Getting the Bead on Hardship

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Research Question and Study Design

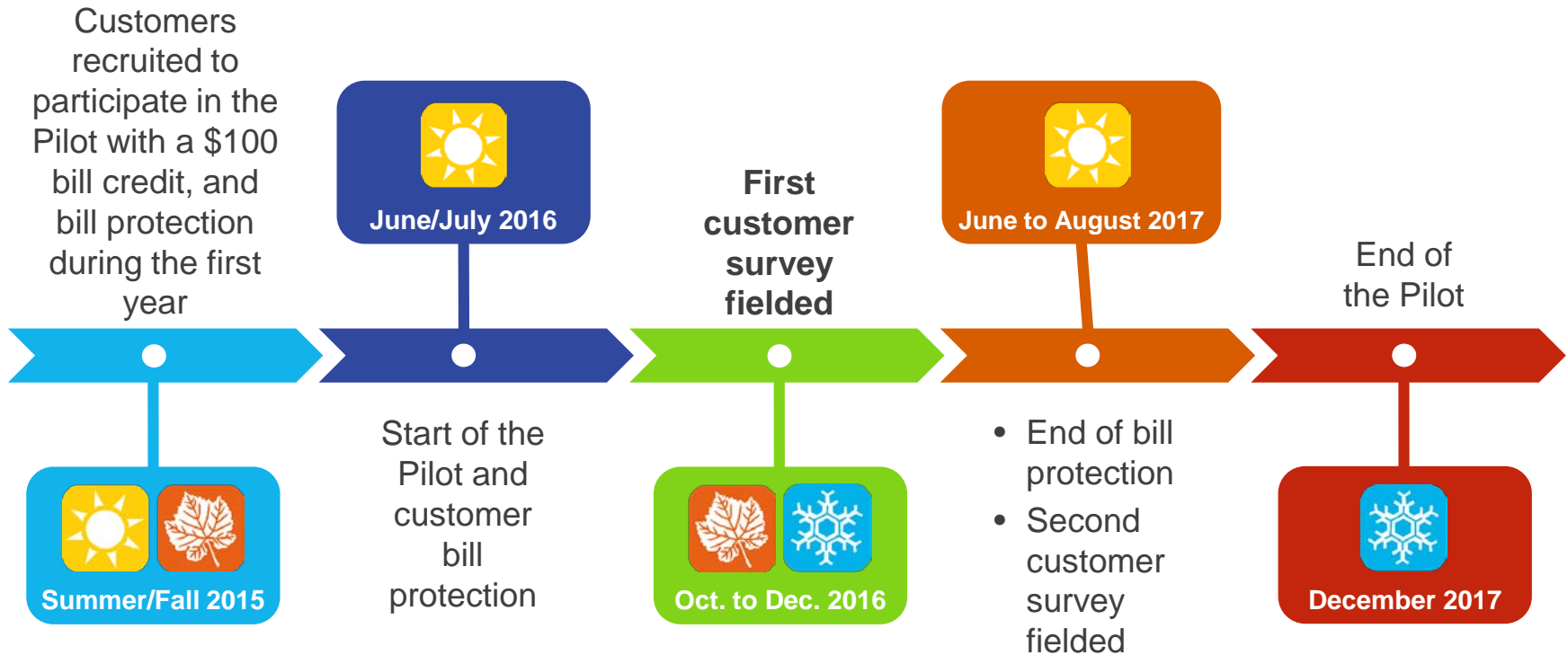# Opt-In TOU Pilot: Is There Hardship?

- CPUC tasked three electric IOUs to assess TOU rates' effects on customers' economic situation and health

  - By segment
    - Low Income customers (California Alternate Rates for Energy [CARE] or Family Electric Rate Assistance [FERA])
    - All other customers

  - By heat zone based on climate
    - Hot
    - Moderate
    - Cool

- 55,000 customers recruited based on customer segments and heat zone location

TOU Pilot Rate Options and RCT Design

- Customers in each segment randomly assigned to control or treatment rate

  - Control group customers (~17,000) received 'otherwise applicable tariff' (OAT) – standard rate

  - Treatment group customers (~48,000) assigned one of the two or three TOU rates, where rate varies by time of day
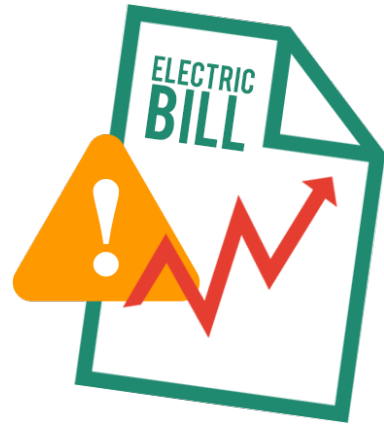
Climate Region	Segment	Control vs. Rate 1	Control vs. Rate 2	Control vs. Rate 3
Hot	Non-CARE/FERA	PG&E, SCE	PG&E, SCE	PG&E, SCE
	CARE/FERA			
Moderate	Non-CARE/FERA	PG&E, SCE, SDG&E	PG&E, SCE, SDG&E	PG&E, SCE
	CARE/FERA			
Cool	Non-CARE/FERA	PG&E, SCE, SDG&E	PG&E, SCE, SDG&E	PG&E, SCE
	CARE/FERA			

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TOU Pilot Timeline

Customers recruited to participate in the Pilot with a $100 bill credit, and bill protection during the first year

June/July 2016

First customer survey fielded

June to August 2017

End of the Pilot

Summer/Fall 2015

Start of the Pilot and customer bill protection

Oct. to Dec. 2016

- End of bill protection
- Second customer survey fielded

December 2017

Links between TOU Rates and Hardship

Economic hardship

Health impacts

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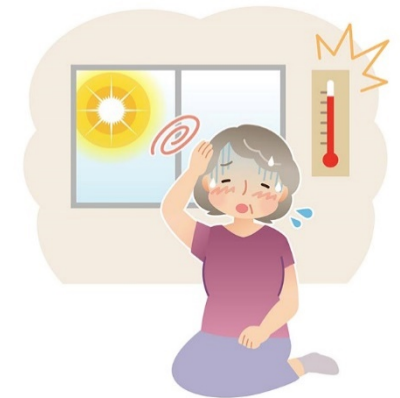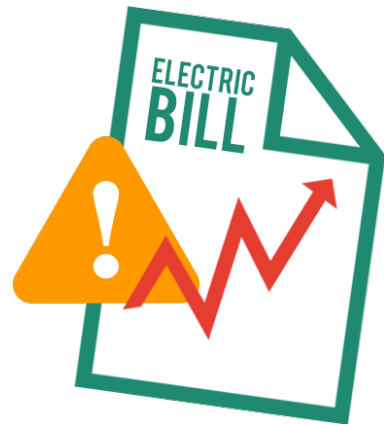
Survey and Analytical Methods

Mixed-Mode Census Survey Approach Achieved an 82% Average Response Rate

If participant has email

Letter invite + 2 email invites + Booklet + Call

If participant does NOT have email

Letter invite then reminder + Booklet then reminder + Call
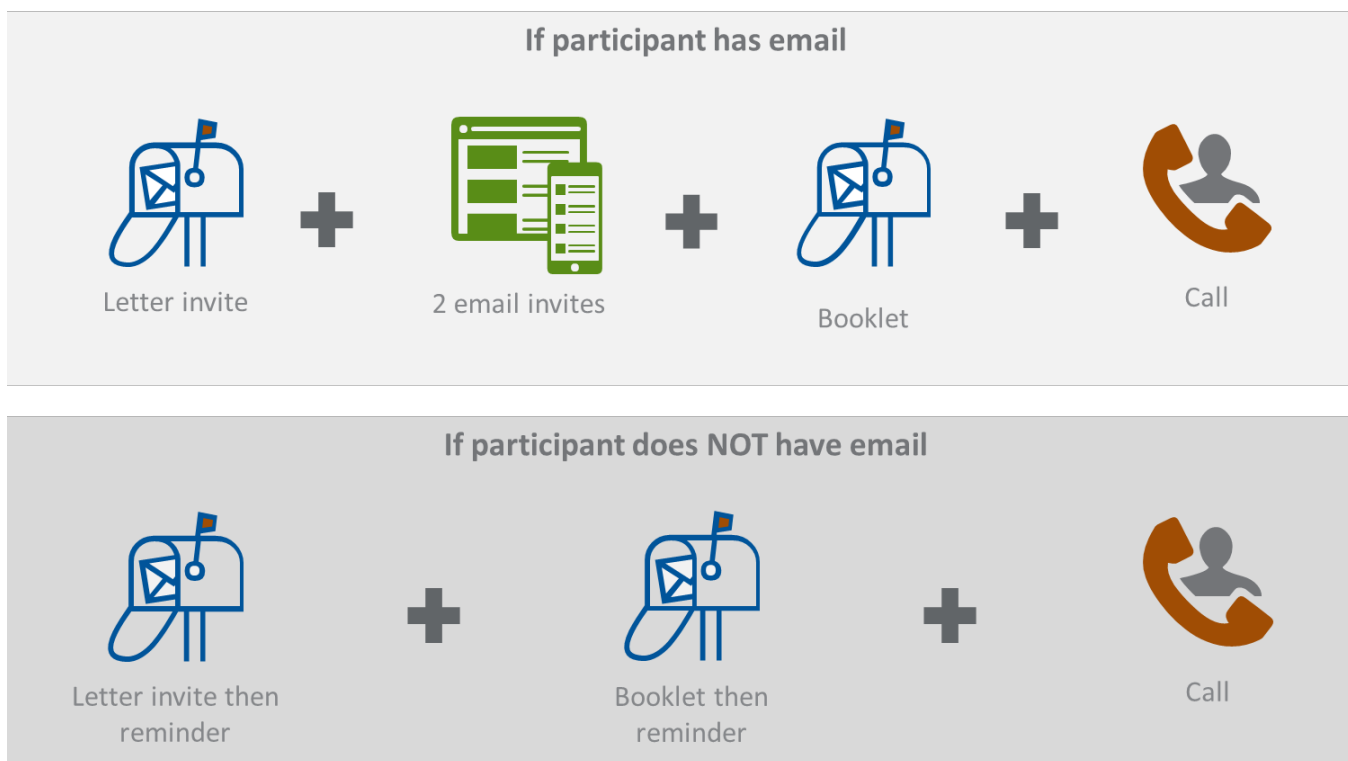
- 44,558 respondents out of 55,269 customers in the Pilot (82%)

- Response rates ranged from 67% to 96% across customer segments

- Customers received a $50, $75, or $100 bill credit for completing the survey

Economic Hardship Index Was Constructed from Four Questions and 18 Items

- Consumer Financial Protection Bureau's Financial Well-Being Questions
    - Asks how well three items about economic outlook describe the customer (5-point scale: 'Not at all' to 'Completely')
    - Asks how often two items about their financial situation describe their situation (5-point scale: 'Never' to 'Always')

- Problems Paying Bills
    - Asks how many times (0, 1, 2, or 3 or more) a customer had difficulty paying their…
        - Electricity bill
        - Bills for other basic needs

- Alternative Ways Used to Pay Bills
    - Asks about 10 methods customers used paid bills other than using their current income (check all that apply)

- Concern for Bill Payment
    - Asks the extent to which customers agree that they often worry if they have enough money to afford electricity bill (10-point scale: 'Not at all' to 'Completely')
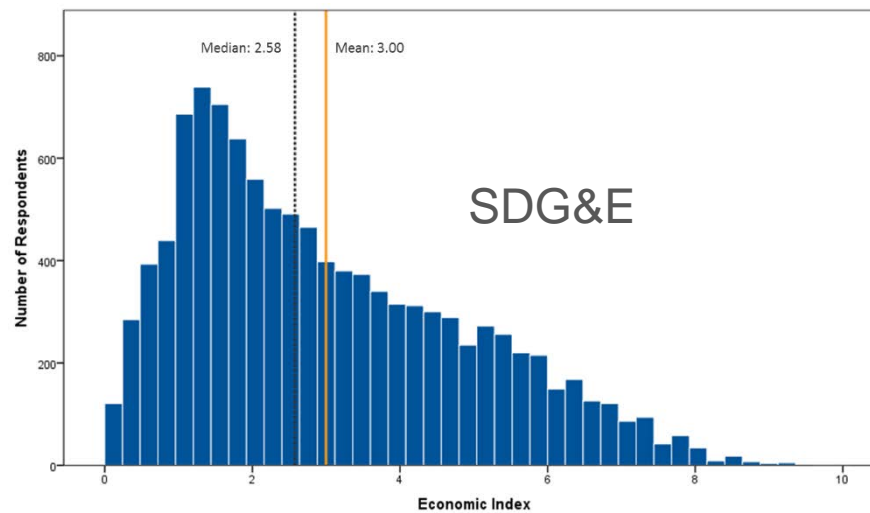
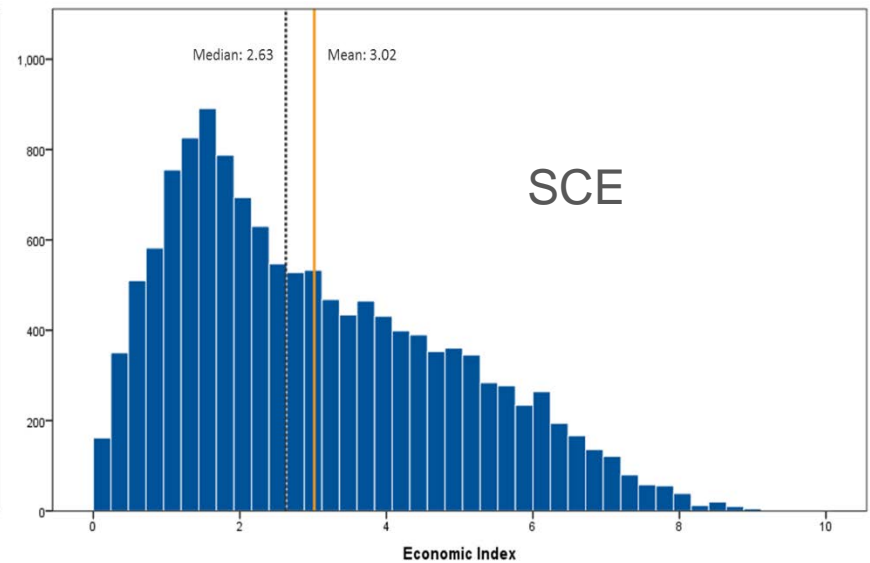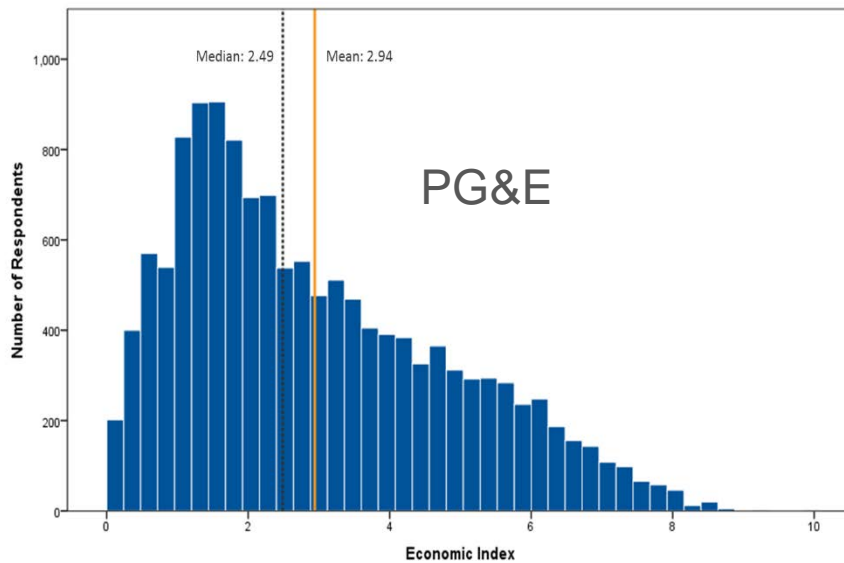# Health Hardship Metric Used Three Questions

- A health hardship index did not work
- Constructed a simpler health hardship metric using:
    - *Experienced Medical Events*: Since June 2016, how often, … did members of your household need medical attention because it was too hot inside your home? (0 to 10 times, or more than 10 times)
    - *Has Disability*: Does anyone in your household have a disability or ….condition that requires … home to be cooled in the summer? (**Yes** or No)
    - *Has Air-Conditioning in Home*: Do you have any of the following …. central AC, room AC unit, evaporative/swamp cooler, heat pump (**Yes** or No)

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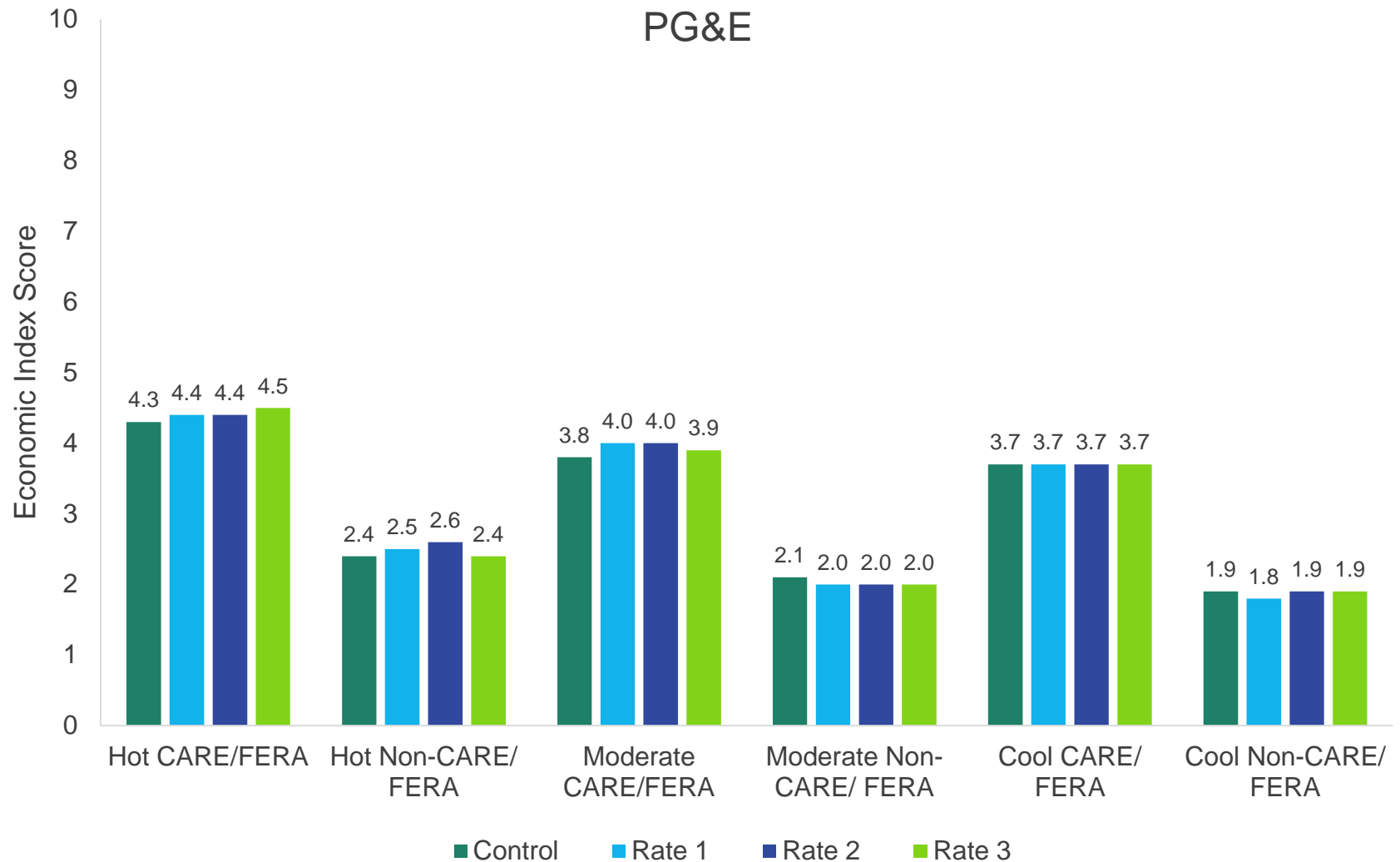
Statistical Comparisons Across RCT Groups

- Economic index score:
  - Used factor analysis to create scale ranging from 0 (very low hardship) to 10 (very high hardship)
  - Calculated average score for each region/segment/rate group
  - Compared Control group to Rate groups using two-tailed t-tests

- Health metric:
  - Calculated proportion of respondents who reported medical event(s), a disability, and air-conditioning
  - Compared Control group to Rate groups using two-tailed z-test

Hardship Results

Histogram Results of Economic Index Scores

PG&E's TOU Rates have no effect on economic index scores

PG&E

Economic Index Score

Category	Control	Rate 1	Rate 2	Rate 3
Hot CARE/FERA	4.3	4.4	4.4	4.5
Hot Non-CARE/FERA	2.4	2.5	2.6	2.4
Moderate CARE/FERA	3.8	4.0	4.0	3.9
Moderate Non-CARE/FERA	2.1	2.0	2.0	2.0
Cool CARE/FERA	3.7	3.7	3.7	3.7
Cool Non-CARE/FERA	1.9	1.8	1.9	1.9

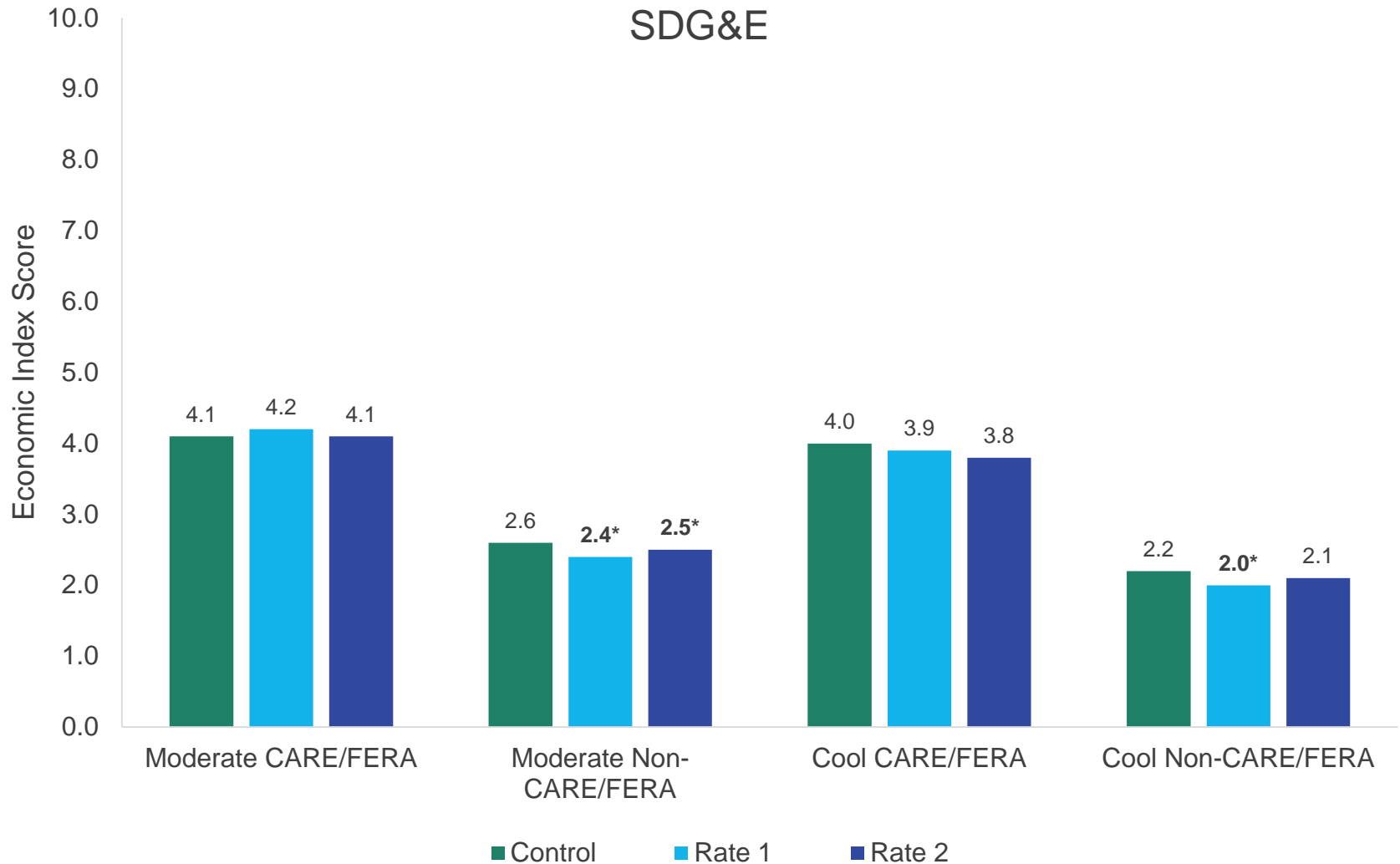■ Control ■ Rate 1 ■ Rate 2 ■ Rate 3

For SCE, only Rate 3 resulted in higher economic index score, for hot region CARE/FERA
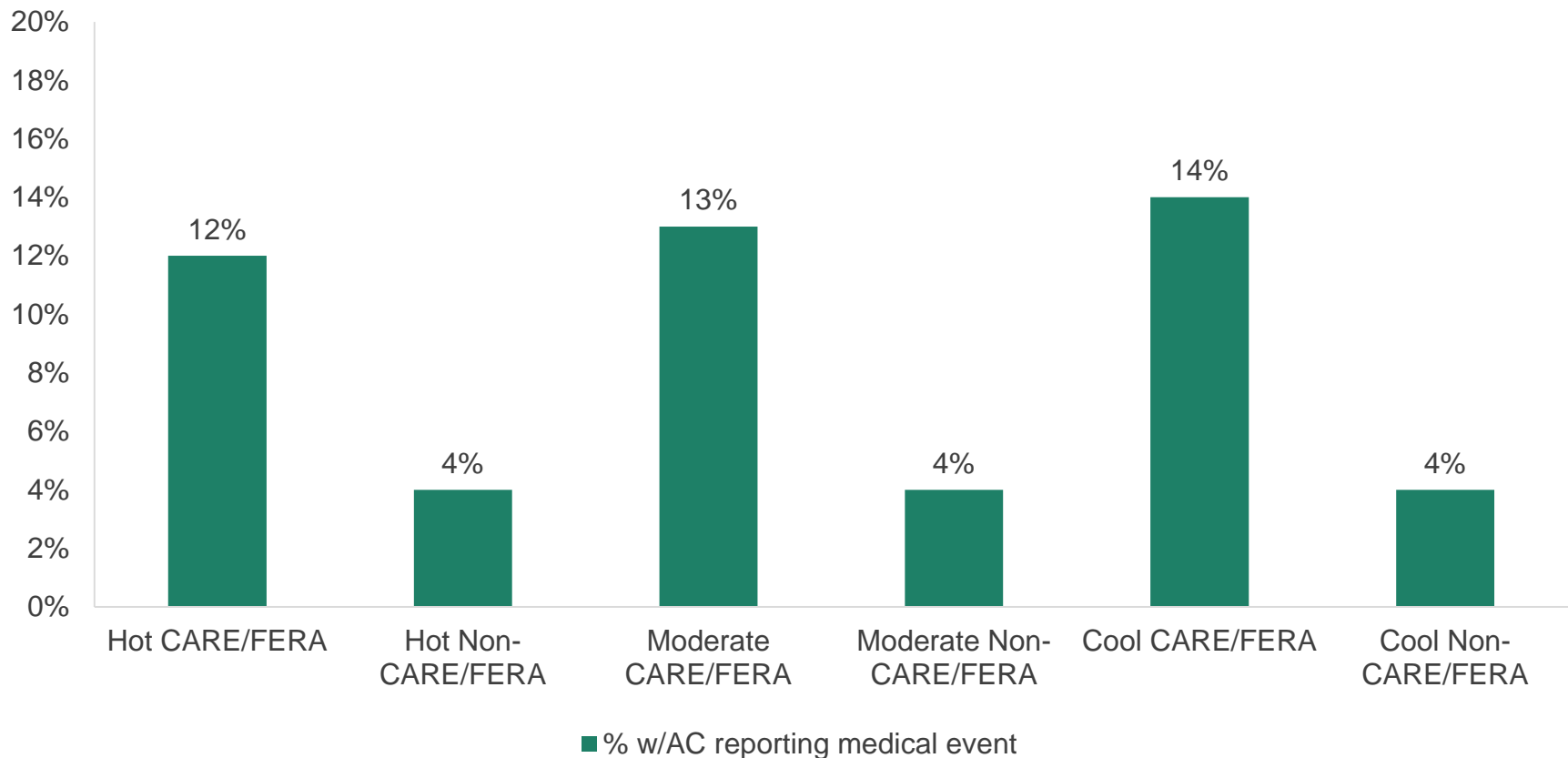
- Rate 3 has a more complex schedule and is more burdensome than Rates 1 & 2, and will not be used in the default
  - No baseline credit, no online billing

SCE

Economic Index Score

	Control	Rate 1	Rate 2	Rate 3
Hot CARE/FERA	4.1	4.1	4.2	4.4*
Hot Non-CARE/FERA	2.4	2.3	2.5	2.6
Moderate CARE/FERA	4.0	3.8	3.8	3.9
Moderate Non-CARE/FERA	2.3	2.4	2.2	2.4
Cool CARE/FERA	3.9	3.9	3.9	3.9
Cool Non-CARE/FERA	2.0	2.1	2.1	2.1

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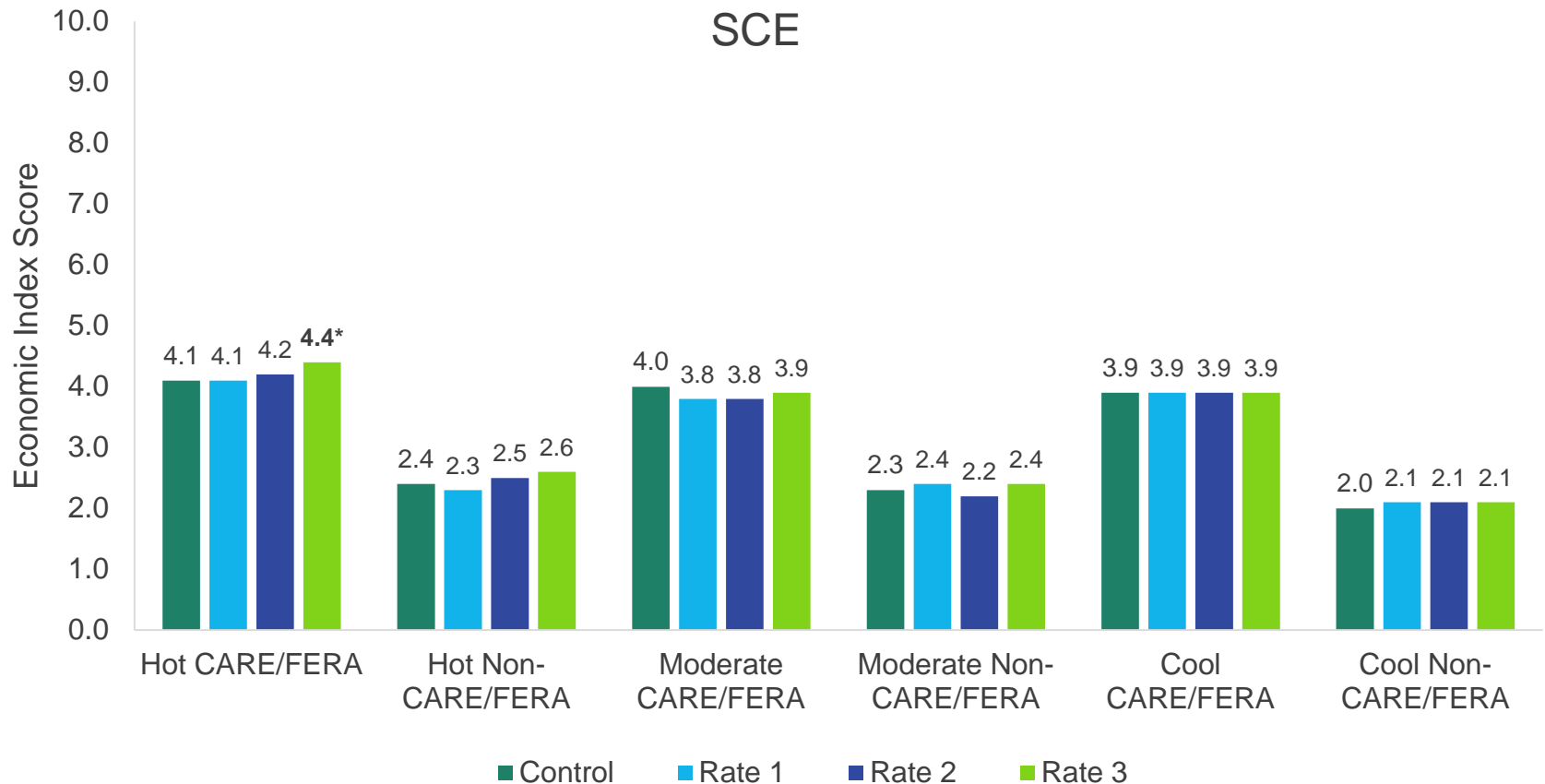
SDG&E's Rate 1 and 2 resulted in lower economic index scores for Non-CARE/FERA

SDG&E

Economic Index Score

|	Control	Rate 1	Rate 2
Moderate CARE/FERA	4.1	4.2	4.1
Moderate Non-CARE/FERA	2.6	2.4*	2.5*
Cool CARE/FERA	4.0	3.9	3.8
Cool Non-CARE/FERA	2.2	2.0*	2.1

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Small percentages of customers with AC reported one or more medical events

- Found very few differences in comparisons, and all differences indicate smaller proportions of Rate customers reported a medical event vs. Control customers

Larger percentages of customers with AC and disability reported one or more medical events
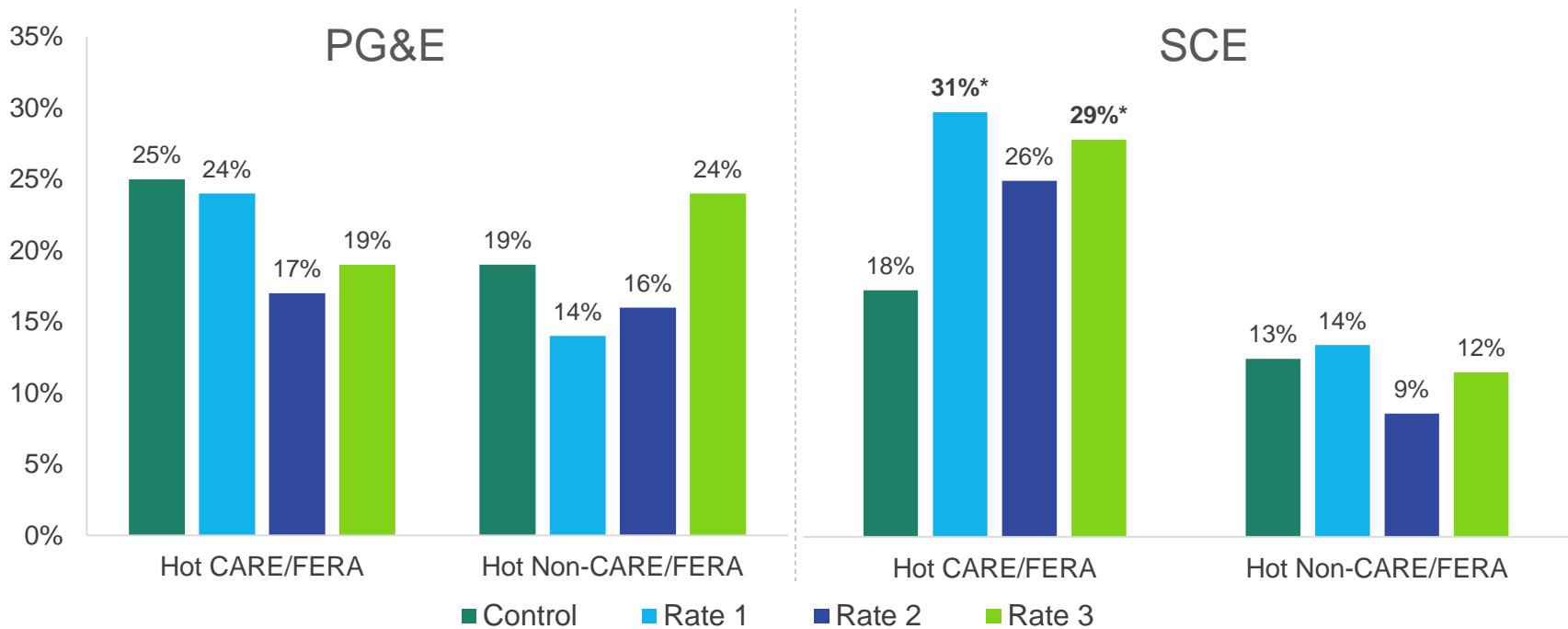
- SCE Rate 1 and 3 for Hot CARE/FERA has significantly higher proportion of customers reporting medical events

- Counts are too small for significance testing across groups in moderate and cool climate regions

  - Differences are less substantial than in hot climate regions

Conclusions

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TOU Rates have the potential to influence economic and health hardship for low-income customers

- The mixed-mode survey design and bill credit incentives were successful at achieving a very high response rate

  - Important for index and metric development

- The economic index appears effective for measuring economic effects of TOU rates on customers

  - The health metric is less robust but appears useful for identifying vulnerable customers

- The ALJs are deciding on the issue of whether to exclude any customers from the default TOU rates

  - Decision expected in September

Questions?

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