Impact of Federal Housing Assistance on Housing and Environmental Quality among U.S. Households

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IAPHS 2021
Conference

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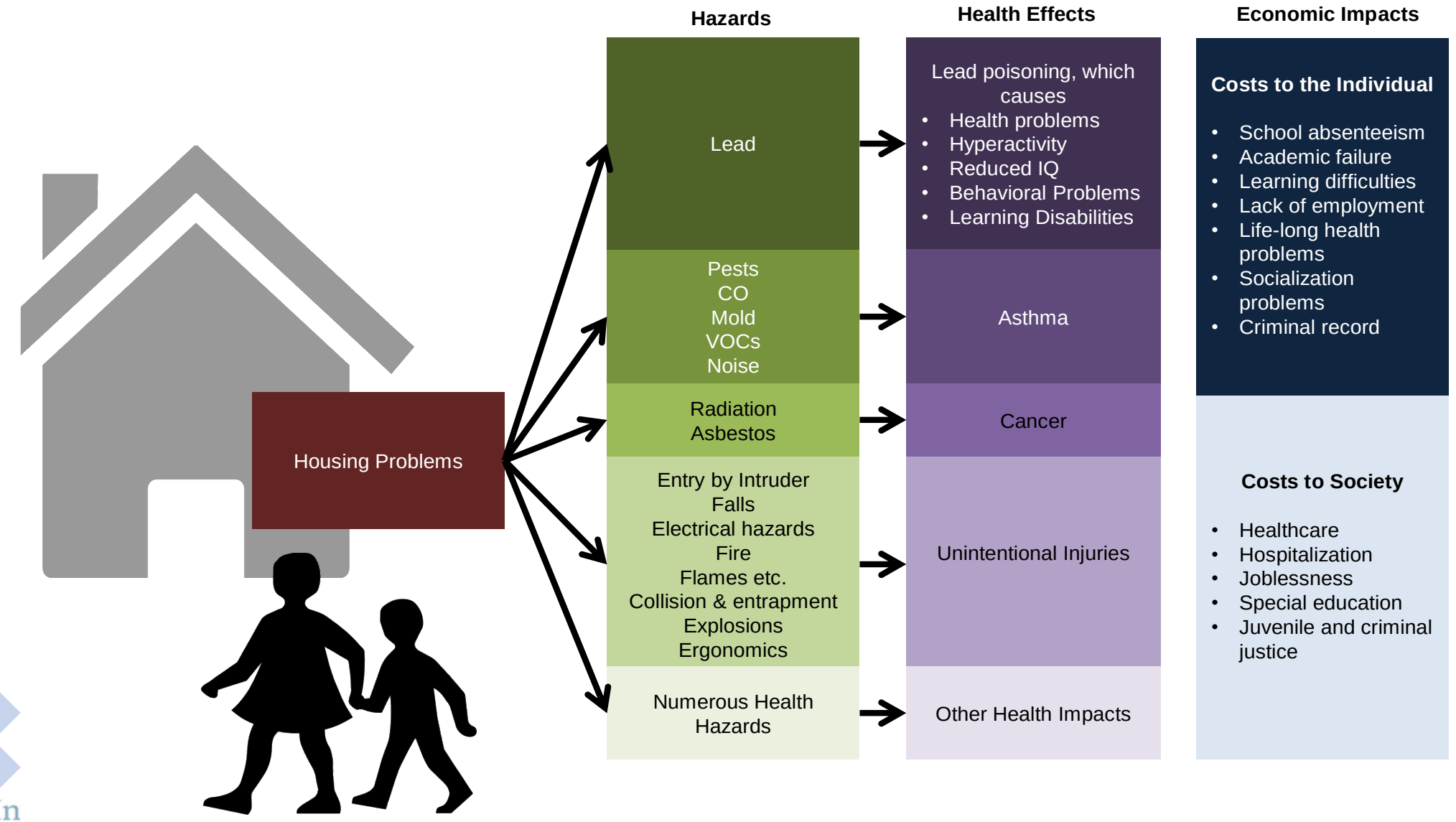
Health & Economic Impacts of Poor Housing Conditions



(Based on: OLHCHH, 2014, Healthy Homes Rating System Operating Guidance; Loyola University 2015)

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Socioeconomic and Racial inequalities in Housing access

Estimating Evictions in Massachusetts during COVID-19
August 2020

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Housing and Health

Intersection of Poverty and Environmental Exposures

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Urban institute, 2020

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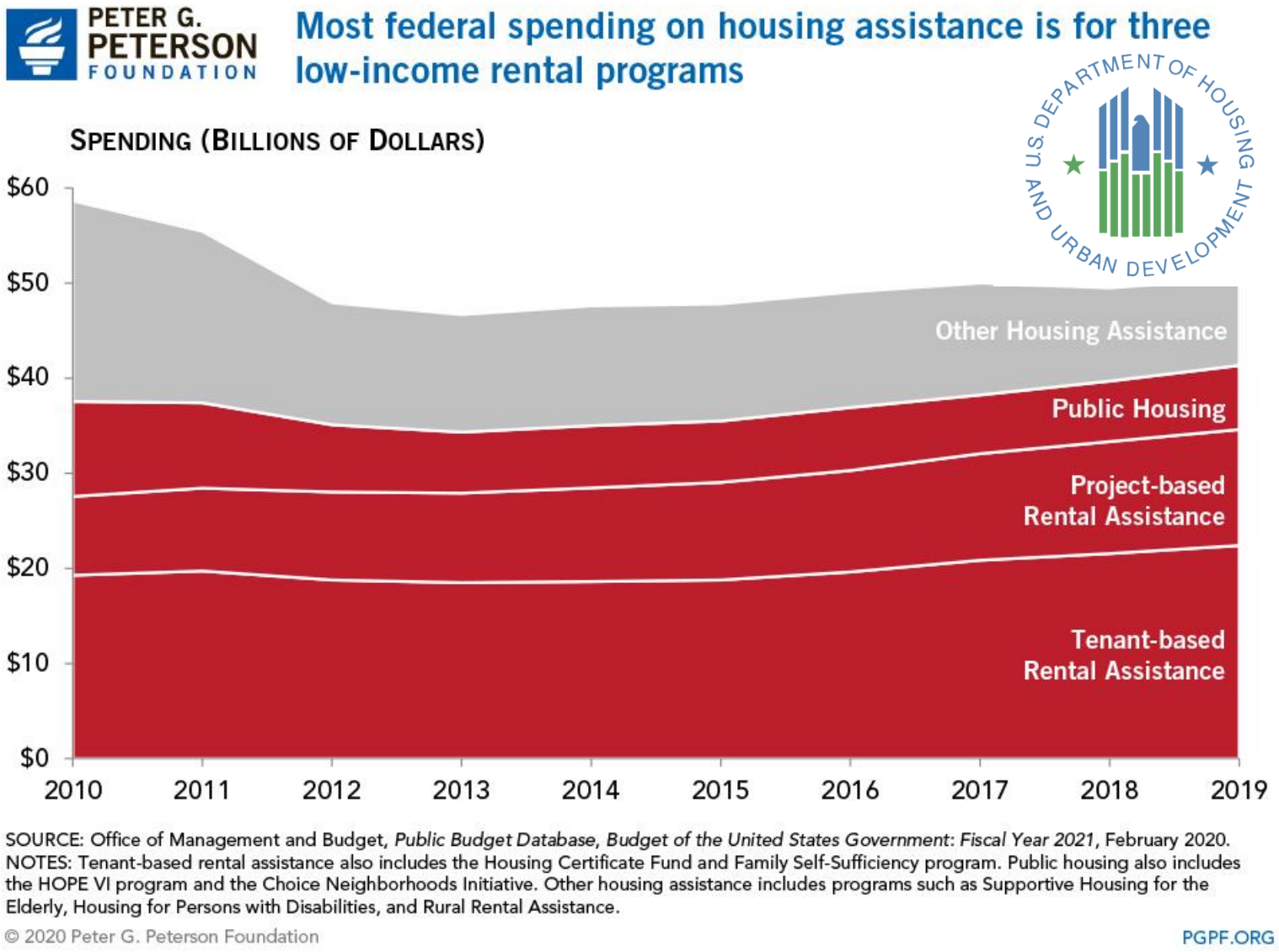
Federal HUD Rental Assistance

Eligibility:

- <50% Area Median Income (AMI) for tenant-based
- <80% AMI for public housing & project-based



Access at: www.pgpf.org/blog/2020/07/how-does-the-federal-government-support-housing-for-low-income-households

Research Objective

- Investigate the association of federal housing assistance and residential housing and environmental conditions among low-income renter households at the national level

- Evaluate effect modification by program type (i.e. project-based and housing choice vouchers)

Methods

Data source

2011, 2015, 2015, 2017, and 2019
American Housing Survey
National Public Use Files (PUFs)

Design

National Cross-sectional

Study population

Selection criteria:
U.S. occupied housing
Non-homeownership: renters, occupy without rent
Single & Multifamily units, land-based
First AHS household interview (removed repeats across years)

Measures

HUD assistance x FPL
- FPL ≤ 50%
- FPL 101+%
- *Categorical*

→

HEQ Index
- 9 Domains
- Continuous scores

Statistical Analyses

1. Descriptive: Chi-square tests
2. Negative binomial regression models, log-link
3. Test effect modification of program type – interaction term
   - Public & Project-based housing
   - Housing Choice Vouchers

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Housing & Environmental Quality (HEQ) Index

- 9 HEQ domains
- 47 AHS items
- Self-reported, prevalence or frequency of condition
- Items weighted (1-3) based on hazard severity
  - Higher score = Worse quality

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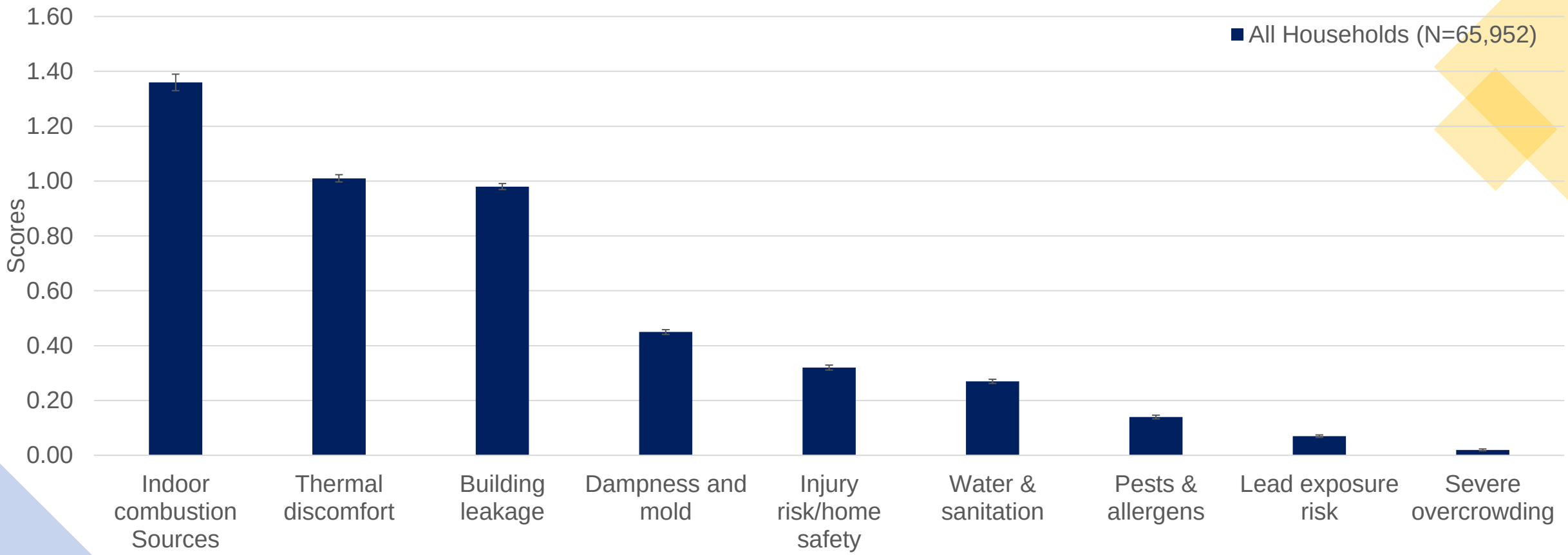
Results

- U.S. renter households in single- and multifamily housing (N=65,952)
- HUD-assisted households: n=14,703, 22.2%
  - 61% Project-based housing
  - 39% Housing choice vouchers
- Very low-income households (0 -50% Federal Poverty Level [FPL]: n=9,699, 14.7%
- *Notable differences in sociodemographic characteristics and household composition*

Low-Income Households (0-50% FPL)	**HUD assistance** (N=4,366)	**No HUD Assistance** (N=5,333)
Race/Ethnicity		
White Non-Hispanic (NH)	1,121 (25.7%)	2,305 (43.2%)
Asian NH	126 (2.9%)	359 (6.7%)
Black NH	2,235 (51.2%)	1,325 (24.8%)
Hispanic/Latinx	745 (17.1%)	1,183 (22.2%)
Other/Multiracial NH	139 (3.2%)	161 (3.0%)
Education level		
Up to Highschool	1,536 (35.2%)	1,307 (24.5%)
HS Graduate/GED	1,461 (33.5%)	1,522 (28.5%)
Some College (e.g. Assoc, Voc. Tech)	1,145 (26.2%)	1,593 (29.9%)
Bachelor's degree	168 (3.8%)	653 (12.2%)
Graduate degree	56 (1.3%)	258 (4.8%)
US Citizenship		
US-born	3,785 (86.7%)	3,973 (74.5%)
Foreign-born: Naturalized	325 (7.4%)	400 (7.5%)
Foreign-born: Non-US Citizen	256 (5.9%)	960 (18.0%)
Housing Type		
Single-family	1,198 (27.4%)	1,979 (37.1%)
Multifamily	3,168 (72.6%)	3,354 (62.9%)
Presence of children (<18 y.o.)	2,266 (51.9%)	1751 (32.8%)
Presence of elders (65+ y.o.)	821 (18.8%)	886 (16.6%)
1+ HH member has difficulty walking/climbing stair	953 (21.8%)	696 (13.1%)

Distribution of Housing & Environmental Quality Scores



* = p < 0.01
Raw scores

Ratio differences in Housing & Environmental Quality Scores

Reference: very low-income, HUD-assisted households

	No HUD-assistance FPL 0-50%
	PR (95% CI)
Cumulative	1.02 (0.99 - 1.05)
Indoor combustion sources	0.99 (0.94 - 1.05)
Building Leakage	1.01 (0.98 - 1.04)
Dampness & Mold	0.92 (0.82 - 1.03)
Pests & Allergens	0.98 (0.81 - 1.18)
Thermal Discomfort	**0.93 (0.88 - 0.98)**
Lead paint risk	1.20 (0.82 - 1.73)
Injury/home hazards	1.12 (0.97 - 1.29)
Water & Sanitation	**1.35 (1.14 - 1.60)**
Severe overcrowding	**5.10 (3.32 - 7.92)**

Adjusted for: Race/ethnicity, education, US citizenship, presence of children, presence of elders, physical disability, housing type, US Census region, and AHS survey cycle. PR = Prevalence ratio. **Bolded** are statistically significant ($p < 0.01$).

Ratio differences in Housing & Environmental Quality Scores

Reference: very low-income, HUD-assisted households

	No HUD-assistance FPL 0-50%	HUD-assistance **FPL 101+%**
	PR (95% CI)	PR (95% CI)
Cumulative	1.02 (0.99 - 1.05)	**0.81 (0.78 - 0.83)**
Indoor combustion sources	0.99 (0.94 - 1.05)	**0.85 (0.80 - 0.90)**
Building Leakage	1.01 (0.98 - 1.04)	**0.74 (0.71 - 0.76)**
Dampness & Mold	0.92 (0.82 - 1.03)	**0.80 (0.71 - 0.90)**
Pests & Allergens	0.98 (0.81 - 1.18)	**0.56 (0.46 - 0.68)**
Thermal Discomfort	**0.93 (0.88 - 0.98)**	**0.90 (0.85 - 0.94)**
Lead paint risk	1.20 (0.82 - 1.73)	**0.68 (0.47 - 0.99)**
Injury/home hazards	1.12 (0.97 - 1.29)	**0.74 (0.64 - 0.86)**
Water & Sanitation	**1.35 (1.14 - 1.60)**	0.93 (0.78 - 1.10)
Severe overcrowding	**5.10 (3.32 - 7.92)**	0.98 (0.55 - 1.71)

Adjusted for: Race/ethnicity, education, US citizenship, presence of children, presence of elders, physical disability, housing type, US Census region, and AHS survey cycle. PR = Prevalence ratio. **Bolded** are statistically significant ($p < 0.01$).

Ratio differences in Housing & Environmental Quality Scores

Reference: very low-income, HUD-assisted households

	No HUD-assistance FPL 0-50%	HUD-assistance FPL 101+%	No HUD-assistance & FPL 101+%
	PR (95% CI)	PR (95% CI)	PR (95% CI)
Cumulative	1.02 (0.99 - 1.05)	**0.81 (0.78 - 0.83)**	**0.76 (0.74 - 0.78)**
Indoor combustion sources	0.99 (0.94 - 1.05)	**0.85 (0.80 - 0.90)**	1.01 (0.97 - 1.06)
Building Leakage	1.01 (0.98 - 1.04)	**0.74 (0.71 - 0.76)**	0.41 (0.39 - 0.42)
Dampness & Mold	0.92 (0.82 - 1.03)	**0.80 (0.71 - 0.90)**	**0.90 (0.82 - 0.99)**
Pests & Allergens	0.98 (0.81 - 1.18)	**0.56 (0.46 - 0.68)**	**0.61 (0.52 - 0.71)**
Thermal Discomfort	**0.93 (0.88 - 0.98)**	**0.90 (0.85 - 0.94)**	**0.79 (0.76 - 0.83)**
Lead paint risk	1.20 (0.82 - 1.73)	**0.68 (0.47 - 0.99)**	0.92 (0.68 - 1.24)
Injury/home hazards	1.12 (0.97 - 1.29)	**0.74 (0.64 - 0.86)**	**0.82 (0.73 - 0.93)**
Water & Sanitation	**1.35 (1.14 - 1.60)**	0.93 (0.78 - 1.10)	1.05 (0.92 - 1.21)
Severe overcrowding	**5.10 (3.32 - 7.92)**	0.98 (0.55 - 1.71)	**2.18 (1.48 - 3.28)**

Adjusted for: Race/ethnicity, education, US citizenship, presence of children, presence of elders, physical disability, housing type, US Census region, and AHS survey cycle. PR = Prevalence ratio. **Bolded** are statistically significant ($p < 0.01$).

Ratio differences in Housing & Environmental Quality Scores by Program Type - *Among very low-income households*

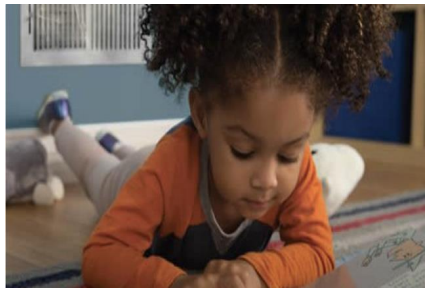
Reference: No HUD-assistance

	HUD: Project-based Housing	HUD: Housing Choice Vouchers
	PR (95% CI)	PR (95% CI)
Cumulative	1.02 (0.98 - 1.06)	**0.93 (0.89 - 0.97)**
Indoor combustion sources	**1.10 (1.03 - 1.17)**	**0.85 (0.79 - 0.92)**
Building Leakage	0.98 (0.94 - 1.02)	1.02 (0.97 - 1.06)
Dampness & Mold	**1.14 (1.00 - 1.30)**	1.00 (0.85 - 1.17)
Pests & Allergens	1.15 (0.93 - 1.42)	0.82 (0.63 - 1.07)
Thermal Discomfort	**1.10 (1.04 - 1.17)**	1.03 (0.96 - 1.11)
Lead paint risk	0.95 (0.63 - 1.46)	0.64 (0.38 - 1.09)
Injury/home hazards	0.95 (0.81 - 1.12)	**0.80 (0.65 - 0.97)**
Water & Sanitation	**0.81 (0.67 - 0.99)**	**0.62 (0.49 - 0.79)**
Severe overcrowding	**0.18 (0.11 - 0.30)**	**0.22 (0.11 - 0.41)**

Adjusted for: Federal poverty level, race/ethnicity, education, US citizenship, presence of children, presence of elders, physical disability, housing type, US Census region, and AHS survey cycle. PR = Prevalence ratio. **Bolded** are statistically significant ($p < 0.01$).

Conclusions

- Socioeconomic disparities persisted in poor housing and environmental conditions
- Federal rental assistance could reduce the risk of severe crowding and water and sanitation issues
- Heterogeneity by HUD program type
  - Area for further research
- A multi-prong and multi-level approach is needed to address environmental health hazards among low-income populations



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AMERICAN HOUSING SURVEY

American Housing Survey Participants

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Extra slides

Correlation of Cumulative & Domain Scores

	Cumulative	Indoor Combustion	Dampness & Mold	Pests & Allergens	Thermal Discomfort	Lead Paint Risk	Injury hazards/home safety	Water & Sanitation	Overcrowding	Building Airtightness
Cumulative	**1.00**	**0.56**	**0.41**	**0.29**	**0.56**	**0.23**	**0.37**	**0.30**	**0.11**	**0.35**
Indoor Combustion	**0.56**	1.00	0.04	0.05	0.17	0.05	0.05	0.00	0.03	-0.09
Dampness & Mold	**0.41**	0.04	1.00	0.16	0.11	0.19	0.24	0.15	0.02	0.02
Pests & Allergens	**0.29**	0.05	0.16	1.00	0.09	0.13	0.15	0.11	0.07	0.09
Thermal Discomfort	**0.56**	0.17	0.11	0.09	1.00	0.11	0.14	0.09	0.05	0.04
Lead Paint Risk	**0.23**	0.05	0.19	0.13	0.11	1.00	0.23	0.09	0.02	0.04
Injury hazards/home safety	**0.37**	0.05	0.24	0.15	0.14	0.23	1.00	0.12	0.02	0.02
Water & Sanitation	**0.30**	0.00	0.15	0.11	0.09	0.09	0.12	1.00	0.02	0.02
Overcrowding	**0.11**	0.03	0.02	0.07	0.05	0.02	0.02	0.02	1.00	0.04
Building Airtightness	**0.35**	-0.09	0.02	0.09	0.04	0.04	0.02	0.02	0.04	1.00

Spearman correlation coefficients

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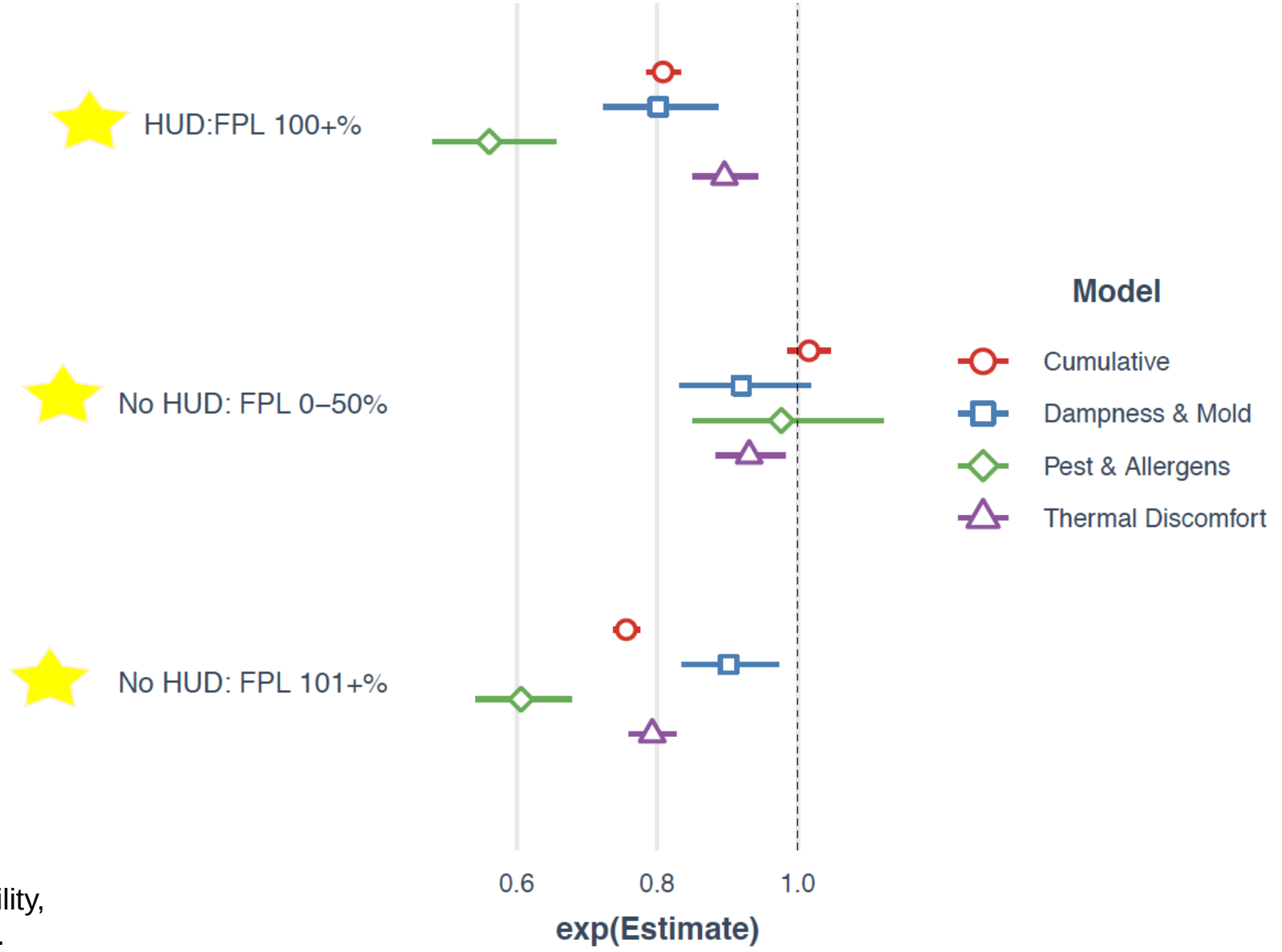
Prevalence ratio of Poor HEQ Score

– *Indoor Combustion, Lead Paint Risk, and Ventilation*

Referent group: HUD assistance: FPL 0-50%
Adjusted for: Race/ethnicity, education, US citizenship, presence of children, presence of elders, physical disability, housing type, US Census region, and AHS survey cycle.

Prevalence ratio of Poor HEQ Score

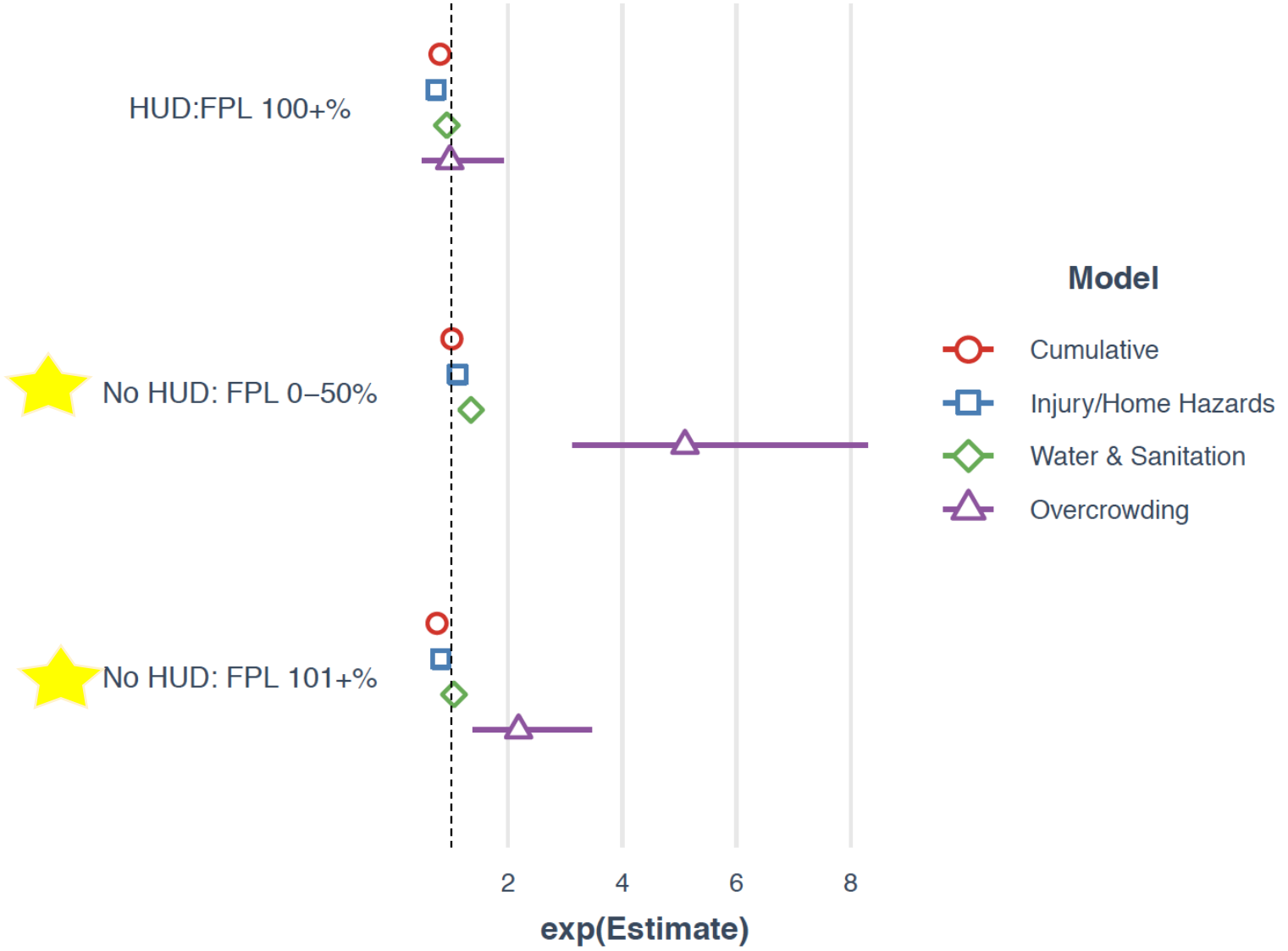
– *Dampness/Mold, Pests & Allergens, Thermal Discomfort*



Referent group: HUD assistance: FPL 0-50%
Adjusted for: Race/ethnicity, education, US citizenship, presence of children, presence of elders, physical disability, housing type, US Census region, and AHS survey cycle.

Prevalence ratio of Poor HEQ Score

– *Injury hazards, Water/Sanitation, Overcrowding*



Referent group: HUD assistance: FPL 0-50%
Adjusted for: Race/ethnicity, education, US citizenship, presence of children, presence of elders, physical disability, housing type, US Census region, and AHS survey cycle.