Effect of Health Shocks on Resource Acquisition for Food Insecure Households

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WEALTH-HEALTH GRADIENT

The difference in incomes of people reporting poor versus excellent health, is similar to the difference in incomes of college dropouts versus college graduates.

1. **Low Income *causes(?)* poor health**
   - Safety net health systems has potential to intervene
   - Utilization often sub-optimal
2. **Poor health *causes(?)* lower income & wealth**
   - Effects extend beyond the financial burden of healthcare
   - Patchwork of social service programs/agencies that may intervene

RESEARCH QUESTION

What is the impact of an unexpected adverse health event on employment, housing mobility, and utilization of social services?

Health Shock = "unexpected adverse health event"

CAUSAL MECHANISMS

Poor health *causes(?)* lower income & wealth

- Low SES households are more adversely affected by health shocks....coping is difficult
- Low SES households experience more health shocks

IDENTIFICATION STRATEGY

- Health shock is exogenous (unpreventable and unpredictable).
- Estimate the relationship between health shocks (independent variable) and changes in employment, housing mobility, and utilization of social services (dependent variables).
  - Changes measured over a minimum 180 days
  - Health shock occurs in between pre- and post- outcome measures

CROSSROADS
COMMUNITY SERVICES

- Largest Non-profit food distributor in the region (>5500 households annually)
- Administrative data collected at client intake
- Monthly, longitudinal records
- Address and household members validated via rental agreements, school records, mortgage

Key Variables

- Household employment
- Household composition
- Crossroads visits
- Address history
- Age, race/ethnicity, gender, marital status

Parkland

- County safety-net health provider
- Integrated health system (hospital & community clinics)
- Epic electronic health records ($\sim$ 65,000 records annually)

Key Variables

- ER visits
  - Excluded potentially preventable conditions (Parchman & Culler, 1999)
  - Excluded visits for chronic conditions (e.g. prescription refills, administrative visits)
- Insurance status
- Outpatient visits

- Real-estate characteristics of all properties in Dallas County (~650,000 parcels)
- Crossroads household address history can be geo-coded to DCAD parcel file

Key Variables

- Distance moved
- Type of housing (e.g. apartment, town home, single-family)
- Housing characteristics for single-family

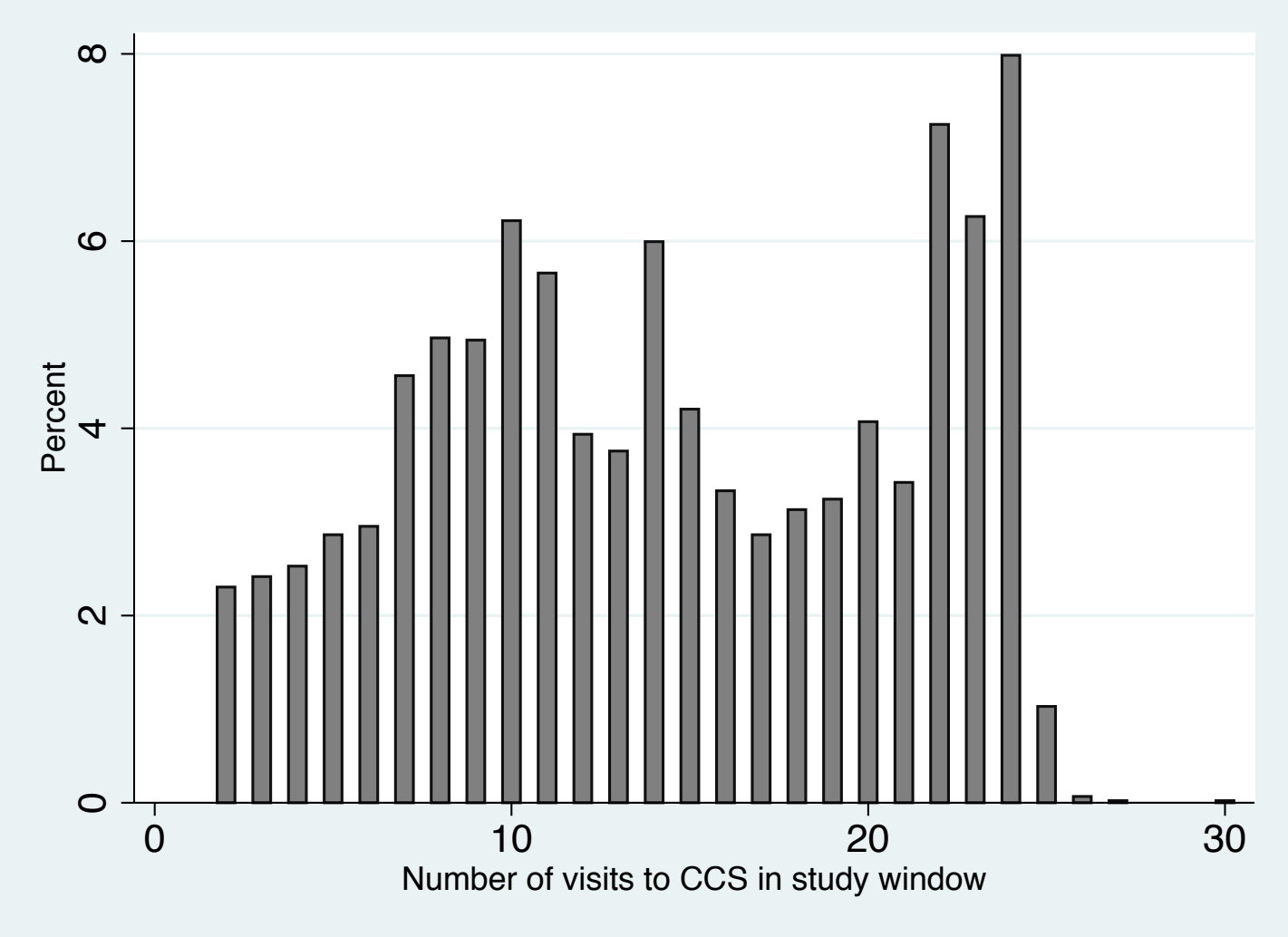
DATA LINKAGE

- Crossroads [Dec. 2013-Nov. 2015]: 10,840 individuals residing in 7,588 households
  - 71,349 household encounters
  - 4471 households with multiple visits spanning at least 180 days
- Merge Crossroads data with Parkland EMR [Dec. 2012-Nov. 2015] using name, DOB, zip code
  - 3696 merged household records (82.67%)
- 100% cadastral geocoding of merged records using DCAD parel file

SAMPLE CHARACTERISTICS

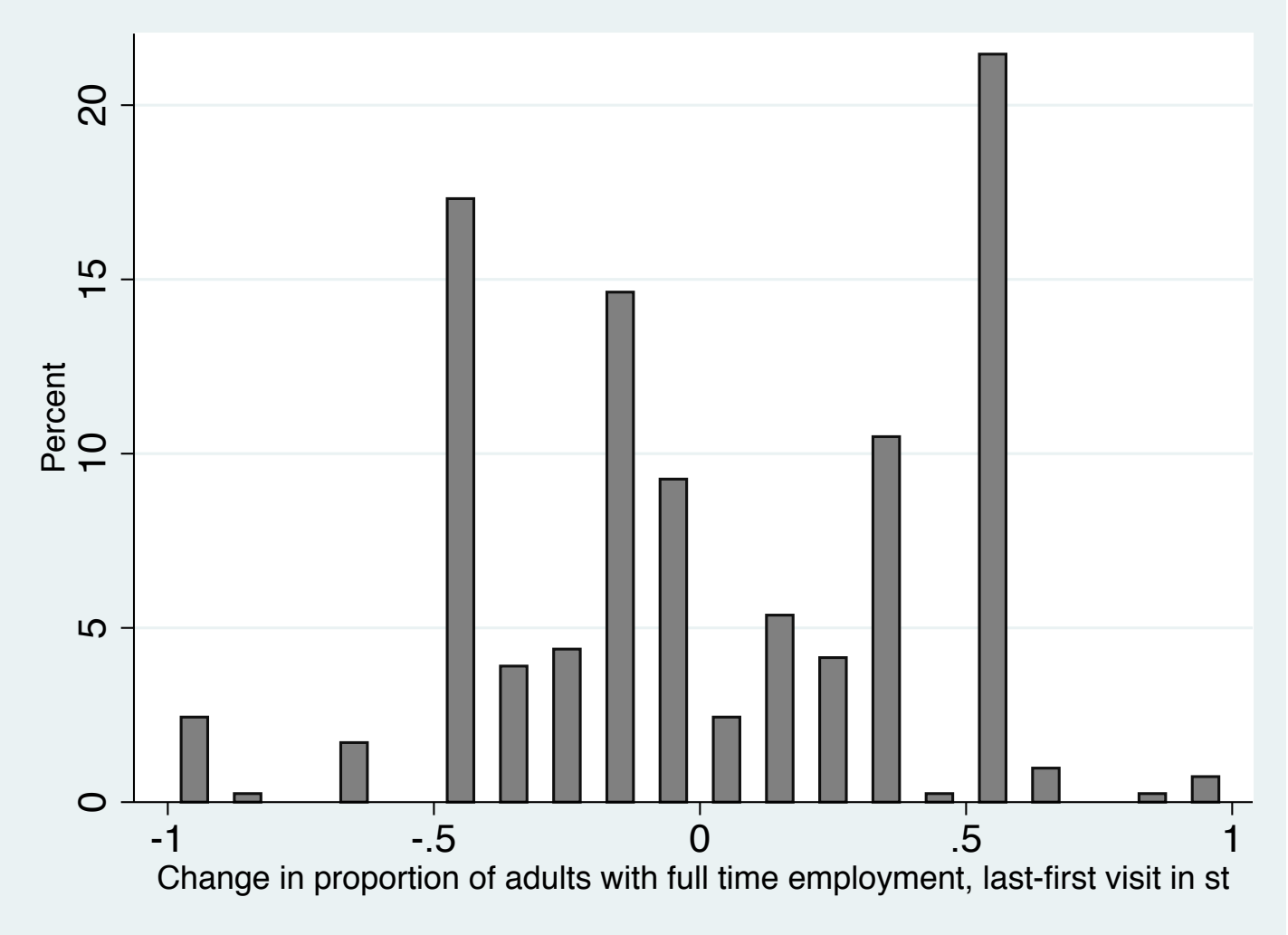
- Average household:
  - 14 Crossroads visits
  - 2.5 members
  - 26 household outpatient encounters
  - Monthly income = $1,205 (if any income)
- Average head of household:
  - 47 years
  - Female (75%)
  - unmarried (68%)
  - African American (53%) or Hispanic (33%)

NUMBER OF CROSSROADS VISITS



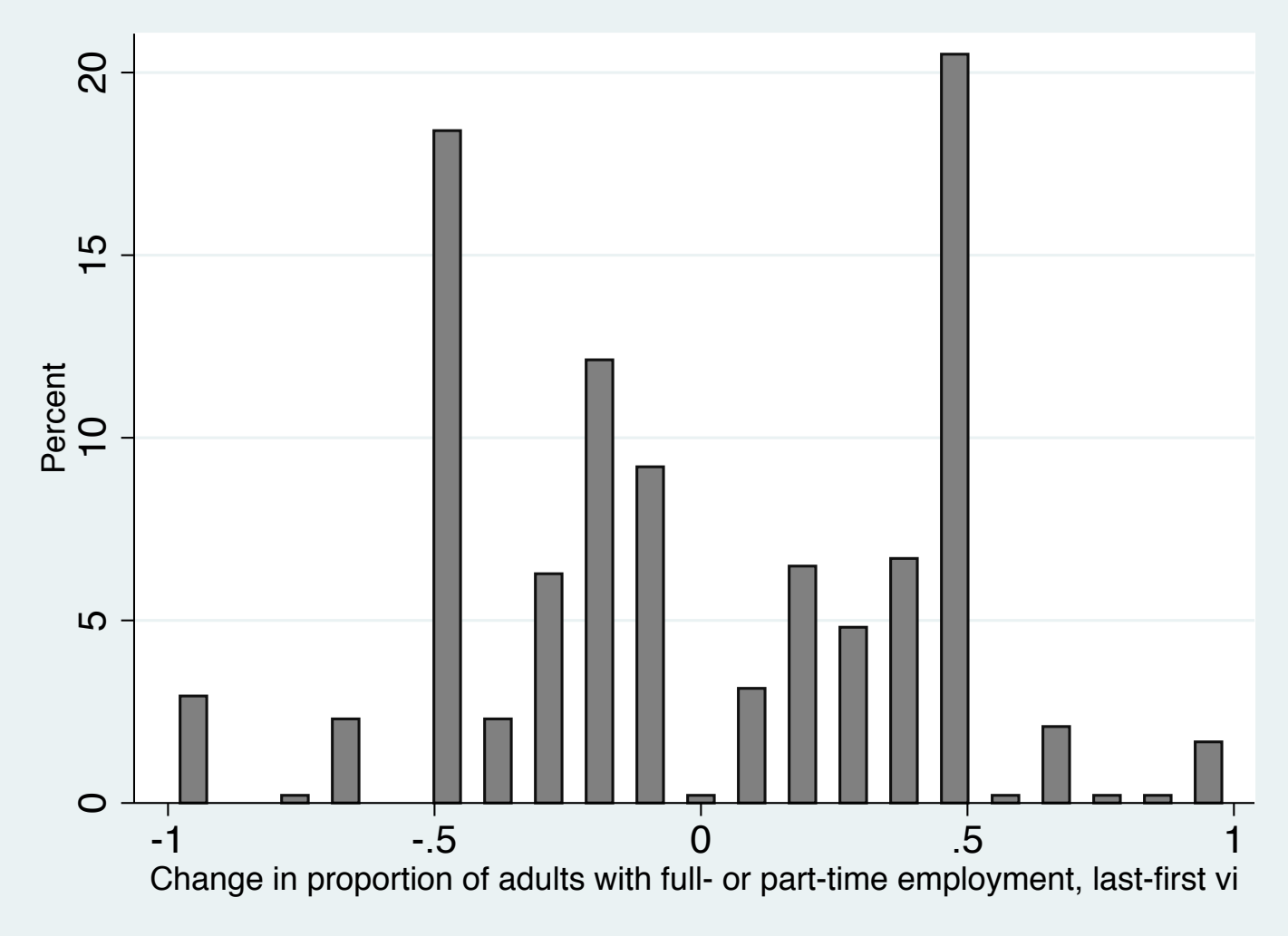
CHANGE IN THE PROPORTION OF ADULTS EMPLOYED FULL-TIME (LAST-FIRST)

90% of sample had no change



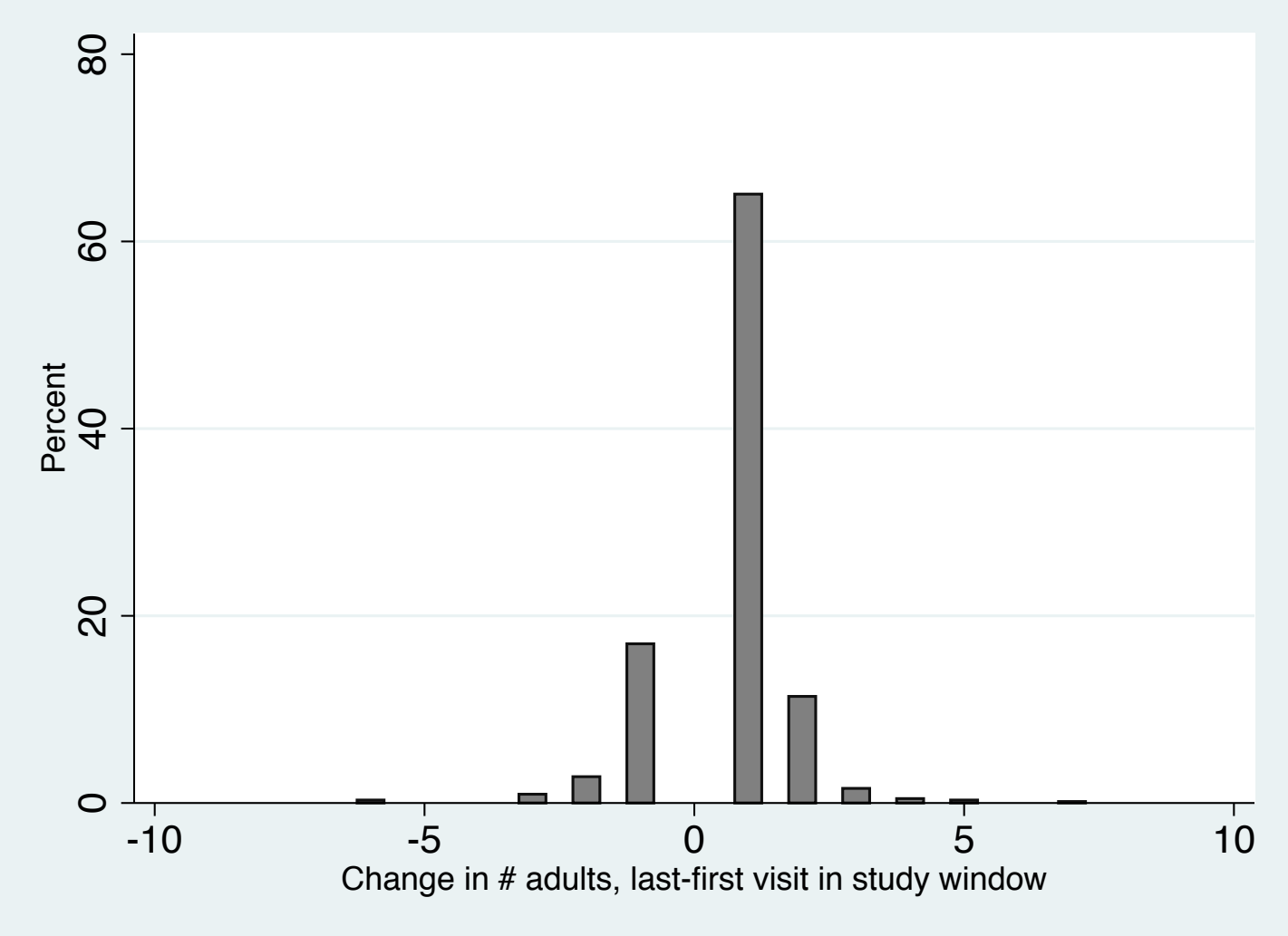
CHANGE IN THE PROPORTION OF ADULTS EMPLOYED FULL- OR PART-TIME (LAST-FIRST)

89% of sample had no change



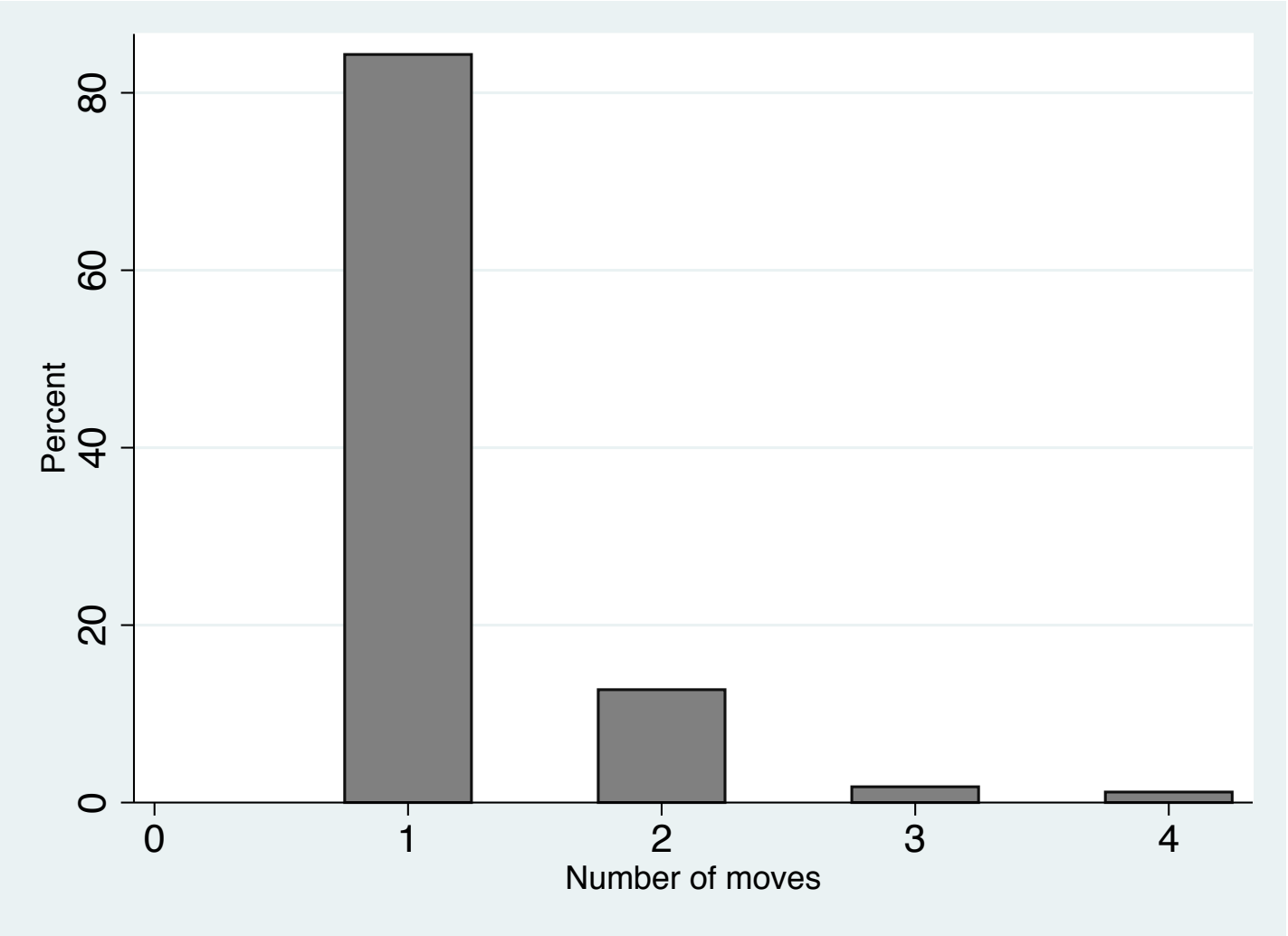
CHANGE IN THE NUMBER OF ADULTS IN THE HOUSEHOLD (LAST-FIRST)

85% of sample had no change



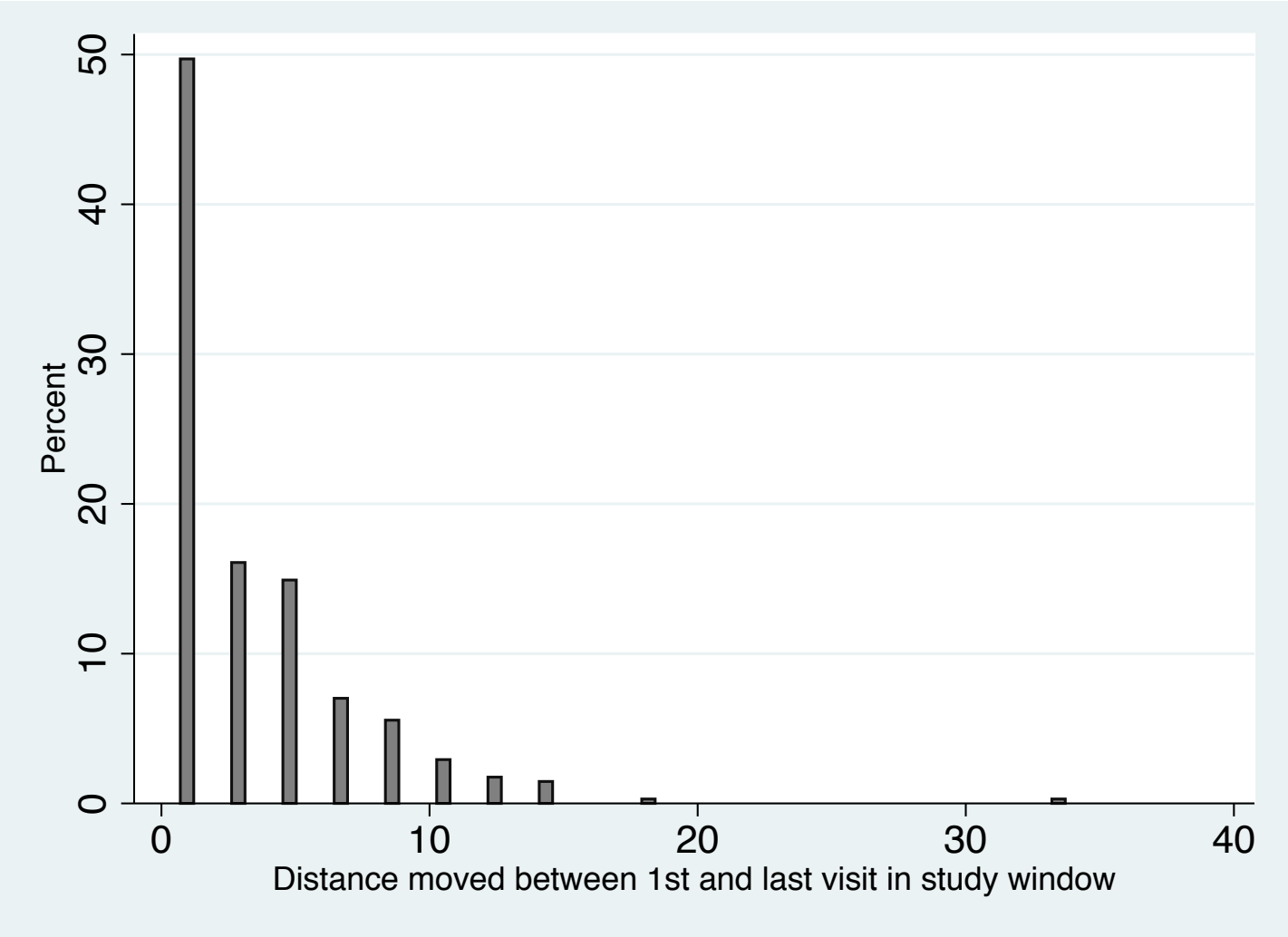
NUMBER OF MOVES

92% of sample did not move



DISTANCE MOVED (MILES)

92% of sample did not move



ECONOMETRIC MODEL

$$y_i = \beta_0 + \beta_1 x_i + \theta \, HS_i + \epsilon_i$$

- In separate models, $y_i =$
  - change in proportion of household adults employed **(OLS)**
  - change in number of household adults **(OLS)**
  - number of Crossroads visits **(Tobit Model)**
  - whether household moved **(Logit Model)**
  - whether the move was over a longer distance **(Logit Model)**
- x is controls for initial household size, initial household employment level, age, age squared, race/ethnicity, head gender, head education, marital status, # of outpatient visits, and health insurance status of head.
- HS indicates whether the household experienced a health shock

ESTIMATION RESULTS (OLS AND TOBIT MODELS)

Dependent Variables N	**Household Shock** 3,235	**Head Shock** 1,151	**Non-head Shock** 1,151
Change in Proportion Adults Employed Full-time (Last-First)	-0.003 (0.006)	-0.018 (0.011)	-0.016 (0.013)
Change in Proportion Adults Employed Full/Part-time (Last-First)	-0.009 (0.007)	-0.004 (0.013)	-0.025^{+} (0.015)
Change in Number of Adults in Household (Last-First)	0.107*** (0.025)	0.091 (0.058)	0.228*** (0.064)
Number of Crossroads Visits (Tobit Model)	0.716* (0.333)	1.569** (0.570)	1.101^{+} (0.640)

Covariates: initial household size, initial household employment level, age, age squared, race/ethnicity, head gender, head education, marital status, # of outpatient visits, and health insurance status of head.

ESTIMATION RESULTS, ODDS RATIOS (LOGIT MODELS)

Dependent Variables N	**Household Shock** 3,235	**Head Shock** 1,151	**Non-head Shock** 1,151
Moved	2.046*** (0.303)	1.929** (0.483)	1.001 (0.320)
Long-distance Move (> 1 mile)	2.42*** (0.381)	1.945* (0.557)	1.178 (0.410)

Covariates: initial household size, initial household employment level, age, age squared, race/ethnicity, head gender, head education, marital status, # of outpatient visits, and health insurance status of head.

DISCUSSION & CONCLUSIONS

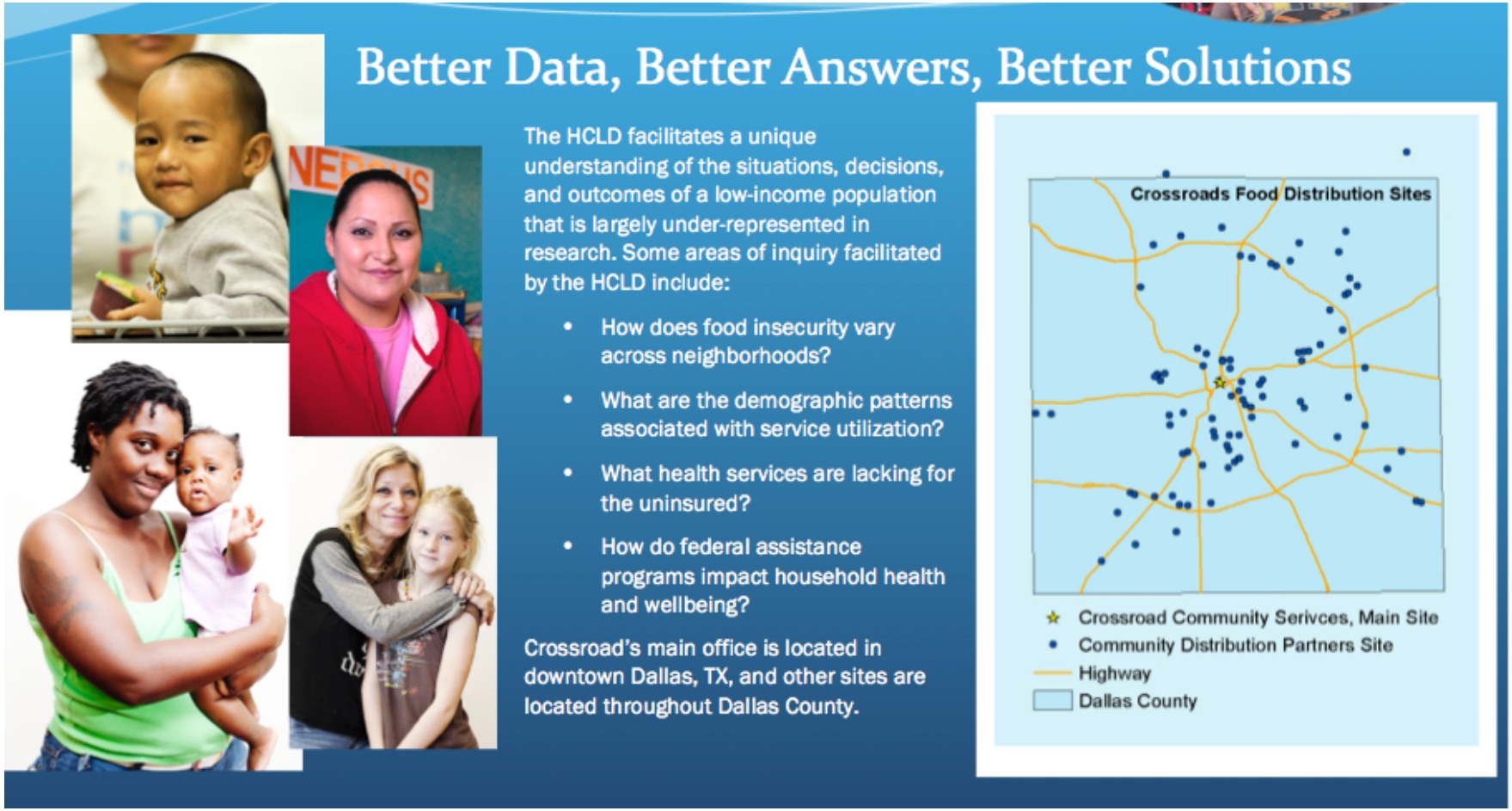
- Health shocks to a household member are associated with
  - Adding adults to the household (doubling up?)
  - More frequent utilization of social services
  - Increased likelihood of moving
  - Moving longer distances
- Health shocks to head versus other adult household members reveal different coping patterns.
  - Non-head shocks associated with adding unemployed adults
  - Head shocks associated with moving
  - Effect size for Crossroads visits larger for a head shock

NEXT STEPS–SHORT TERM

- More robust causal analysis (Spatial difference-in-difference model)
  - More data (longer time horizon)
  - Better data (measured BMI, self-reported health status, USDA Food Security Module since July 2015)
- Hazard analysis to better understand risks and time horizon for different coping mechanisms.
  - Better utilize repeat household observations

LONGER TERM: HCL DATABASE IMPROVEMENTS

Crossroads data is archived in the HCL Database.
RWJF E4A funding will improve and expand this resource.



Thank You !