# Home Energy Insecurity: Socioeconomic Determinants and Causes

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# Study Objectives

❑ Energy Insecurity (EI): Inability to adequately meet household energy needs.

❑ Memphis has #1 energy burden in the U.S.

Overall objective: Assess the linkage of home energy insecurity (HEI) with the sociodemographic factors and health.

➢ Aim 1: Determine the effects of area-based socioeconomic status (SES) and racial variables on energy burden.

➢ Aim 2: Assess associations of energy burden with population health, focusing on asthma and COPD.

➢ Aim 3: Describe the experience of living with EI through qualitative interviews of low-income households in Memphis.

# Methods

- ❑ Data collection:
    - ➢ Zip-level utility bill data in 2014 from MLGW.
    - ➢ Socioeconomic status, demographic, and housing data from ACS.
    - ➢ Health outcome data from CDC's 500 Cities Project.
- ❑ Data Analysis Methods:
    - ➢ Identify the key SES factors using cluster and factor analysis.
    - ➢ Examine associations using multivariable regressions.
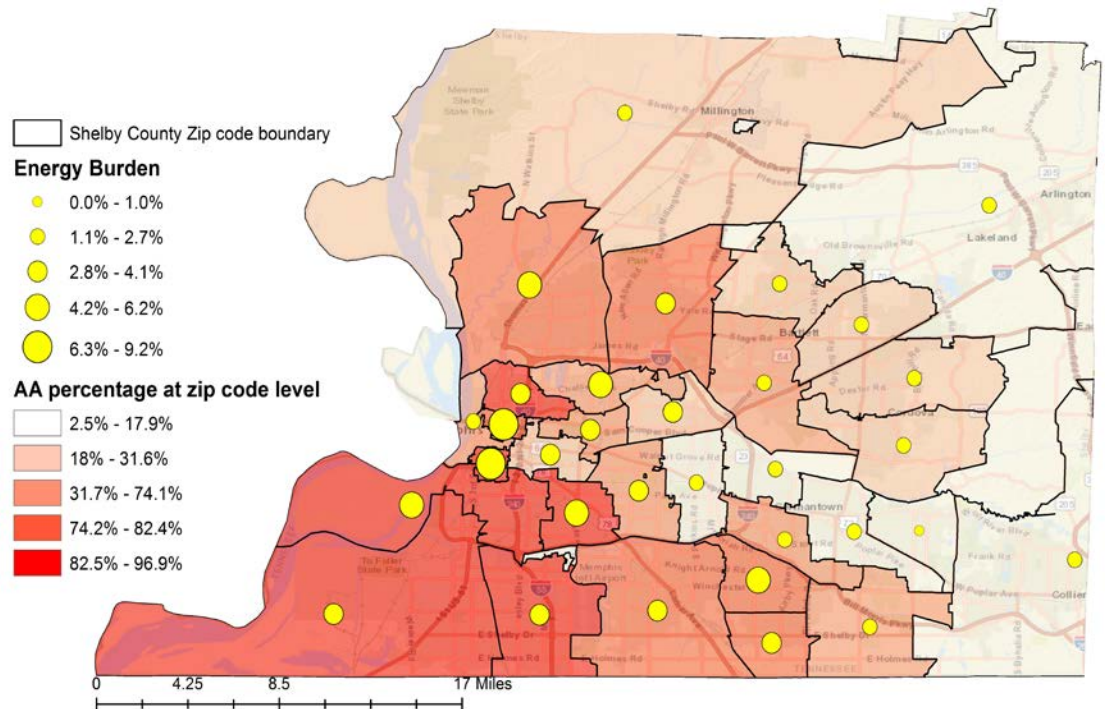- ❑ Interviews
    - ➢ In-depth interviews were used to investigate the nature of EI among low-income families.
    - ➢ 10 participants were recruited in the waiting area of Shelby County LIHEAP Office.
    - ➢ Questions cover financial hardship, personal stress, housing quality, and strategies to handle EI.
    - ➢ Part of a national study of EI.

# Results – EI and SES

❑ Energy burden averaged 3.7% (1.9 – 10.3%) in Shelby County, slightly higher than the national average of 3.5%.

❑ Renters had lower energy burdens than owners (2.1% vs. 4.2%, p<0.0001).

| Parameter | Estimate | P-value |
|---|---|---|
| Intercept | 22.18 | 0.04 |
| Owner | 5.02 | <.0001 |
| Renter | 0.00 | . |
| Pct>age65 | 39.84 | 0.00 |
| Pctblack | 9.20 | <.0001 |
| Pctfemale | -10.20 | 0.46 |
| Pctuscitizen | -12.56 | 0.27 |
| Totpop | 0.00 | 0.05 |



Shelby County Zip code boundary

**Energy Burden**
- 0.0% - 1.0%
- 1.1% - 2.7%
- 2.8% - 4.1%
- 4.2% - 6.2%
- 6.3% - 9.2%

**AA percentage at zip code level**
- 2.5% - 17.9%
- 18% - 31.6%
- 31.7% - 74.1%
- 74.2% - 82.4%
- 82.5% - 96.9%

0   4.25   8.5   17 Miles

# Results – EI and Health

| Parameter | COPD | | Asthma | |
|---|---|---|---|---|
| | Estimate | p-value | Estimate | p-value |
| Intercept | 27.47 | 0.001 | 12.80 | 0.024 |
| Energy_burden | 0.17 | 0.048 | 0.11 | 0.098 |
| Residence 0 | -0.86 | 0.139 | -0.52 | 0.218 |
| Residence 1 | 0.00 | . | 0.00 | . |
| census_pctage65p | 23.44 | 0.004 | 2.98 | 0.595 |
| census_pctblack | 8.36 | <.0001 | 4.90 | <.0001 |
| census_pctfemale | -7.60 | 0.339 | -0.67 | 0.908 |
| pctuscitizen | -25.06 | 0.005 | -5.88 | 0.344 |
| totpop | 0.00 | 0.064 | 0.00 | 0.122 |

# Complex Causes and Consequences

| Causes | Consequences |
|---|---|
| • Housing quality and efficiency<br>• Food/water/taxes/transportation<br>• Elderly & ill- special populations<br>• Life  transitions, setbacks & losses, work, illness, death & moving | • Health<br>• Social Isolation- discomfort/stigma |

*"I suffer because I can't afford it"*
*"Besides the rent, the energy bill is my highest bill"*
*"Since I lost my job, its been about getting back on my feet."*
*"This stress is now a way of life"*