State and Local Energy Efficiency Action Network

- Network of 200+ leaders and professionals, led by state and local policymakers, bringing energy efficiency to scale
- Support on energy efficiency policy and program decision making for:
  - Utility regulators, utilities and consumer advocates
  - Legislators, governors, mayors, county officials
  - Air and energy office directors, and others
- Facilitated by DOE and EPA; successor to the National Action Plan for Energy Efficiency

The SEE Action Network is active in the largest areas of challenge and opportunity to advance energy efficiency

LAWRENCE BERKELEY NATIONAL LAB

Electricity Markets and Policy Data Analytics

Insights from Smart Meters: Focus on Home Energy Report Programs

Annika Todd, Michael Li, Michael Sullivan

November 2013

Smart meters increasingly rolled out

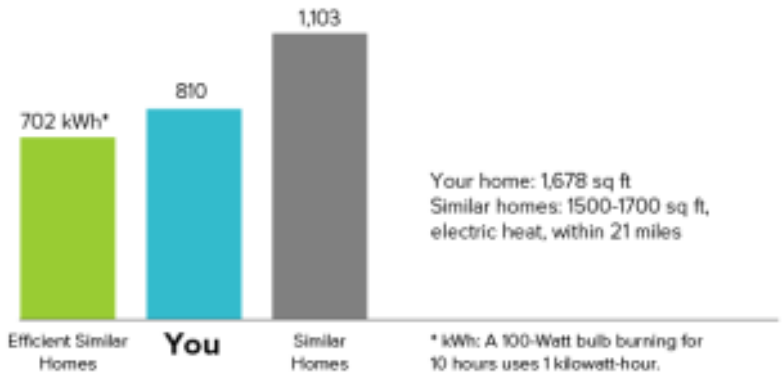
Smart meter data enables new types of analysis

- What can we do with this data?
- Many possibilities
- Valuable for a range of energy programs

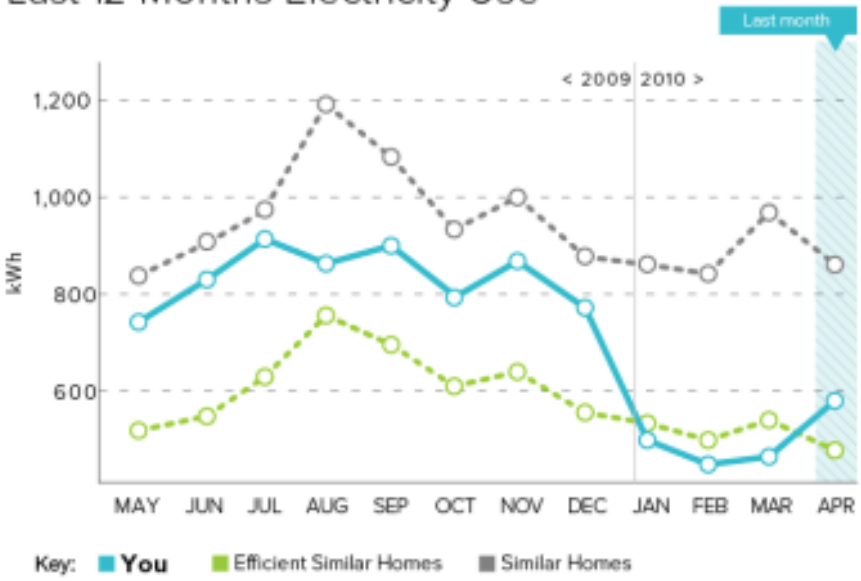
- Today: focus on behavior-based (BB) programs
  - Specifically: Home Energy Report (HER) programs
  - An illustrative example of the value of this analysis

What is a HER program?

Last Month Electricity Use



Last 12 Months Electricity Use



Welcome to your first home energy report.
This report is part of a free program to help you save money and energy.

How you're doing:

Great

Good

Using more than average

We estimate that you could **save $150** each year.

Turn over for ways to save

Key policy questions for HER (and BB) programs

Key policy questions:

1. **Do these programs have potential to provide peak-hour savings?** *(Yes – for our dataset)*
2. **What actions and characteristics are related to savings?** *(Suggestive of AC – best guess: changing thermostat set point)*
3. **What is the short-term persistence of savings?** *(Savings within one-two weeks after first report mailed, stabilize after second report)*

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Outline

- Smart meter data enables many opportunities for new forms of analysis
- Purpose of this study: focus on one particular aspect of this analysis enabled by smart meters – what insights can we gain into Home Energy Report (HER) programs?
- **Description of data**
- Analyses and results
- Conclusions and future research

Data description

- HER program implemented as a “randomized controlled trial”
- Hourly electricity data from Pacific Gas & Electric’s (PG&E) AMI system
- Two datasets from different rollouts (“waves”)

	# Treat	# Control	Launch Date	Hourly interval data available	PG&E baseline territory	Quartile of energy use
Wave One	**400,000**	**100,000**	Feb 2012	Aug 1, 2012-Oct 31, 2012	**P, Q, R, S, T, V, W, X, Y**	**Top 3 quartiles**
Gamma Wave	72,300	72,300	**Nov 2011**	**Nov 4, 2011-Aug 1, 2012**	**R**, S, **T**, **W**, X	All quartiles

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- Description of HERs, data, limitations of report
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Three analyses – each focusing on one key policy question

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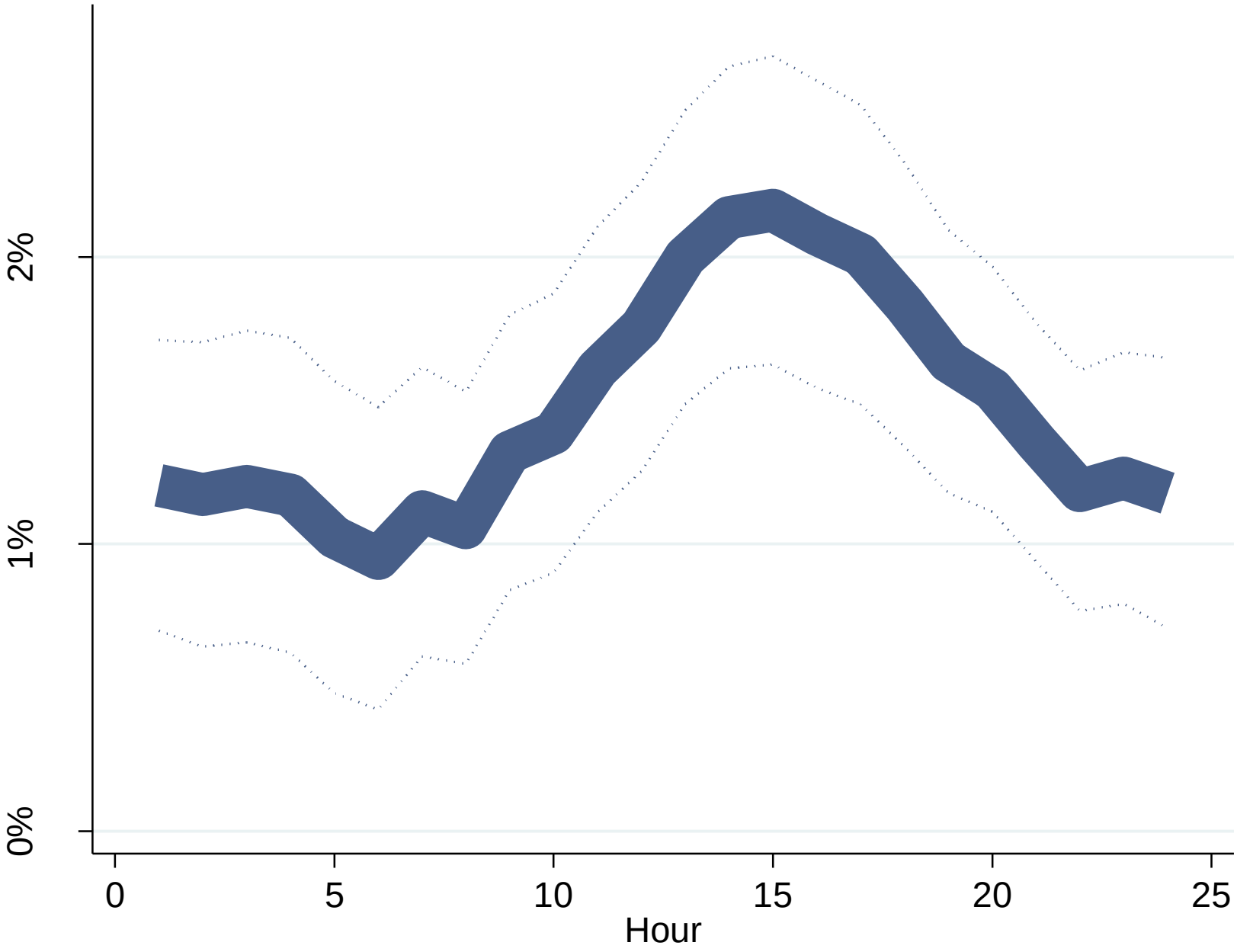
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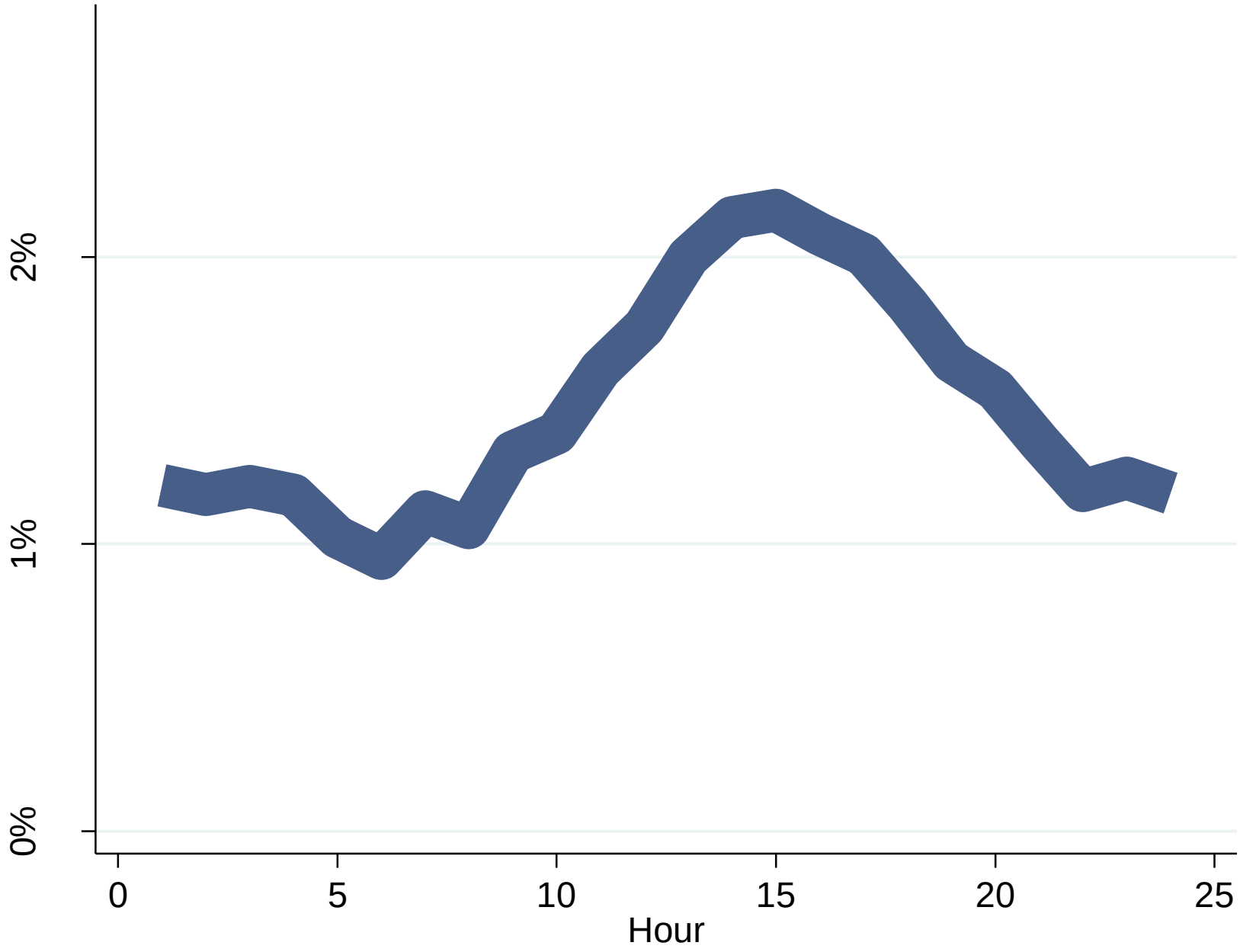
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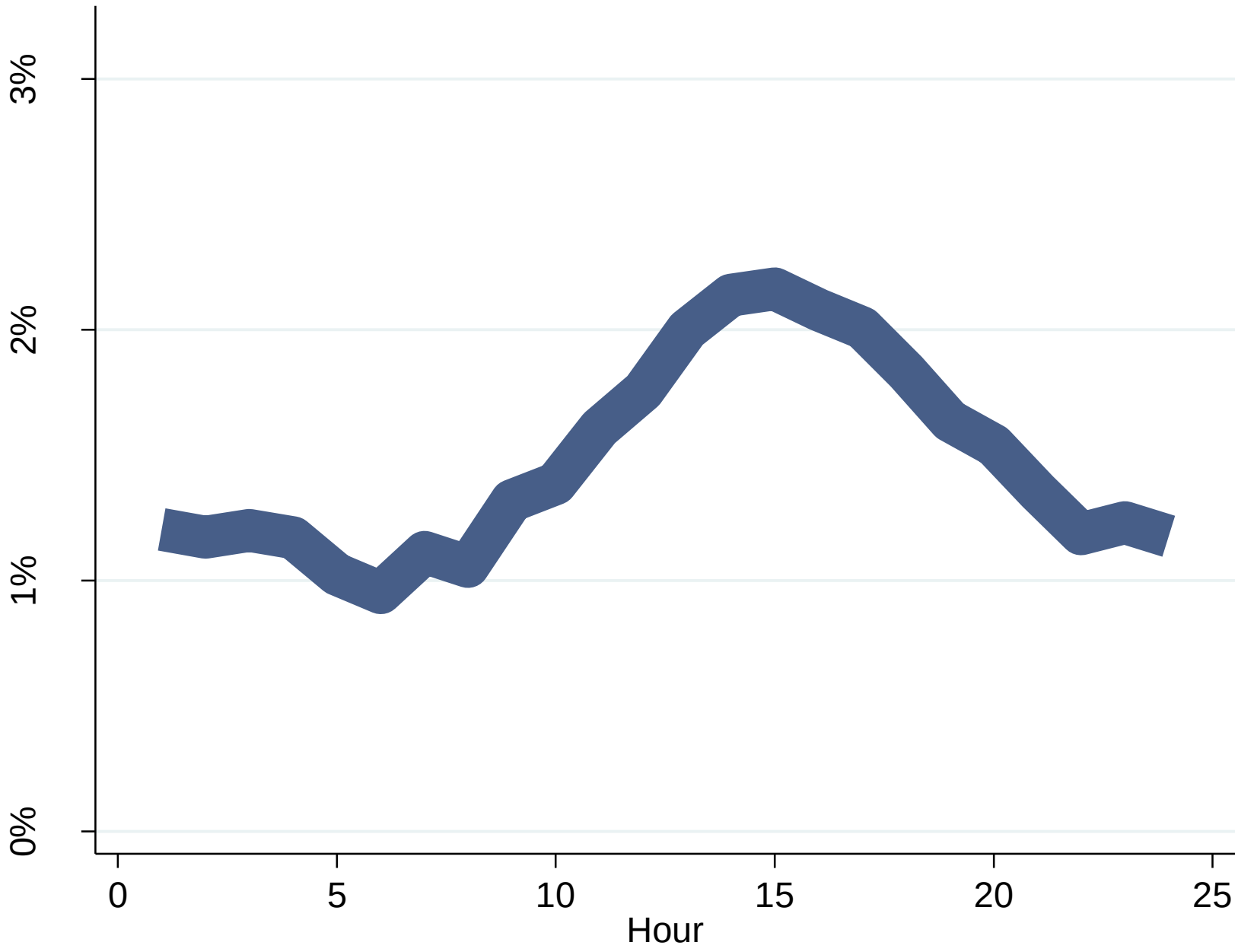
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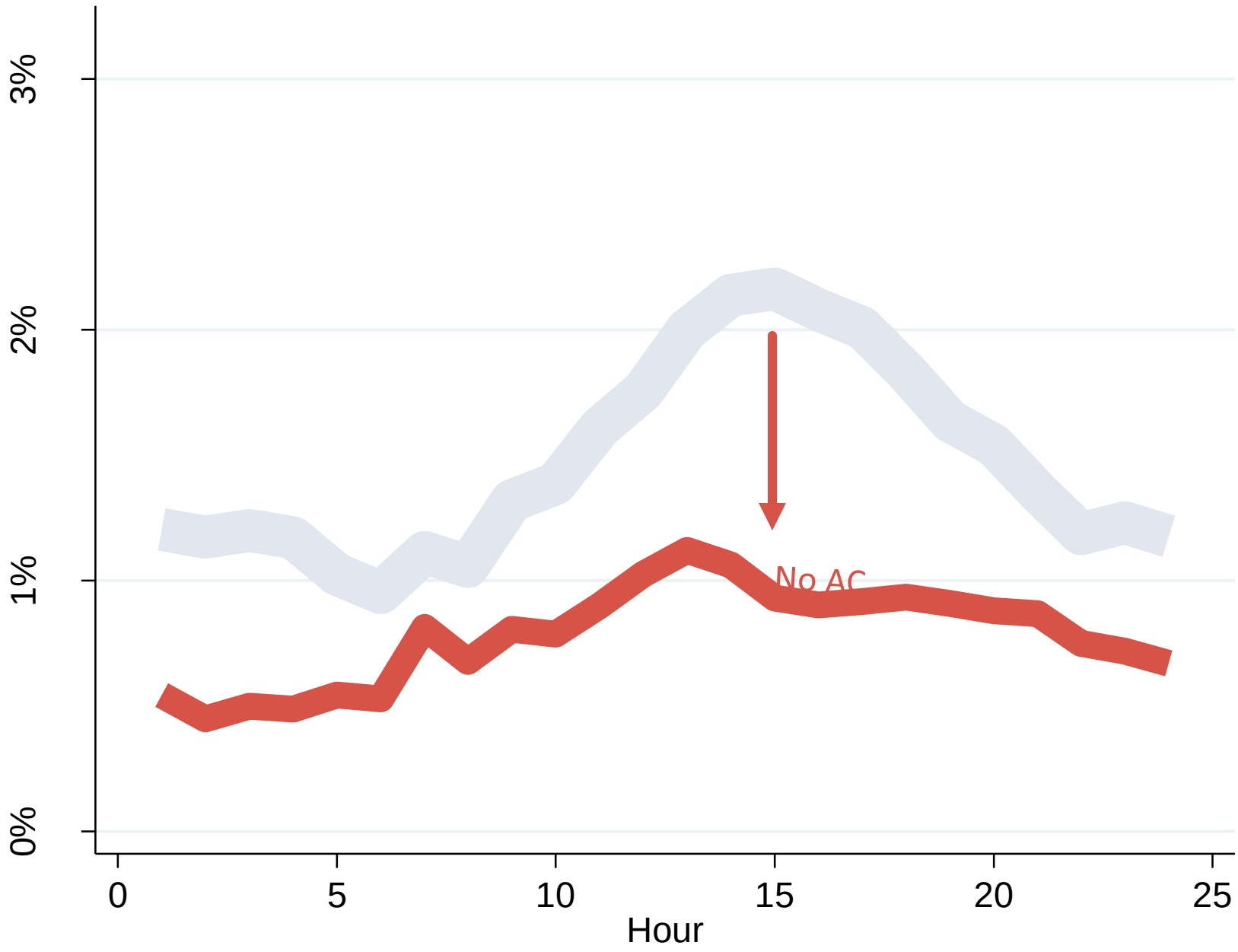
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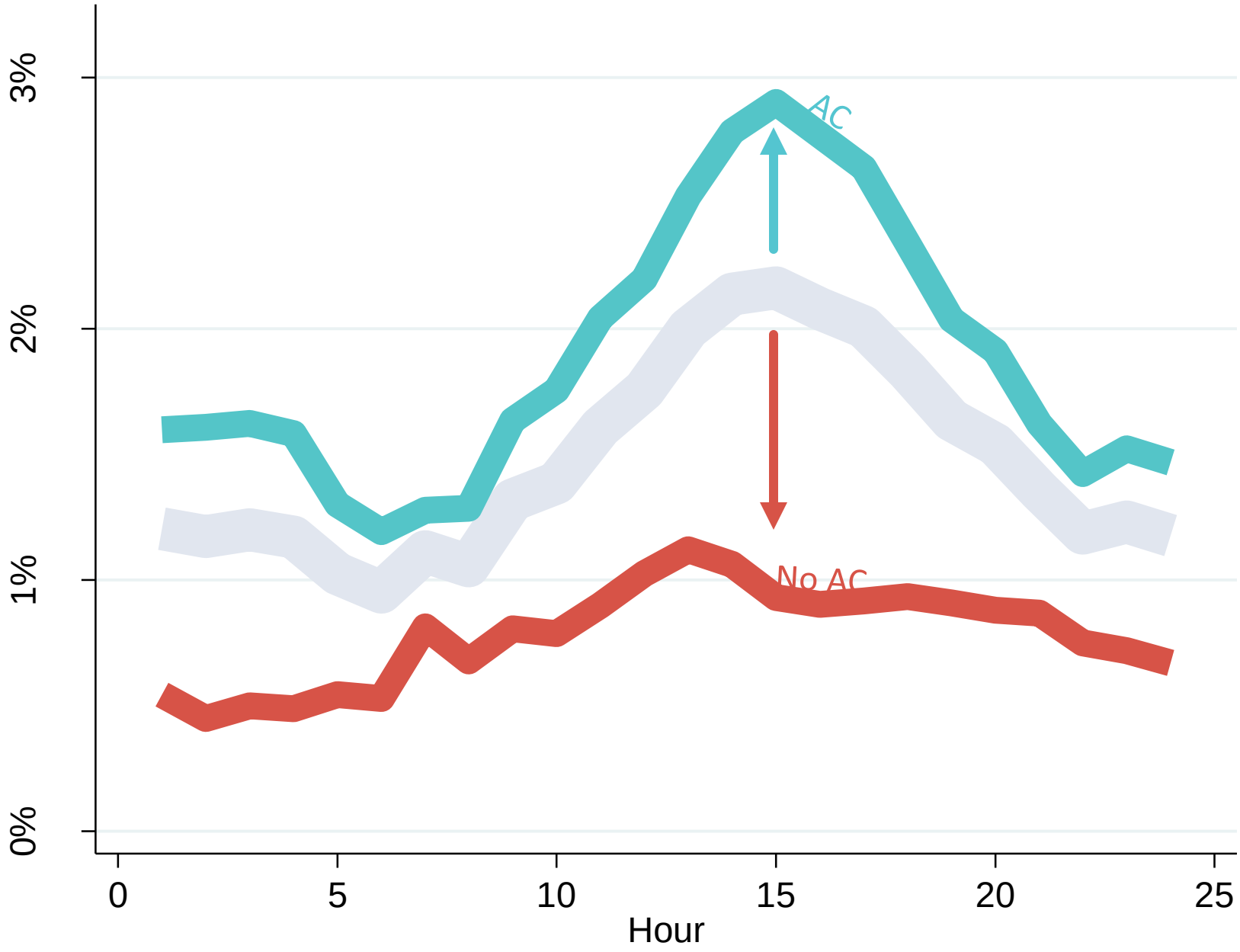
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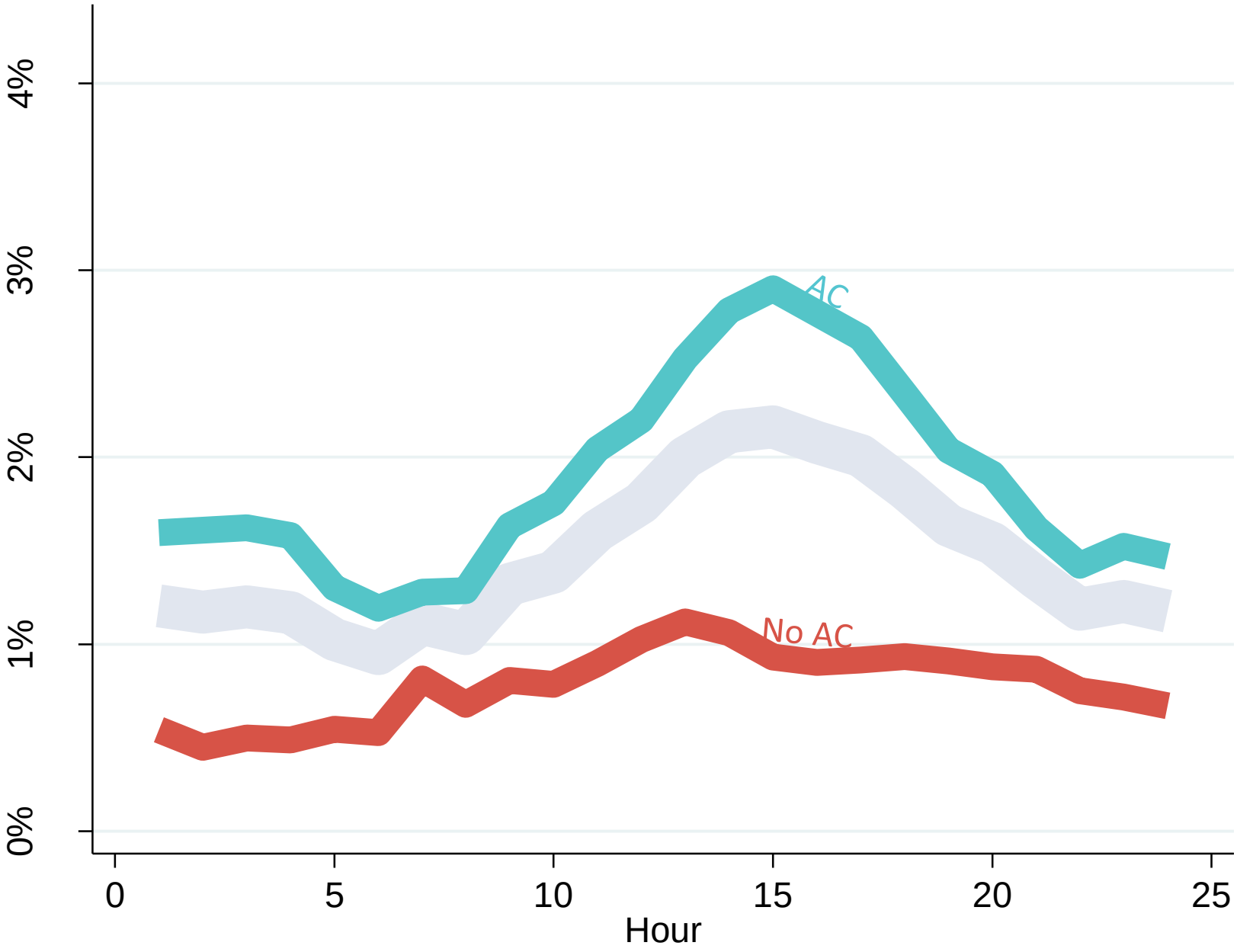
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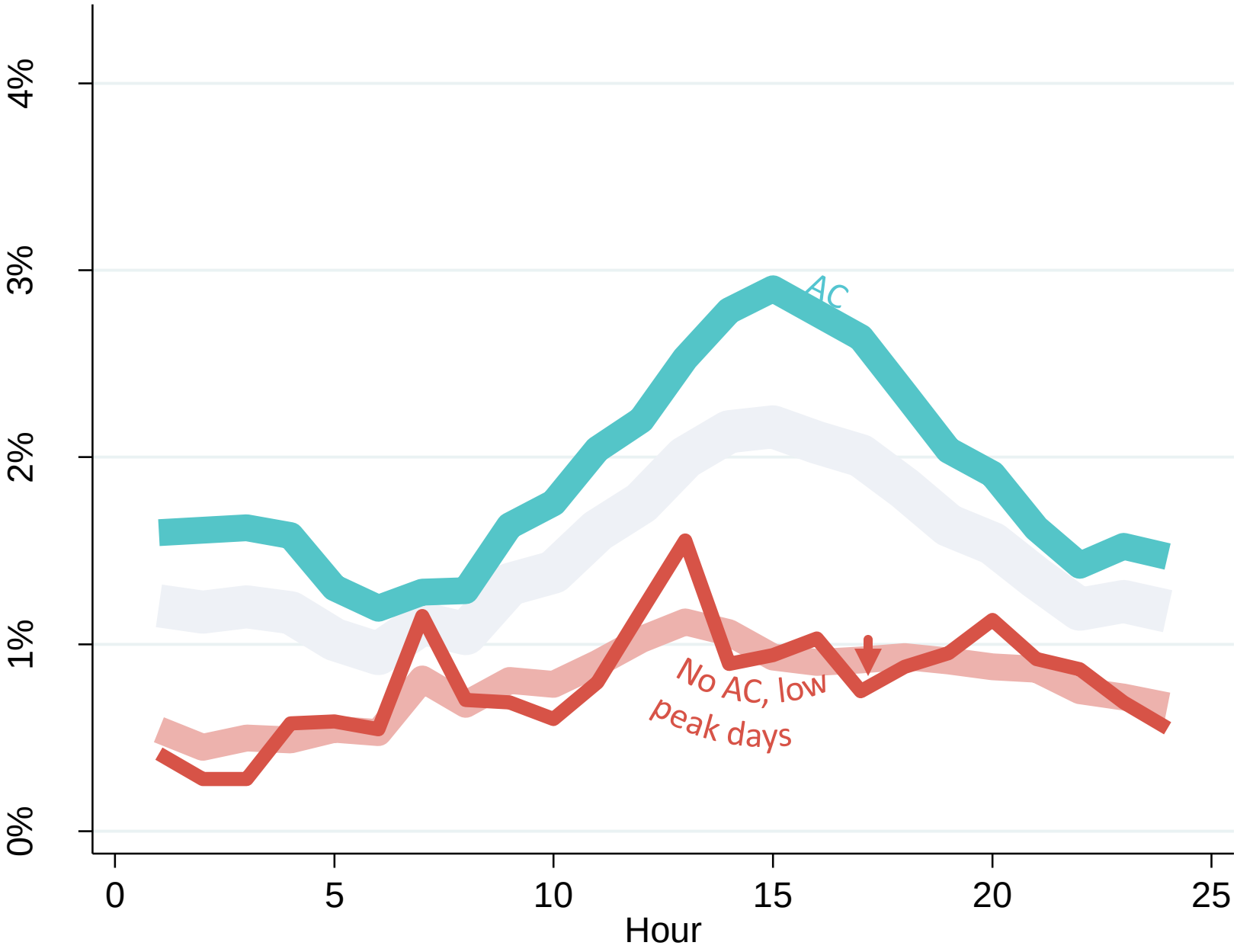
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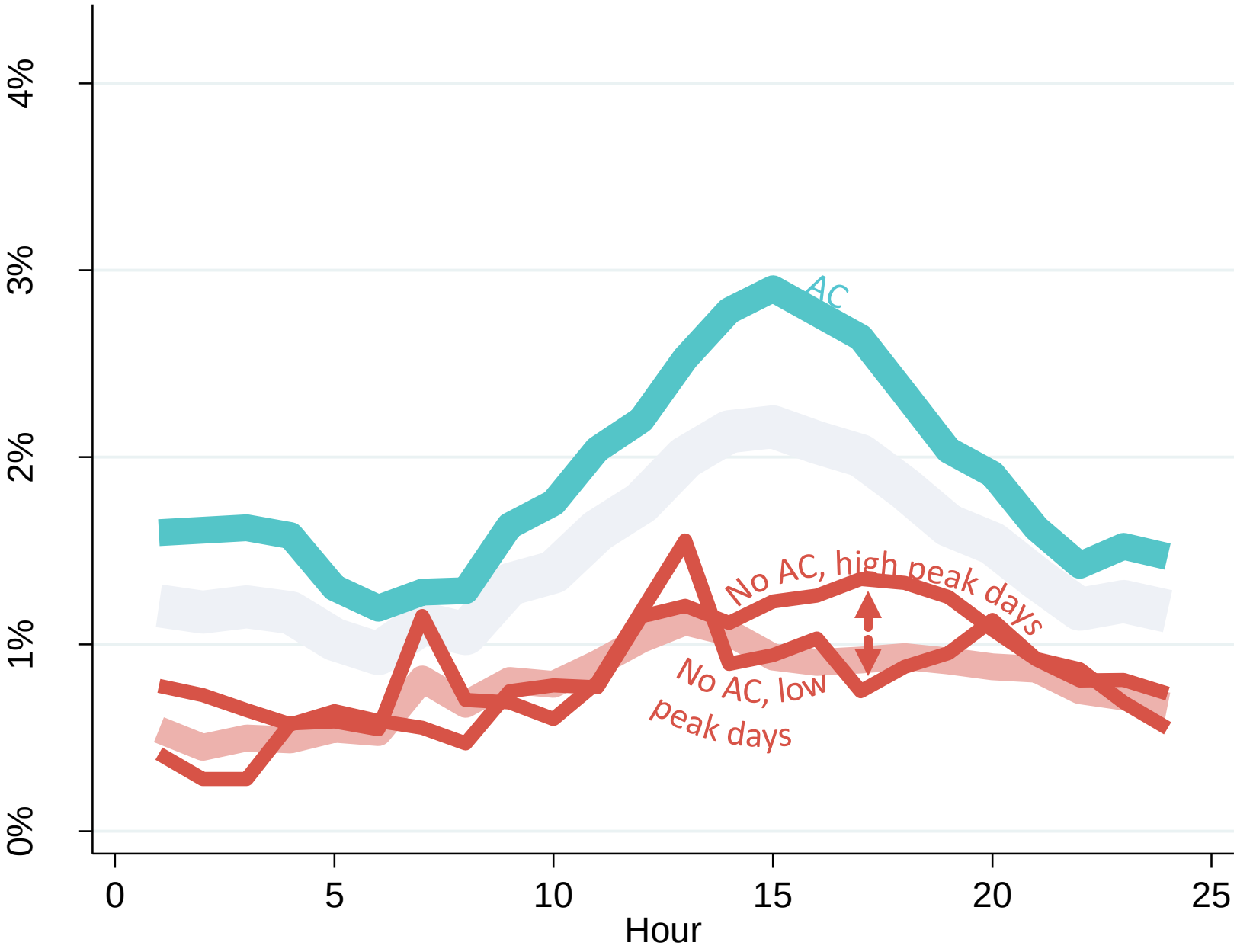
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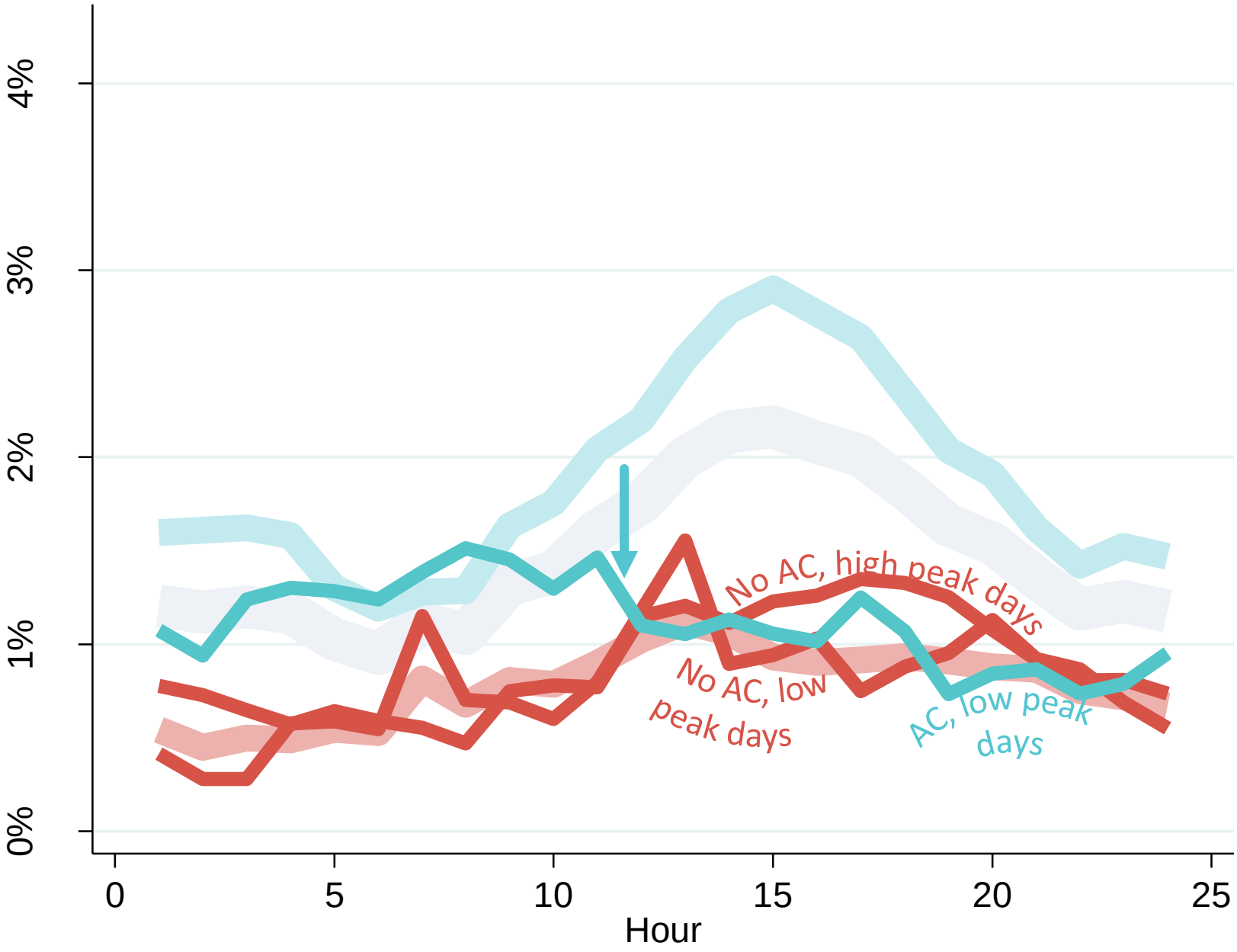
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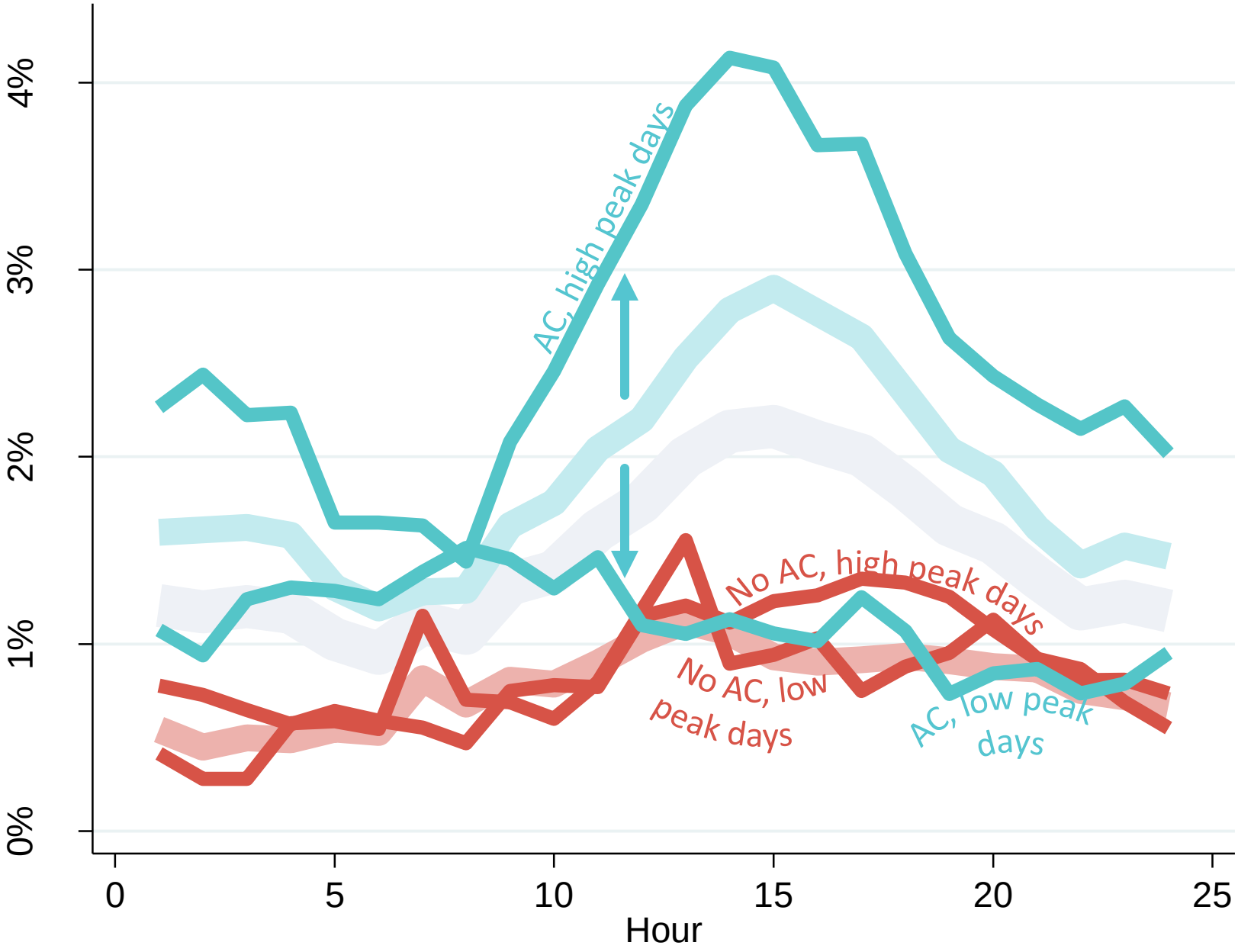
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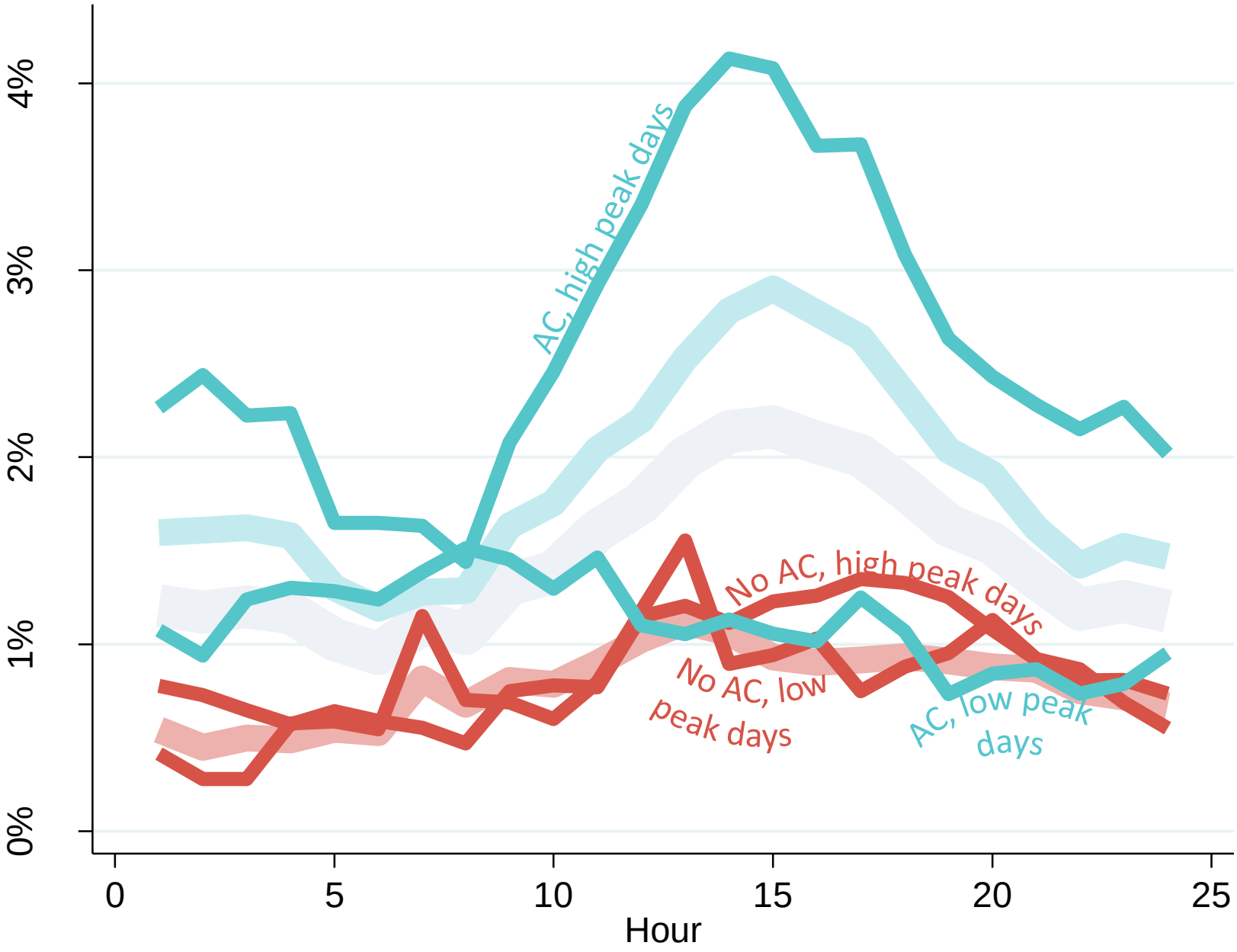
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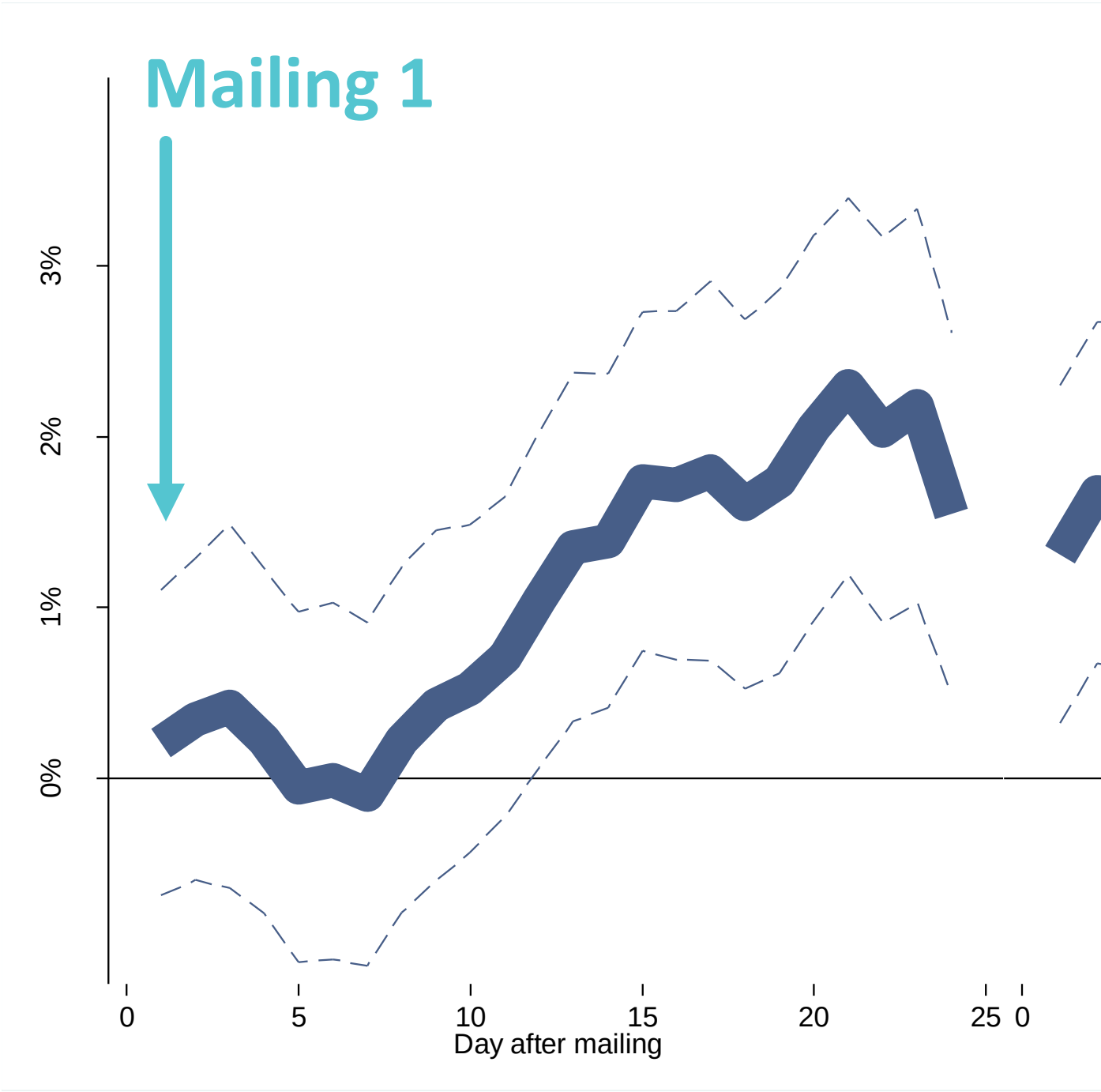
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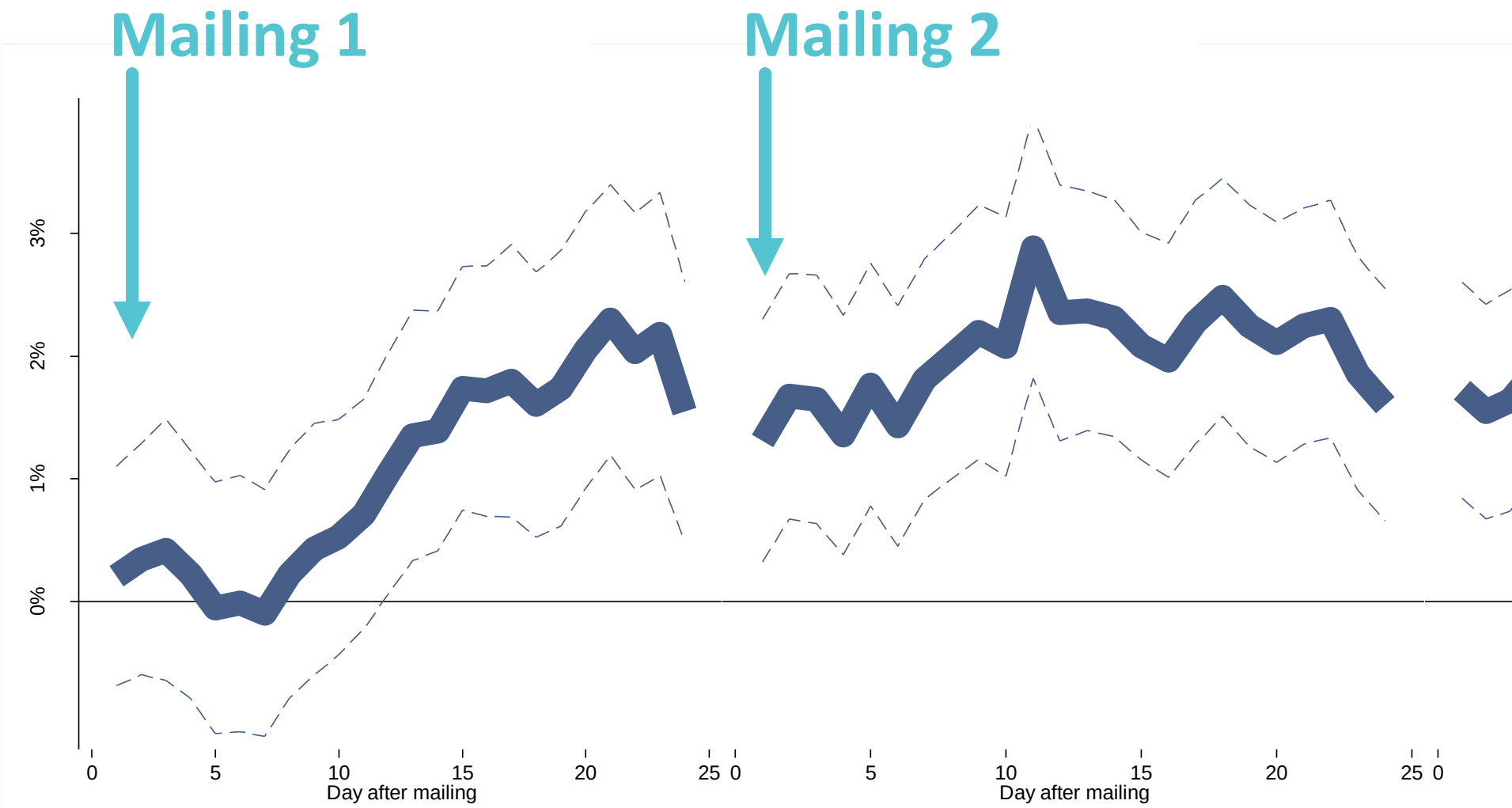
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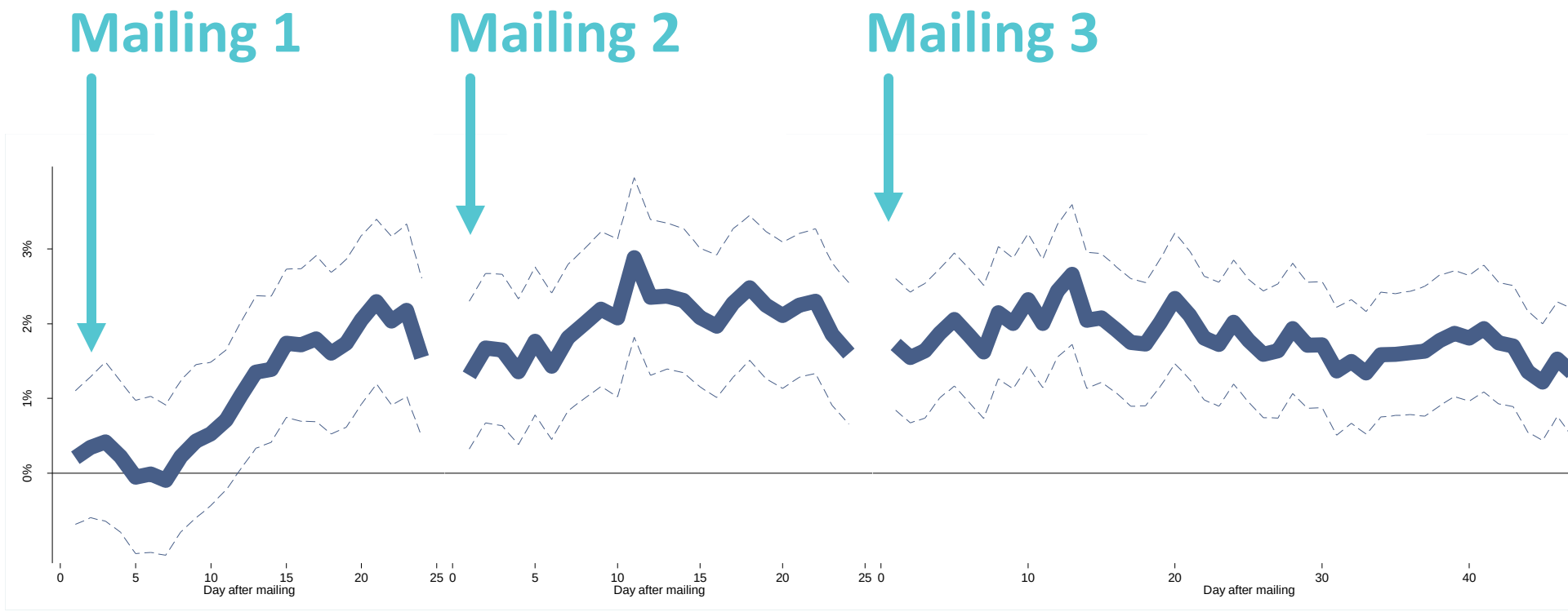
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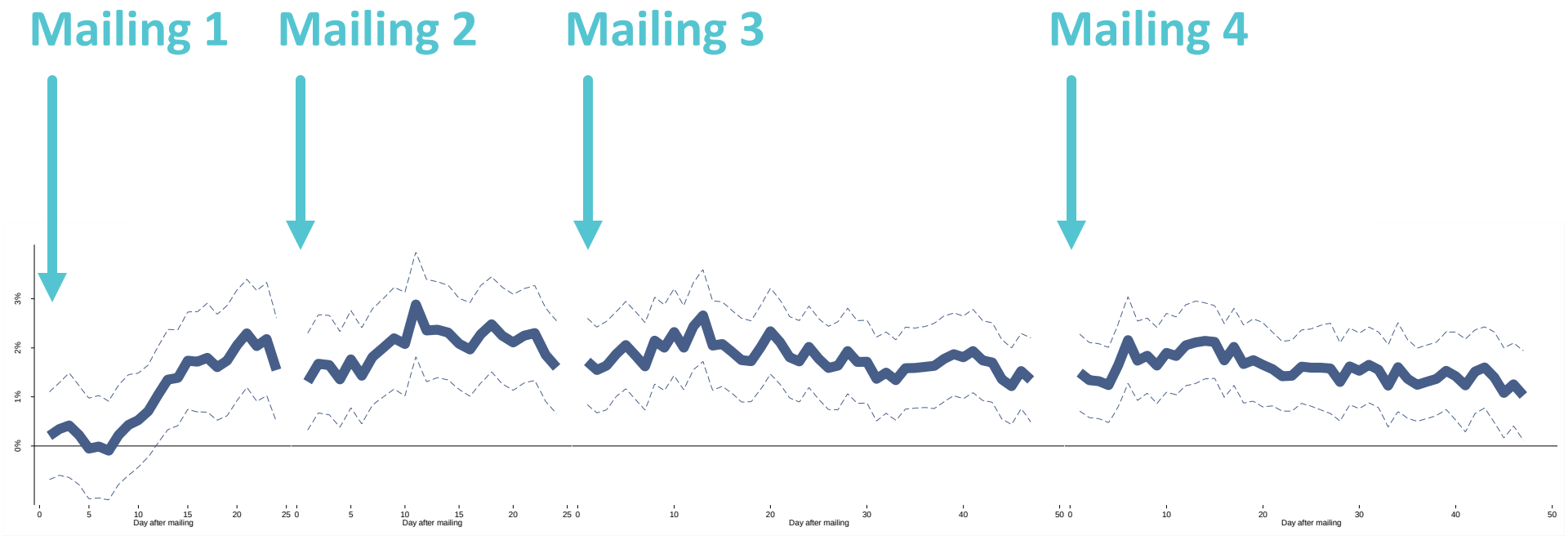
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Limitations of the report

- Limited data access
- Limited time period
- Only a few rollouts

Conclusions

- Lots of smart meter data
- Opportunity for new types of analysis
- Today – one example of the value of this data
- We show (for our datasets):
  1. Potential for peak-hour savings from HERs
  2. Savings driven by actions related to AC
  3. Savings show increase within one-two weeks of first mailing, stabilize after second mailing
- Many other examples of the value of this data
- Future – a lot of potential research

Questions?

Annika Todd: atodd@lbl.gov