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# DO HOUSING VOUCHERS IMPROVE ACADEMIC PERFORMANCE? EVIDENCE FROM NEW YORK CITY

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# MOTIVATION

- Housing Choice Voucher (HCV) program provides subsidies to more than 2.5 million children under the age of 18
  - Federal Government spends \$18 billion dollars annually
- Vouchers may improve educational outcomes through multiple channels
  - Increased housing stability
  - Decrease overcrowding
  - Income effects from rental subsidy
  - Lower levels of stress among parents
  - *Provide access to better neighborhoods and schools*
- Evidence on effectiveness limited
  - MTO estimated effects on sample of households already receiving public housing
  - Other studies find mixed evidence
    - Jacob, Kaputson, Ludwig (2014) find no effects
    - Andersson (2016) evidence of positive effects when conducting within sibling analyses

# THIS PAPER

- Estimate the impacts of the Housing Choice Voucher on educational outcomes using full sample of HCV households in New York City
  - Use detailed longitudinal data allow us to observe student outcomes before, during, and after HCV
  - Match over 88,000 voucher recipients to public school records
  - Follow schooling and residential experiences
- Exploit precise timing of voucher receipt to compare students receiving HCV to those who will receive HCV in future
- Compare effects of HCV to effects of Public Housing
- Explore potential mechanisms

# PREVIEW OF FINDINGS

- Students in voucher households perform better in both English Language Arts (ELA) and math in years after receiving a voucher
  - Effects do not differ by gender or age at first voucher receipt
  - Effects concentrated among Hispanic and White/Asian students
- Potential mechanisms include residential mobility, income effects, and long term stability

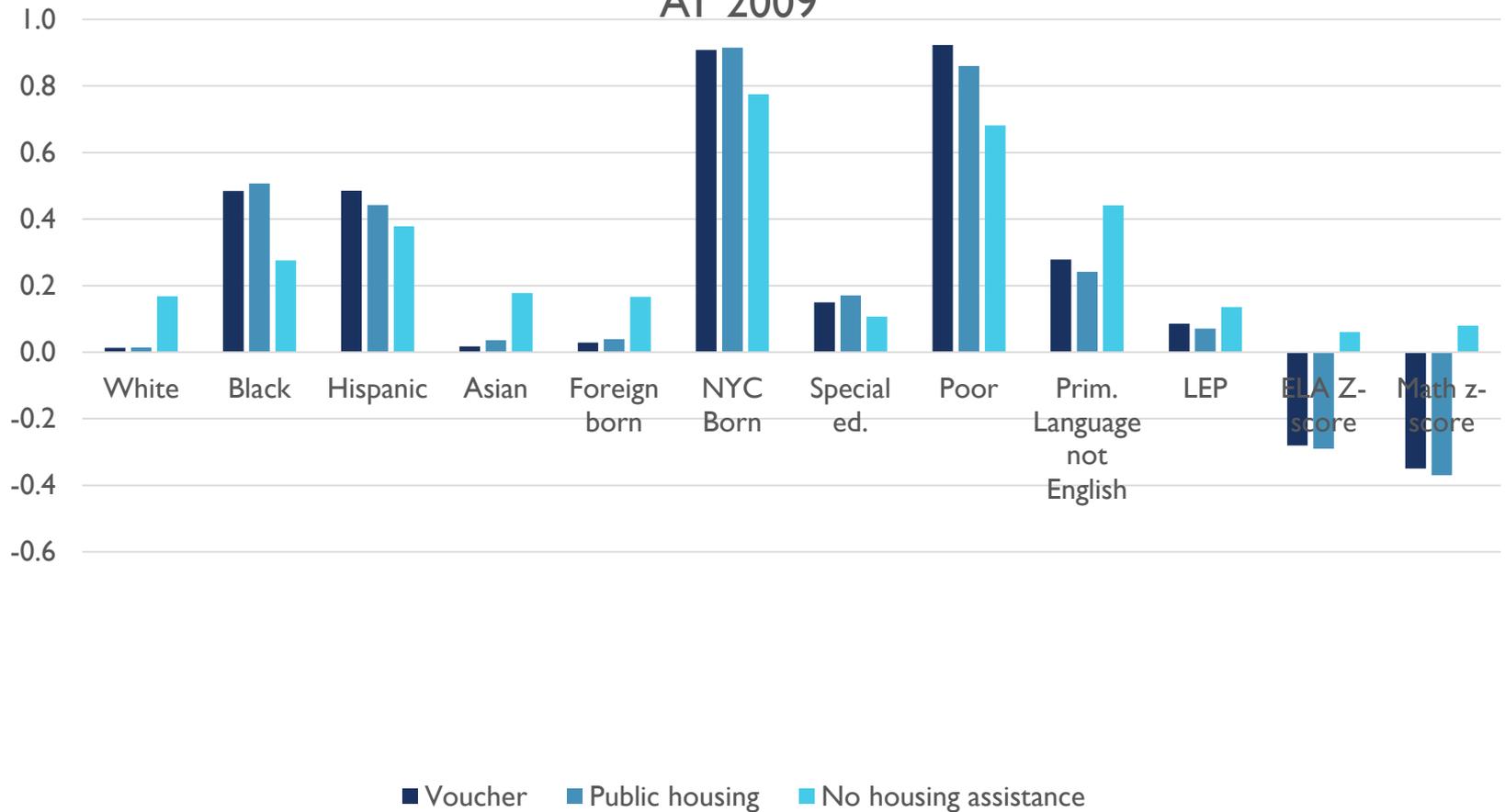
# BACKGROUND ON HCV PROGRAM

- Provides assistance to eligible low- and moderate-income families
  - Family income may not exceed 50% of Area Median Income (AMI)
  - Rent housing on private market
  - Different from public housing, which is place-based and government operated
- Households conduct search and select unit on the private rental market
  - Receive payment that is the lesser of payment standard minus 30% of family's adjusted income or the gross rent of unit minus 30% of monthly income
  - Families have a minimum of 60 days to "lease up"
- Assistance is substantial
  - Nationally median voucher household with children has family size of four, earns \$13,000, lives in a unit rents for \$1,000/month. Voucher increases their income by \$8,000 or 60 percent.

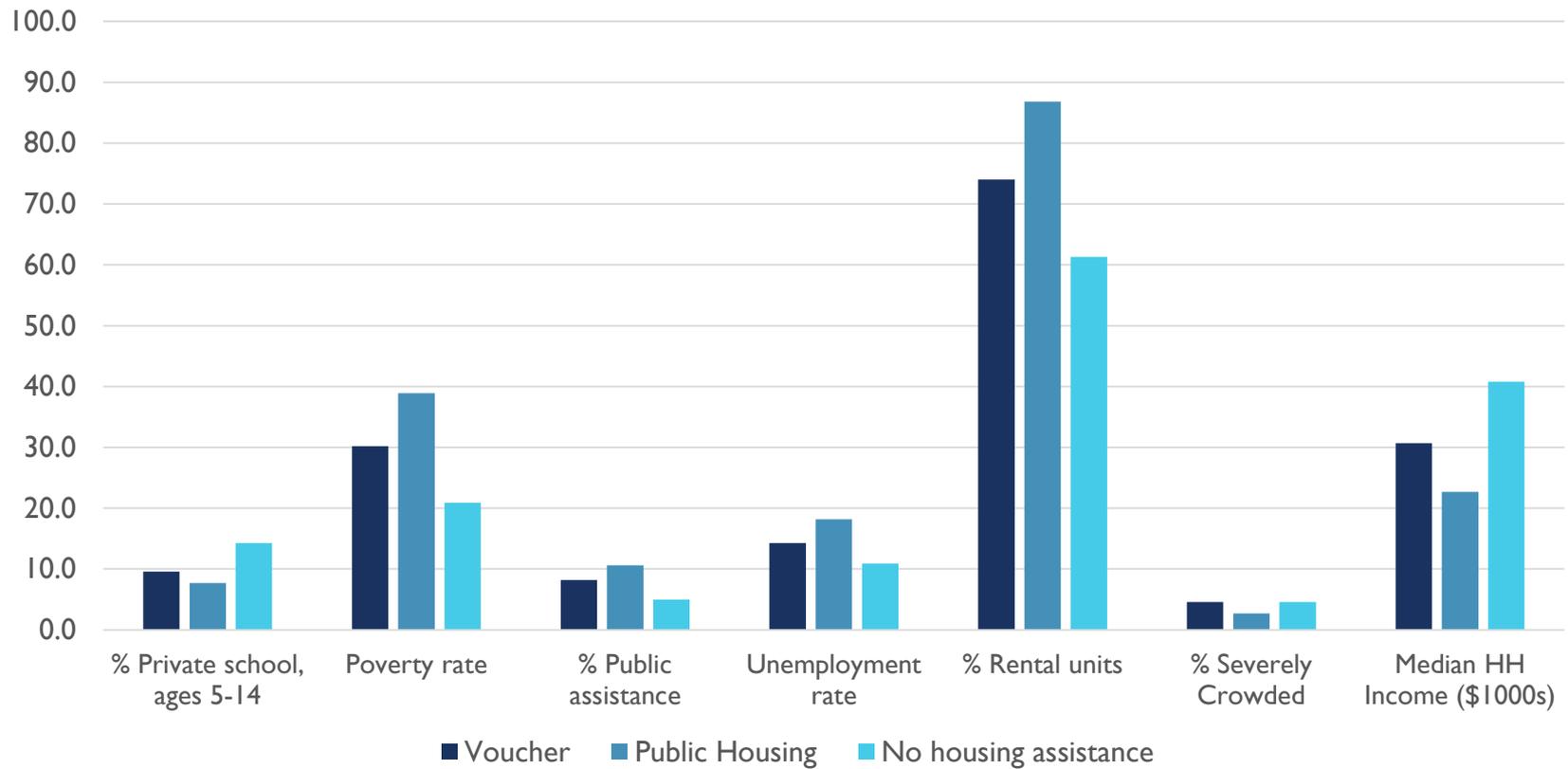
# HCV PROGRAM IN NYC

- Eligibility based on family income and size
  - Family's income may not exceed 50% of median income
    - \$43,150 for family of 4 in NYC
  - Must reserve 75% of vouchers for families below 30% of AMI
    - \$25,900 for family of 4 in NYC
- Currently ~90,000 households (w/ and w/o children); 200K+ individuals use vouchers
- In March 2015, 121K+ families on wait list, which was closed in March 2007
- Virtually impossible to estimate wait time – exploit this to estimate the impact of HCV

## Student Characteristics by Type of Housing Assistance, Grades 3-8, AY 2009



## Neighborhood (census tract) characteristics by Type of Housing Assistance, 2009



# EMPIRICAL STRATEGY

- Primary challenge – students with housing assistance different
- Solutions
  - Limit sample to those students who we ever observe receiving housing assistance
  - Exploit precise timing of voucher receipt
- Long wait lists for HCVs
  - Virtually impossible to estimate wait time
  - Whether student in a household that receives a voucher this year rather than next year should be unrelated to prior performance or family background
- Compare the outcomes of students who currently receive vouchers to
  - Those who will receive a voucher in the future
  - Students in public housing

# DATA & SAMPLE

- Department of Housing and Urban Development (HUD)
  - Panel of subsidized housing tenants, 2002-2012
  - Residential address, household composition, and certification date
  - Gender, race, birth month, and birth year of each household resident
- New York City Department of Education (NYCDOE)
  - Complete census of NYC public school students from 1997-2013
  - Student demographic/program char.: free lunch eligible, gender, race, birth date, etc.
  - Annual address data and performance on standardized exams
  - Link to HUD using building, gender, race, birth month, and birth year
- New York City Housing Authority – ID students in public housing units

# LINKING VOUCHER TO STUDENT RECORDS

- Match proceeds in three steps
  - Exact match on BBL, birth month, birth year, gender, and race
  - Exact match on gender, BBL, birth month, and birth year and fuzzy match on race
  - Exact match on gender, birth month, and birth year plus exact match on BBL in  $t+1$  or BBL in  $t+2$  and non-matches on race
- Link 89,169 of the 143,903 unique voucher holders ages 6-14
  - Varies from a low of 61 percent match in 2005 to 68 percent match in 2009
  - Match rate of 78.7 percent when we exclude CDs with high percentages of private school enrollments
  - Average of 38,000 unique student voucher holders linked in any given year
- Final sample: all students in grades 3-8 with at least two scores in ELA or math, who are in our sample when they are in the third grade

# BASELINE MODEL

$$Y_{ibt} = \beta_0 + \beta_1 \text{Voucher}_{ibt} + \mathbf{X}'_{ibt} \boldsymbol{\gamma} \\ + \delta_g + \tau_t + \varphi_b + \eta_i + \varepsilon_{ibt}$$

- $Y$  is outcome of student  $i$  in borough  $b$  at time  $t$
- $\text{Voucher} = 1$  if after student first receives and identified by HUD data as new admission
- $\mathbf{X}$  is a vector of student characteristics (Other Voucher, FRPL, LEP, SPED)
- $\delta_g, \tau_t, \varphi_b, \eta_i, \varepsilon$  are grade, year, borough, student effects and the error term respectively
- Coefficient of interest is  $\beta_1$  - performance of student after he/she receives a HCV compared to his/her performance before receiving a HCV

## TABLE 2 VOUCHERS AND STUDENT PERFORMANCE

Vouchers Only Sample, Grades 3-8, AY 2005-2011

Variables	ELA (1)	MATH (2)	ATTENDANCE (3)
Voucher Receipt	0.058*** (0.008)	0.048*** (0.008)	-0.000 (0.001)
Observations	135,636	137,493	138,848
R-squared	0.705	0.736	0.671
Student FE	X	X	X

Standard errors in parentheses, \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

# TABLE 3 PROBABILITY OF RECEIVING A VOUCHER

	Start Voucher Receipt (1)	Start Voucher Receipt (2)
ELA (t-1)	0.003 (0.006)	0.013 (0.008)
MATH (t-1)	0.011* (0.006)	0.003 (0.009)
Attendance (t-1)	-0.179*** (0.060)	-0.108 (0.102)
Free Lunch (t-1)	-0.023 (0.028)	-0.034 (0.037)
Reduced Price Lunch (t-1)	0.060* (0.034)	-0.042 (0.041)
Recent Immigrant (t-1)	-0.062** (0.025)	0.068* (0.038)
Special Education (t-1)	0.036*** (0.012)	0.020 (0.027)
Limited English Proficient (t-1)	-0.017 (0.013)	0.080*** (0.026)
Observations	10,218	10,218
Number of Unique Students	4,540	4,540
R-squared	0.380	0.776
Student FE		X

Standard errors in parentheses, \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

## TABLE 4 PLACEBO TEST

	ELA (1)	MATH (2)	ATTENDANCE (3)
Random Voucher Receipt	0.002 (0.005)	-0.007 (0.005)	-0.001 (0.001)
Observations	135,954	137,814	139,171
R-squared	0.705	0.736	0.671
Student FE	X	X	X

Standard errors in parentheses, \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

## TABLE 5 VOUCHERS AND STUDENT PERFORMANCE

Vouchers and Public Housing Sample, Grades 3-8, AY 2005-2011

Variables	ELA (1)	MATH (2)	ATTENDANCE (3)
Voucher Receipt	0.068*** (0.008)	0.049*** (0.007)	-0.000 (0.001)
Public Housing Receipt	0.028*** (0.006)	0.031*** (0.006)	0.005*** (0.001)
Observations	308,821	312,734	315,889
R-squared	0.709	0.743	0.669
Student FE	X	X	X

Standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

## TABLE 6 VOUCHERS AND STUDENT PERFORMANCE

Vouchers Sample, Grades 3-8, AY 2005-2011, by Gender

	ELA (1)	MATH (2)	ATTENDANCE (3)
Voucher Receipt	0.072*** (0.011)	0.061*** (0.011)	0.000 (0.001)
Voucher Receipt * Female	-0.026 (0.016)	-0.025 (0.016)	-0.001 (0.002)
Observations	135,636	137,493	138,848
Unique students	32,671	32,707	32,730
R-squared	0.706	0.737	0.710
Student FE	X	X	X

Standard errors in parentheses, \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

## TABLE 7 VOUCHERS AND STUDENT PERFORMANCE

Vouchers Sample, Grades 3-8, AY 2005-2011, by Age

Variables	ELA (1)	MATH (2)	ATTENDANCE (3)
Voucher Receipt	0.067*** (0.011)	0.044*** (0.011)	0.002* (0.001)
Voucher Receipt * Middle	-0.016 (0.015)	0.007 (0.015)	-0.005*** (0.002)
Observations	135,636	138,848	137,493
Unique students	32,671	32,707	32,730
R-squared	0.706	0.710	0.737
Student FE	X	X	X

Standard errors in parentheses, \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

## TABLE 8 VOUCHERS AND STUDENT PERFORMANCE

Vouchers Sample, Grades 3-8, AY 2005-2011, by Race/Ethnicity

Variables	ELA (1)	MATH (2)	ATTENDANCE (3)
Voucher Receipt	0.004 (0.012)	-0.001 (0.013)	0.004*** (0.001)
Voucher Receipt * Hispanic	0.078*** (0.015)	0.061*** (0.015)	-0.007*** (0.002)
Voucher Receipt * White/Asian	0.140*** (0.029)	0.198*** (0.029)	-0.001 (0.003)
Observations	135,636	137,493	138,848
Unique students	32,671	32,707	32,730
R-squared	0.705	0.736	0.672
Student FE	X	X	X

Standard errors in parentheses, \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

## EXPLORING MECHANISMS

- Increased housing stability
- Decrease overcrowding
- Lower levels of stress among parents
- Income effects from rental subsidy
- **Provide access to better neighborhoods and schools**

## TABLE 9 VOUCHERS AND STUDENT PERFORMANCE

Vouchers Sample, Grades 3-8, AY 2005-2011, by Mobility

	ELA (1)	MATH (2)	ATTENDANCE (3)
<i>Voucher Receipt</i>			
Move First Year	0.070*** (0.011)	0.053*** (0.011)	-0.001 (0.001)
Move after First Year	0.043** (0.017)	0.039** (0.017)	-0.001 (0.002)
Lease in Place	0.044*** (0.014)	0.038*** (0.014)	0.001 (0.001)
Observations	135,636	137,493	138,848
Unique students	32,671	32,707	32,730
R-squared	0.705	0.736	0.672
Student FE	X	X	X

Standard errors in parentheses, \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

## TABLE 10 NEIGHBORHOOD CHARACTERISTICS

	Median Income (1)	Poverty Rate (12 months) (2)	High Poverty Rate (3)	Extreme Poverty Rate (4)	Asian (5)	Other- Multiracial (6)	White (7)	Black (8)
Voucher Receipt	808*** (186)	-0.006*** (0.001)	-0.020*** (0.006)	-0.004 (0.005)	-0.000 (0.001)	-0.020*** (0.002)	-0.006*** (0.002)	0.027*** (0.003)
Observations	131,677	131,677	131,677	131,677	131,677	131,677	131,677	131,677
Unique students	32,573	32,573	32,573	32,573	32,573	32,573	32,573	32,573
R-squared	0.810	0.828	0.803	0.812	0.846	0.899	0.850	0.877
Student FX	X	X	X	X	X	X	X	X

# TABLE 1 | VOUCHERS AND STUDENT PERFORMANCE

Vouchers Sample, Grades 3-8, AY 2005-2011, by Mobility

Variables	ELA (1)	MATH (2)	ATTENDANCE (3)
<i>Voucher Receipt</i>			
School Move First Year	0.054*** (0.012)	0.029** (0.012)	-0.002* (0.001)
School Move Later	0.053*** (0.014)	0.038*** (0.014)	-0.003* (0.001)
No School Move	0.069*** (0.013)	0.079*** (0.013)	0.004*** (0.001)
Observations	135,636	137,493	138,848
Unique students	32,671	32,707	32,730
R-squared	0.705	0.736	0.672
Student FE	X	X	X

Standard errors in parentheses, \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

# TABLE 12 SCHOOL CHARACTERISTICS

	(1) Share Passing Math	(2) Share Passing ELA	(3) Share Advanced in Math	(4) Share Advanced in ELA	(5) Attendance Rate	(6) Share Free Lunch	(7) Share Red. Price Lunch	(8) Title I Status
Voucher Receipt	0.008*** (0.002)	0.004** (0.002)	0.004** (0.002)	0.000 (0.001)	0.014*** (0.003)	-0.005** (0.002)	0.002*** (0.001)	-0.010** (0.000)
Observations	128,688	128,688	128,688	128,688	128,688	128,688	128,688	128,688
Unique students	32,185	32,185	32,185	32,185	32,185	32,185	32,185	32,185
R-squared	0.80	0.82	0.71	0.71	0.49	0.62	0.66	0.58
Student FX	X	X	X	X	X	X	X	X

	(9) Share Asian	(10) Share Black	(11) Share Hispanic	(12) Share White	(13) Share Female	(14) Share Immigrants	(15) Share LEP	(16) Share Special Ed.
Voucher Receipt	-0.002 (0.001)	0.016*** (0.002)	-0.016*** (0.002)	0.002 (0.001)	-0.001* (0.001)	0.000 (0.070)	-0.017*** (0.001)	0.004*** (0.001)
Observations	128,688	128,688	128,688	128,688	128,688	128,688	128,688	128,688
Unique students	32,185	32,185	32,185	32,185	32,185	32,185	32,185	32,185
R-squared	0.84	0.89	0.90	0.82	0.45	0.68	0.80	0.62
Student FX	X	X	X	X	X	X	X	X

# DISCUSSION

- Results suggest HCV increases student performance
  - Effects larger than from public housing
  - Suggestive evidence that additional income or increased stability drive most of the improvement in performance
- Demonstrates potential for housing subsidies to improve student performance

# QUESTIONS?

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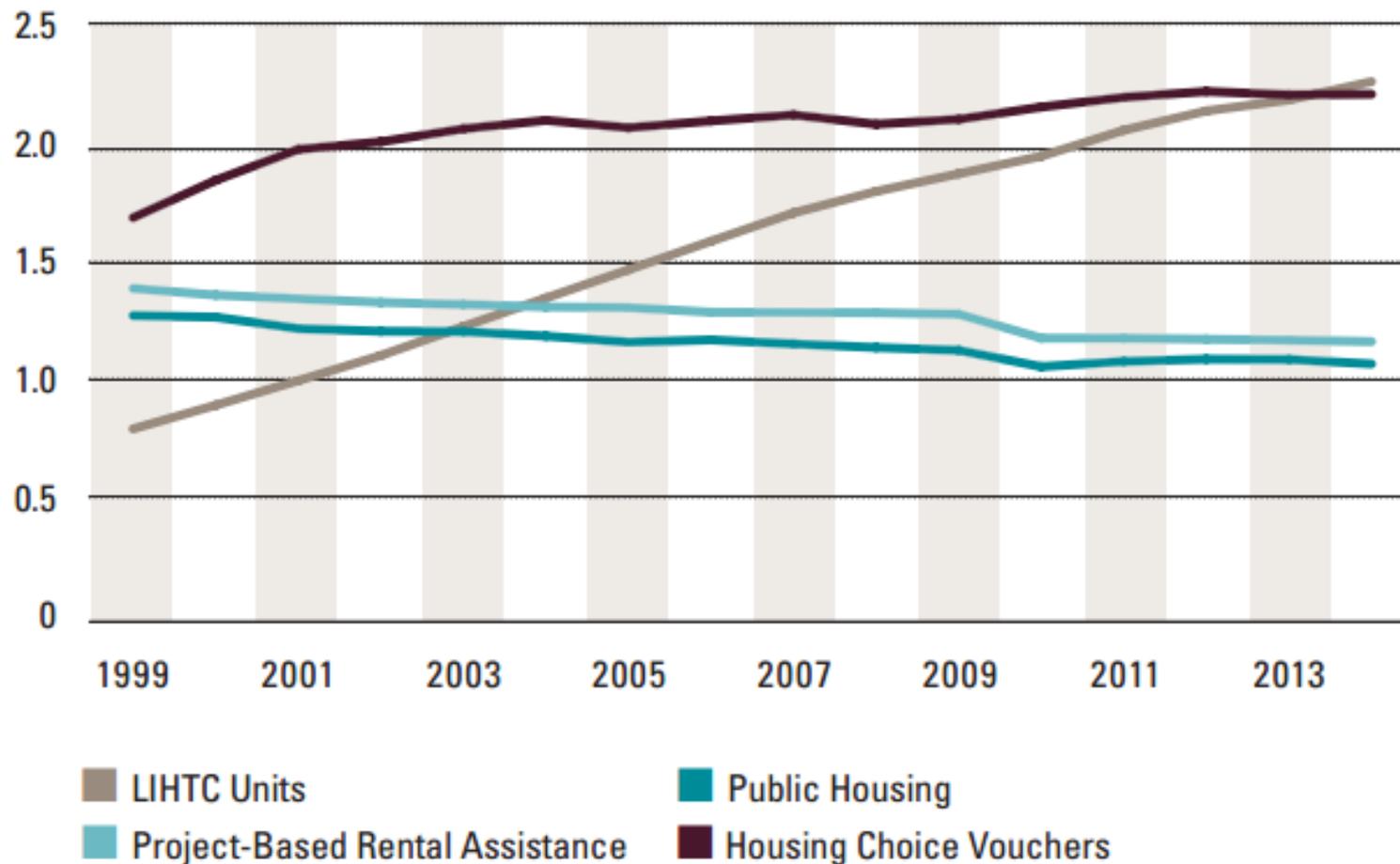
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# BACKGROUND FEDERAL HOUSING ASSISTANCE

Assisted Rental Units (Millions)



**Figure V: Effects of Cash Transfers on Test Scores of Young Males Across Studies**

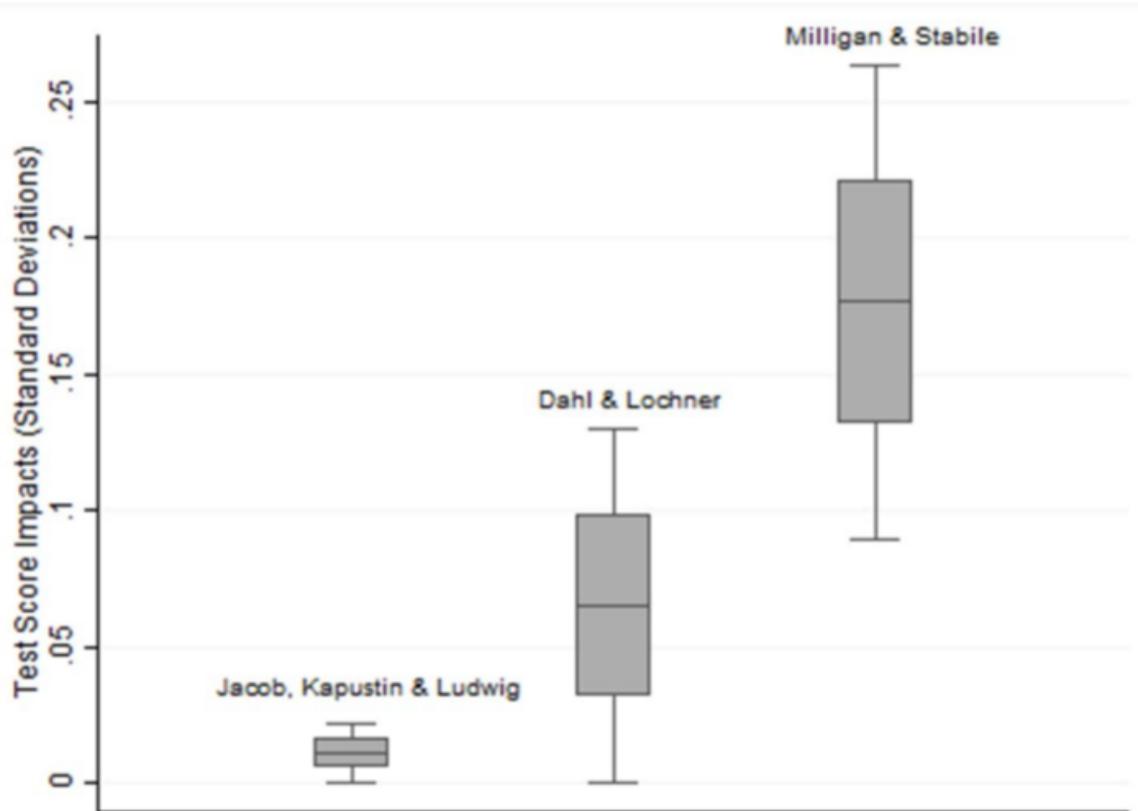
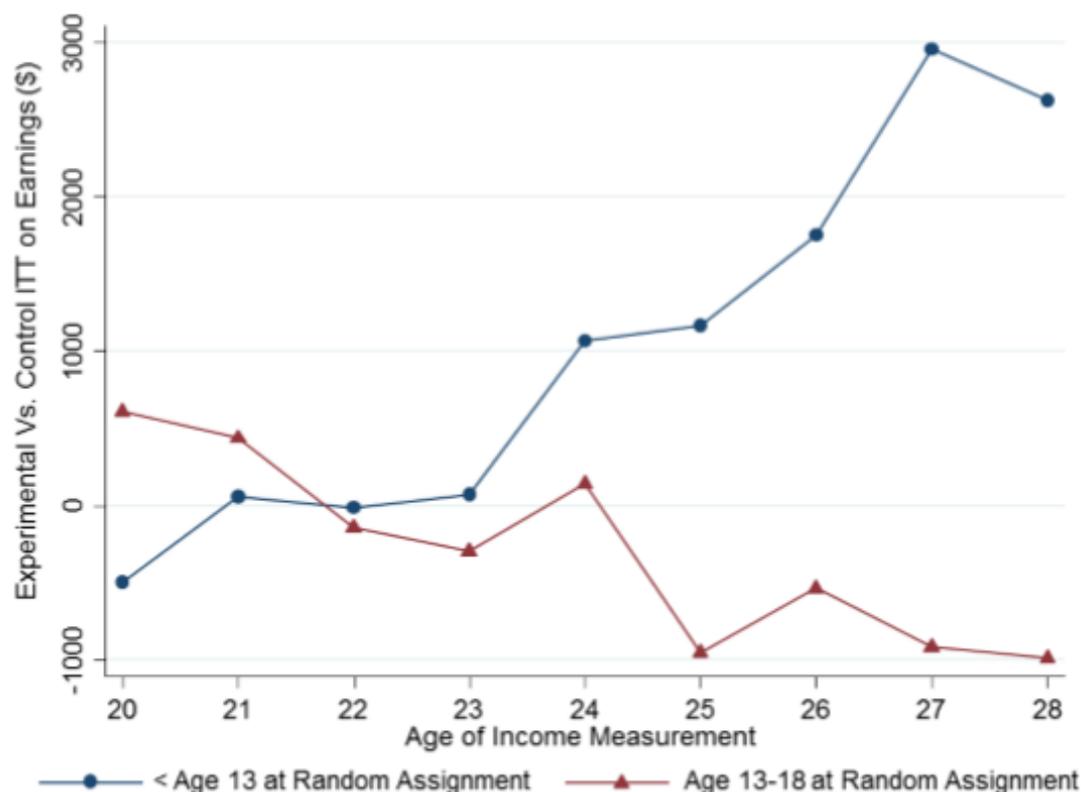


Figure reports the effects on children's achievement test scores per \$1,000 change in family income (in 2013 dollars). The estimate from Jacob, Kapustin and Ludwig is for males 0-6 at baseline taken from Table VI, column 5, using as the dependent variable an average of reading and math achievement test scores from Chicago Public Schools student-level school records. The estimate from Dahl and Lochner (2012) is also for an average of reading and math test scores, taken from their Table 6 for males (equal to 0.088 standard deviations in their paper reported in 2000 constant dollars, and equal to 0.065 when we update to 2013 dollars). Estimate from Milligan and Stabile (2011) is for math scores for males, taken from their Table 3, equal to 0.23 standard deviations in their paper for a \$1,000 change in Canadian 2004 dollars, and equal to 0.177 when we update to 2013 US dollars.

FIGURE 1

## Impacts of Experimental Voucher by Age of Earnings Measurement

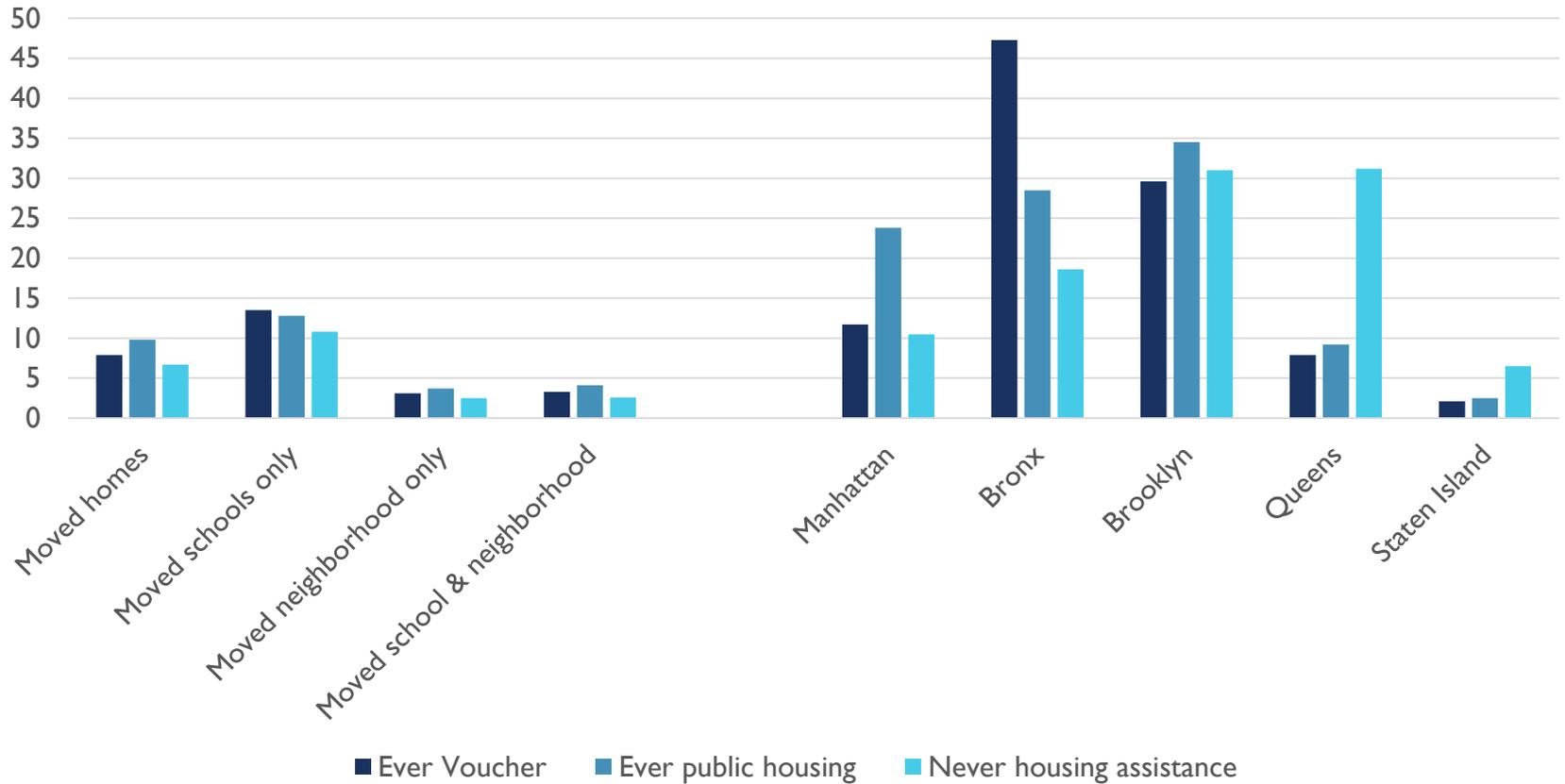


*Notes:* This figure presents intent-to-treat (ITT) estimates of the impact of being assigned to the experimental voucher group on individual earnings, varying the age at which earnings is measured from 20 to 28. The estimate at each age is obtained from an OLS regression (weighted to adjust for differences in sampling probabilities across sites and over time) of individual earnings at that age on indicators for being assigned to the experimental voucher group and the section 8 voucher group as well as randomization site indicators. We plot the coefficient on the experimental voucher group indicator in this figure; the corresponding estimates for the Section 8 voucher group are shown in Appendix Figure 1. The series in circles restricts the sample to children below age 13 at random assignment; the series in triangles includes children between age 13 and 18<sup>0</sup>at random assignment. The estimates in the two series are obtained from separate regressions. The estimates at age 26 exactly match those reported in Column 5 of Table 3; the remaining estimates replicate that specification, varying the age at which earnings is measured. See notes to Table 3 for further details on specifications and variable definitions.

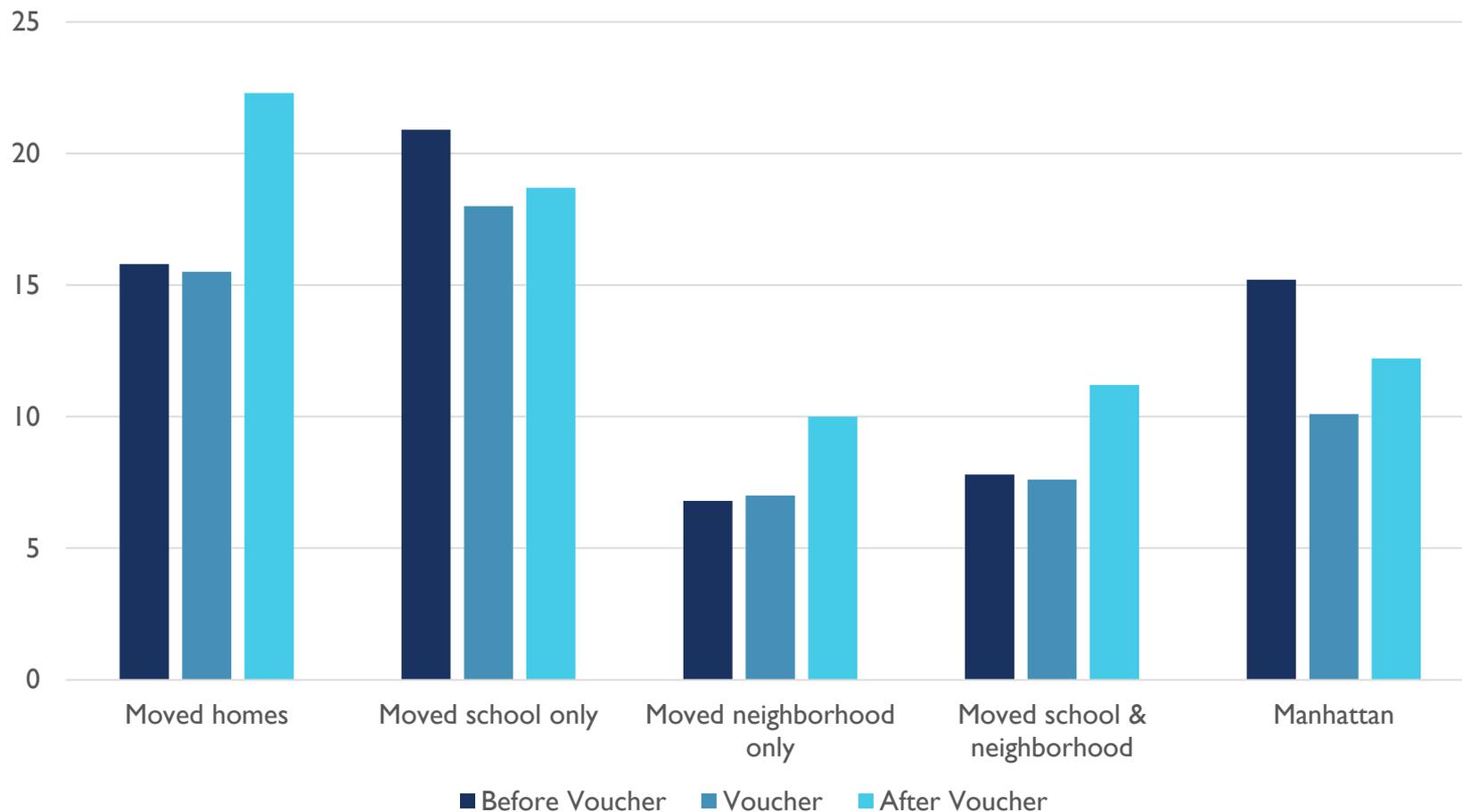
# WHAT WE KNOW

- Chetty, Hendren, Katz (2015) new look at Moving To Opportunity (MTO)
  - Large increases in earnings (31%) for children < 13 who received experimental vouchers in comparison to public housing sample (also slightly smaller increases (15%) in earnings for non experimental voucher recipients)
  - Comparison is experimental voucher vs. public housing
- Jacob, Kapustin and Ludwig (2014) explore outcomes for households in Chicago, who were given vouchers through a housing voucher lottery.
  - They find housing vouchers have no impacts on a child's cognitive outcomes, based on reading and math scores. (in line with previous MTO results)
  - For boys < 6 at time of initial voucher receipt find 3% increase in test scores.
- Andersson et al (2013) examine earnings outcomes for children raised in various assisted housing settings, sample includes individuals ages 13-18 in 2000 and looks at earnings for those with housing assistance vs. those without.
  - Overall results of voucher receipt and public housing are negative.
  - When looking within families to there is some evidence of positive effects for some demographic groups, particularly black women receiving housing-vouchers

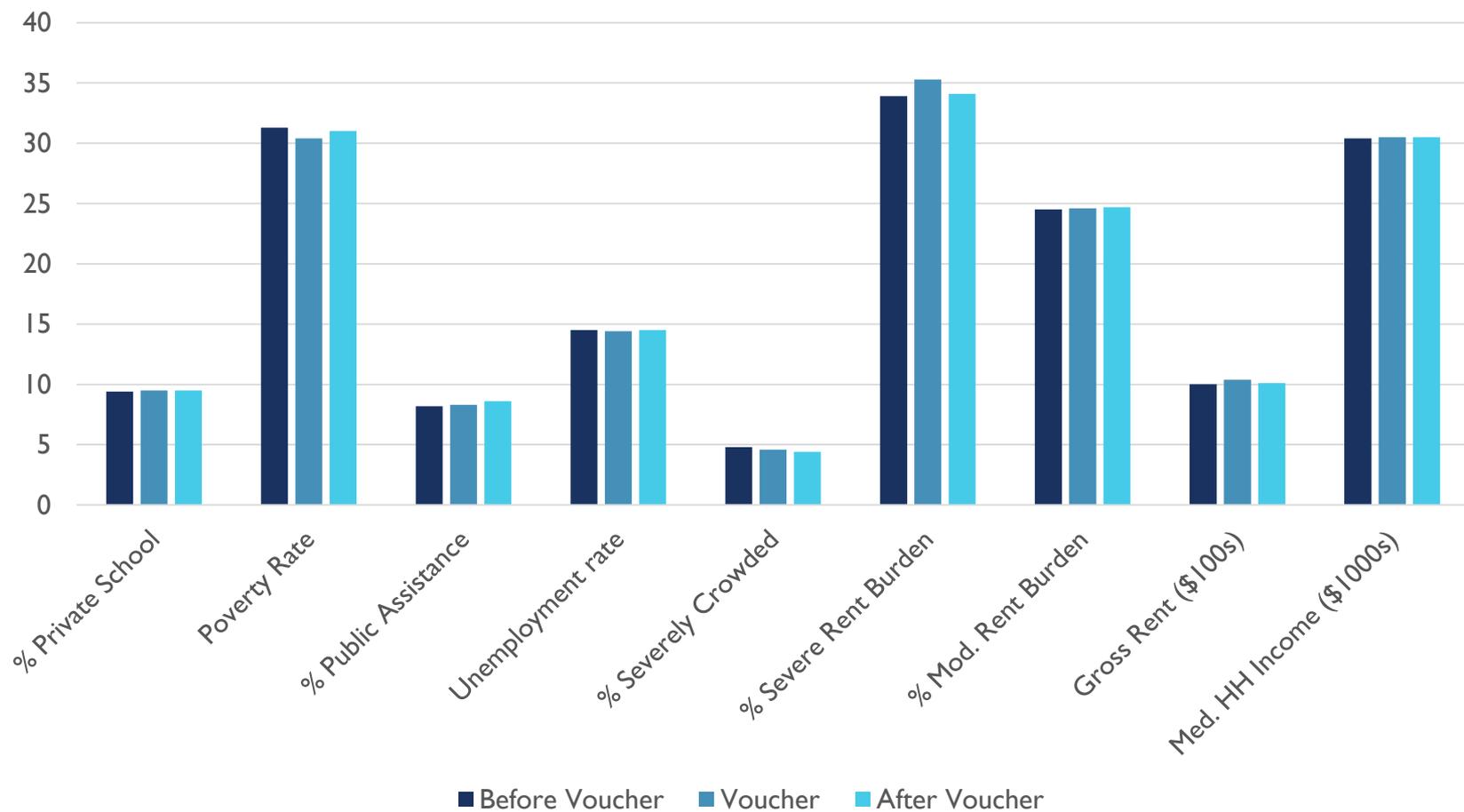
## Mobility and Borough of Residence by Type of Housing assistance



# HOW MOBILE ARE VOUCHER HOLDERS?



# DO VOUCHER HOLDERS MOVE TO BETTER NEIGHBORHOODS?



# CHARACTERISTICS OF ASSISTED HOUSEHOLDS

**Table 1**

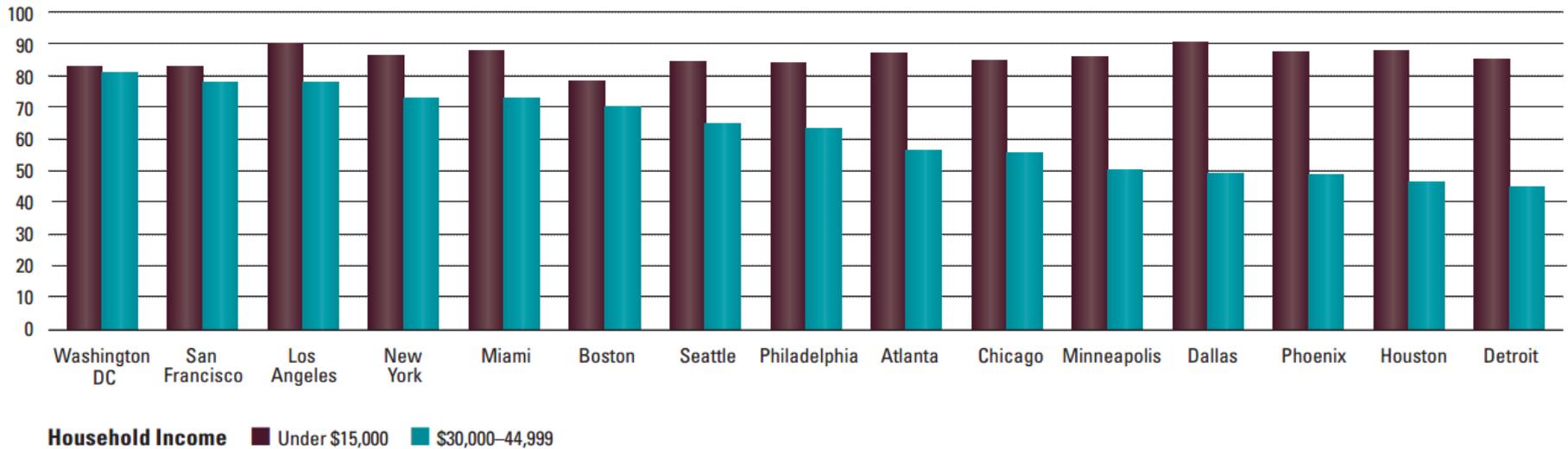
Characteristics of subsidized and other households with children.

	Voucher households <sup>a</sup>	Public housing <sup>b</sup>	LIHTC units <sup>c</sup>	All poor households <sup>d</sup>	All renter households <sup>e</sup>
<i>Household characteristics</i>					
Median income	\$15,095	\$14,977	–	\$12,900	\$33,214
Earning below 30% AMI	69.9%	72.1%	–	71.2%	24.9%
Earning between 30% and 50% of AMI	24.0%	19.2%	–	17.5%	19.4%
Earning above 50% AMI	6.1%	8.7%	–	11.3%	55.7%
Below poverty line	72.6%	74.4%	–	100.0%	31.8%
Average number of children	2.2	2.1	–	2.2	1.9
Average years in program	5.0	6.3	–	–	–
<i>Percentage of household heads that are:</i>					
White	22.1%	14.1%	–	32.2%	37.1%
Hispanic	17.7%	23.0%	–	31.9%	28.7%
Black	58.1%	60.9%	–	29.6%	26.4%
<i>Geographic distribution</i>					
Northeast	22.4%	36.1%	11.5%	17.8%	19.3%
Midwest	20.5%	16.0%	23.9%	20.2%	17.0%
South	35.5%	37.1%	42.1%	37.8%	34.5%
West	21.6%	10.9%	22.5%	24.3%	29.2%
Central city	59.1%	79.1%	52.1%	70.0%	70.5%
Suburban	40.9%	20.9%	47.9%	30.0%	29.5%
Total number of households	1,024,767	289,144	753,650	4,502,676	10,171,088

FIGURE 4

### While Most Lowest-Income Households Have Cost Burdens, the Cost-Burdened Share of Moderate-Income Renters Varies Widely Across Markets

Share of Renters with Cost Burdens (Percent)



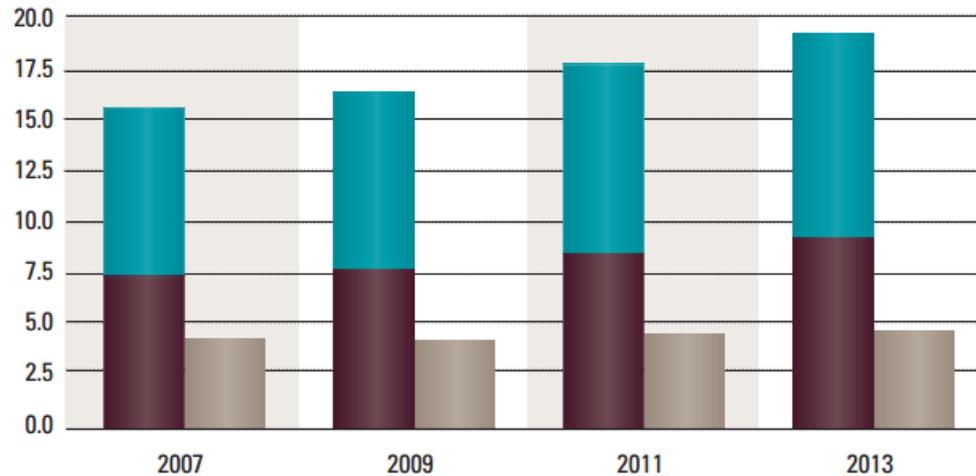
Notes: Cost-burdened households pay more than 30% of income for housing. Households with zero or negative income are assumed to have cost burdens, while households paying no cash rent are assumed to be without burdens.

Source: JCHS tabulations of US Census Bureau, 2014 American Community Survey.

**FIGURE 5**

## Growth in the Number of Lowest-Income Renters Far Outstrips Increases in Assisted Households

Renter Households (Millions)



### Household Income

- Under \$15,000
- \$15,000–29,999
- Very Low-Income Households with Assistance

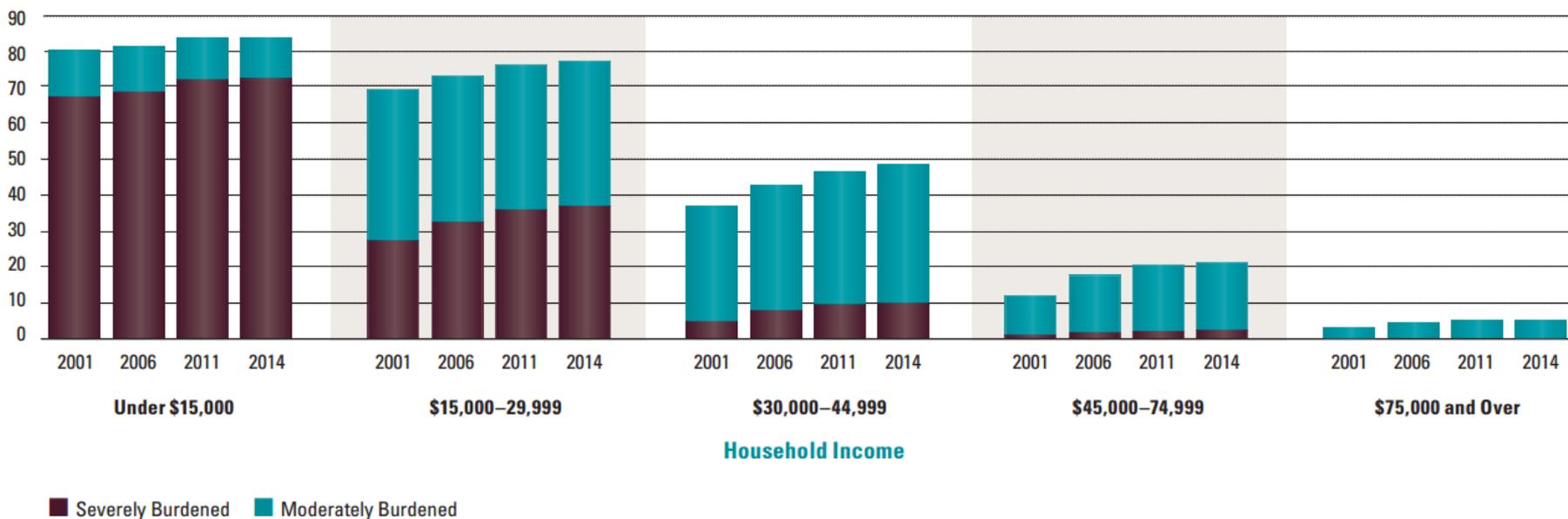
Notes: Household incomes are adjusted for inflation using the CPI-U for All Items. Household counts by income are based on three-year trailing averages. Very low-income renter households have incomes up to 50% of local area medians.

Sources: JCHS tabulations of US Census Bureau, Current Population Surveys; US Department of Housing and Urban Development, Worst Case Housing Needs Reports to Congress.

FIGURE 23

## Cost Burdens Are a Fact of Life for Lowest-Income Renters, But Are Becoming More Common Among Middle-Income Households as Well

Share of Renter Households with Cost Burdens (Percent)



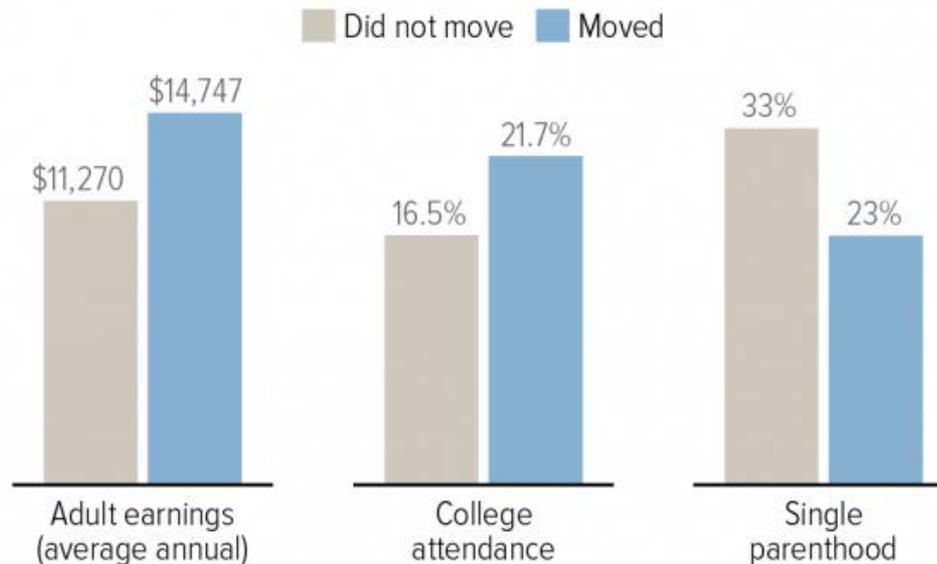
Notes: Household incomes are adjusted to 2014 dollars using the CPI-U for All Items. Moderately (severely) cost-burdened households pay more than 30% and up to 50% (more than 50%) of income for housing. Households with zero or negative income are assumed to have severe burdens, while households paying no cash rent are assumed to be without burdens.

Source: JCHS tabulations of US Census Bureau, American Community Surveys.

FIGURE 3



## Moving with Voucher to Lower-Poverty Neighborhoods While Young Improves Key Adult Outcomes



Note: Outcomes are for children up to age 13 at the time of random assignment under the Moving to Opportunity demonstration. Experimental group families received vouchers that could only be used to relocate to neighborhoods where fewer than 10 percent of residents were poor; results are for children whose families used their voucher.

Source: Raj Chetty, Nathaniel Hendren, and Lawrence F. Katz, "The Effects of Exposure to Better Neighborhoods on Children: New Evidence from the Moving to Opportunity Experiment," May 2015.