

The Use of Utility Bills as an Information Retrieval Aid in the American Housing Survey

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U.S. Census Bureau

American Association for Public Opinion Research

Annual Meeting

Chicago, Illinois

May 16, 2010

Disclaimer

This presentation is intended to inform interested parties of ongoing research to encourage discussion of work in progress.

The views expressed on methodological, technical and operational issues are those of the author and not necessarily those of the U.S. Census Bureau.

Utility Data Collection

- Utility costs are an important component of housing costs
- The American Housing Survey (AHS)
 - Key source of housing cost and utility data for the United States
 - Collected by the U.S. Census Bureau for HUD
- Utility record use in the AHS
 - Respondents are encouraged to use actual bills to aid information retrieval
 - Goal: Improved accuracy
- Research Question
 - Who uses electricity and gas bills to answer the AHS?

Outline

1. AHS Advance Letter
2. How Electricity Costs are Collected in the AHS
3. How Gas Costs are Collected in the AHS
4. Prior Research on Respondent Record Usage
5. Theoretical Expectations
6. Methods
7. Descriptive Statistics
8. Logit Models
9. Summary of Findings
10. Future Research

AHS Advance Letter

UTILITY COSTS FOR MOST RECENT MONTHS				
Utility	January	April	August	December
Electricity	\$	\$	\$	\$
Gas	\$	\$	\$	\$

This worksheet is not a questionnaire but an aid to help you when our field representative contacts you. **Do not mail this back to the U.S. Census Bureau.** Keep it for your reference. Thank you again for your time and effort in completing this important survey!

Completing the survey will be easier if you will look up the following bills in your checkbook or other records before the interview. Record the amounts for the past year in the spaces provided, skipping any costs that do not apply to you. **Please keep this worksheet** for reference, so you can refer to it when our field representative contacts you.

How Electricity Costs Are Collected in the AHS

- Do you use electricity in your home?
- Are you billed separately for electricity?
- How many months does each electric bill cover?
- If electric is billed separately and respondent gave the number of months each bills covers...
 - Do you have any of these records available showing your costs for electricity? (Can you please get them now?)
 - (From your records, what were the costs for electricity for the months of...) January, April, August, December
- If doesn't have bills or doesn't know or refuses or provides only 1 or no valid amounts for the months...
 - How much was your most recent bill?
 - What month was the bill for?

How Gas Costs Are Collected in the AHS

- Similar questions to electricity costs collection
- Ask if they use gas
- If yes,...Is it from underground pipes or from bottled gas?
- If the gas is piped, we ask if they have bills and proceed to ask them the monthly amounts

Related Research

- Not much research on respondent record use
- Research by (Marquis, Moore, and Bogen 1993) explored ways to increase record use in the Survey of Income and Program Participation (SIPP)
- Assumption: Record Use Improves Accuracy
 - This has not been tested
 - Need administrative data to test this with the AHS
- Here we answer the question of who has records and uses them to answer the survey

Who Should We Expect to Have Records?

- Who pays the bills?
 - Reference person or spouse
 - Child or other relative of reference person less likely
 - Occupied without payment of rent less likely
- Who is more likely to have bills readily available?
 - Older respondents
 - Respondents with higher levels of education and higher incomes
 - Owners
- How could the FR influence record use?
 - In person, the FR can visibly see if the respondent is using records
 - This could decrease the amount of respondents saying they have records when they are answering the questions

Methods

- Data from 2007 AHS National Public Use File and Internal Use File
- Logistic Regression Models
- $\ln(\text{odds}) = \ln(p_i/(1-p_i)) = \beta_0 + \beta_1 X_{1i} + \beta_2 X_{2i} + \dots + \beta_p X_{pi}$
 - Model 1: Has All 4 Electricity Bills
 - Model 2: Has All 4 Gas Bills
- Independent Variables
 - Respondent Demographic and Economic Characteristics
 - Housing Characteristics
 - Mode of Interview

Reference Groups in Models

- Race: White Only
- Hispanic Origin: Non-Hispanic
- Age: <35
- Education: Less than High School
- Income: First Monthly Income Quintile
- Marital Status: Not Married
- Family Relationship: Reference Person
- Tenure: Rented
- Region: Northeast
- Building Type: Building with 2+ apartments
- Mode of Interview: Telephone Interview

Chart 1: Percentage of Respondents with Electricity Bills

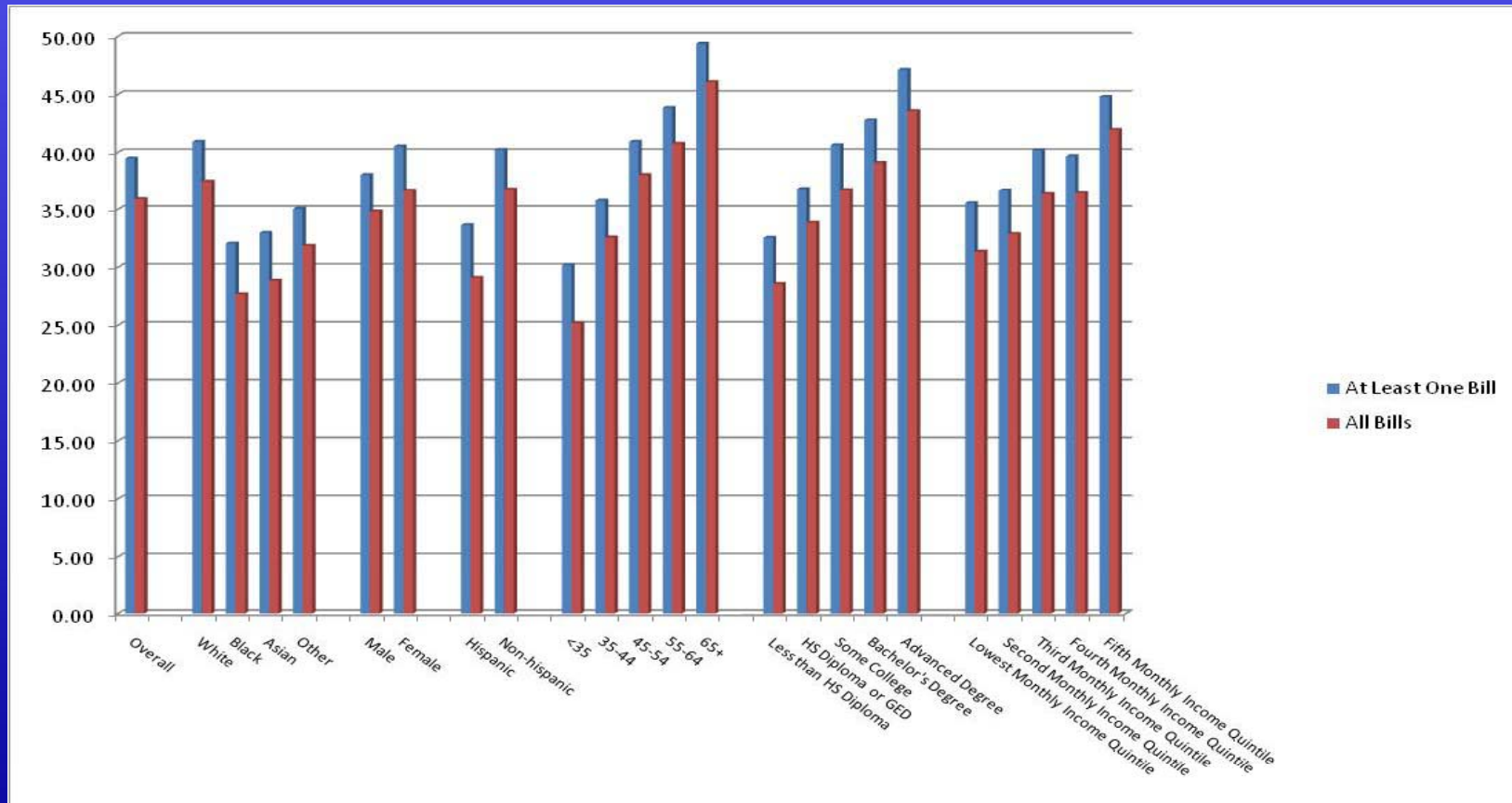


Chart 1: Percentage of Respondents with Electricity Bills (cont.)

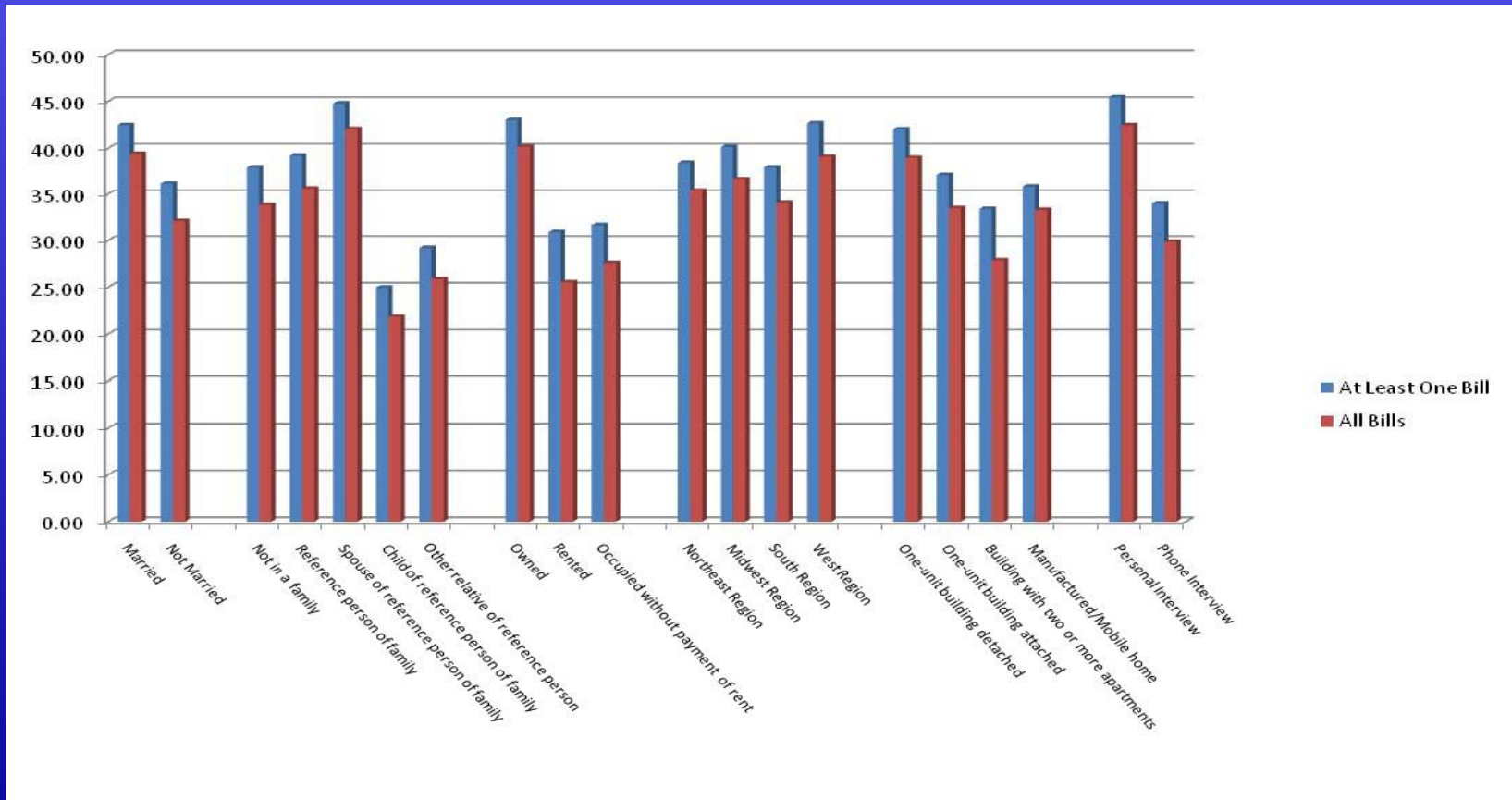


Chart 2: Percentage of Respondents with Gas Bills

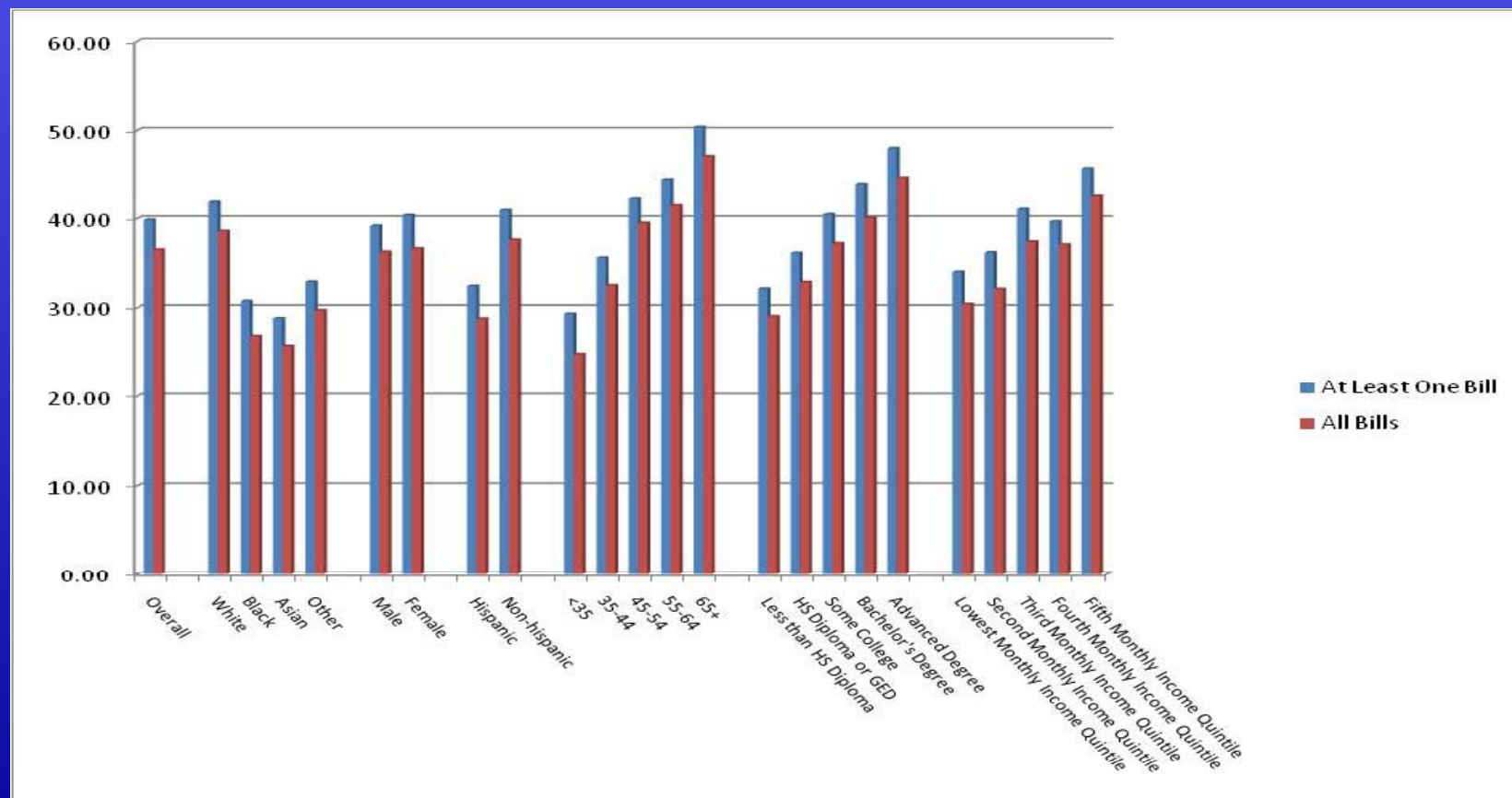
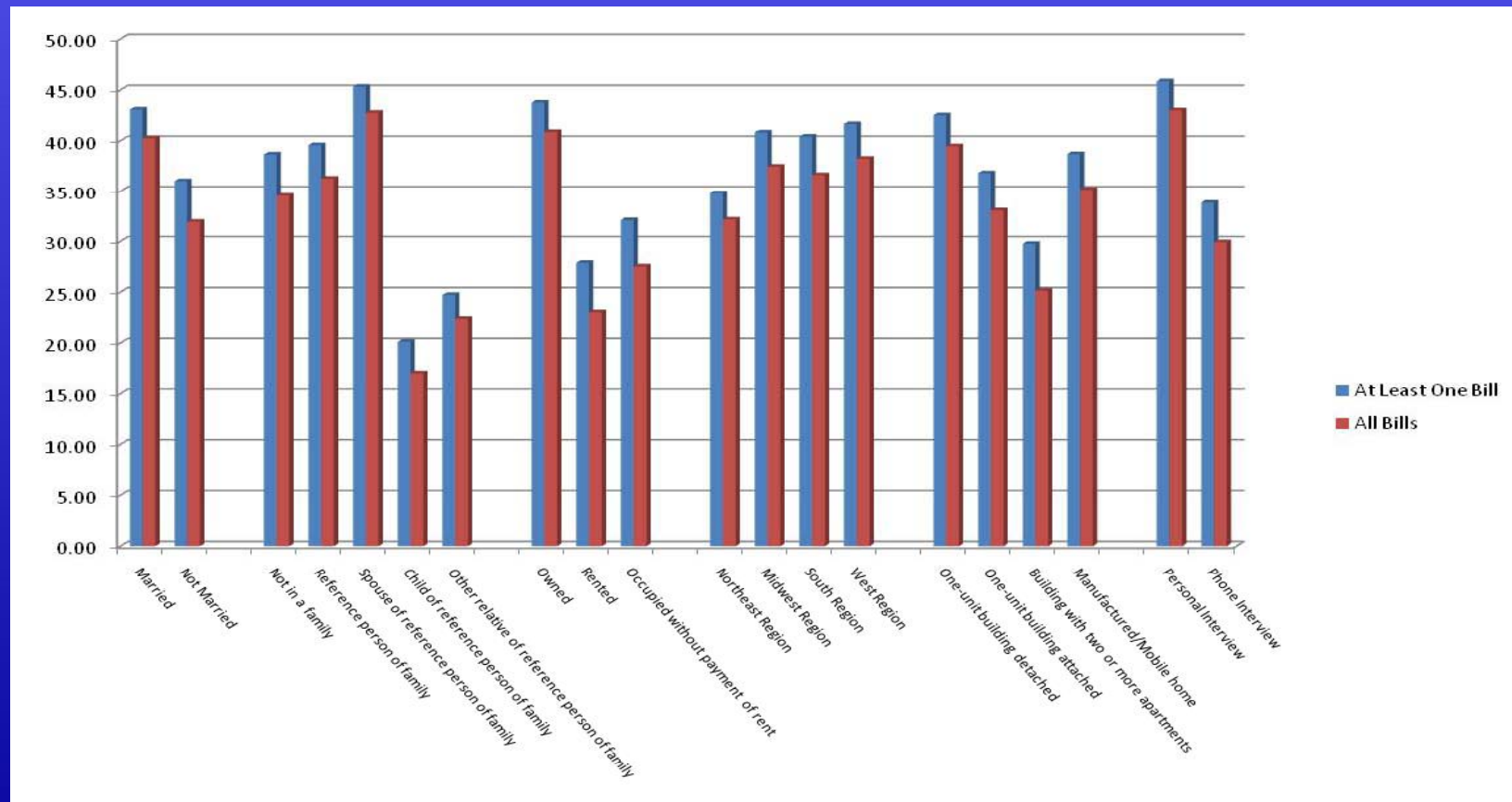


Chart 2: Respondents with Gas Bills (cont.)



Electricity Bill Model¹

- Model 1: Has All 4 Electricity Bills
 - Positive Effects
 - 65+ (1.54)^{***}
 - Advanced Degree (1.24)^{***}
 - Fifth Income Quintile (1.22)^{***}
 - Owned (1.17)^{***}
 - Respondent is Spouse of Reference Person (1.18)^{***}
 - Personal Visit (1.17)^{***}

¹Odds ratios in parentheses.

- Negative Effects
 - Asian Only (1.18)^{***}
 - Respondent is Child of Reference Person (1.23)^{**}

*Significant at the 90% level.

**Significant at the 95% level.

***Significant at the 99% level.

Gas Bill Model¹

- Model 2: Has All 4 Gas Bills
 - Positive Effects
 - 65+ (1.61)^{***}
 - Respondent is Spouse of Reference Person (1.31)^{***}
 - Owned (1.25)^{***}
 - Advanced Degree (1.24)^{***}
 - Fifth Income Quintile (1.13)^{***}
 - Not in a family (1.20)^{***}
 - Personal Visit (1.19)^{***}
 - Negative Effects
 - Asian Only (1.34)^{***}
 - Respondent is Child of Reference Person (1.42)^{***}

*Significant at the 90% level.

**Significant at the 95% level.

*Significant at the 99% level.

¹Odds ratios in parentheses.

Did the models match theoretical expectations?

- Who pays the bills?
 - Reference person or spouse were more likely to have bills
 - Child of reference person less likely
 - Other relative of reference person less likely, but not statistically significant
 - Owners are more likely to have bills
 - Occupied without payment of rent less likely, but not statistically significant
- Who is more likely to have bills readily available?
 - Older respondents are more likely to have bills
 - Respondents with higher levels of education are more likely to have bills
 - Respondents with higher income are more likely to have bills
 - Owners are more likely to have bills
- How could the FR influence record use?
 - More records with personal interviews.
 - Did not match expectations.
 - Respondent may have more social pressure to retrieve records when the interviewer is in front of them

Summary

- Who is more likely to have bills?
 - Older
 - Higher Levels of Education
 - Higher Incomes
 - Owners
 - Reference Person or Spouse
 - White Only
 - Personal Interviews
- Who is less likely to have bills?
 - Younger
 - Lower Levels of Education
 - Lower Incomes
 - Renters
 - Children of Reference Person
 - Asian Only
 - Telephone Interviews

Future Research

- Does record use improve accuracy?
 - Administrative record checks
 - Comparison of respondent records to respondent responses
- Do advance letters improve record usage?
 - Split panel studies could be designed to test the advance letter effect
 - Can advance letters be redesigned to improve record usage in groups that use them less?
- Alternative ways of collecting utility data
 - Respondent signs waivers so data can be requested of utility companies
 - Collect tract level information from utility companies. Model utility costs based upon location and housing and household characteristics.
 - These methods would reduce respondent burden

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