level spending data from the data is closely tracking the officially published statistics.

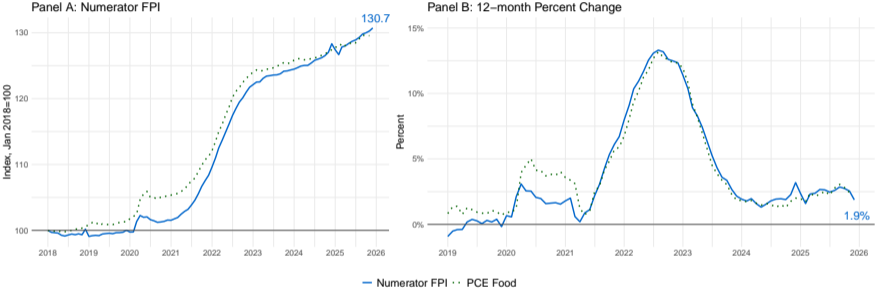
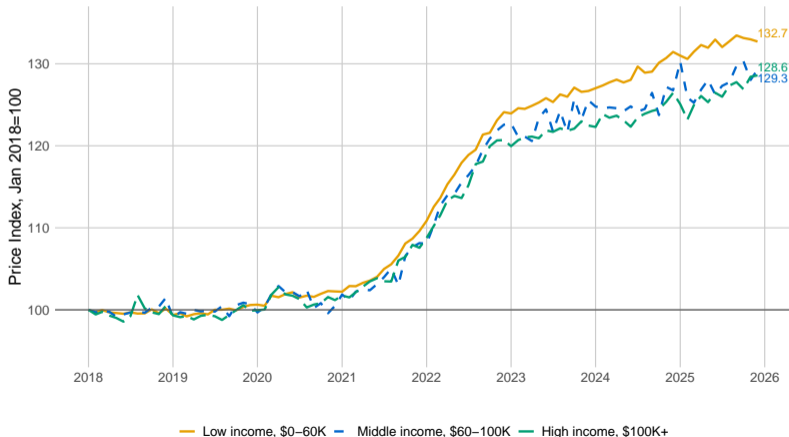


Table 1: Correlation between inflation measures and Numerator FPI

PCE Food & Bev	PCE Goods ex Auto	Core PCE	CPI	CPI Food
0.96	0.81	0.85	0.85	0.85

Price indices by income group

Low-income households have been facing progressively higher inflation rates compared to other groups since post-2021.



Tariffs, Prices and Spending

2025 Tariffs Hit Low-Income Households Hardest

- Low-income households face **nearly twice** the price pass-through (at 28 percent) of high-income households (at 15 percent) on tariff-exposed goods
- All income groups **cut spending** on tariff-exposed goods but **low-income households** bear **5–9**× the welfare cost as a share of income
- How households cope differs by income:
 - **Low-income:** absorb higher prices, little room to adjust
 - **Middle-income:** cut discretionary spending, shift basket toward essentials
 - **High-income:** adjust easily given financial cushion
- **Bottom line:** tariffs affect **low-income households disproportionately more**

Conclusion

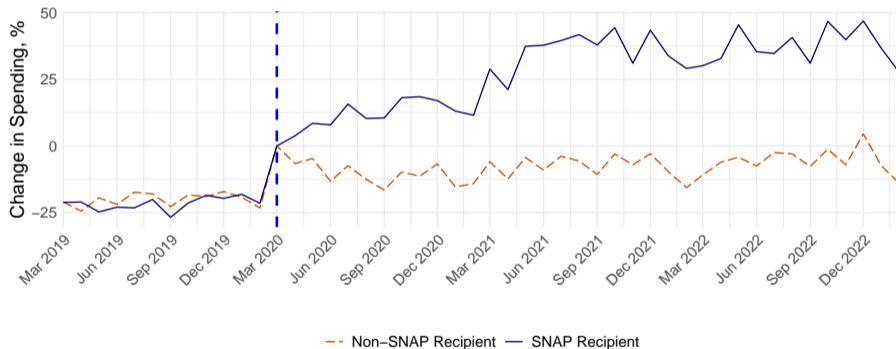
- **Consumer sentiment** moves in tandem with **lower income**.
- **Middle- and high-income households** have been fueling the strong demand for retail goods in the economy while **low-income households' spending** has been stable in the post-pandemic period.
- There have been striking **inflation** disparities across income levels that emerged in late-2021 as inflation accelerated with low-income households experiencing higher inflation rates.
- **Tariffs** lead to **low-income households** bearing a **disproportionate burden** through regressive pass-through.

Thank you!

SNAP

Food-at-Home spending of SNAP and non-SNAP recipients

Starting in March 2020, roughly until early-2023, SNAP recipients received **emergency allotments** that increased their monthly benefits substantially.



Note: Percent change in average monthly food-at-home spending of SNAP recipients (treatment group) in blue solid and non-SNAP recipients (control group) in orange dashed line. Blue vertical line marks March 2020 when emergency allotments started and is normalized to 0.

Summary, rather than big tables...

Emergency allotments during the pandemic and post-pandemic period led to more spending on

1. **Food-at-home:**

- **Necessary items:** fresh meat as well as fresh fruits and vegetables
- **Items that can be stored longer:** canned and frozen goods
- **And also** beverages, candy and snacks

2. **Some Non food-items:** More spending on health & beauty, and clothing and apparel.

Spending on SNAP declined in states that terminated emergency allotments earlier.

IRP Housing Affordability Discussion

UW IRP Affordability Webinar
Madison, WI

Gregg Colburn | April 29, 2026
University of Washington



Agenda

1. Housing Policy Context
2. Housing Affordability
3. Housing Supply
4. Housing in the Midwest



Housing Policy Context

1. Poverty

- a) OPM (2024): 10.6%, 35.9mm people
- b) SPM (2024): 12.9%, 43.7mm people

2. Food Assistance

- a) SNAP: entitlement, all eligible households
- b) SNAP (2025): 41.7mm people, 22.4mm households

3. Housing Assistance

- a) Federal housing assistance, not an entitlement
- b) Federal programs: public housing, vouchers, LIHTC
- c) Federal support: 10.1mm people, 5.2mm households

Housing Policy Context

THE THREE

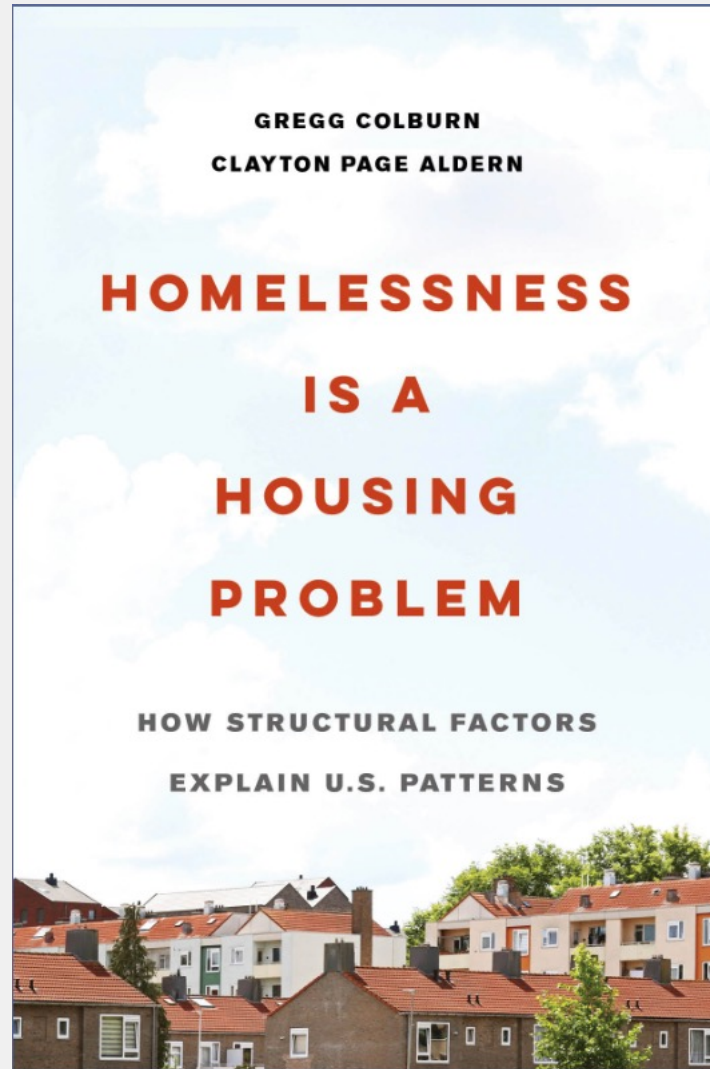
WORLDS

OF WELFARE

CAPITALISM

Gøsta Esping-Andersen

Housing Policy Context



Housing Affordability





The dynamics of housing cost burden among renters in the United States

Gregg Colburn^a, Christian Hess^b, Ryan Allen^c, and Kyle Crowder^a

^aUniversity of Washington; ^bKennesaw State University; ^cUniversity of Minnesota

Social Science Research 119 (2024) 102984

Contents lists available at [ScienceDirect](#)

Social Science Research

journal homepage: www.elsevier.com/locate/ssresearch



Cumulative housing cost burden exposures and disadvantages to children's well-being and health

Chris Hess^{a,*}, Gregg Colburn^b, Ryan Allen^c, Kyle Crowder^b

^a Kennesaw State University, United States

^b University of Washington, United States

^c University of Minnesota, United States



Racial disparity in exposure to housing cost burden in the United States: 1980–2017

Chris Hess^a, Gregg Colburn^b , Kyle Crowder^c and Ryan Allen^d

^aCenter for Urban Research and Education, Rutgers University-Camden, Camden, NJ, USA; ^bDepartment of Real Estate, University of Washington, Seattle, WA, USA; ^cDepartment of Sociology, University of Washington, Seattle, WA, USA; ^dHumphrey School of Public Affairs, University of Minnesota, Minneapolis, MN, USA

Article

Urban Studies

Rent burden and the Great Recession in the USA

Gregg Colburn

University of Minnesota, USA

Ryan Allen

University of Minnesota, USA

Urban Studies
2018, Vol. 55(1) 226–243
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DOI: 10.1177/0042098016665953
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Housing Affordability Dynamics

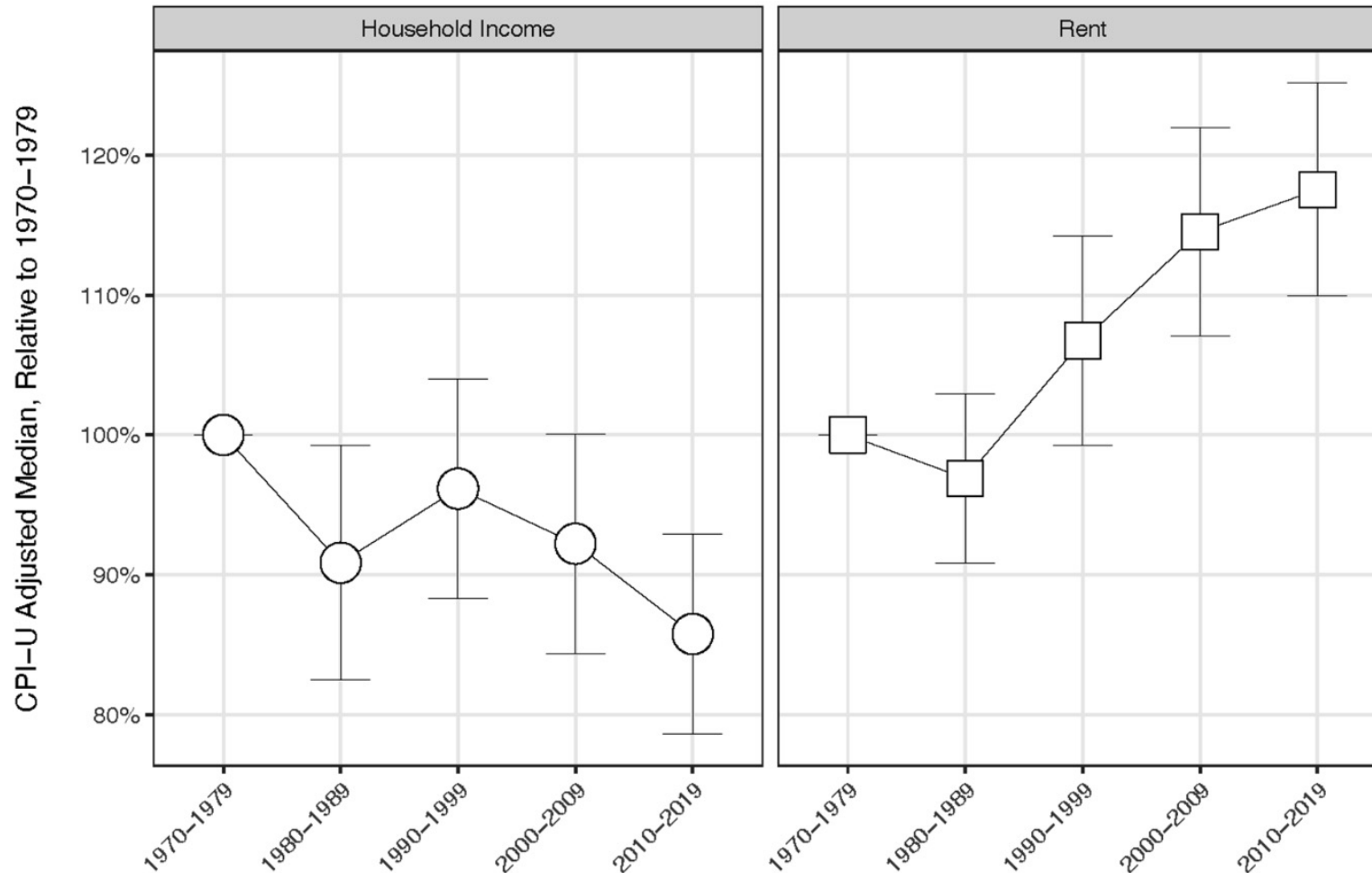
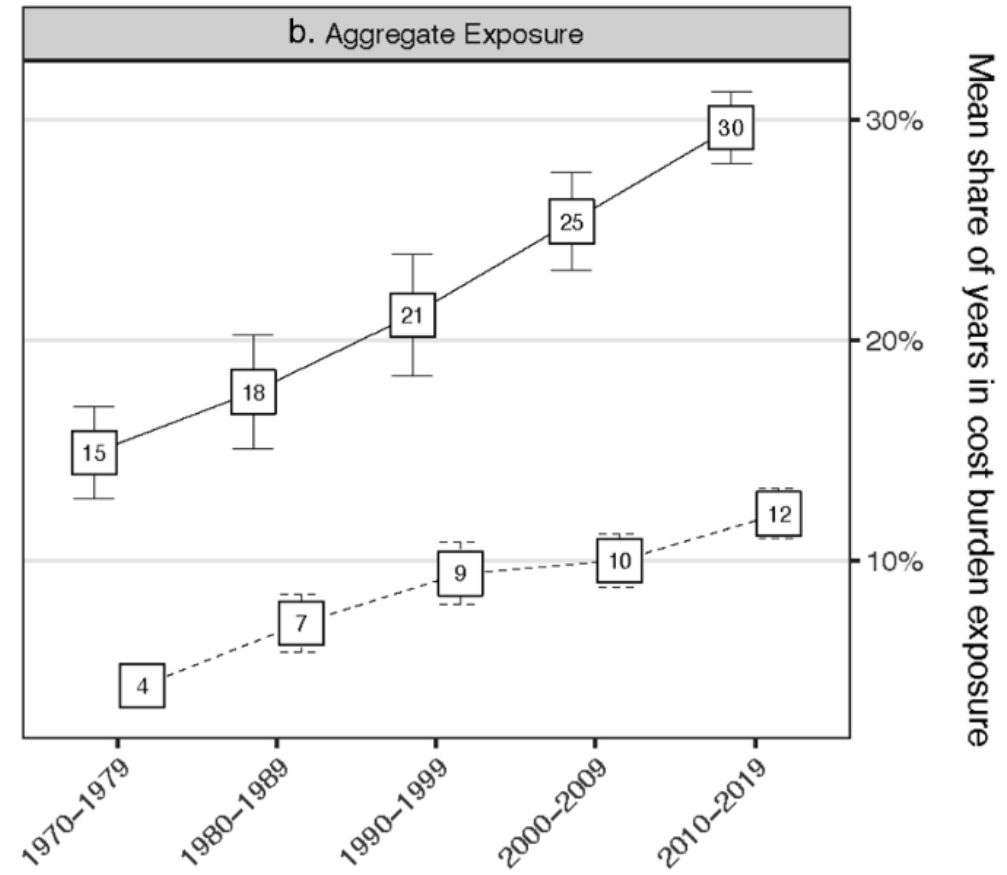
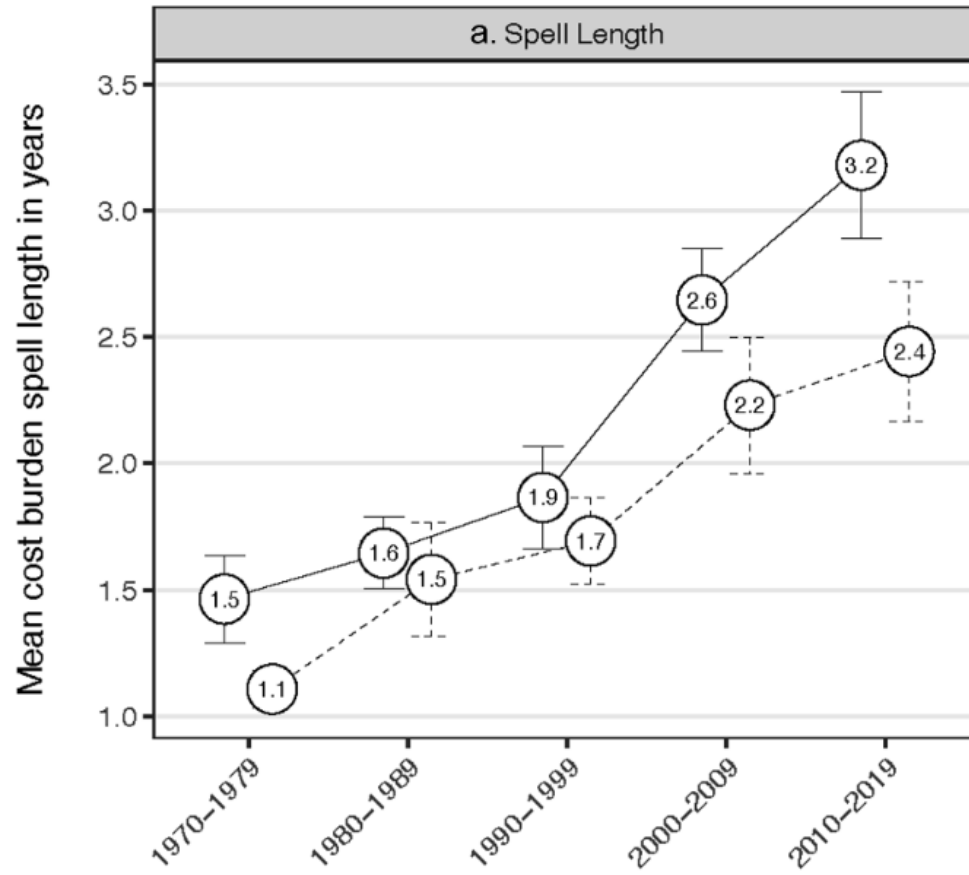


Figure 1. Trends in annual household income and rent, relative to 1970-1979 period. Ninety-five percent confidence intervals denoted with bars. Rent and income measures adjusted for inflation to 2019 dollars using CPI-U.

Housing Affordability Dynamics



Housing Affordability Dynamics

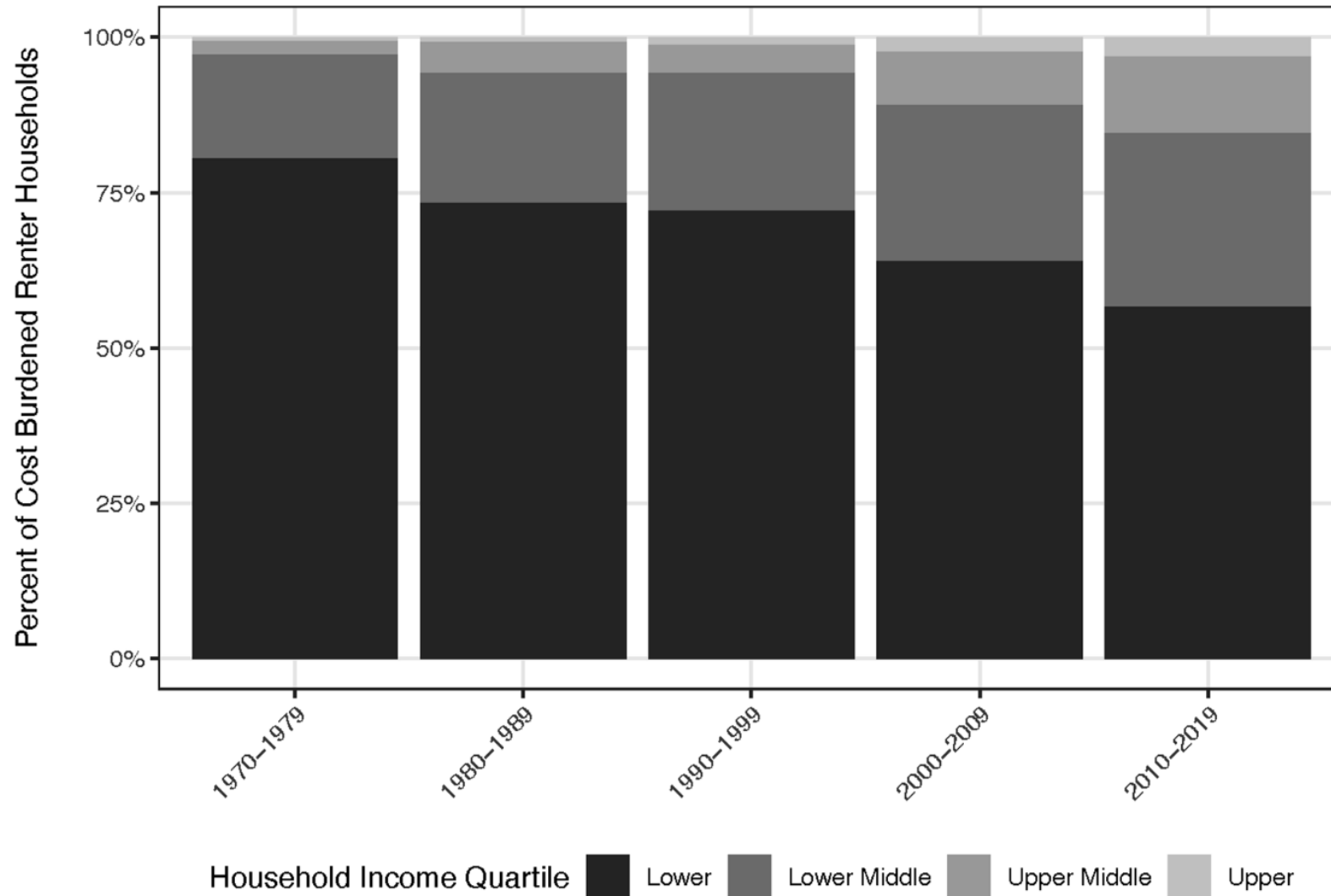
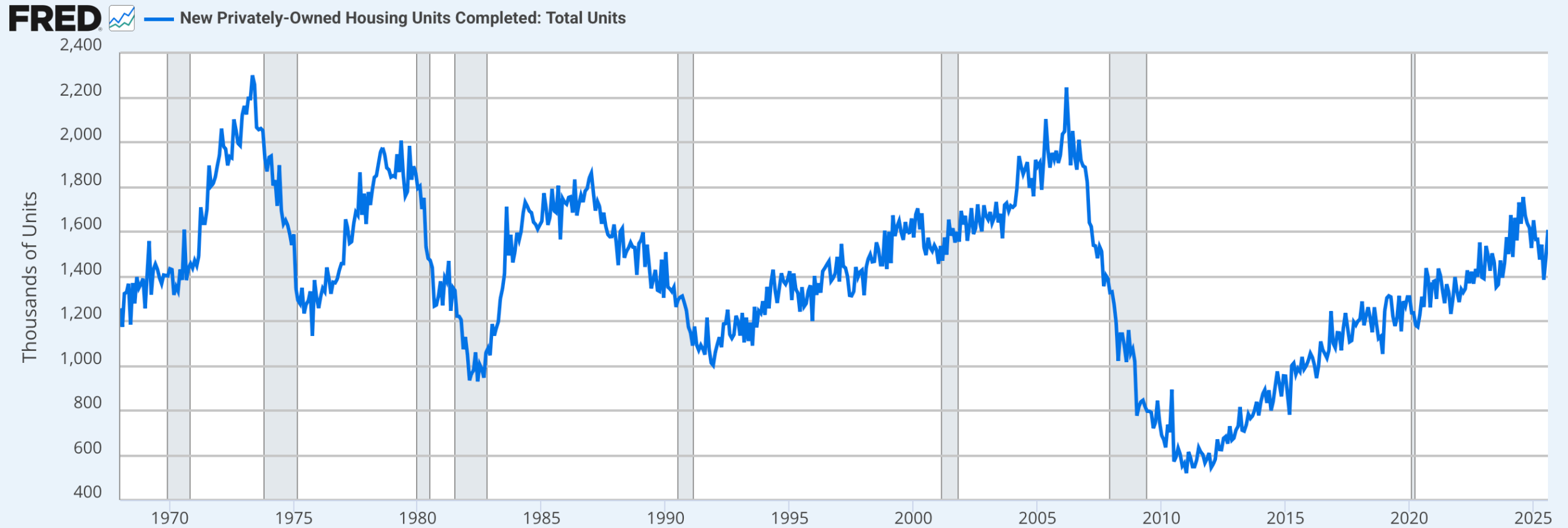


Figure 5. Composition of 30% housing cost-burdened households by household income quartile.

Lack of Housing Supply



Housing Supply



Sources: U.S. Census Bureau; U.S. Department of Housing and Urban Development via FRED®

Shaded areas indicate U.S. recessions.

fred.stlouisfed.org

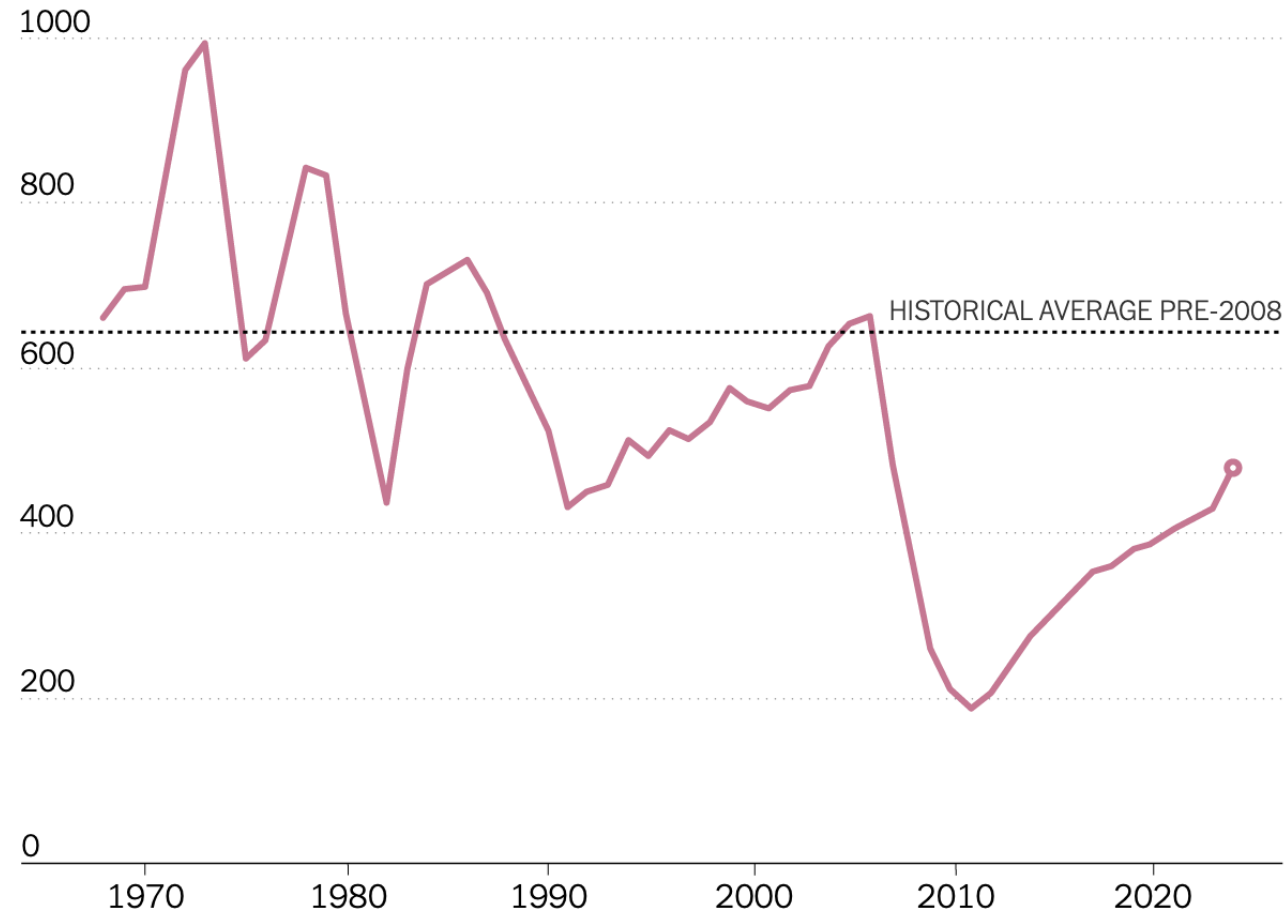
Fullscreen

US Population 1970: 203mm
US Population 2025: 342mm

Housing Supply

America is still building fewer homes than it was before 2008

Total housing units built per 100,000 people per year



Source: U.S. Census Bureau

Housing Supply

MARKET TRENDS, POLICY & INDUSTRY

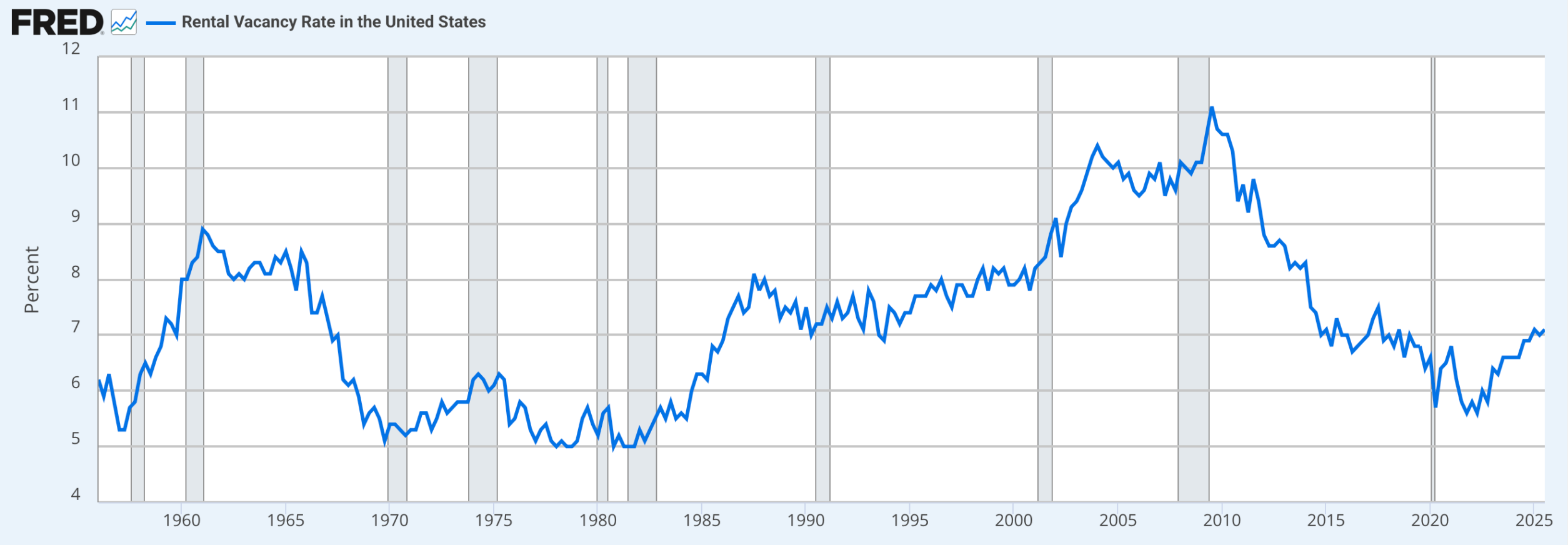
The National Housing Deficit Grew by 159,000 Homes in 2023, Reaching 4.7 Million

The pandemic homebuilding surge was not enough to make up lost ground

Figure 1: Estimates of the Nationwide Housing Shortfall

Estimated Housing Shortage (Units)	Year of Estimate	Source
1.5 million	2021	NAHB
3.8 million	2020	Freddie Mac
5.5 million	2021	NAR

Housing Supply



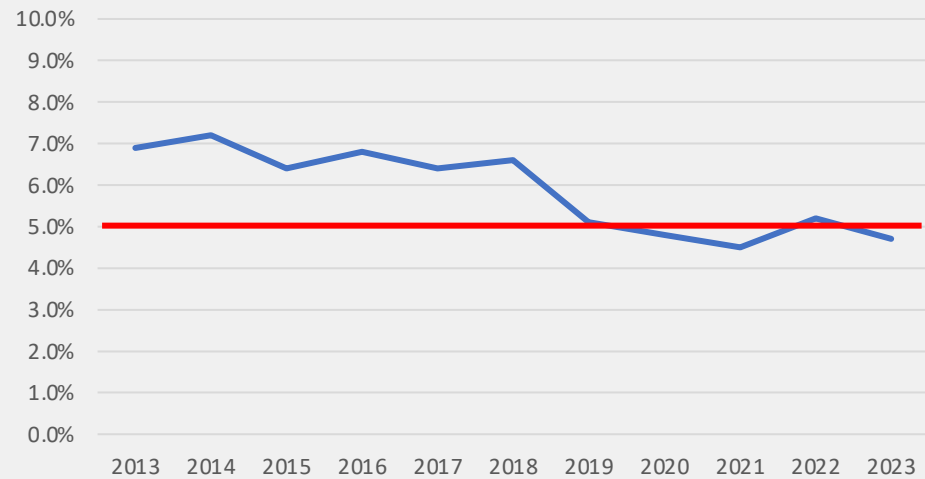
Source: U.S. Census Bureau via FRED®
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Housing in the Midwest

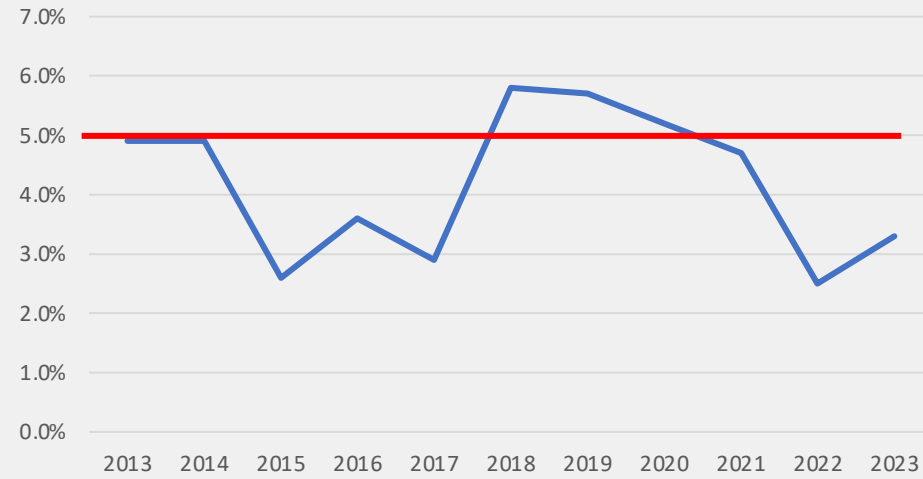


Updates – Housing Market Dynamics

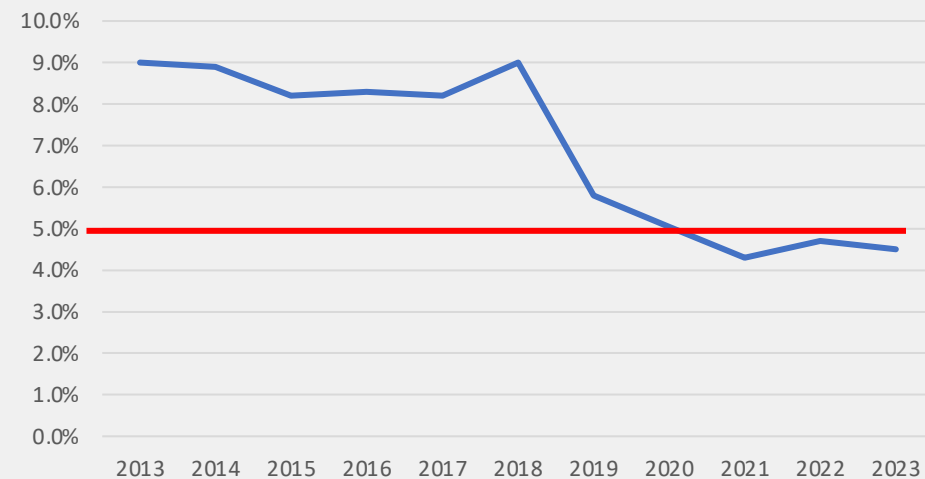
State of Missouri - Rental Vacancy Rate



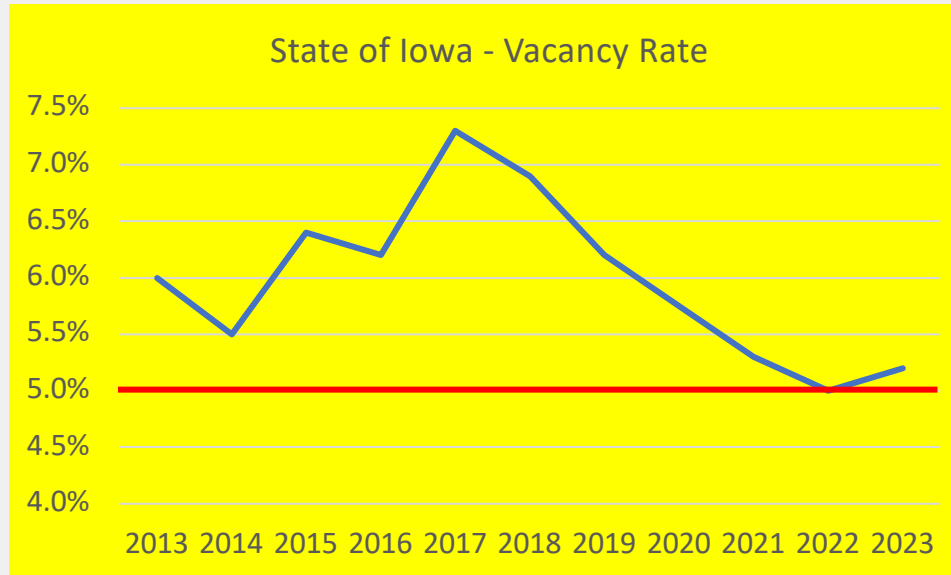
Green Bay - Rental Vacancy Rate



Indianapolis - Rental Vacancy Rate



State of Iowa - Vacancy Rate



**EXCLUSIVE** REAL ESTATE

Apartment Shortage Draws a Major U.S. Landlord to the Midwest

Morgan Properties pays \$501 million for more than 3,000 units, lured by lack of supply and signs of job growth in the region

By [Rebecca Picciotto](#) [Follow](#)

April 4, 2025 at 5:30 am ET

Morgan Properties, one of the country's largest privately held apartment landlords, has agreed to pay \$501 million for 11 multifamily properties across the Midwest, the latest wager that the region's lack of supply provides fertile ground for rent hikes.

Morgan has been aggressively expanding its Midwest footprint over the past several years, believing the region is primed for a mini Sunbelt-style boom .

Conclusion

1. Summary – Challenge confluence of factors

- a. Limited federal engagement
- b. Stagnant incomes, particularly for renters
- c. Supply constraints, increasing rents
- d. Contested local responses: tenant's rights, subsidies, regulatory reform

2. Opportunities

- a. Broader awareness of issues, awareness/passion can be converted to action
- b. Attention at all levels of government



Residential Energy Affordability and Insecurity

Sanya Carley

Presidential Distinguished Professor of Energy Policy and City Planning

Vice Provost for Climate

Mark Alan Hughes Faculty Director, Kleinman Center for Energy Policy

University of Pennsylvania



POWER LINES

THE HUMAN COSTS OF AMERICAN ENERGY IN TRANSITION

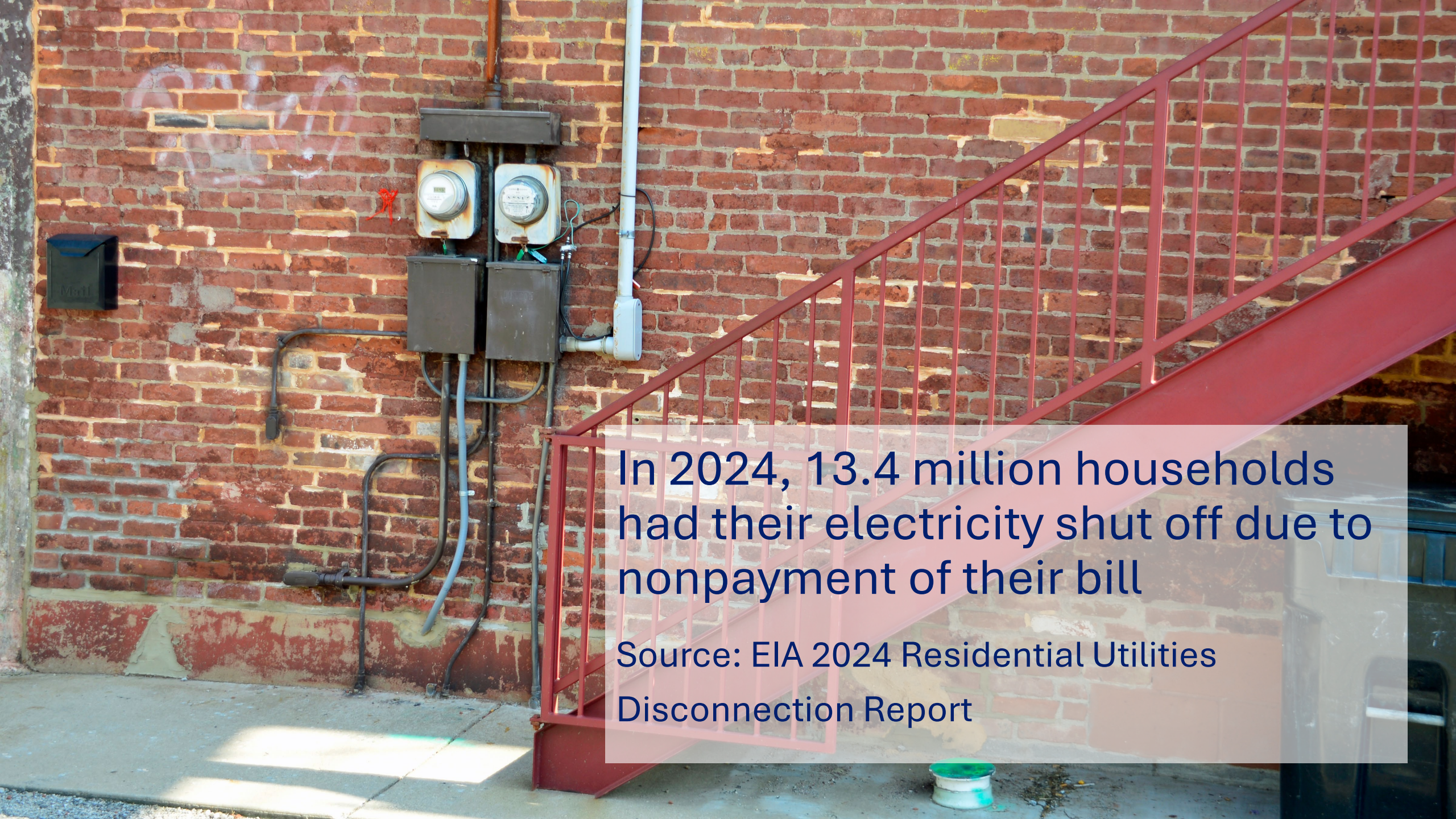
Sanya Carley & David Konisky







Each year in the United States,
over one in four households
experience energy insecurity



In 2024, 13.4 million households had their electricity shut off due to nonpayment of their bill

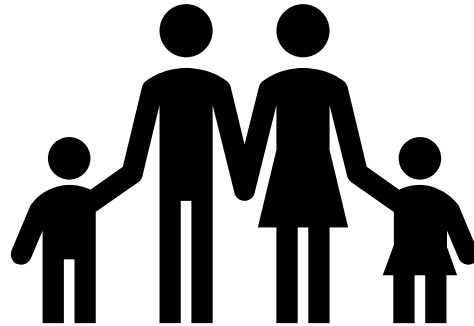
Source: EIA 2024 Residential Utilities Disconnection Report



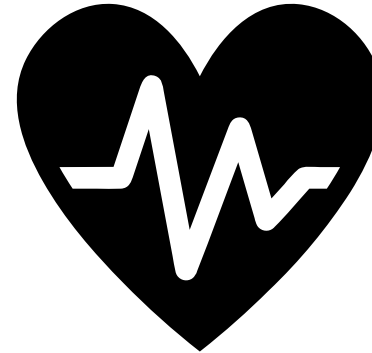
Who is disconnected most often?



Households of color



Children under 5 years old



Electronic medical devices



Poor housing conditions



Source: Memmott, Carley, Graff, Konisky. 2021. Socioeconomic disparities in energy insecurity among low-income households before and during the COVID-19 pandemic. *Nature Energy* 6, 186-193

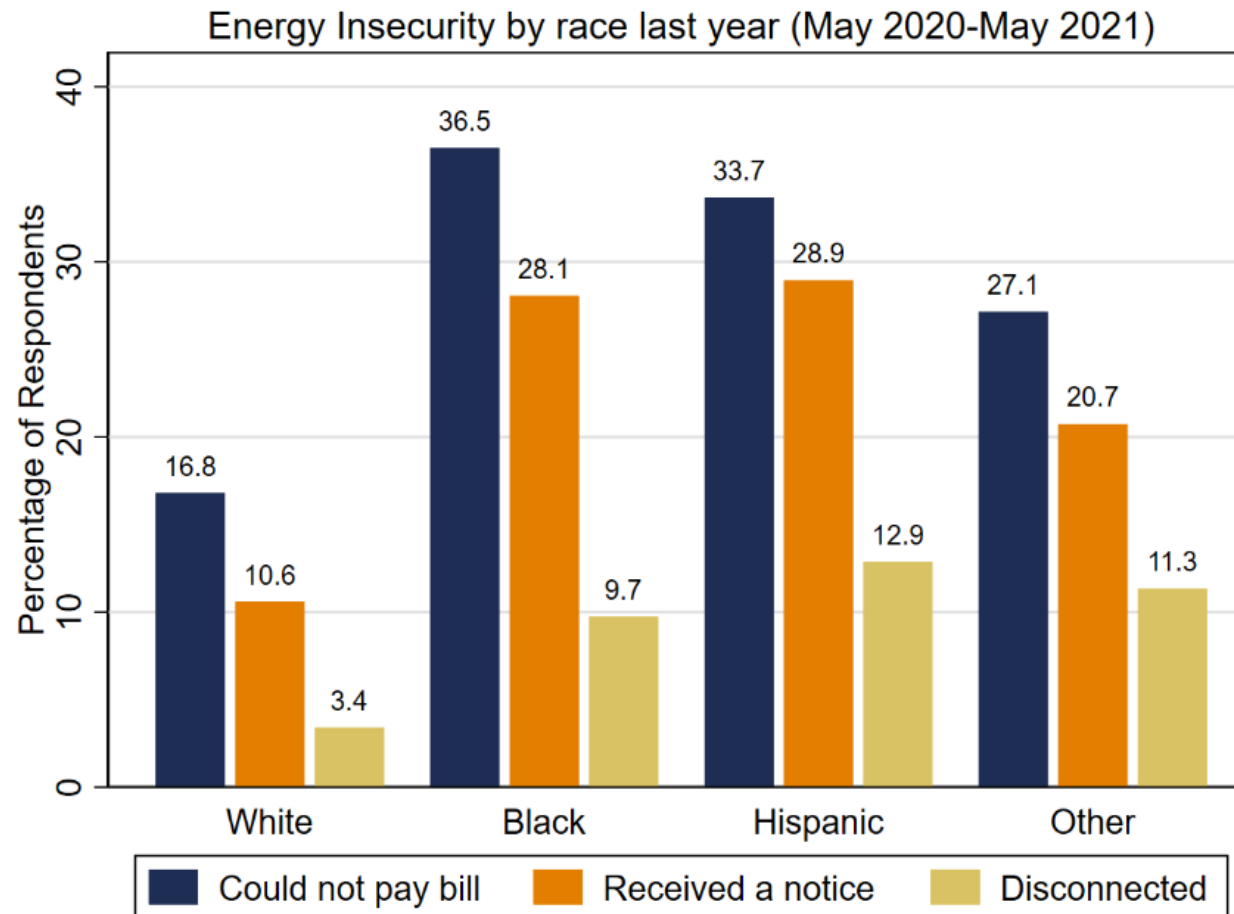


Source: Konisky, Carley, Graff, Konisky. 2022. The persistence of household energy insecurity during the COVID-19 pandemic. *Environmental Research Letters*.

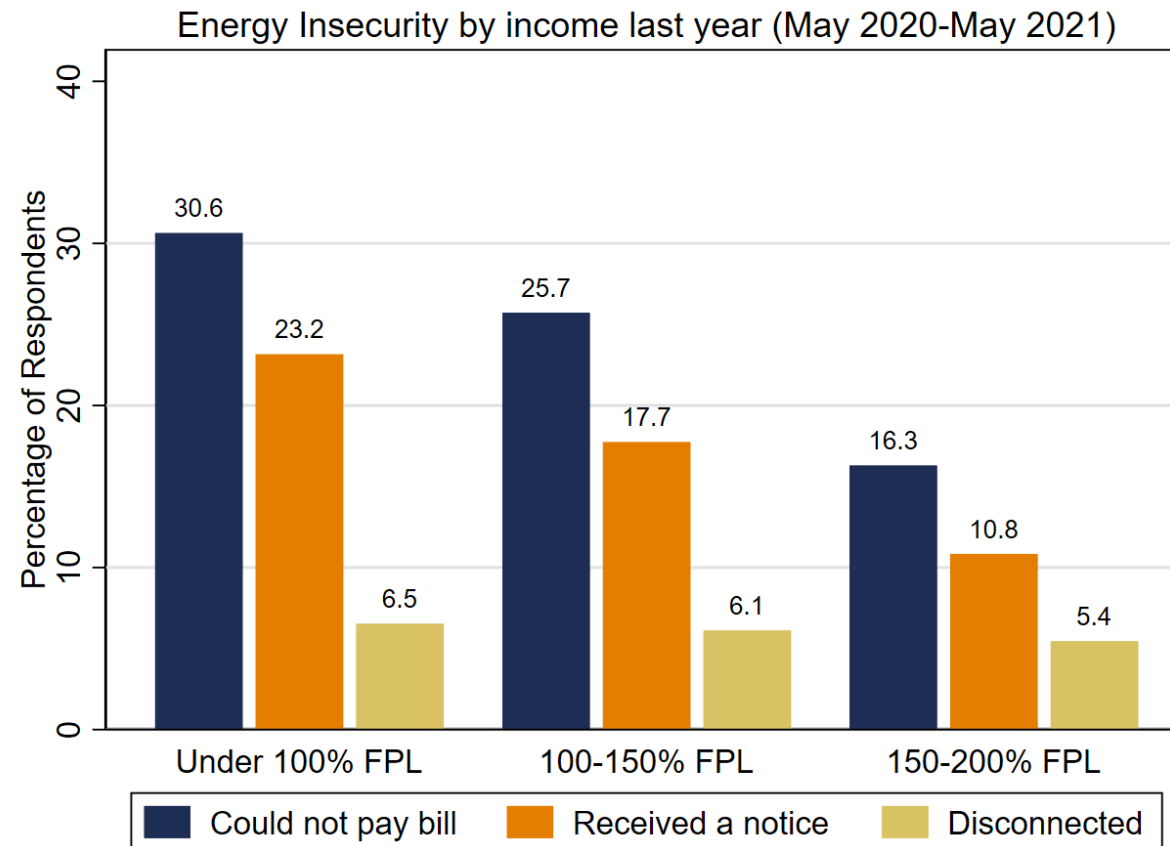


Source: Memmott, Konisky, Carley. 2024. Assessing demographic vulnerability and weather impacts on utility disconnections in California. *Nature Communications* 15.

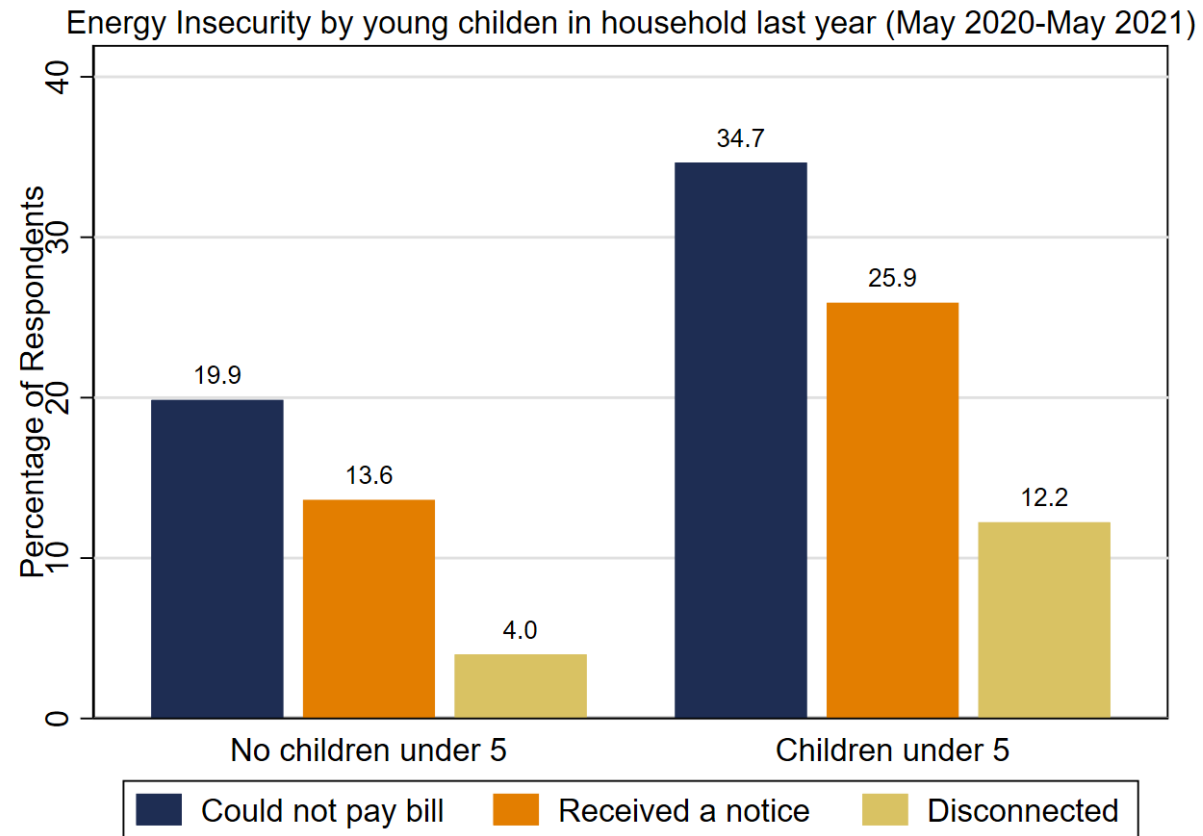
Disparities by Race



Disparities by Income

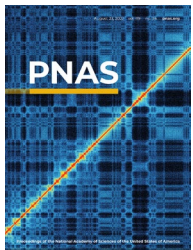
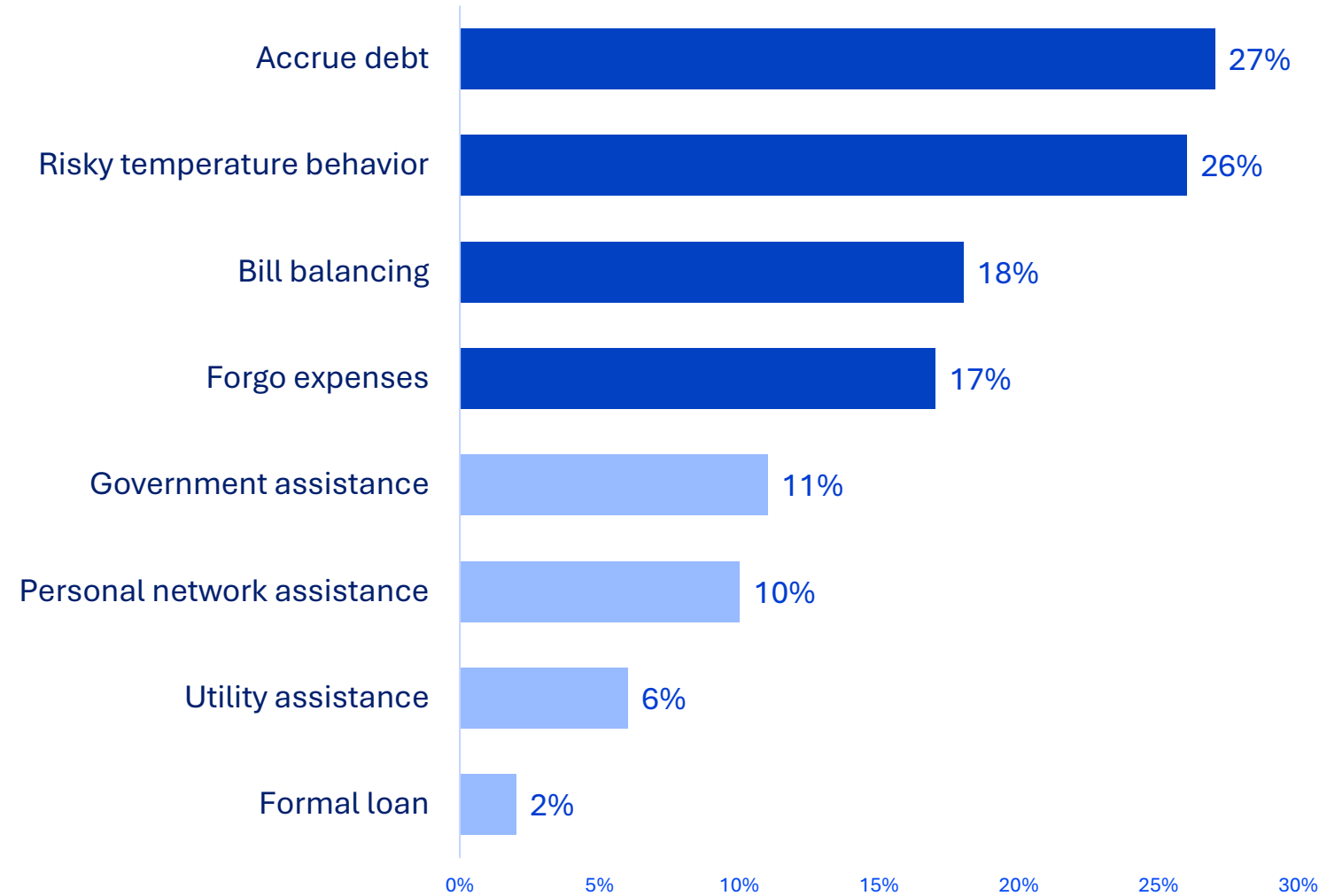


Disparities by Children



When households are energy insecure, how do they cope?

Percentage of Households in Sample



Source: Carley, Graff, Konisky, Memmott. 2022. Behavioral and financial coping strategies among energy insecure households. *Proceedings of the National Academy of Sciences*.

Space heater sparked fire in the Bronx that killed 17 people, including 8 children

BY SUSANNAH CULLINANE, BRYNN GINGRAS, BONNEY KAPP, MIRNA ALSHARIF AND AMIR VERA, CNN

© POSTED JAN 10, 2022 0



Emergency personnel work at the scene of the fatal fire on Sunday.

NATION & WORLD

Family died of gas poisoning after utility cut power to home

BY TRIBUNE WIRE REPORTS
APR 07, 2015 AT 10:05 PM

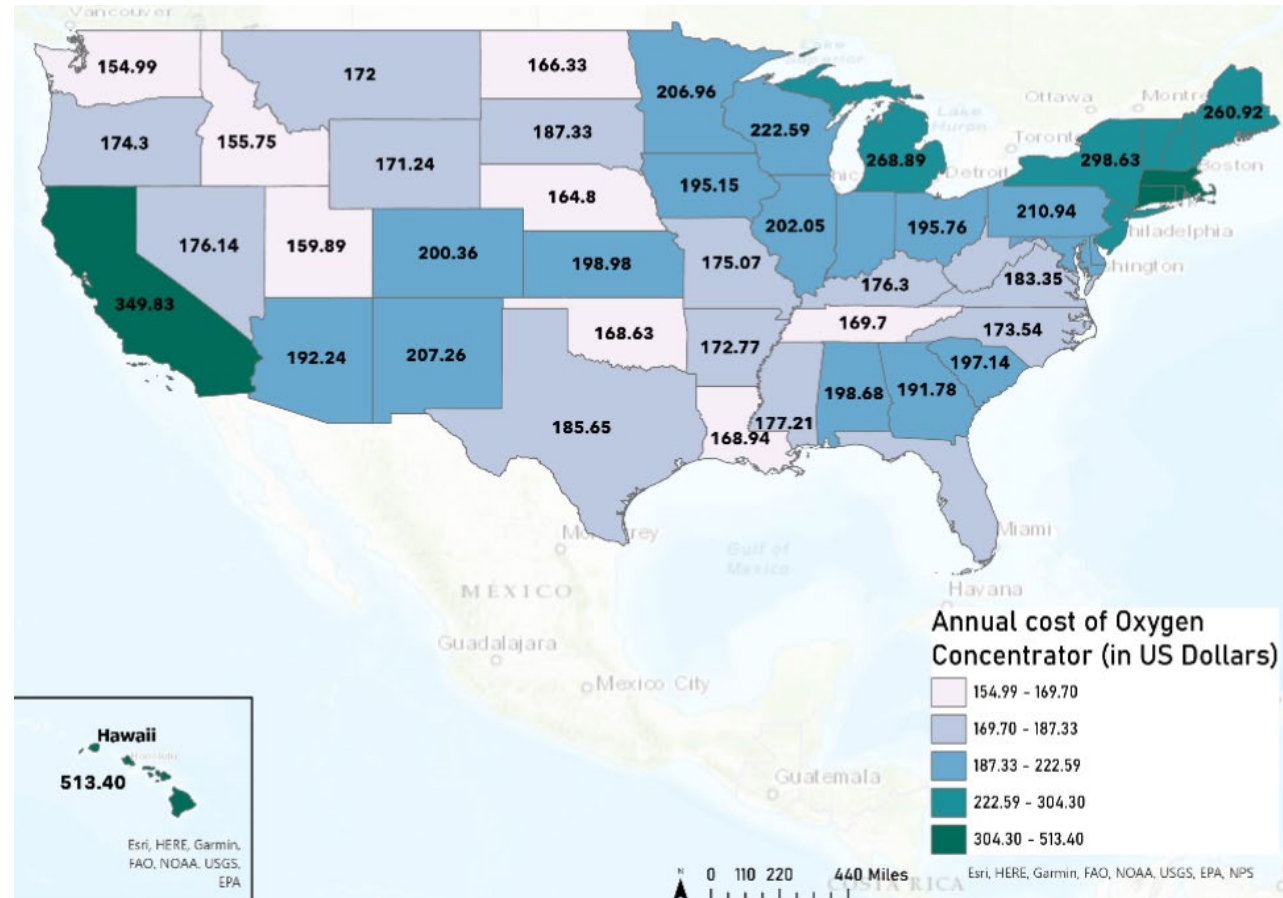


HEATBEAT

82-year-old APS customer died after power was shut off in May 2024

—
An 82-year-old woman died in May 2024 after her power was cut off on a very hot day. Her son and an advocate say this shows an issue with state policies.

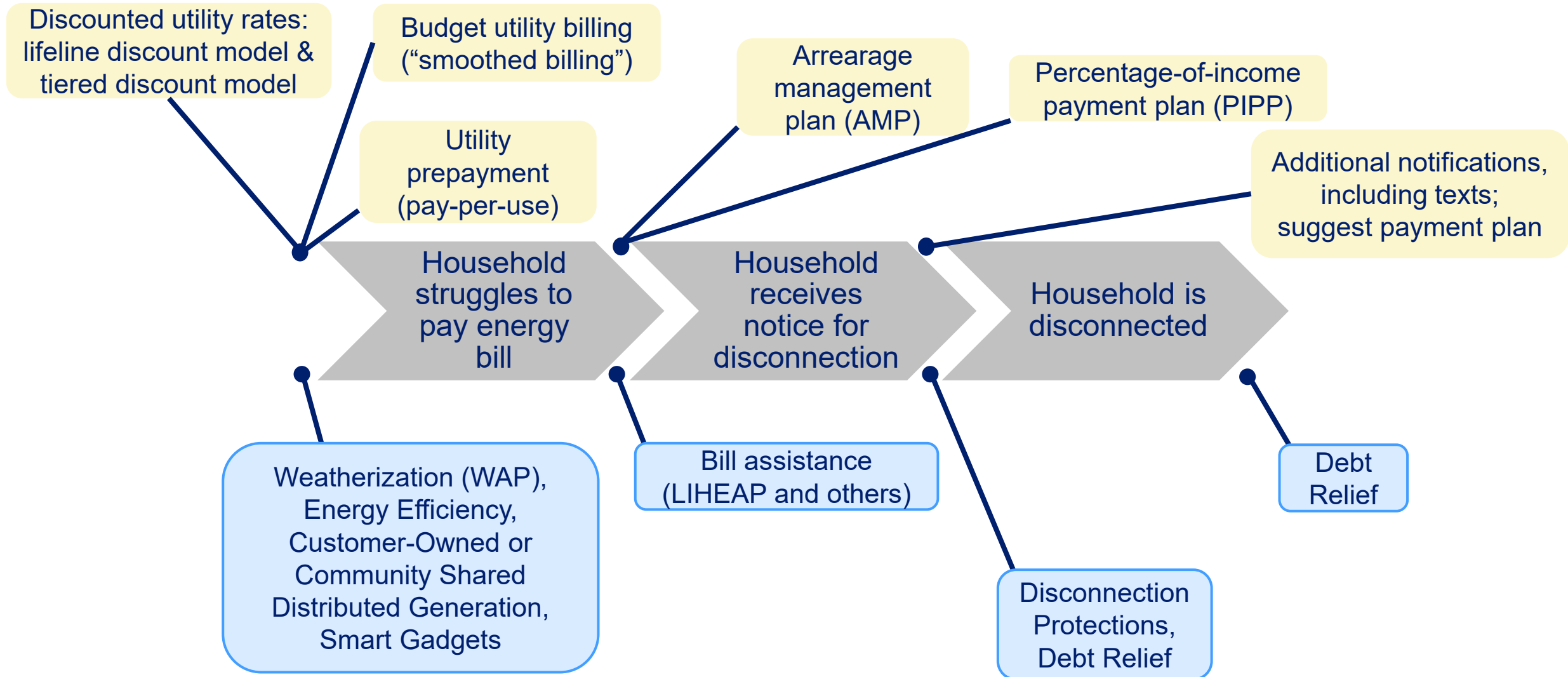
Durable medical equipment can significantly increase bills



Source: Carley, Bansal, Harak, Kahn, Konisky, Simon. The electricity cost burden of durable medical equipment in the United States. *Scientific Reports* 14.

-
- Electricity prices have increased by 30% on average over the past five years
 - The EIA estimates that prices will continue to increase, by an estimated 8.5% this year
 - The average electricity bill in the U.S. in 2024 was \$144
 - This would make the average electricity bill increase by over \$12 on average
 - Much more in some regions (Pacific, New England, Mid Atlantic)
 - This does not account for natural gas expenditures, which are also predicted to rise
 - Also does not account for months when more electricity/gas is needed

Policy and programmatic support



Can solar reduce incidence of energy insecurity?

In 2023, sent a survey to low-to-moderate households
Compare self-reported energy insecurity among a matched sample:

Solar Households

Households who adopted in 2021
with the lowest estimated income*

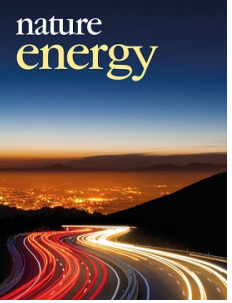
vs.

Non-Solar Households

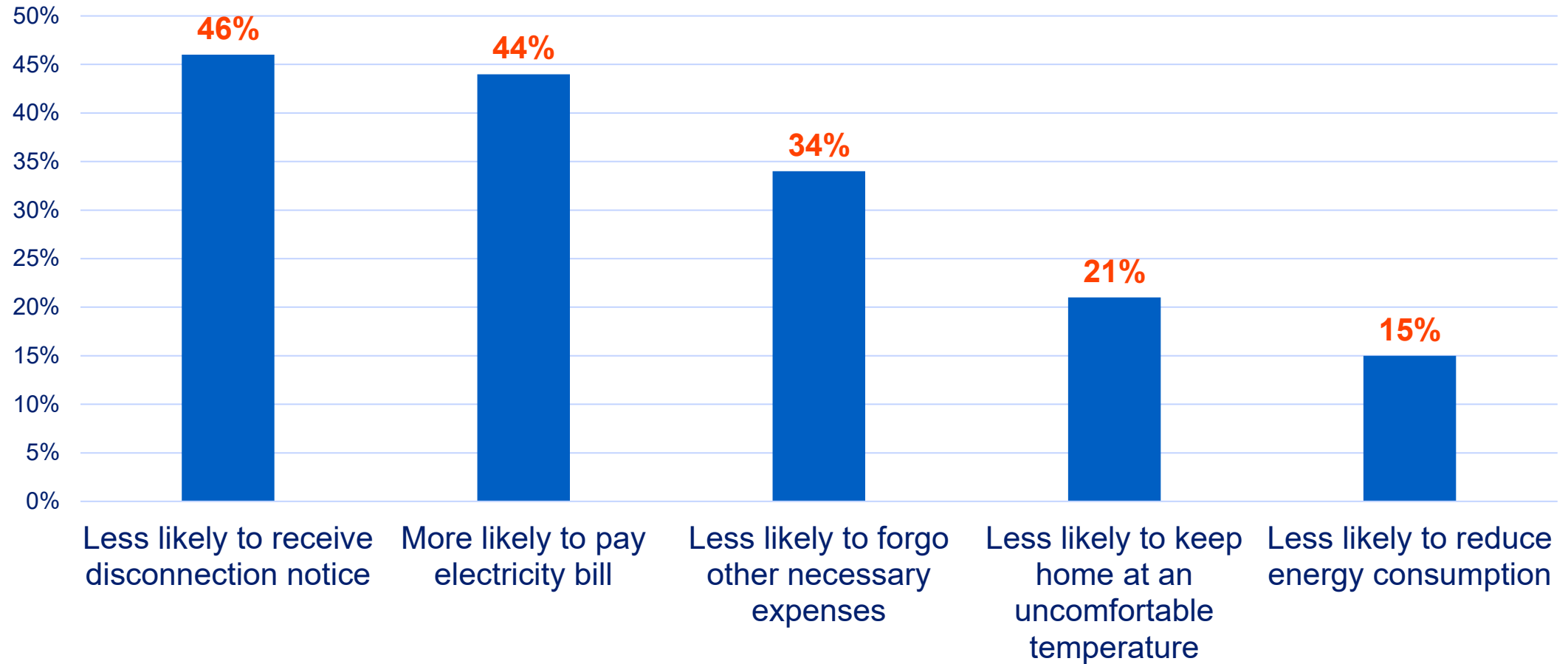
Households that are similar on
mean **observable** characteristics+

Data:
*Tracking the Sun, Experian
+Core Logic (housing), Experian
(income), "wru" algorithm (race)

Yozwiak, Barbose, Carley,
Montanes, Forrester, Konisky,
Memmott, O'Shaughnessy, 2025.
The effect of residential solar on
energy insecurity among low- to
moderate-income households.
Nature Energy.



We find that those with solar are:



While technologies like solar would most benefit energy insecure households...

1. Access to benefits is uneven
2. Barriers to adoption are more pronounced for certain groups
3. Access to and contributions toward government incentives is uneven
4. Wealth begets wealth
5. Given market structures, these inequities could become more pronounced in the future

Customer Protection Policies

WINTER

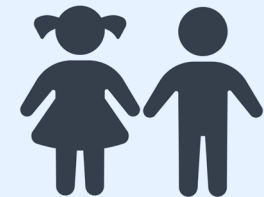
SUMMER



Temperature and seasonal moratoria



Notification requirements



Protections for vulnerable groups

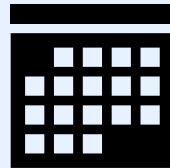


Utility disconnection protections

Disconnection protections: utility opportunities for enhancement



Clearly specify minimum days of notice prior to disconnection + provide multiple forms of notice



Establish date-range when customers can pay bills before being considered late or delinquent

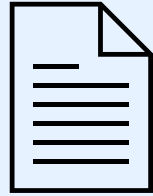


Regularly provide information to customers (e.g., at least twice annually)

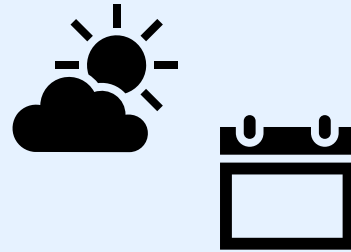


Carley, Konisky.
2025. It's time to modernize energy insecurity policies to account for extreme heat.
Joule 9(3).

Disconnection protections: government opportunities for enhancement



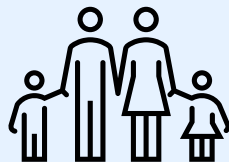
Easily understood and transparent language with few administrative burdens



Combined temperature & date-based protections



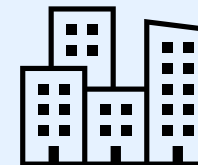
Broad definitions of medical conditions & delays for utilities requiring certificates



Protections for households with children, elderly, or people with disabilities



Establish a minimum arrearage before disconnections occur

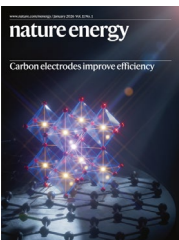


Tenants should not suffer disconnection due to their landlord's failure to pay the building's utility bills

Levers extend beyond direct protections and bill assistance

Examples:

- **State legislatures** can provide funding for weatherization and distributed energy resources (DERs)
- **Public utility commissions** can adopt explicit “energy justice” principles in their rate-making
- **Utilities** can pursue grid distribution planning that prioritizes affordability and reliability; and facilitate DER interconnection
- **Regional transmission organizations** can work to make interconnection queues faster and more efficient
- **Federal Energy Regulatory Commission** can mandate practices for transmission planning, interconnection procedures, and practices that prioritize affordability
- **Local governments** can direct communities toward resources and amend zoning ordinances to facilitate energy infrastructure siting



Knasin, Carley, Klass, Konisky, Welton. 2026. Levers to address energy insecurity in the United States. *Nature Energy*.



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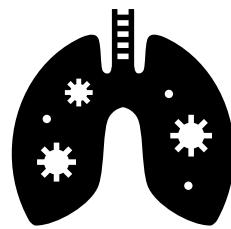
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Implications of energy insecurity



More likely to experience
long-term poverty

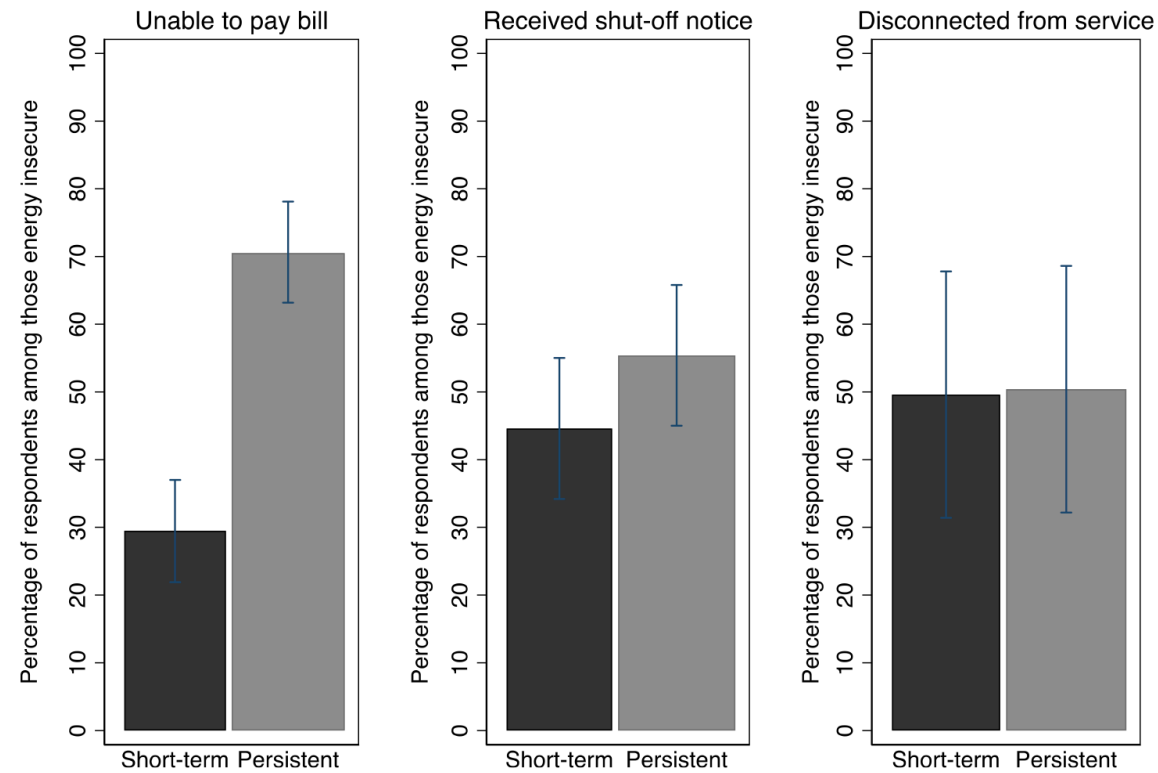


Acute and chronic health conditions such as asthma, poor sleep, and lower self-reported mental health

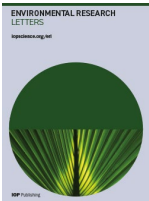


Children more likely to face hospitalization, lower health ratings, consume fewer calories, face social stigmatization and struggle in school, and face **developmental delays**

Energy insecurity is reoccurring for more than half of those who experience it



Source: Konisky, Carley, Graff, Konisky. 2022. The persistence of household energy insecurity during the COVID-19 pandemic. *Environmental Research Letters*.





Weather patterns increase disconnections

Source: Memmott, Konisky, Carley. 2024. Assessing demographic vulnerability and weather impacts on utility disconnections in California. *Nature Communications* 15.