

inequities in long-term disaster recovery:

the inquiry, challenges & next steps

james r. elliot
professor of sociology

the inquiry



U.S. GOVERNMENT ACCOUNTABILITY OFFICE

441 G St. N.W.
Washington, DC 20548

May 6, 2019

The Honorable Bennie G. Thompson
Chairman, Committee on Homeland Security
House of Representatives

Dear Mr. Chairman:

Thank you for your letter, jointly signed by Senator Elizabeth Warren, requesting that the Government Accountability Office review federal disaster relief programs to determine the extent to which the structure and administration of those programs exacerbate racial and socioeconomic inequities in the U.S., and the extent to which they have a disparate impact on Native tribal nations.

GAO accepts your request as work that is within the scope of its authority. At the current time we anticipate that staff with the required skills will be available to initiate an engagement in about five months. Your request has been assigned to Mr. Charles M. Johnson, Jr., Managing Director, Homeland Security and Justice. Closer to the time GAO can start this engagement, Mr. Johnson or a member of his team will contact your office to confirm that this request continues to be your priority for us. As applicable, we will also be in contact with the cognizant Inspector General's office to ensure that we are not duplicating efforts. If an issue arises during this coordination, we will consult with you regarding its resolution.

If you have any questions, please contact Mr. Johnson at 202-512-7331 or johnsoncm@gao.gov, or Mr. Chuck Wilson, Assistant Director, Congressional Relations on my staff at 202-512-6891 or WilsonCE@gao.gov.

Sincerely yours,

A handwritten signature in black ink that reads "Orice Williams Brown".

Orice Williams Brown
Managing Director
Congressional Relations

cc: Lauren McClain

Ref: CCAR 19-0722

[the GAO] accepts your request “to determine the extent to which the structure and administration of [federal disaster programs] exacerbate racial and socioeconomic inequities”

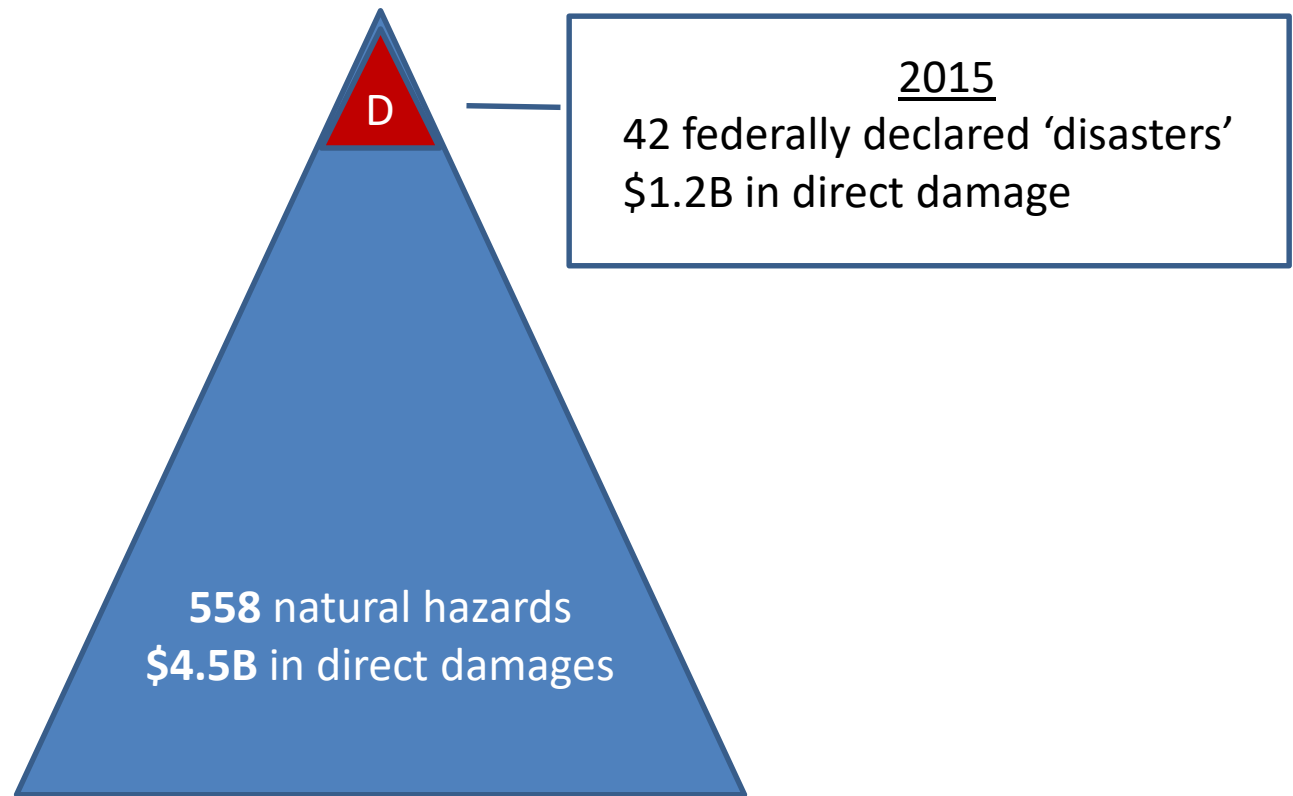
challenges



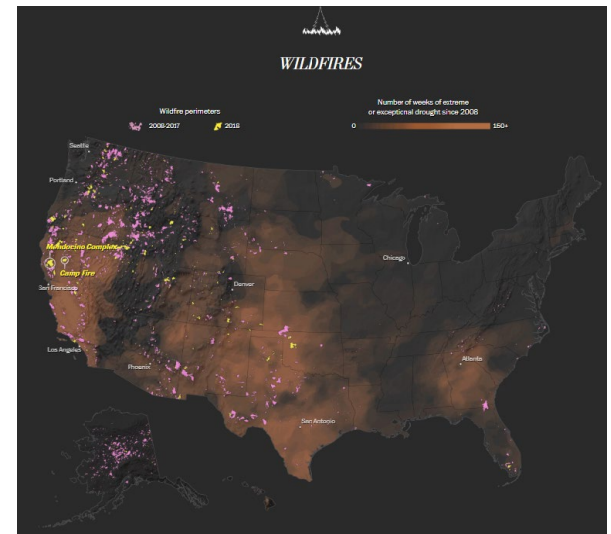
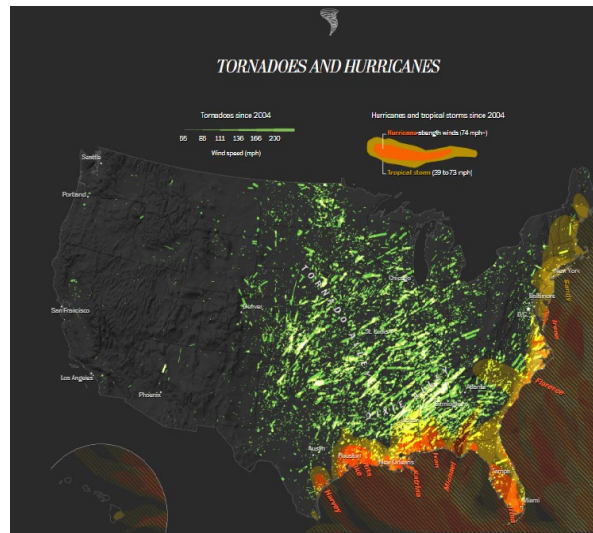
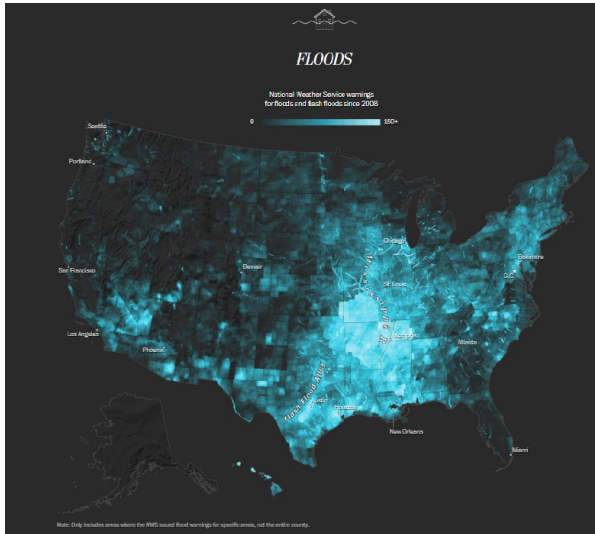
1. conceptualization
2. data & design
3. unintended consequences

1. conceptualization

from 'big events' to '**big picture**'

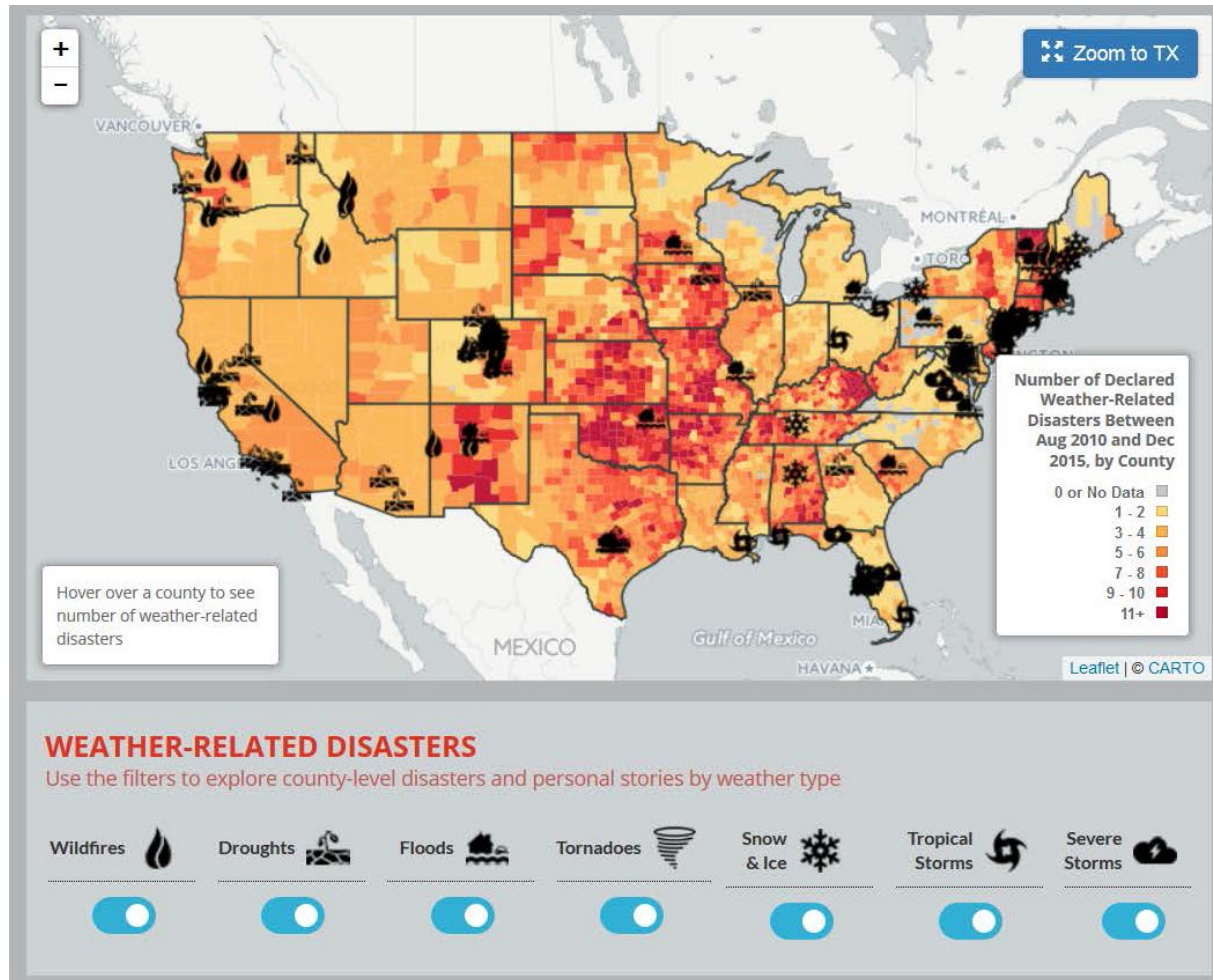


from places to **entire nation**



source: National Oceanic and Atmospheric Administration and [Washington Post](#)

from single event to **ongoing impacts**



2. data & design

from event- to **population-centered** approach



3. unintended consequences

exhibit a: wealth

exhibit b: self-employment

a. wealth

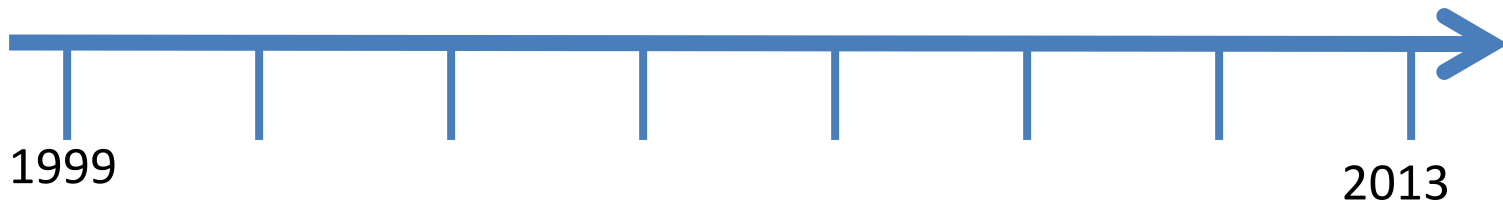
research design



PSID

A national study of socioeconomics and health
over lifetimes and across generations

N= 3,408 individuals x 8 interviews each (restricted data file)



Spatial Hazard Events and Losses Database
for the United States

N= 3,142 counties



FEMA

public assistance funded projects summary – county level*

* proxy for long-term recovery investments

interview data every 2 years, 1999-2013

individual factors

gender

race

native/foreign born

education

age

family factors

married/cohabiting

children in household

annual insurance premiums paid (\$)

household factors

renter/owner

non/mover

neighborhood (tract) factors

median income

% with Bachelor's degree

% of adults employed

county factors

hazard damage

FEMA assistance

total population

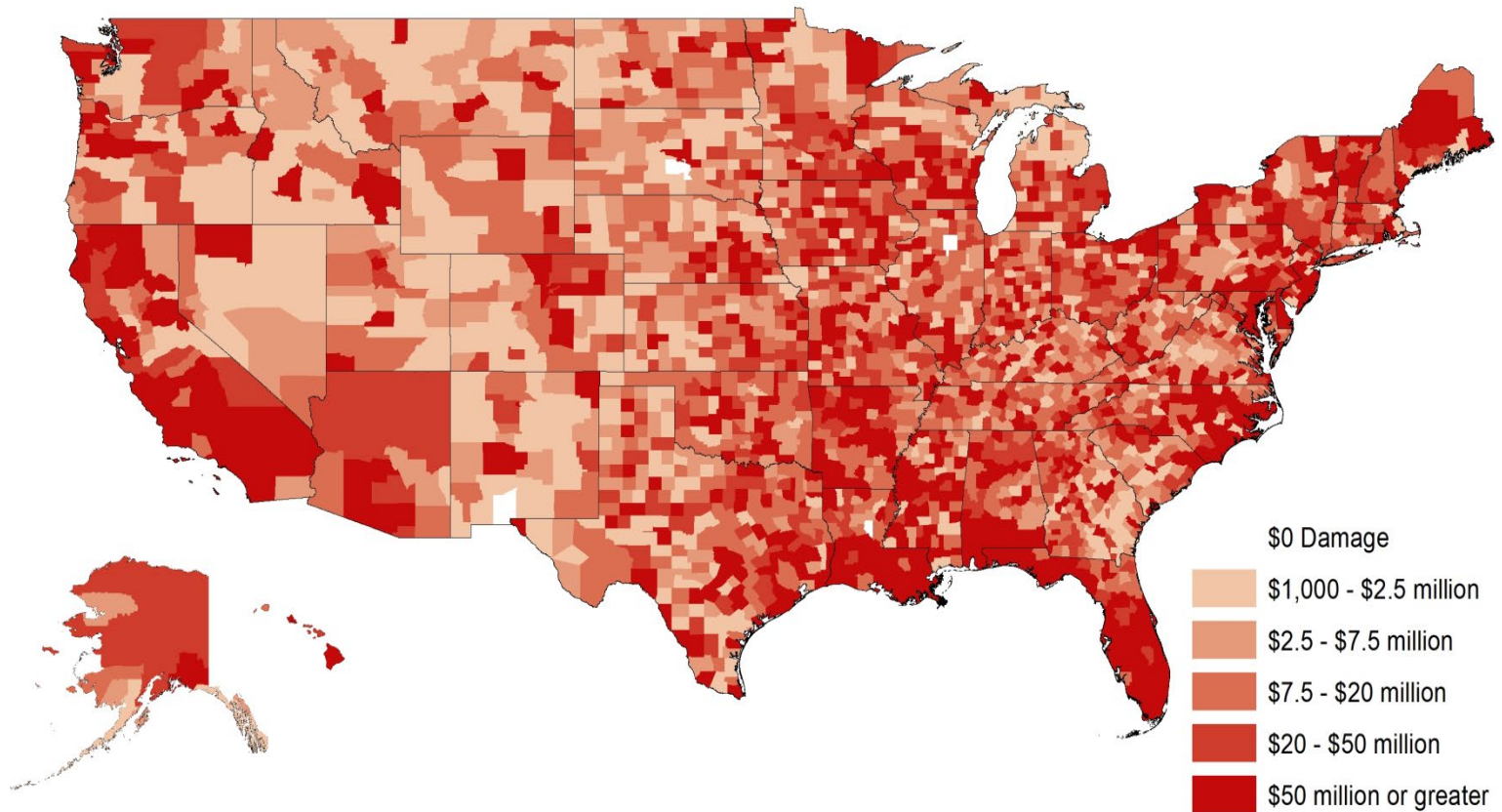
urban/rural scale (1-9)

wealth



(adjusted \$2012)

direct damages from natural hazards, 1999-2013



Source: SHEL DUS v. 15.2, authors' calculations

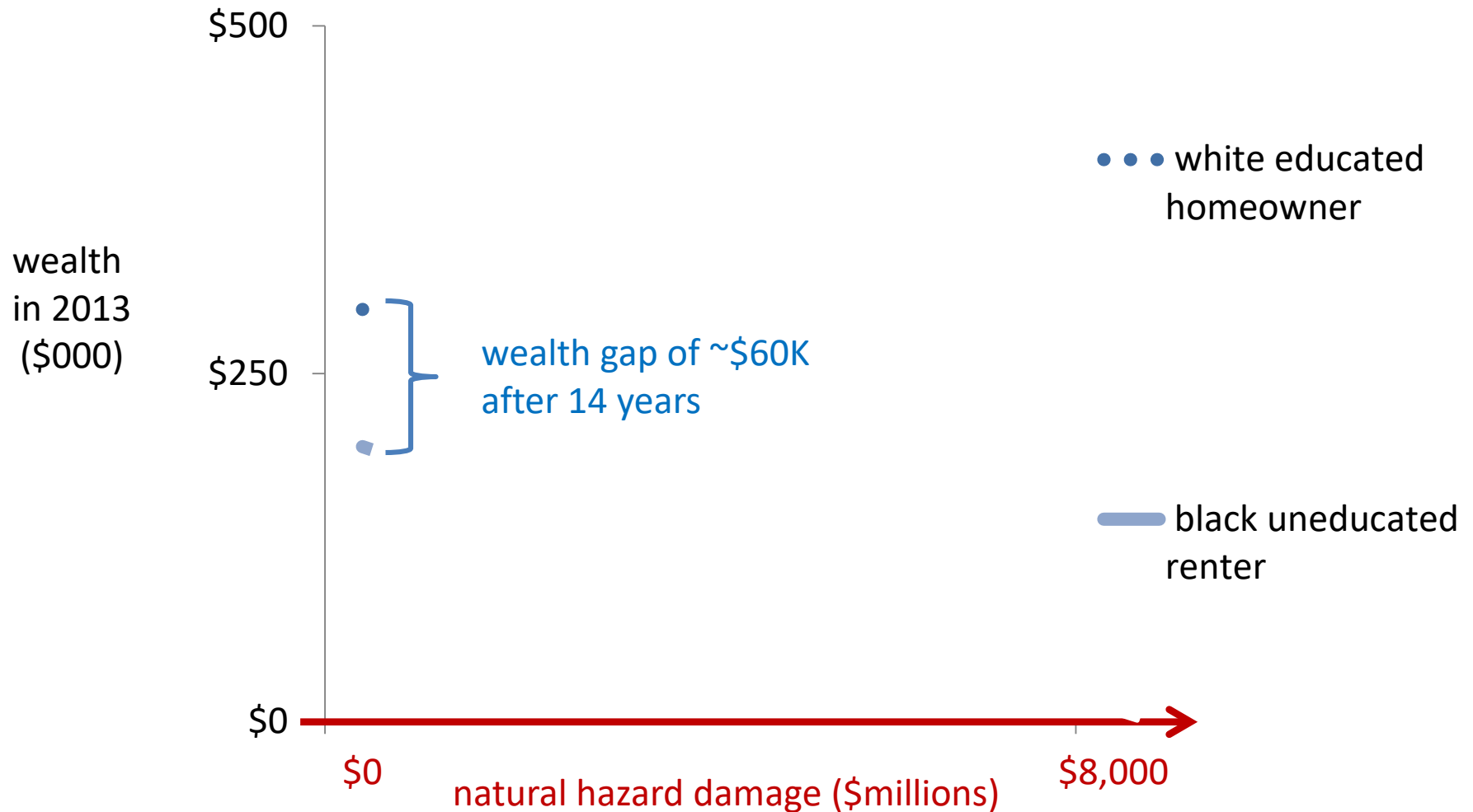
panel, random (& hybrid/fixed) effects models

Table 2. Coefficients from Longitudinal Random Effects Models Predicting Wealth, Interval to Interval, 1999-2013.

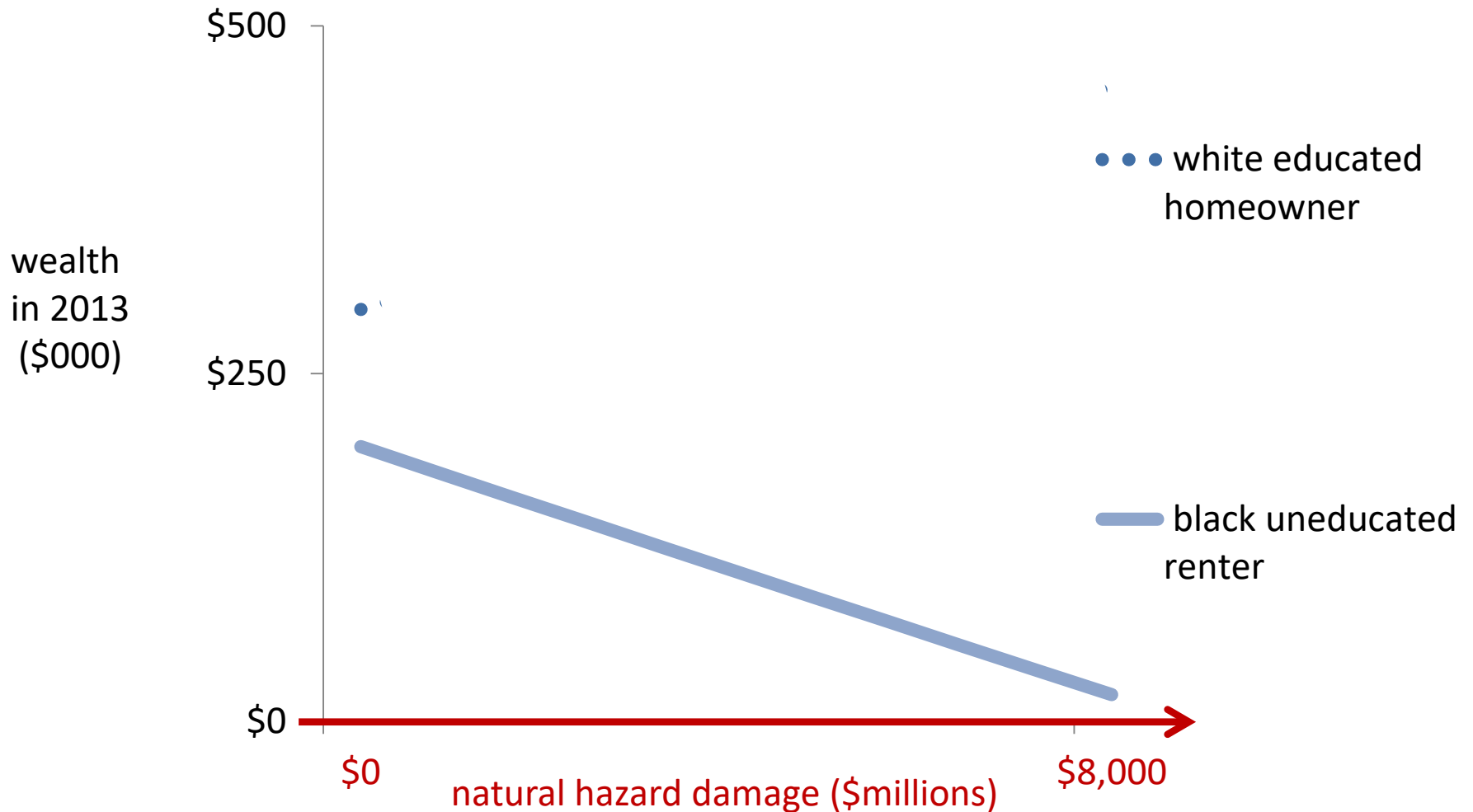
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Hazard Damage, Logged	3.57 (1.27)*	2.86 (1.26)*	8.61 (1.61)*	3.04 (1.26)*	6.14 (1.42)*	8.56 (1.67)*	8.45 (1.59)*
<i>Individual-Level Factors</i>							
Race							
Black		-19.43 (5.09)*	-18.89 (5.09)*	-19.33 (5.09)*	-19.33 (5.09)*	-18.99 (5.10)*	-17.95 (4.84)*
Latino		-5.11 (9.32)	-3.54 (9.38)	-4.22 (9.33)	-5.50 (9.32)	-4.43 (9.38)	-4.70 (8.93)
Other		-14.14 (10.37)	-14.30 (10.37)	-15.14 (10.37)	-14.14 (10.37)	-15.02 (10.37)	-16.21 (9.86)
Foreign Born		-2.63 (23.85)	-3.34 (23.86)	-0.65 (23.85)	-2.92 (23.85)	-1.82 (23.87)	0.80 (22.76)
Education		13.45 (2.30)*	13.45 (2.30)*	13.49 (2.30)*	13.24 (2.30)*	13.36 (2.30)*	11.97 (2.19)*
Age		12.09 (2.28)*	11.78 (2.28)*	12.02 (2.28)*	12.10 (2.28)*	11.85 (2.28)*	10.20 (2.17)*
<i>Family-Level Factors</i>							
Married		20.08 (3.35)*	20.03 (3.35)*	20.02 (3.35)*	20.17 (3.35)*	20.03 (3.34)*	15.06 (3.21)*
Children at Home		2.25 (1.29)	1.63 (1.29)	1.96 (1.29)	2.13 (1.30)	1.58 (1.29)	1.55 (1.23)
<i>Household-Level Factors</i>							
Renter		-7.06 (3.46)*	-7.26 (3.46)*	-6.52 (3.46)	-7.01 (3.46)	-6.71 (3.46)	-2.43 (3.36)
Moved		4.00 (2.64)	4.25 (2.64)	4.16 (2.64)	4.57 (2.65)	4.60 (2.65)	2.71 (2.51)
Wealth in 1999		141.59 (2.38)*	141.49 (2.38)*	141.50 (2.38)*	141.59 (2.38)*	141.47 (2.38)*	139.50 (2.26)*
<i>Neighborhood-Level Factors</i>							
Socioeconomic Status		8.15 (1.75)*	8.05 (1.75)*	8.08 (1.75)*	8.18 (1.75)*	8.02 (1.75)*	8.18 (1.66)*
<i>County-Level Factors</i>							
Total Population		1.94 (2.41)	1.82 (2.41)	1.89 (2.41)	1.65 (2.41)	1.65 (2.41)	1.15 (2.29)
Urban/Rural Scale		0.14 (1.19)	0.30 (1.19)	0.09 (1.19)	0.14 (1.19)	0.21 (1.19)	0.54 (1.13)
<i>Property Insurance</i>							
Yearly Premiums Paid							7.90 (1.11)*
Year (Interview Year - 1998)	3.92 (0.50)*	2.87 (0.61)*	2.72 (0.61)*	2.87 (0.61)*	2.81 (0.61)*	2.74 (0.61)*	3.01 (0.58)*
<i>Interaction Terms</i>							
Hazard*Black			-12.62 (2.34)*			-8.04 (2.52)*	-8.79 (2.37)*
Hazard*Latino			-12.32 (4.34)*			-4.58 (4.59)	-6.02 (4.46)
Hazard*Other			-9.65 (4.34)*			-7.46 (4.37)	-7.86 (4.21)
Hazard*Education				5.98 (1.05)*		4.53 (1.12)*	3.78 (1.06)*
Hazard*Renter					-11.40 (2.28)*	-7.04 (2.43)*	-6.23 (2.28)*
Constant	1747.14 (3.32)	1747.62 (4.64)	1748.75 (4.64)	1747.63 (4.64)	1747.82 (4.64)	1748.49 (4.64)	1748.84 (4.42)
N of Individuals	3,408	3,408	3,408	3,408	3,408	3,408	3,408

* p < .05; two-tailed test.

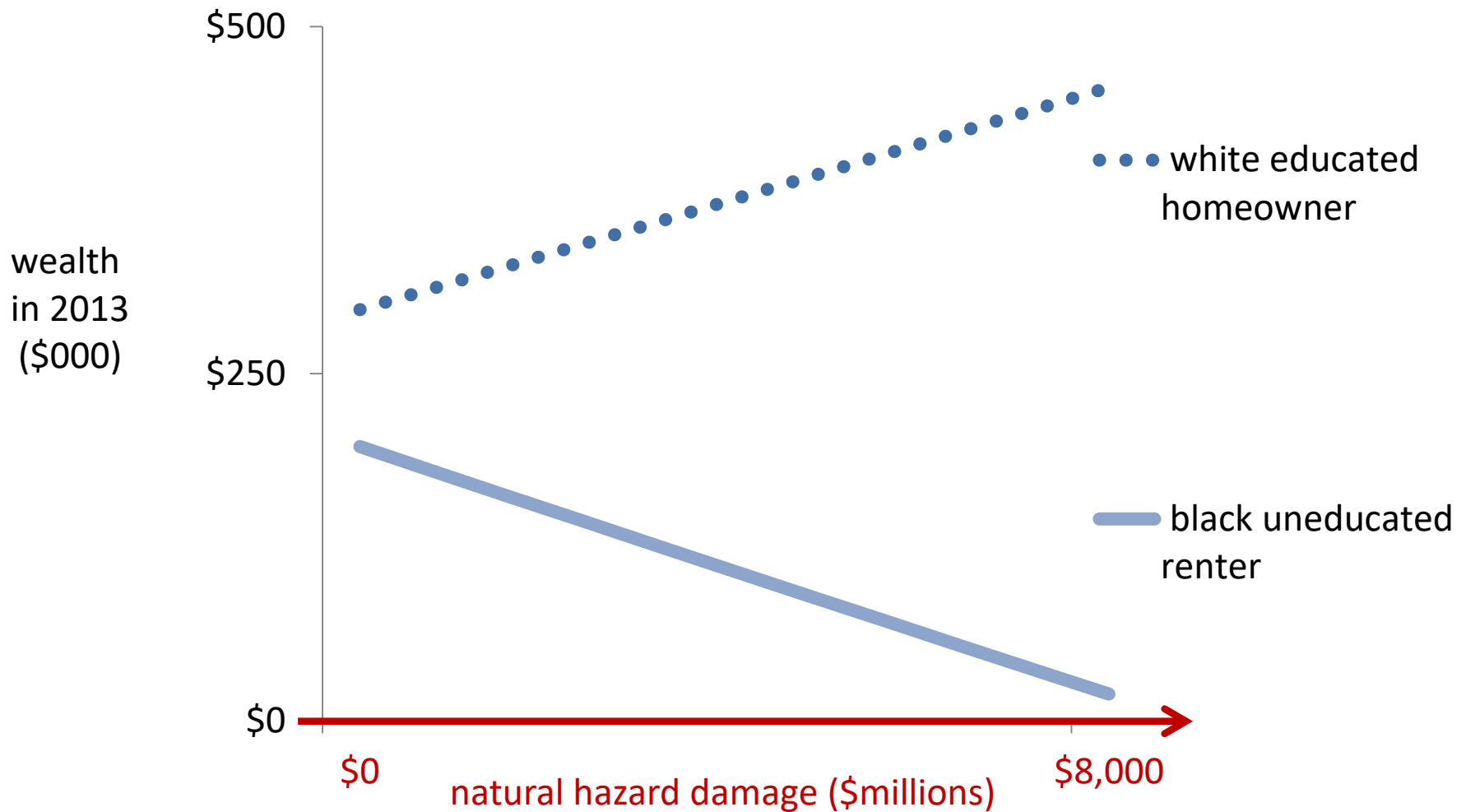
estimated wealth in 2013 with \$0 in natural hazard damage,
all else equal (including starting wealth & insurance premiums)



as natural hazard damage increases, the wealth of **socially vulnerable** populations **decreases**, all else equal



but, the wealth of **socially privileged** populations **increases**



does federal public assistance reduce this polarization?



1999-2013 FEMA Public Projects
Assistance

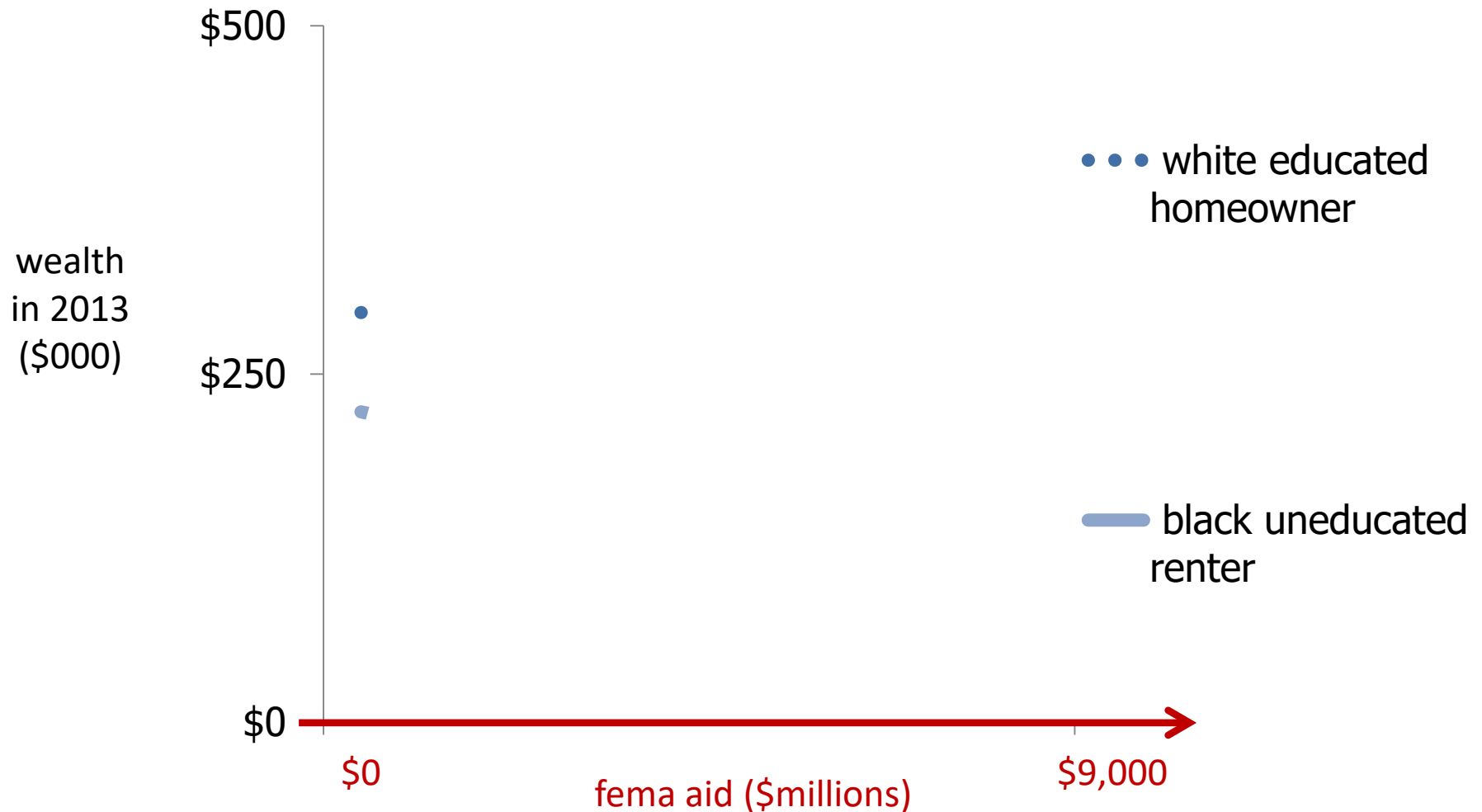
Every respondent's county received some of this assistance

Range: \$1K - \$7.5B

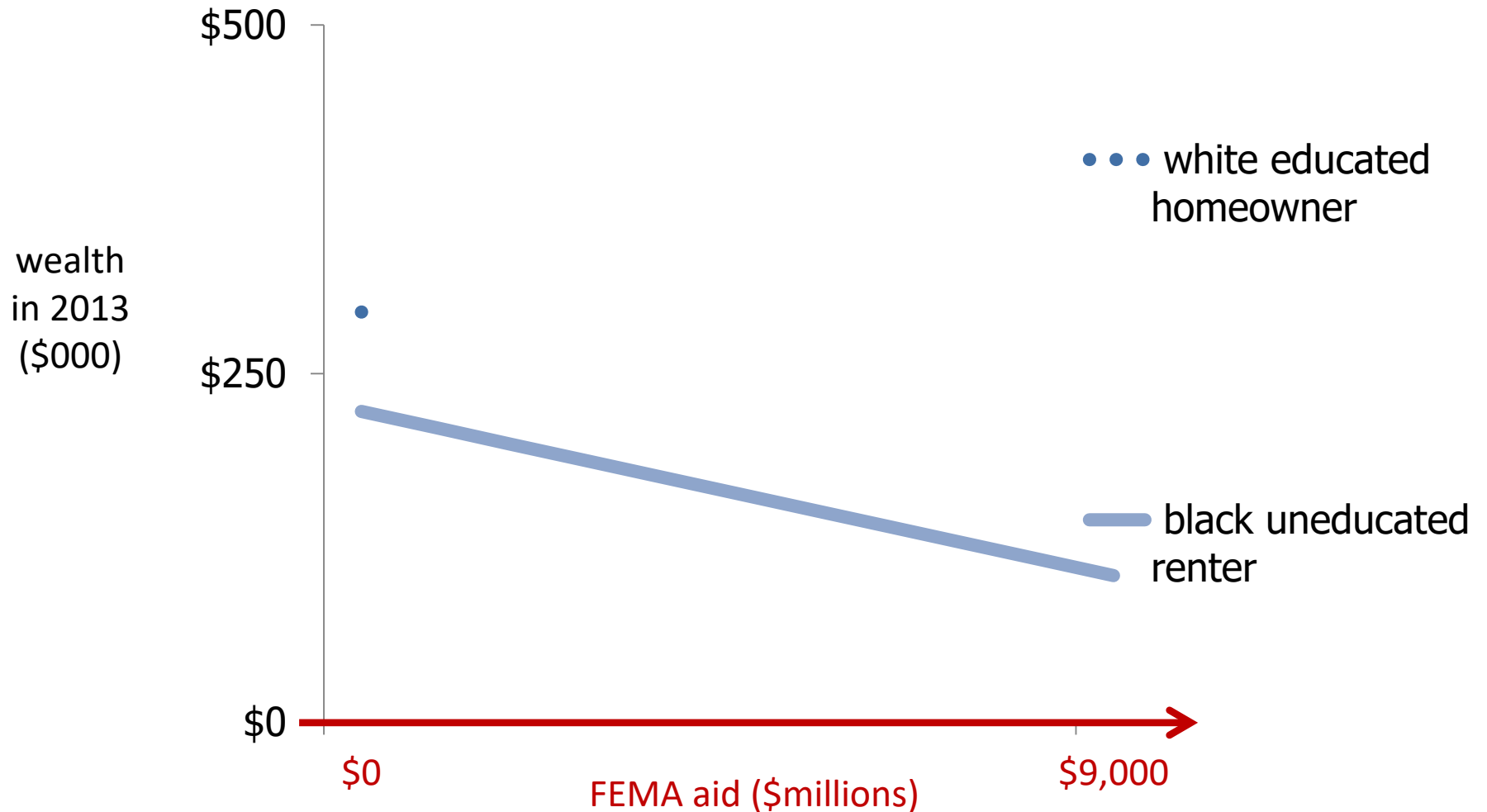
Mean, 2001: \$5.2M

Mean, 2013: \$263M

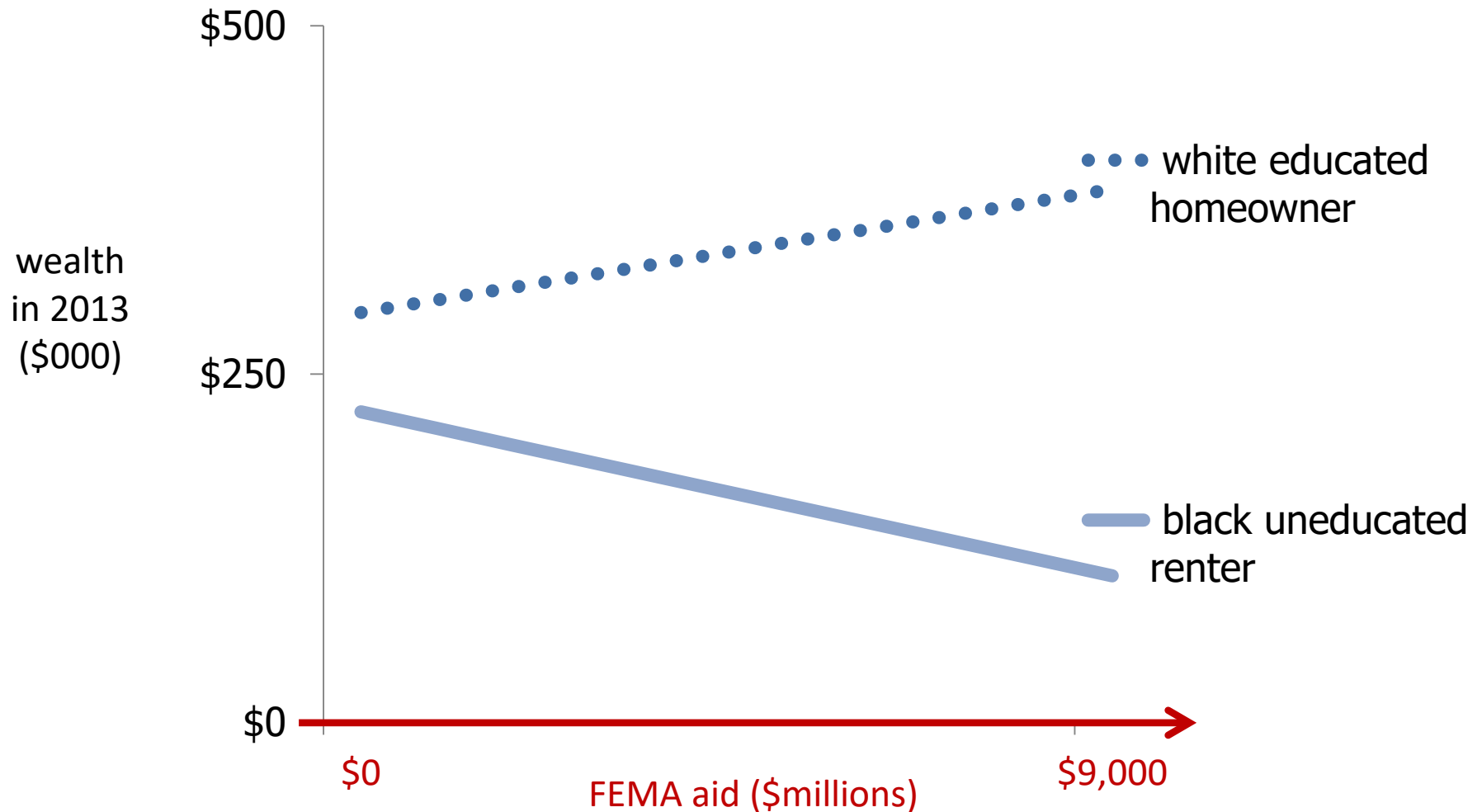
estimated wealth in 2013, with \$0 FEMA public assistance,
all else equal (including natural hazard damage)



as **FEMA public assistance** increases, the wealth of **socially vulnerable** populations **decreases**, all else equal



but, the wealth of **socially privileged** populations **increases**



3. unintended consequences

exhibit b: self-employment rates

research design

unit: counties

data:

- > 5% PUMS (self-employment rates by race: puma > county)
- > census & ACS (population data)
- > SHELATUS (direct hazard damages)
- > FEMA public assistance funded projects summaries file
- > FEMA disaster declarations summaries file

time frame: 2000-2010

sample: **n= 267** central metro **counties**
with 1000+ residents of each race/ethnicity (white; black; hispanic) and < \$1.3B in damages to avoid outliers (e.g., New Orleans)

change-score model, by race and ethnicity

$$\Delta \text{ self-emp. rate}_{j, 2000-10} = B_o + B_1 \$\text{damage}_{j,2000-09} + B_2 \text{FEMA aid}_{j,2000-09} + B_i[X_i]_j + e_j$$

where $[X_i]_j$ are controls: natural hazard damage, 1999

 number of federally declared disasters, 1990-99

Δ in population, 2000-10

**natural hazard damage increases self-employment,
for whites only (all else equal)**

	Whites		Blacks		Hispanics	
	1a	1b	2a	2b	3a	3b
2000-2009 natural hazard damage (in 2015 \$100 millions)	.018*		-.014		.037	
	(.008)		(.021)		(.028)	
2000-2009 FEMA recovery assistance (in 2015 \$100 millions)						

* p < .05 (two-tailed test)

controlling for natural hazard damage, 1999; number of federally declared disasters, 1990-90; Δ in population, 2000-10

FEMA assistance explains that increase for whites

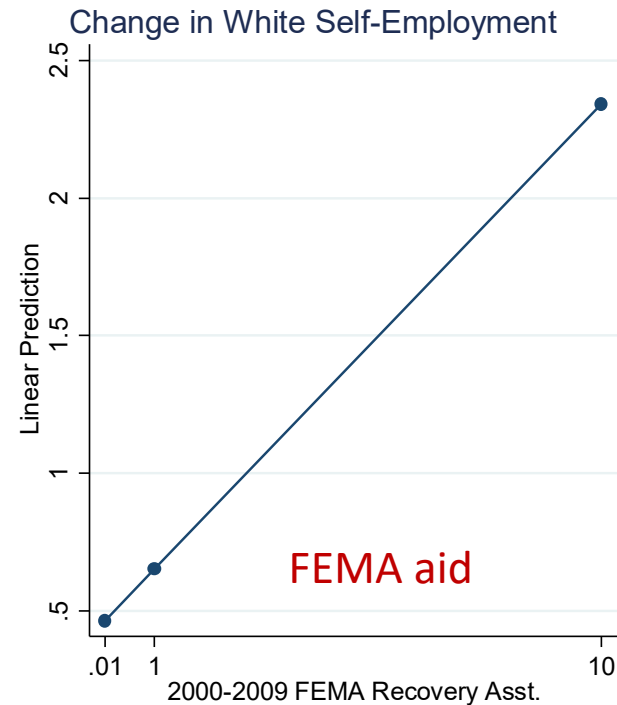
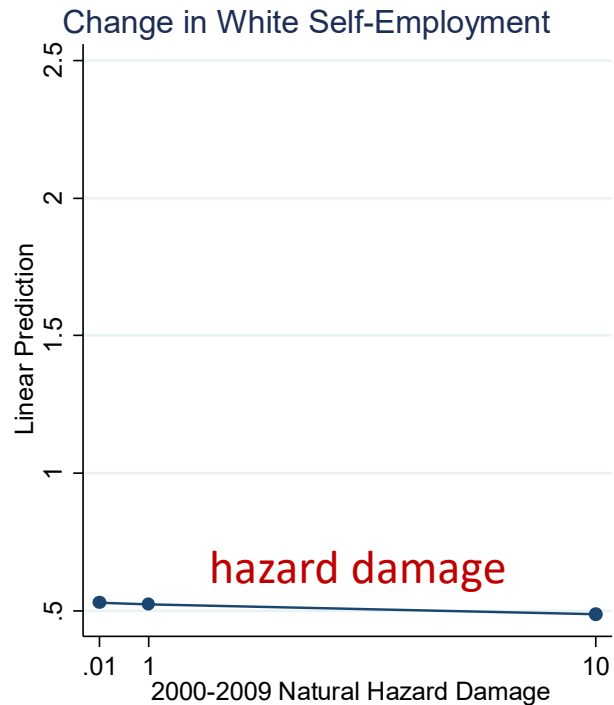
	White		Black		Hispanic	
	1a	1b	2a	2b	3a	3b
2000-2009 natural hazard damage (in 2015 \$100 millions)	.018* (.008)	-.004 (.011)	-.014 (.021)	-.043 (.031)	.037 (.028)	.033 (.041)
2000-2009 FEMA recovery assistance (in 2015 \$100 millions)		.188* (.095)		.056 (.172)		-.188 (.355)

* $p < .05$ (two-tailed test)

controlling for natural hazard damage, 1999; number of federally declared disasters, 1990-90; Δ in population, 2000-10

model 1b illustrated (for whites)

Comparison of Change in Self-Employment at \$1 million, \$100 million, and \$1 billion of 2000-2009 Natural Hazard Damage and FEMA Recovery Asst.



Notes:

2000 and 2010 Public Use Microdata Series; SHELDS 15.2; FEMA Public Asst. Projects Summaries
2000-2009 Natural Hazard Damage and FEMA Recovery Asst. reported in \$100 millions

next steps



1. legal
2. legislative
3. empirical

1. legal

challenges to ‘propertied citizenship’


HARVEY RECOVERY

Lawsuit by four Texas renters says State of Texas, HUD discriminate on race in Hurricane Harvey aid



BY JOHN HENNEBERGER

OCTOBER 14, 2019

 COMMENTS 0

2. legislative

advances in the GAO inquiry



May 6, 2019

The Honorable Bennie G. Thompson
Chairman, Committee on Homeland Security
House of Representatives

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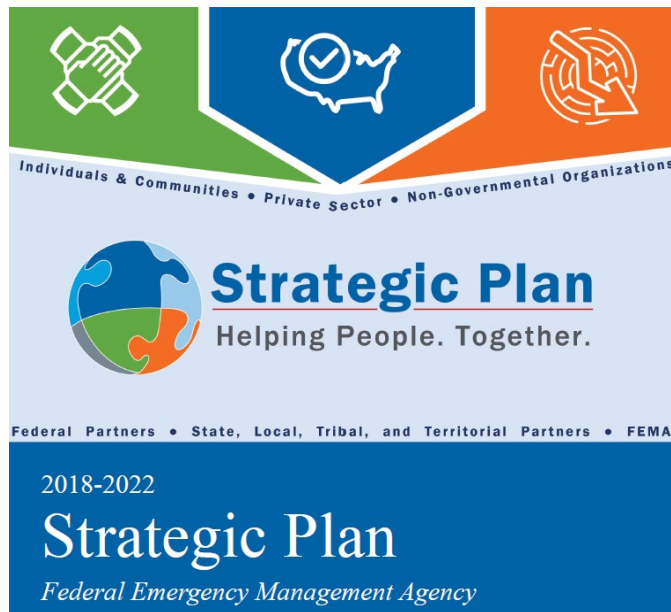
Orice Williams Brown
Managing Director
Congressional Relations

cc: Lauren McClain

Ref: CCAR 19-0722

3. empirical

enhancements in FEMA's new strategic plan



Objective 3.4 Strengthen Grants Management, Increase Transparency, and Improve Data Analytics

- increase data availability, integration, and access
- target social inequities in long-term recovery

abridged bibliography (hyper-linked to articles)

[Elliott, James R. and Junia Howell. 2017. "Beyond Disasters: A Longitudinal Analysis of Natural Hazards' Unequal Impacts on Residential Instability." *Social Forces* 95\(3\): 1181-1207.](#)

[Howell, Junia and James R. Elliott. 2019. "Damages Done: The Longitudinal Impacts of Natural Hazards on Wealth Inequality in the United States." *Social Problems* 66\(3\): 448-467.](#)

[Howell, Junia and James R. Elliott. 2019. "Climate Change Isn't Hurting Everyone: White Middle Class Americans Benefit from Natural Disasters." *Work in Progress*.](#)

[Loughran, Kevin and James R. Elliott. 2019. "Residential Buyouts as Environmental Mobility: Examining Where Homeowners Move to Illuminate Social Inequities in Climate Adaptation." *Population and Environment* 41\(1\): 52-70.](#)

[Loughran, Kevin, James R. Elliott, S. Wright Kennedy. 2019. "Urban Ecology in the Time of Climate Change: Houston and the Case of Water." *Social Currents* 6\(2\): 121-140.](#)

[Smiley, Kevin T., Junia Howell and James R. Elliott. 2018. "Disasters, Local Organizations, and Poverty in the United States, 1998 to 2015." *Population and Environment* 40\(2\): 115-135.](#)

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<https://sociology.rice.edu/jim-elliott>

INEQUALITY IN DISASTER RECOVERY: HOUSING AND MIGRATION

Elizabeth Fussell, PhD

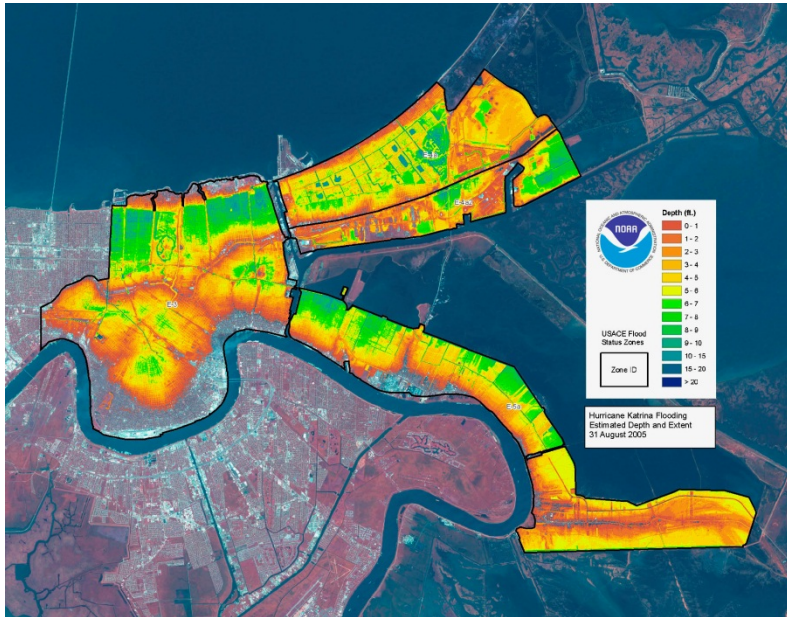
*Brown University, Population Studies and Training Center and Institute at
Brown on Environment and Society*

PAA at GAO presentation, November 13, 2019

Funding support: NICHD R24HD041020 Population Studies and Training Center,
Brown University; NICHD P01HD082032; and HUD RP-15-RI-006

NEW ORLEANS POPULATION AND HOUSING RECOVERY AFTER HURRICANE KATRINA

Flooding damaged majority of housing units



Flood print, August 31, 2005

Source: National Oceanic and Atmospheric Agency

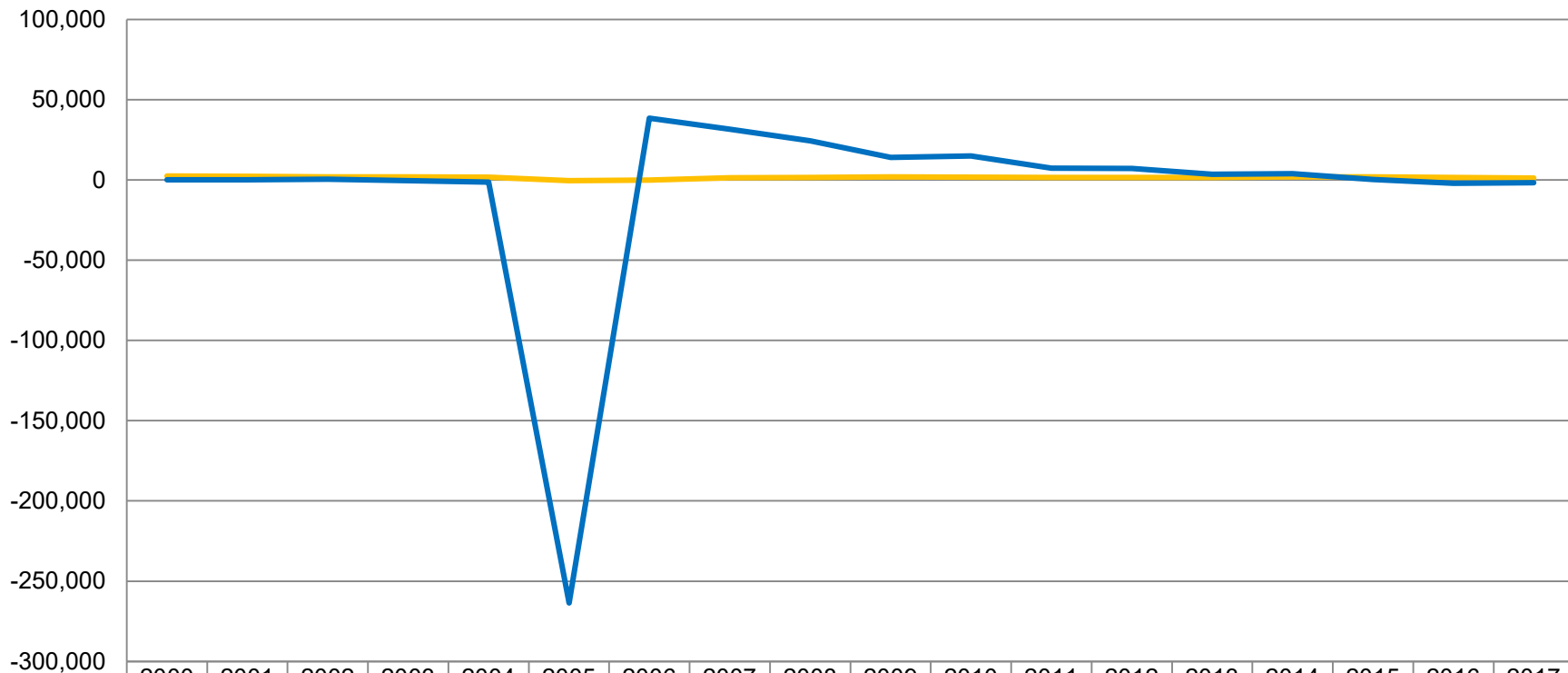
Damage	Pop.	%	HUs	%
None	122,073	25.2	52,718	28.0
Minor	26,617	5.5	10,534	6.0
Serious	67,853	14.0	26,898	14.0
Severe	268,131	55.3	98,101	52.0
Total	484,674	100.0	188,251	100.0

Population and Housing Units (HUs) by flood-damage strata for Orleans Parish

Source: McCarthy et al. 2006. *The Repopulation of New Orleans after Hurricane Katrina*. RAND Gulf States Policy Institute.

Net migration drove population change

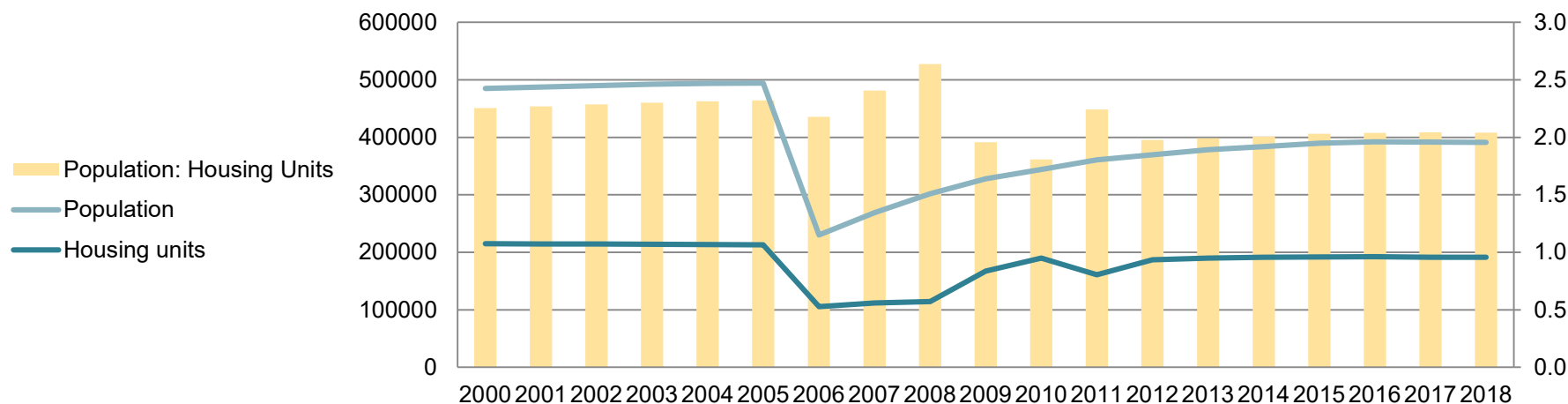
Components of Change in New Orleans' Population



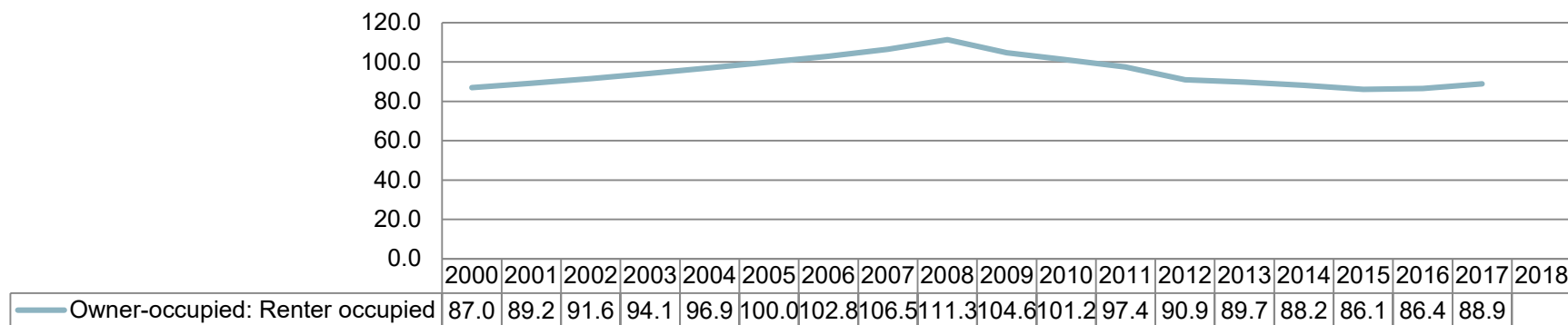
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Natural Growth	2,529	2,222	2,002	1,929	1,823	-450	-43	1,433	1,550	1,862	1,797	1,677	1,657	1,658	1,947	1,872	1,562	1,201
Net Migration	160	137	463	-351	-1,294	-263,6	38,622	31,658	24,411	14,163	15,061	7,398	7,205	3,649	3,914	314	-2,001	-1,733

Housing stock recovered slower than population, and rental housing slower than owner-occupied housing

Population and housing trends, 2000-2017

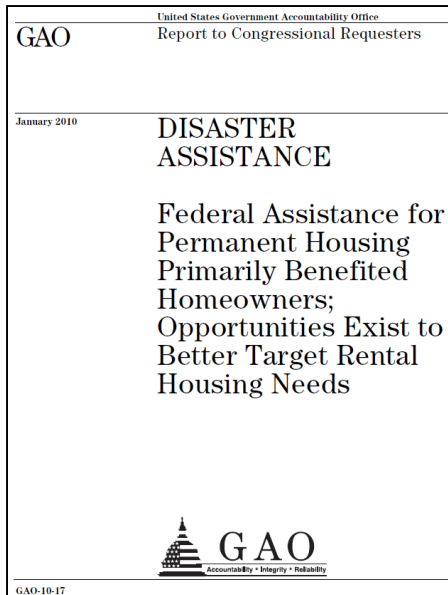


Owner: renter ratio, 2000-2017



Source: Author's compilation from U.S. Census, American Factfinder

Homeowners received more assistance sooner



Housing Authority of New Orleans (HANO) placed in Federal Receivership , 10/09

LA Road Home (Homeowners), 8/06

LA Road Home (Small Rentals), 1/07

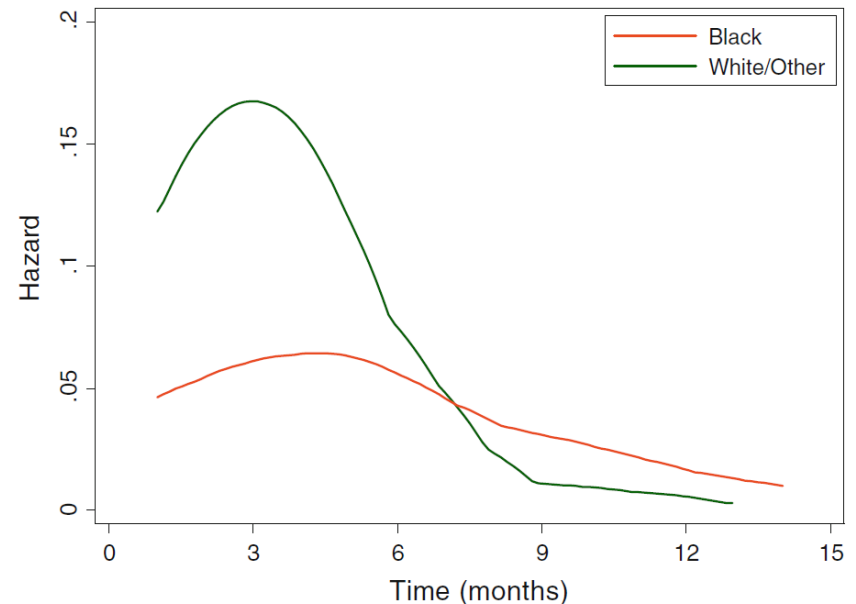
Homeowners insurance, 9/05

FEMA temporary rental assistance,
9/05 – 5/09

Blacks and those with less than college education returned later and less often

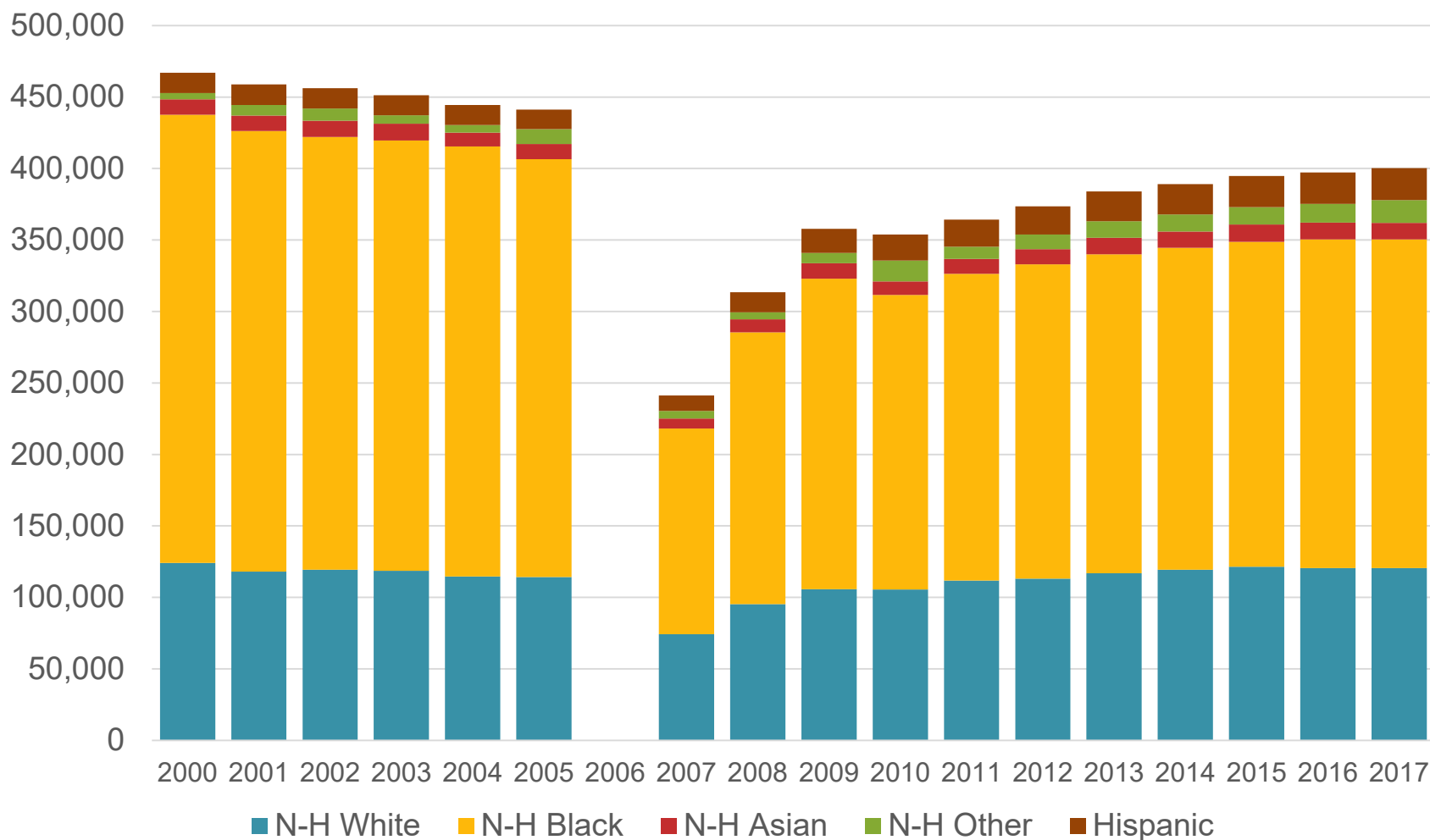
Duration of displacement (age 18+)

	25%	
Total (months)	2	7
Race		
Black	3	>14
White/Other	2	3
Education		
Less than BA	3	14
BA+	2	4



Source: Fussell, Sastry & VanLandingham. 2010. "Race, socioeconomic status, and return migration to New Orleans after Hurricane Katrina." *Population & Environment* 31: 20-42.

Blacks were a smaller proportion of New Orleans' reduced population



Source: B03002: HISPANIC OR LATINO ORIGIN BY RACE - Universe: Total population, Years 2005-2017

DATA AND METHODS TO MOVE BEYOND CASE STUDY APPROACHES

Case study design for disaster research

Disaster exposure	Pre-disaster measures	Exposure measure	Post-disaster measures	
	T0	D	T1	T2..X
Exposed		X	X	X
Unexposed				

Panel study design for disaster research

Disaster exposure	Pre-disaster measures	Exposure measure	Post-disaster measures	
	T0	D	T1	T2..X
Exposed	X	X	X	X
Unexposed	X	0	X	X

Panel study design for disaster research without accounting for mobility

Disaster exposure	Pre-disaster measures	Exposure measure	Post-disaster migration	Post-disaster measures	
	T0	D	M	T1	T2..X
Exposed	X	X	?	X	X
Unexposed	X	0	?	X	X

Panel study design for disaster research accounting for mobility

Disaster exposure	Pre-disaster measures	Exposure measure	Post-disaster migration	Post-disaster measures	
	T0	D	M	T1	T2..X
Exposed	X	X	0	X	X
			X	X	X
Unexposed	X	0	0	X	X
			X	X	X

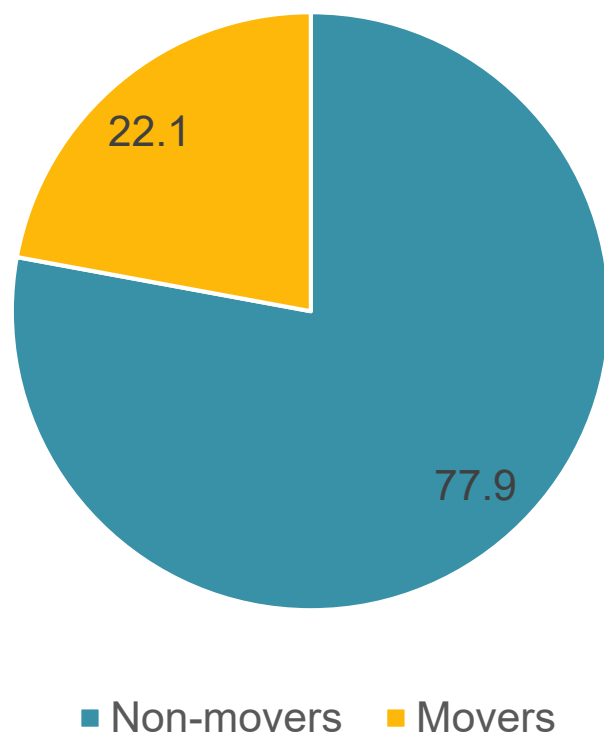
Opportunities exist for panel studies of disaster outcomes

- Administrative data, linked records
 - US Census Bureau, Census Longitudinal Infrastructure Project
 - Equifax Consumer Credit Panel
- Panel studies with nationally representative samples
 - Panel Study of Income Dynamics
 - National Health and Nutrition Examination Survey
 - Others...

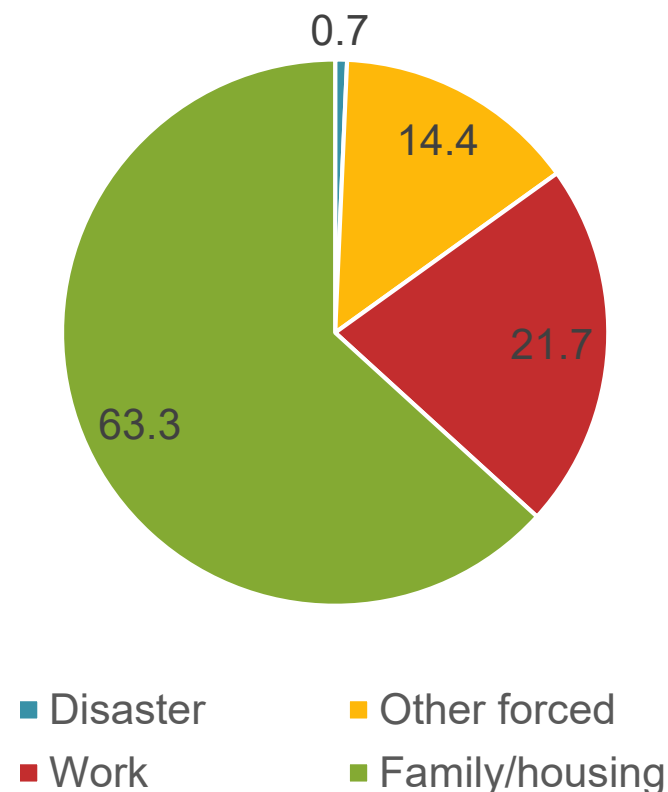
DISASTER-RELATED RESIDENTIAL MOBILITY

Disaster-related moves are only 0.7% of all recent household moves

Households that moved in previous 24 months



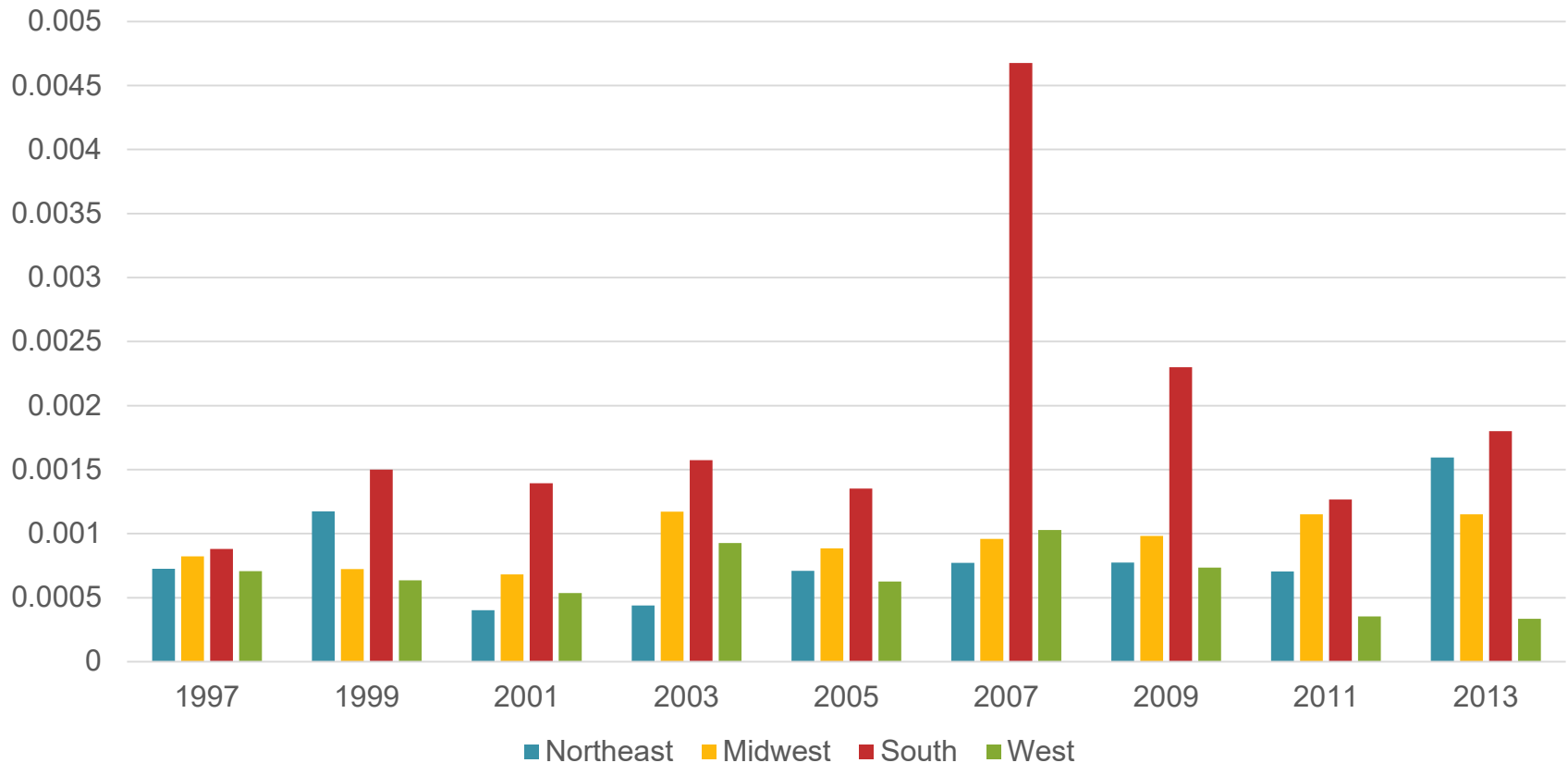
Reasons for moving among recent movers



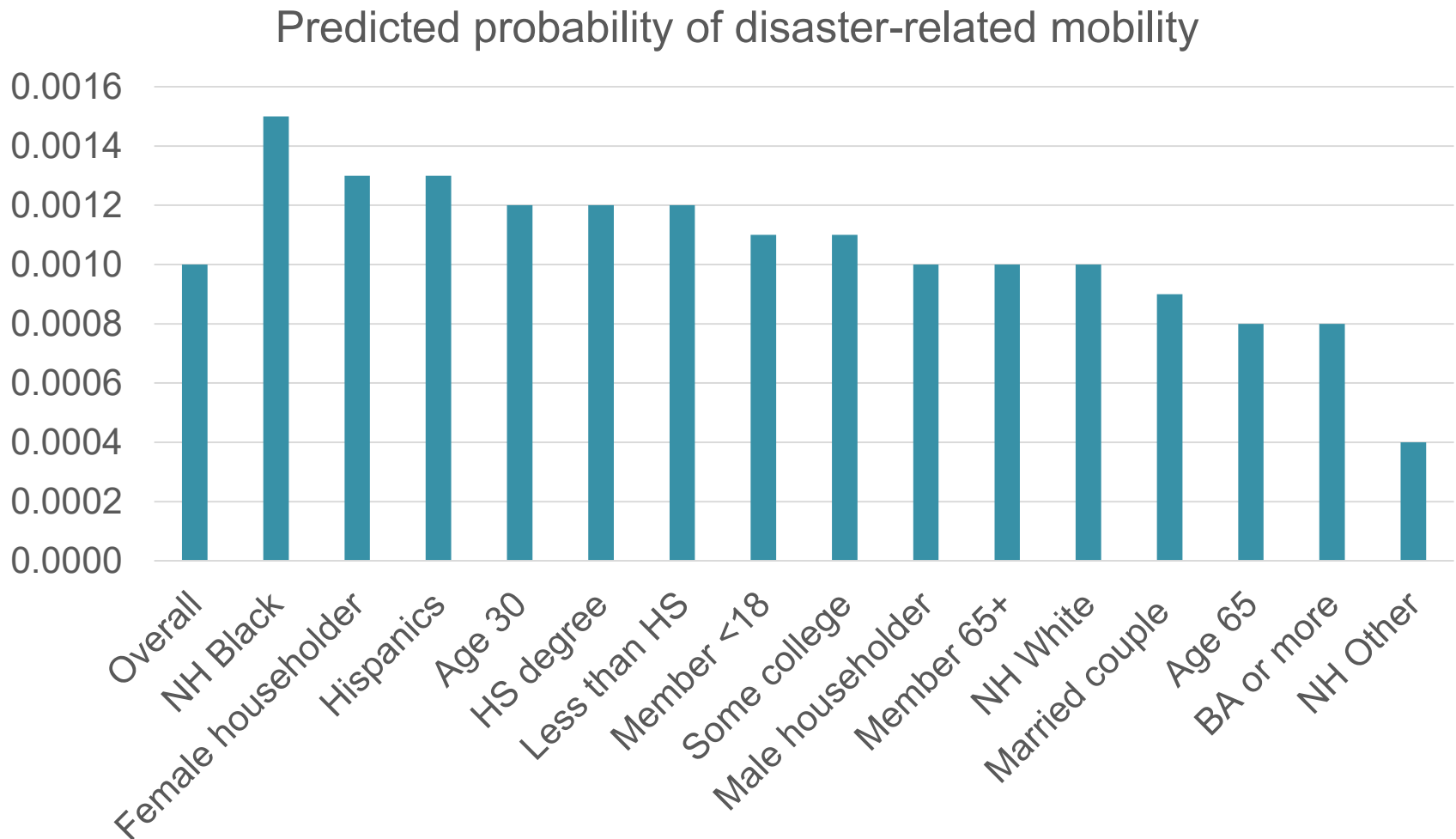
Source: Author's calculations from American Housing Survey, 1997-2013

More disaster-related mobility in regions affected by destructive hurricane seasons

Predicted probability of moving because of a disaster



Disaster-related mobility is related to householder sociodemographics



Disaster-related residential mobility is unequal

- Evidence is mounting to show that disaster recovery occurs unequally
 - Pre-disaster housing characteristics matter
 - Demographic groups are unequally affected
 - More research on long-term outcomes of disaster-affected individuals and households is forthcoming

Disaster-related residential mobility is unequal

- Stafford Act: Return people to their pre-disaster condition
 - Is this what is happening?
 - Is this what should happen?
 - Why not take disasters and disaster planning as opportunity to improve housing and move people away from hazards?