

Structural racism and child injuries

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Disclosures

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Definition of structural racism

A system in which public policies, institutional practices, cultural representations, and other norms work in various, often reinforcing ways, to perpetuate racial group inequity.



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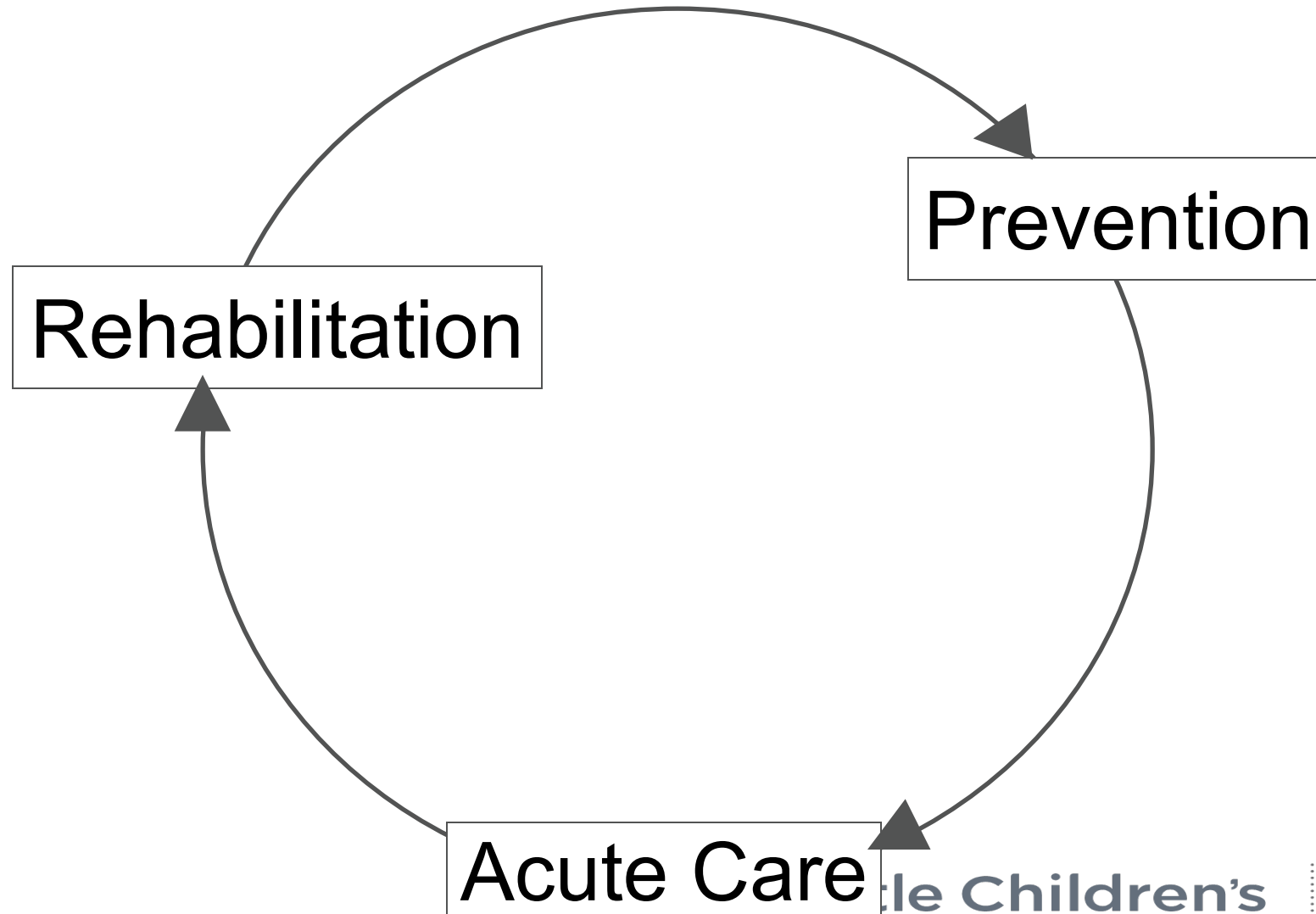
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Haddon Matrix

	Person	Agent/vector	Social environment	Physical environment
Pre-event				
Event				
Post-event				



Phases of Injury Control

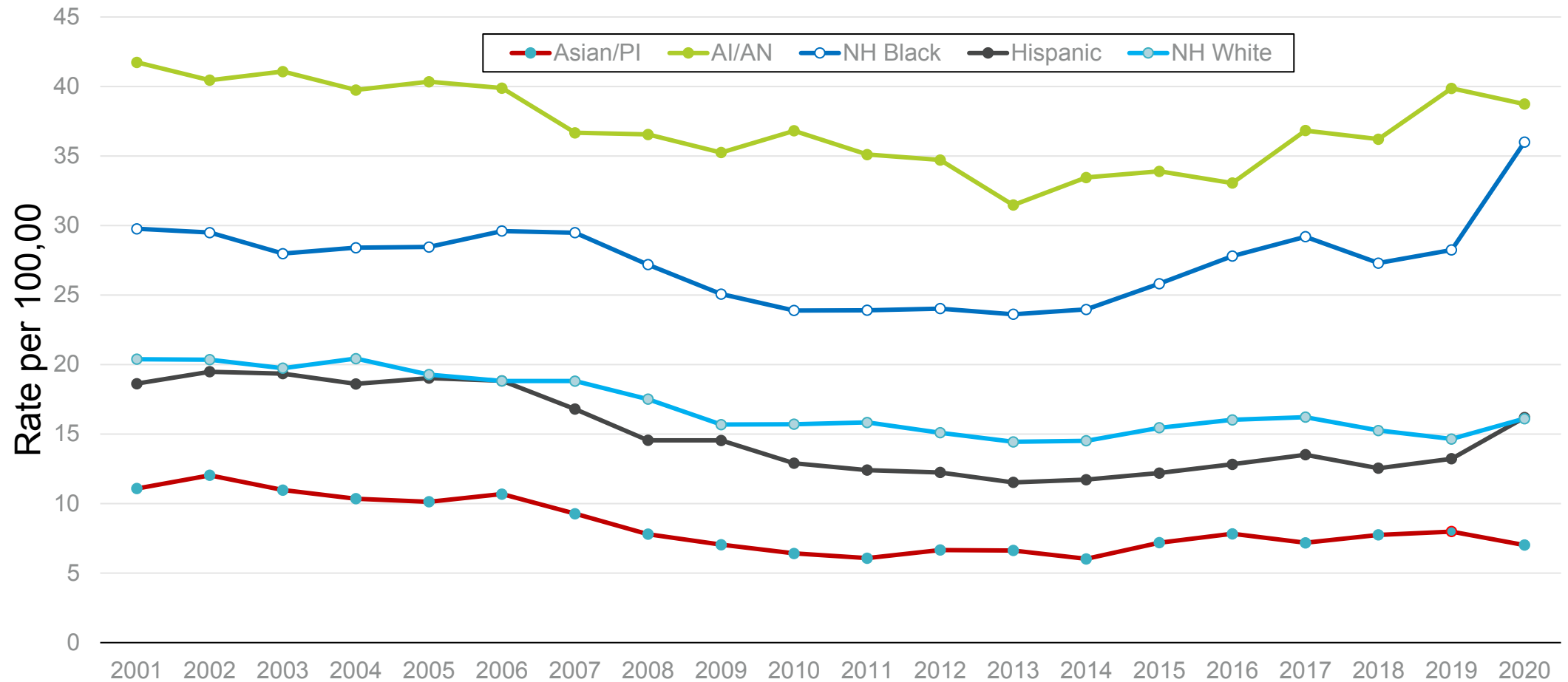


Acute Care

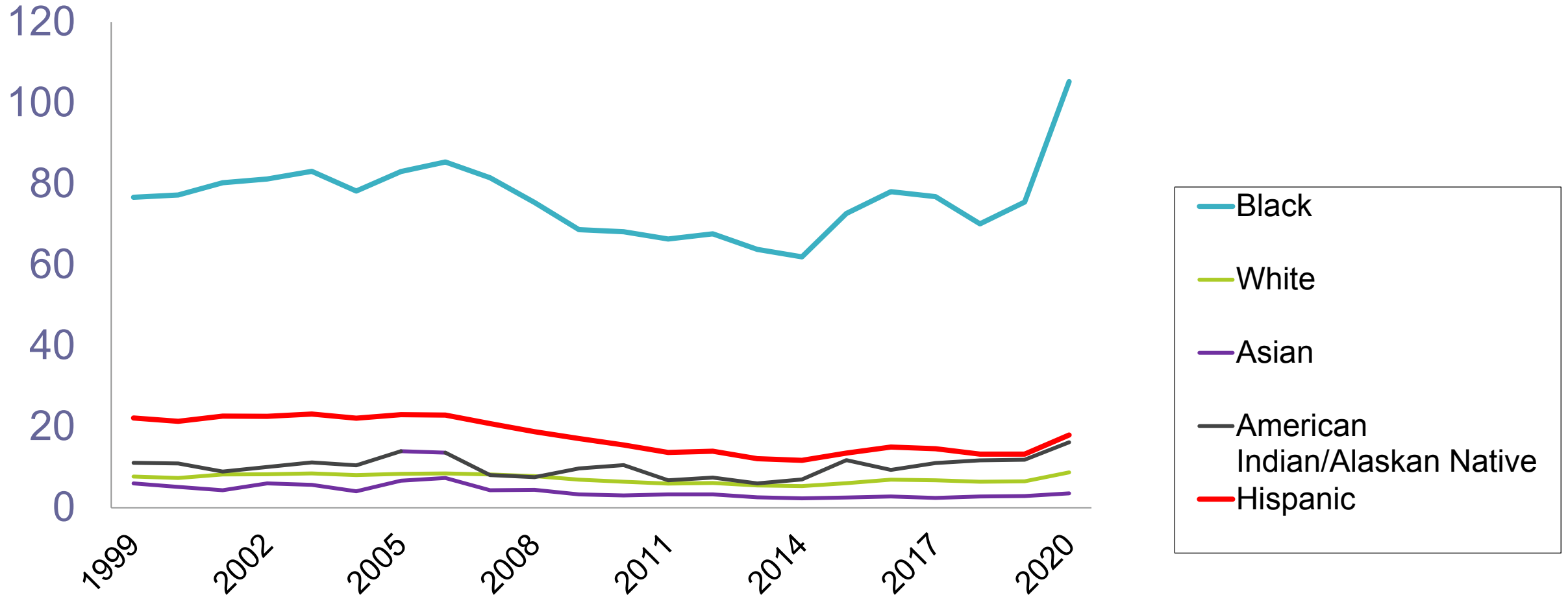
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Injury death rates to youth ≤ 19 in U.S., 2001-2020

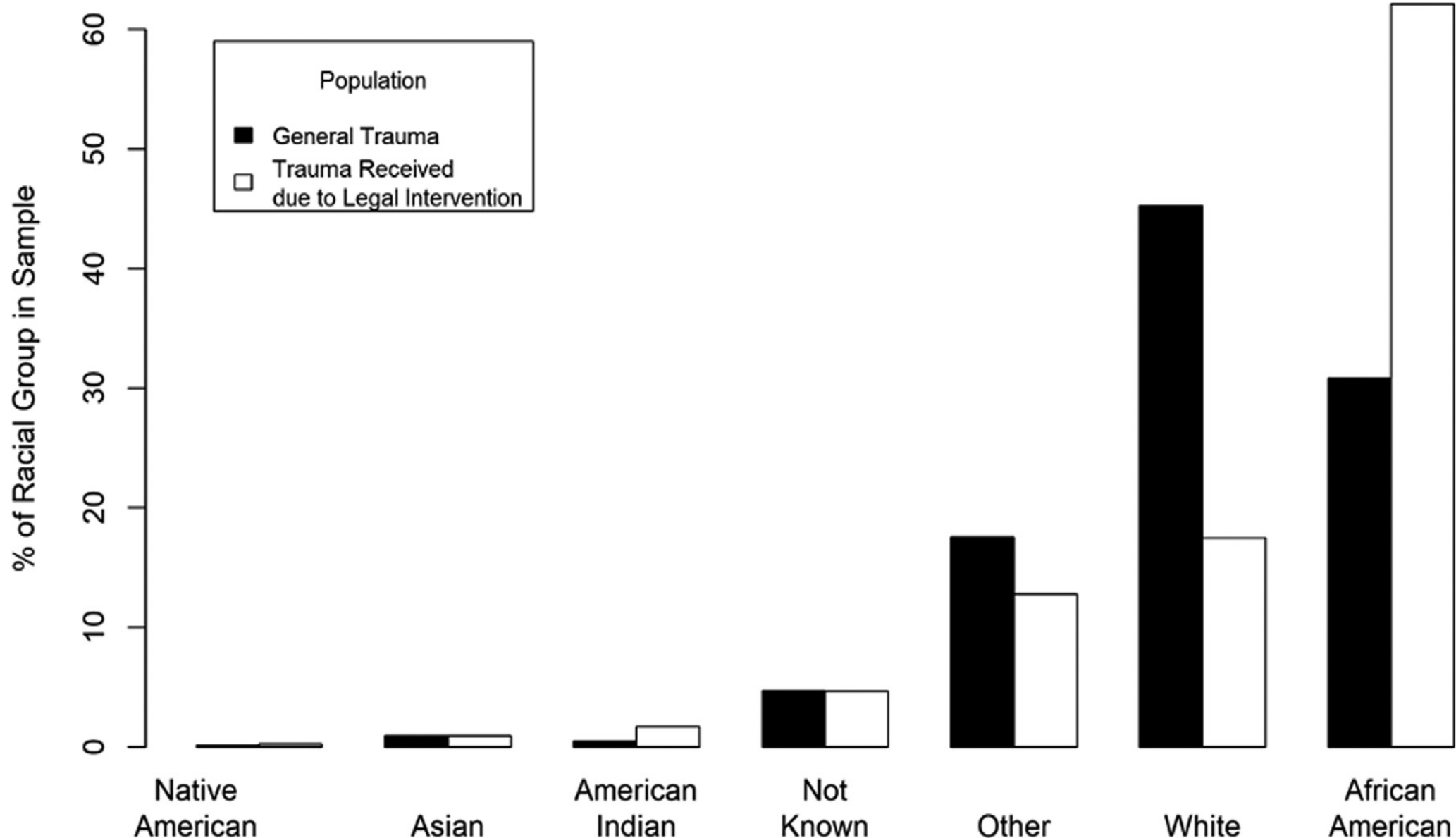


Male firearm homicides by race, 15-29



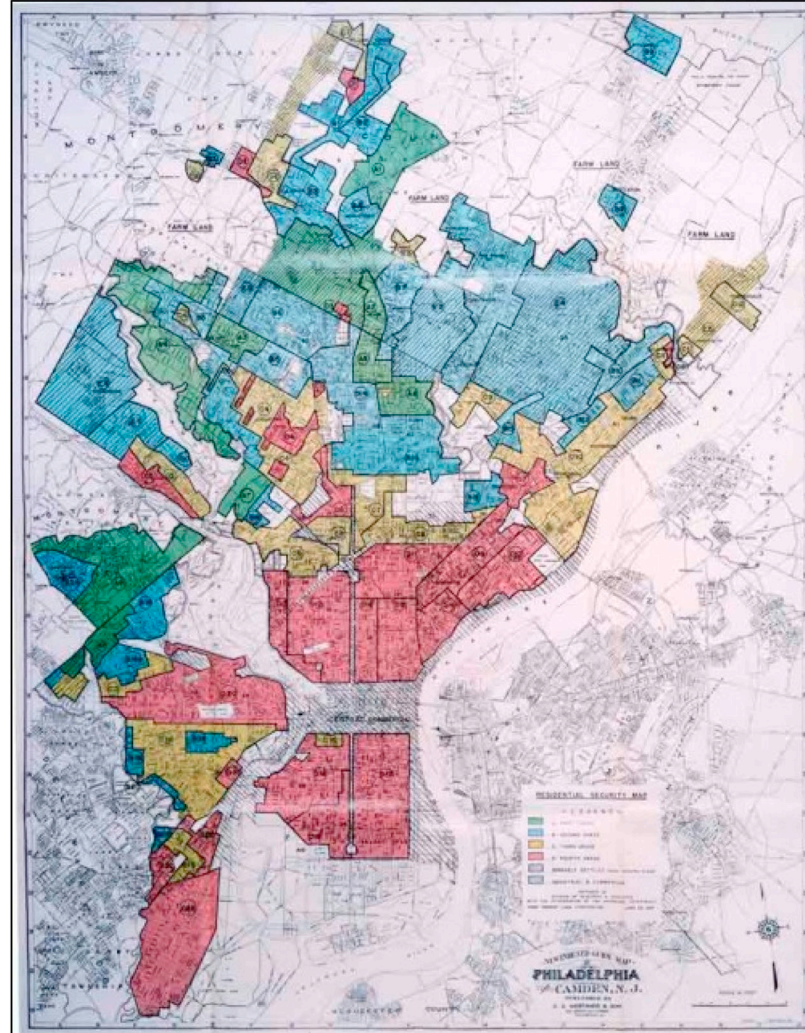
In 2020, Black females this age died from firearm homicides at a rate 6 times greater than for white females

Patients <18 with trauma due to legal intervention vs general NTDB popul.



Gibbs et al, 2021

Home Owners' Lending Corporation security map Philadelphia, 1937



Jacoby et al
Social Sci & Med 2017

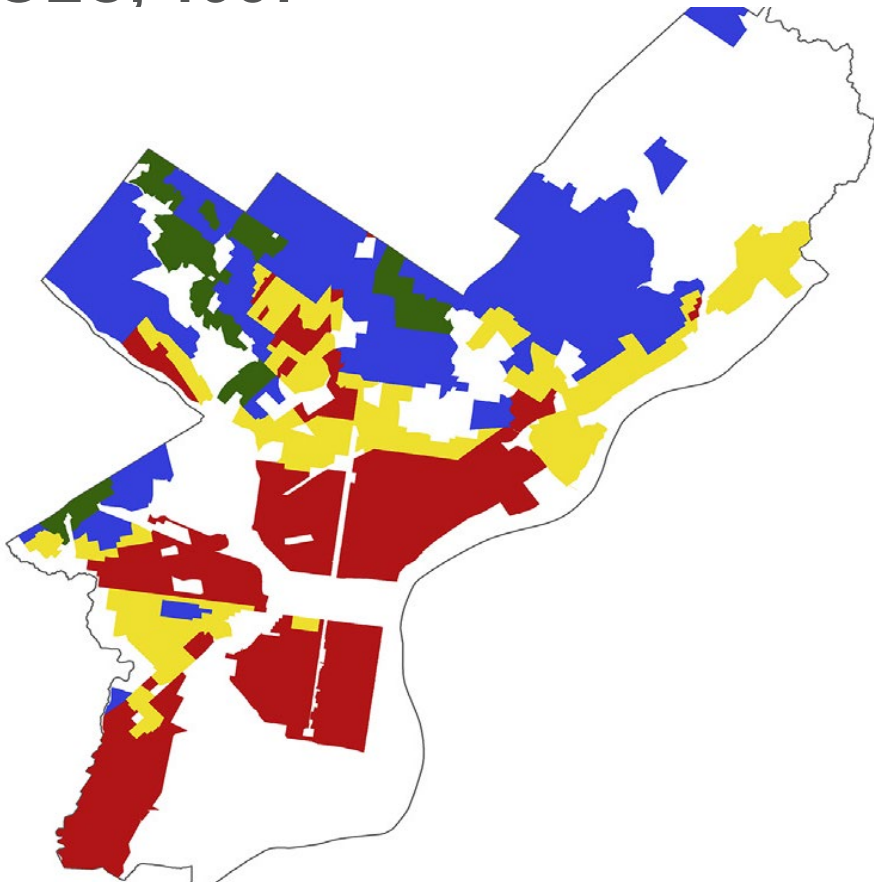


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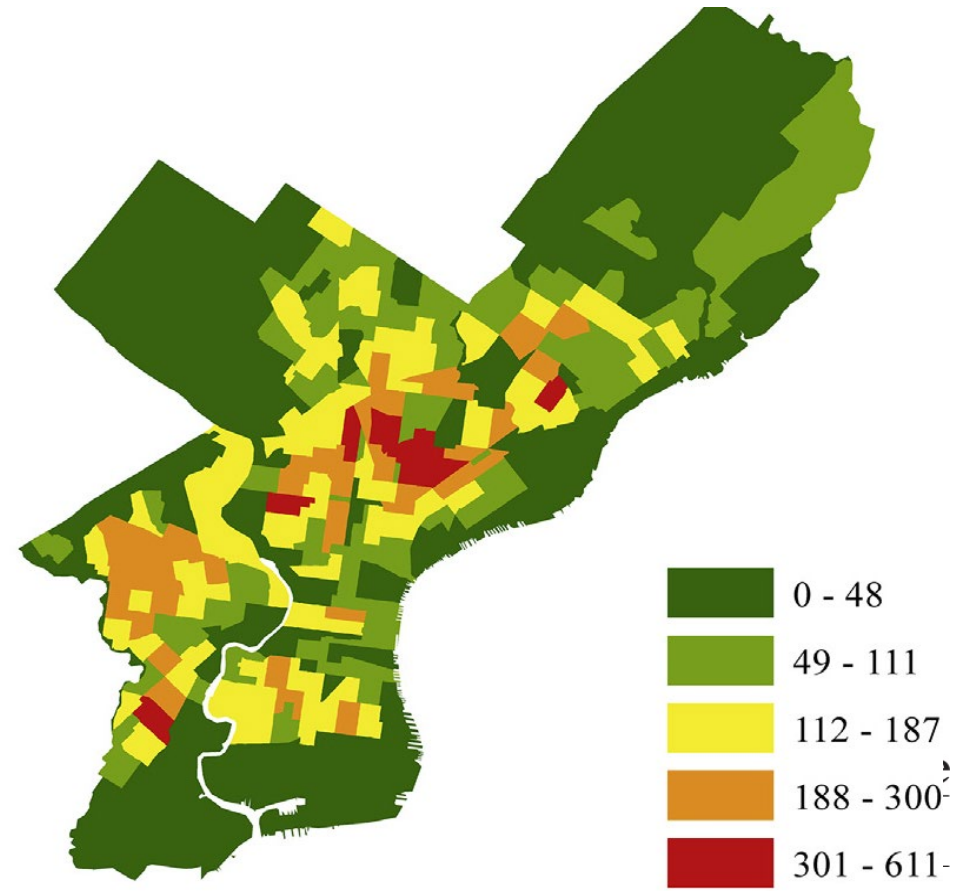
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Long term effects of structural racism on crime in Philadelphia

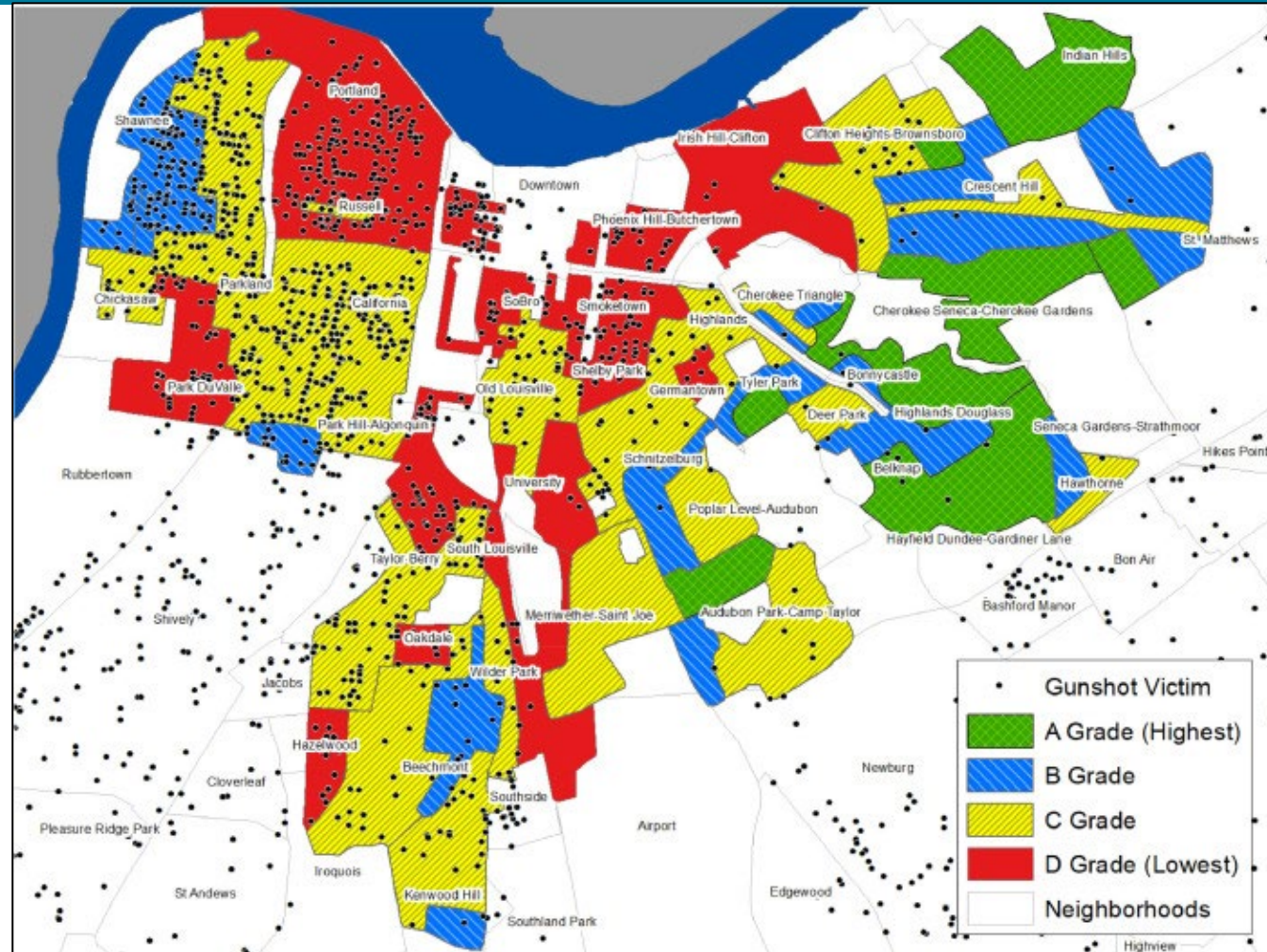
HOLC, 1937



Violent crimes, 2013-14



Effects of 1937 redlining in Louisville on gun violence in 2012-18



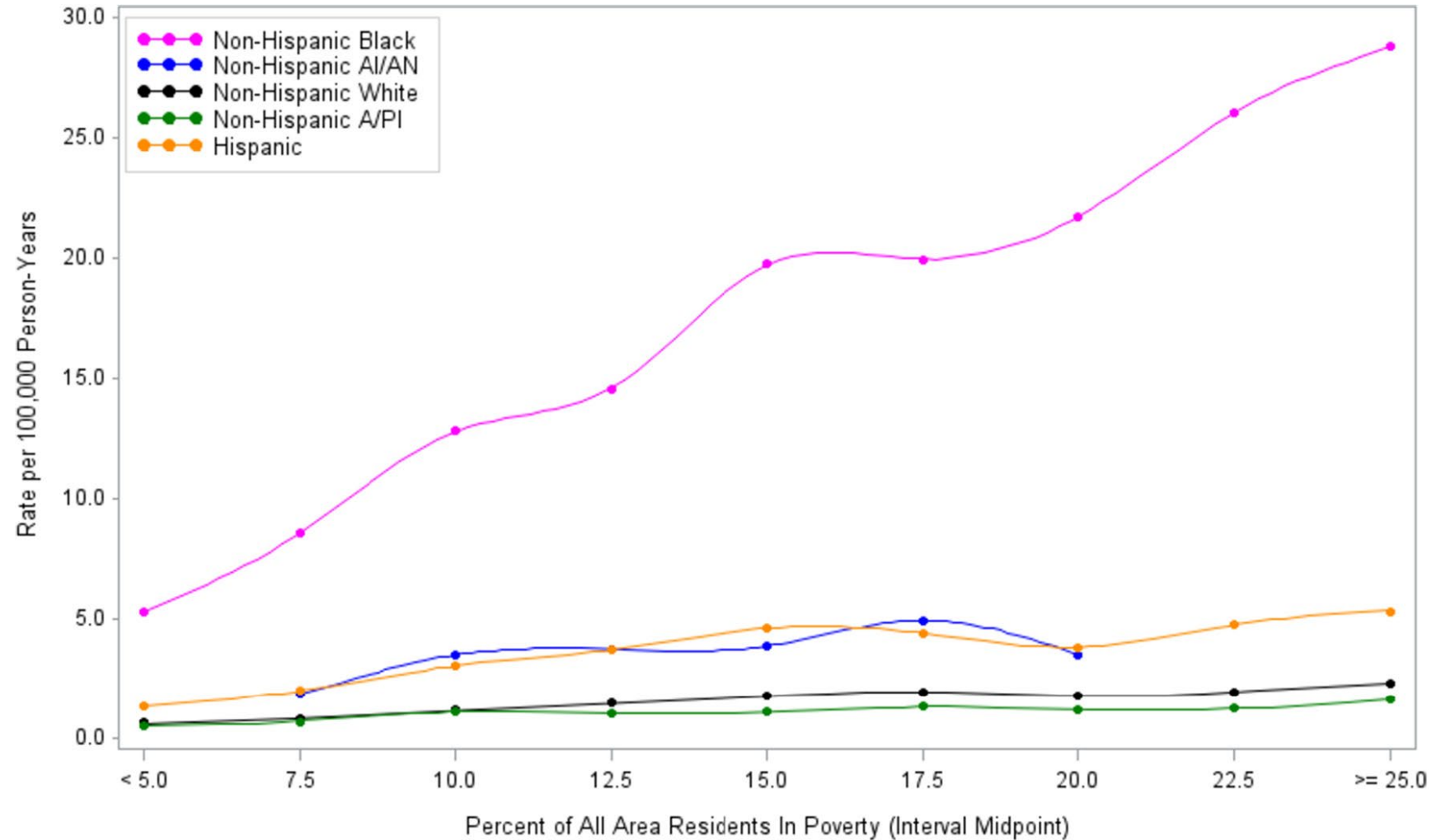
Benns et al, Injury 2020



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Firearm homicide rates – associations with poverty by ethnicity/race – large metro counties 2004-2018



Kegler et al, 2021



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Effect of structural racism in US cities on firearm homicide rates

	Median	Range	Absolute change in homicide rate
Firearm homicide rate per 100,000	5.1	1.1-16.6	
Segregation index	59.8	39.5-79.7	2.8 per 10 point increase
% Black population	14.8	2.8-46.5	3.5 per 10% point increase
Property crime rate	2692	1356-4081	1.9 per 10% point increase
Firearm legislation ranking		A-D	-2.6 per Grade increase

Houghton et al, 2021

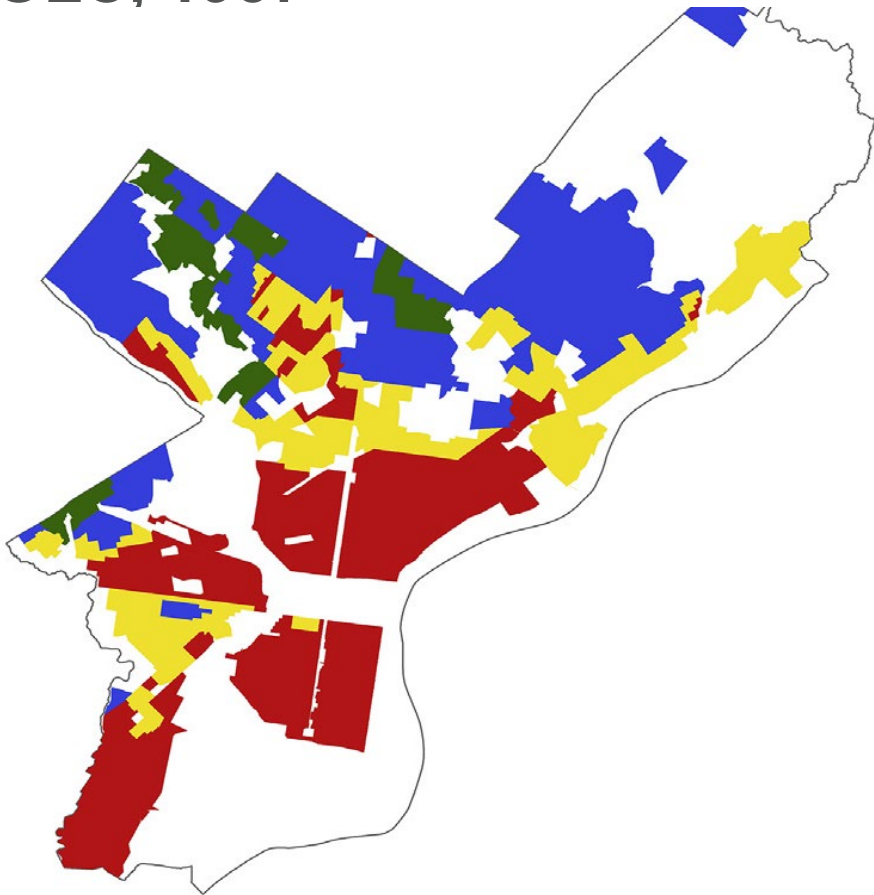


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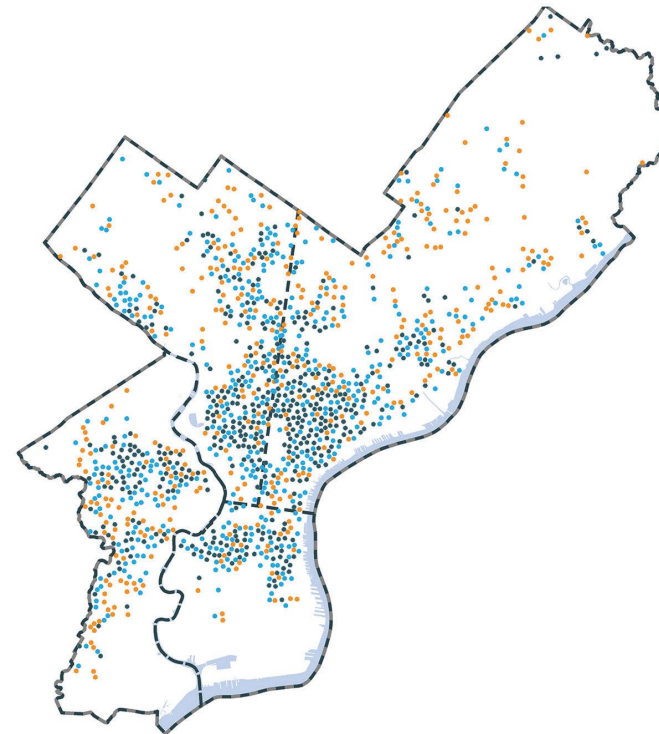
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Another effect of redlining in Philadelphia

HOLC, 1937



Vacant lots, 2018



Restoring blighted vacant urban land

Before



After



Effects of removing blight in the RCT of 541 lots

Police reported crimes	All neighborhoods	In neighborhoods below poverty line
All crimes	-8.7%	-13.3%
Gun assaults	-12.3%	-29.1%
Robbery	-2.8%	-0.1%
Burglary	-10.7%	-21.9%
Illicit drugs	-1.9%	-5.3%



Effect of the intervention on mental health

Reported mental health by area residents	Percent change
Nervous	-39.6%
Hopeless	-45.3%
Restless	-45.1%
Depressed	-68.7%
Everything an effort	-38.4%
Feeling worthless	-52.6%
Poor mental health	-76.7%

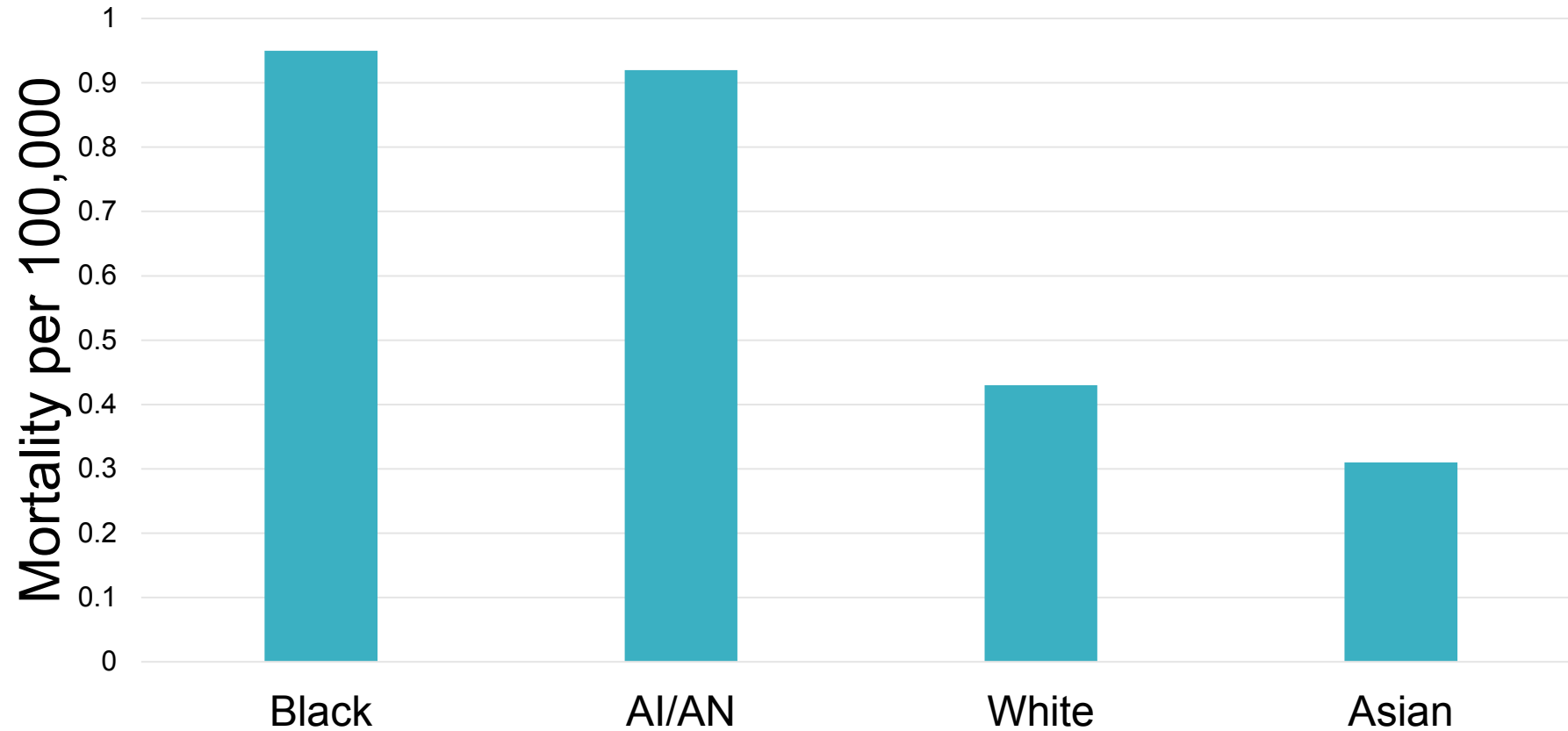
South et al, JNO 2018



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Deaths from pedestrian injuries \leq 19 years of age, US 2000-2020



Pedestrian injuries in Memphis by race of neighborhoods

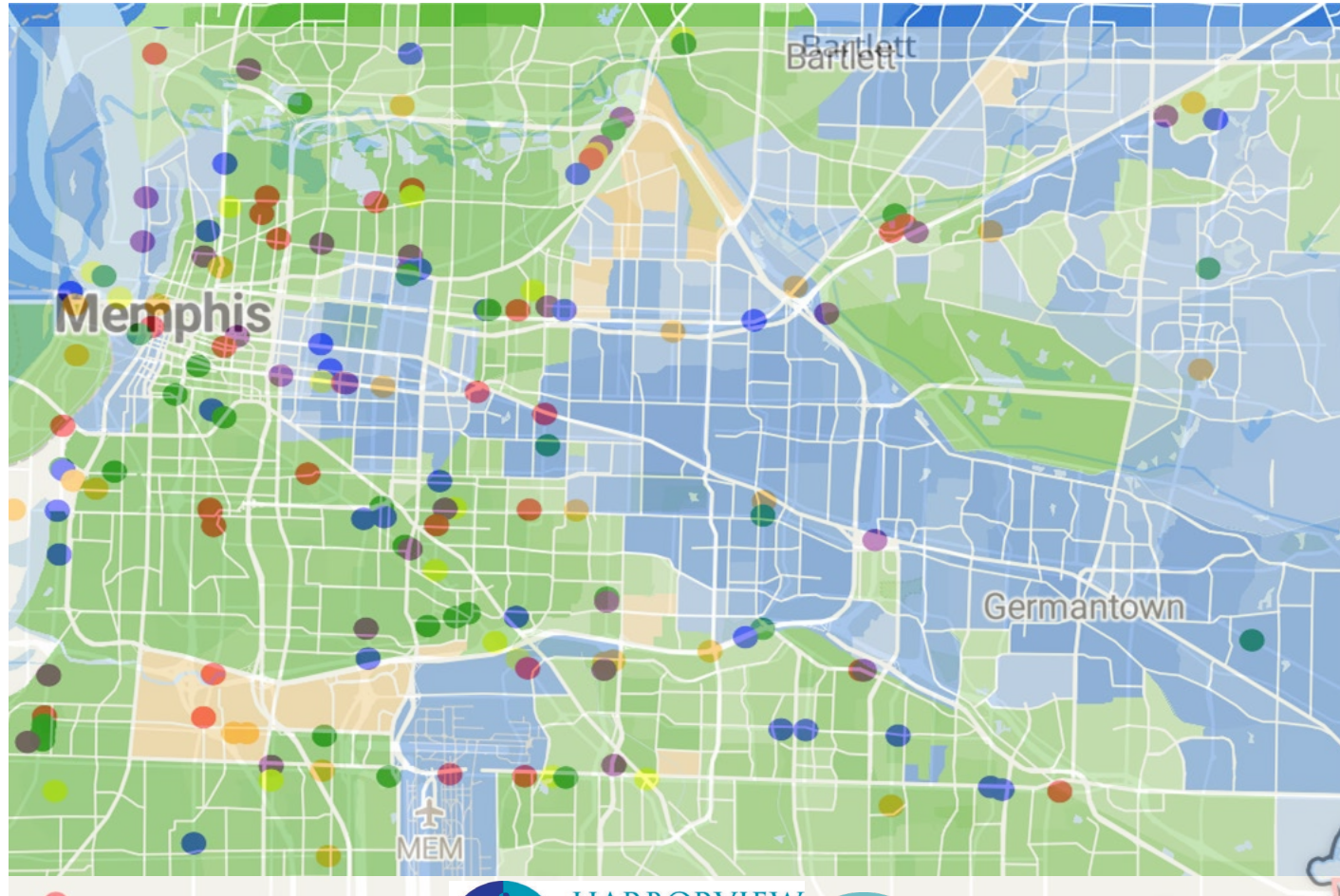
White

Hispanic

Black

Asian

Multiple/Other



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Characteristics of census tracts in Memphis with and without child pedestrian injuries

	Without Injuries	With Injuries
Non-white population	32.2%	62.4%
Median household income	\$15 768	\$11 769
Families below poverty line	20.1%	29.4%
Median housing value	\$44,000	\$28,000
Households with >1 person per room	3.5%	7.6%
Female headed households	27.7%	40.3%

Rivara 1985



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Pedestrian injuries to children in Toronto

	Low income areas	High Income areas	Odds Ratio of PMVC
Child PMVC rates/1000 km of road	1.13	0.21	5.38
Speed bumps per 1000 km of road	0.8	3.1	0.09 (0.01-0.77)
Local roads per 1000 km	568	792	0.61 (0.46-0.82)

Rothman et al, Inj Preven 2020



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A CASE–CONTROL STUDY OF THE EFFECTIVENESS OF BICYCLE SAFETY HELMETS

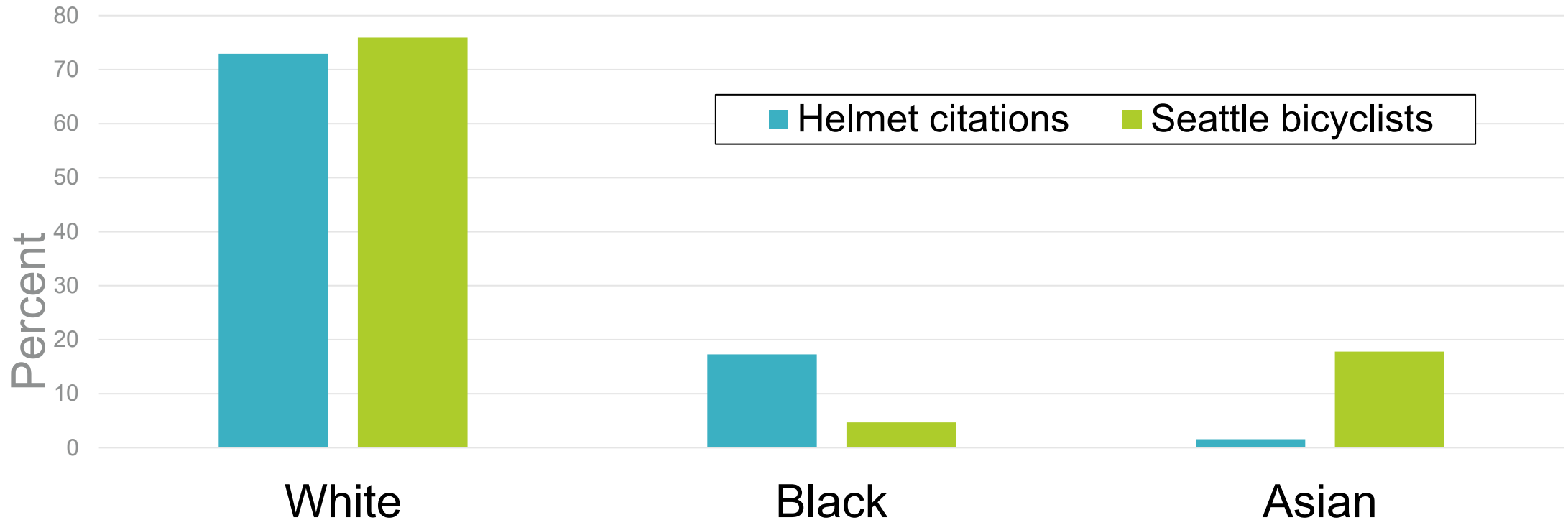
ROBERT S. THOMPSON, M.D., FREDERICK P. RIVARA, M.D., M.P.H., AND DIANE C. THOMPSON, M.S.



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Racial disparities in helmet citations in Seattle 2003-2020



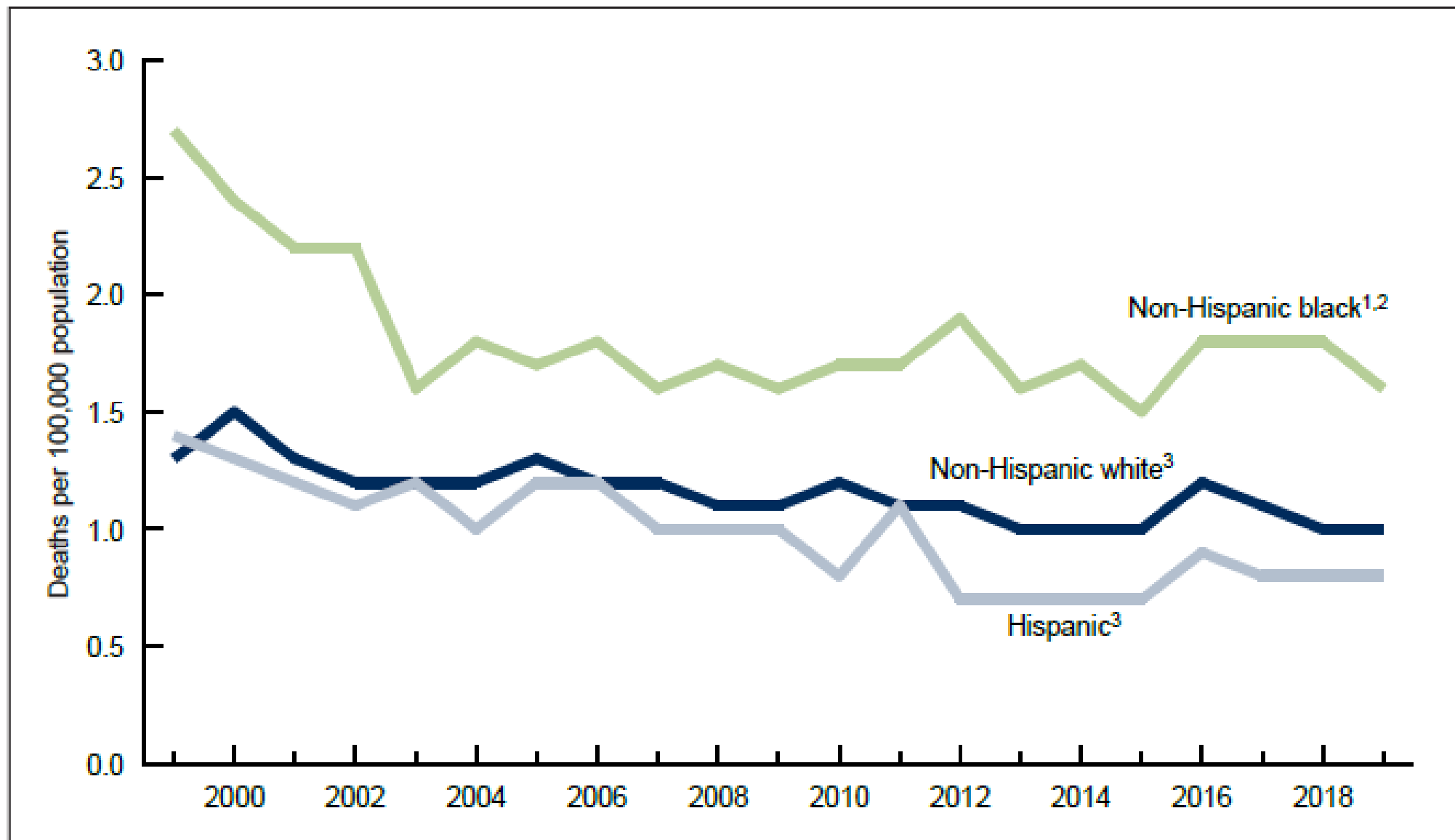
Seattle police have issued helmet citations to Black cyclists at a rate **3.8x higher** than white cyclists
People experiencing homelessness received **at least 43%** of helmet citations since 2017 in Seattle



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Drowning deaths, children 0-17 years, US 1999-2019



Protective effect of swimming lessons for drowning

	Percent with formal swimming lessons		Risk of drowning
	Cases	Controls	aOR (95% CI)
Children 1-4 years	3%	26%	0.12 (0.01-0.97)
Children 5-19	27%	53%	0.36 (0.09-1.51)

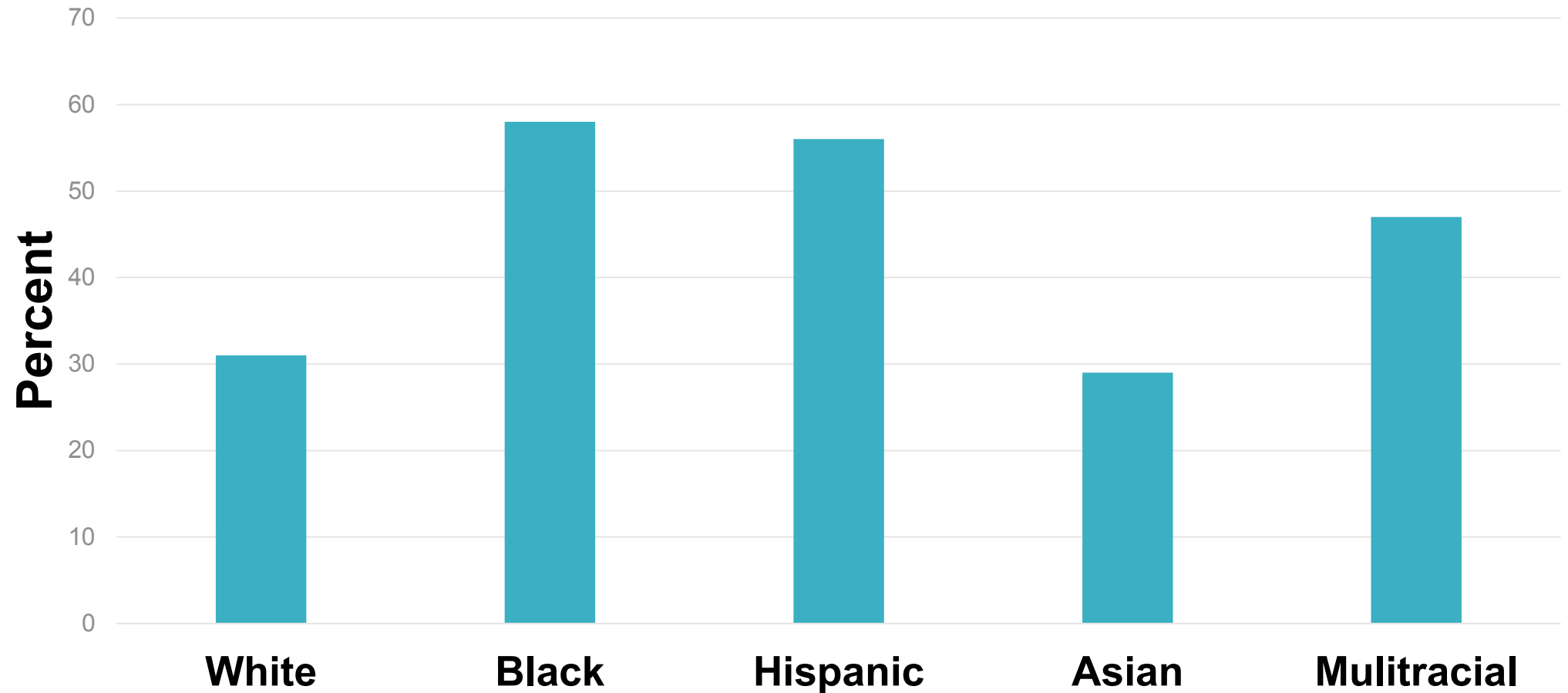
Brenner et al, APAM 2009



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Poor or no ability to swim among 4-17 year olds, US



Irwin et al, Inj Preven 2009



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Swim classes in Bangladesh



93% reduction in
Child drowning deaths

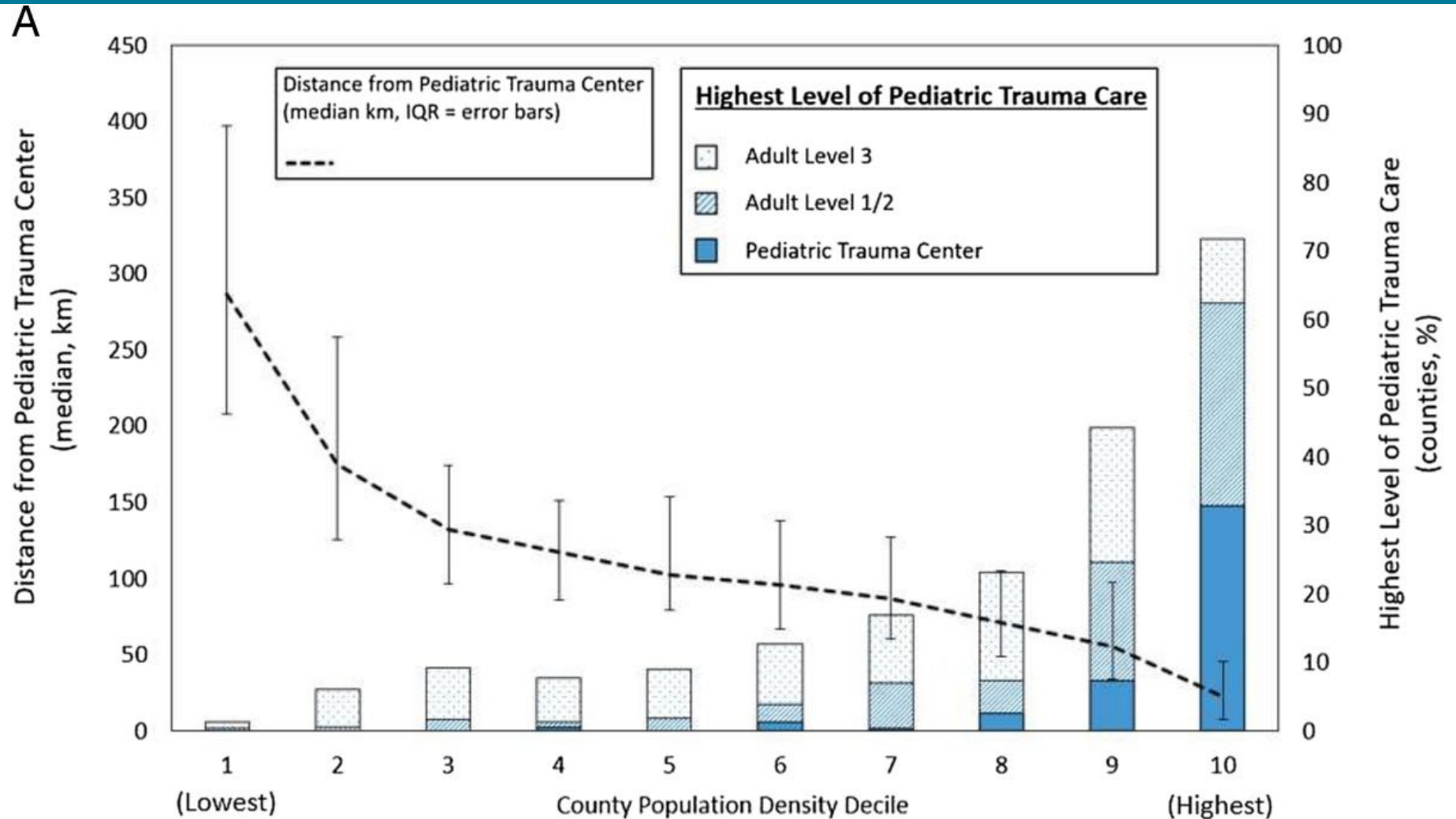
Cost per death
Averted=\$12 596

Racial differences in trauma care

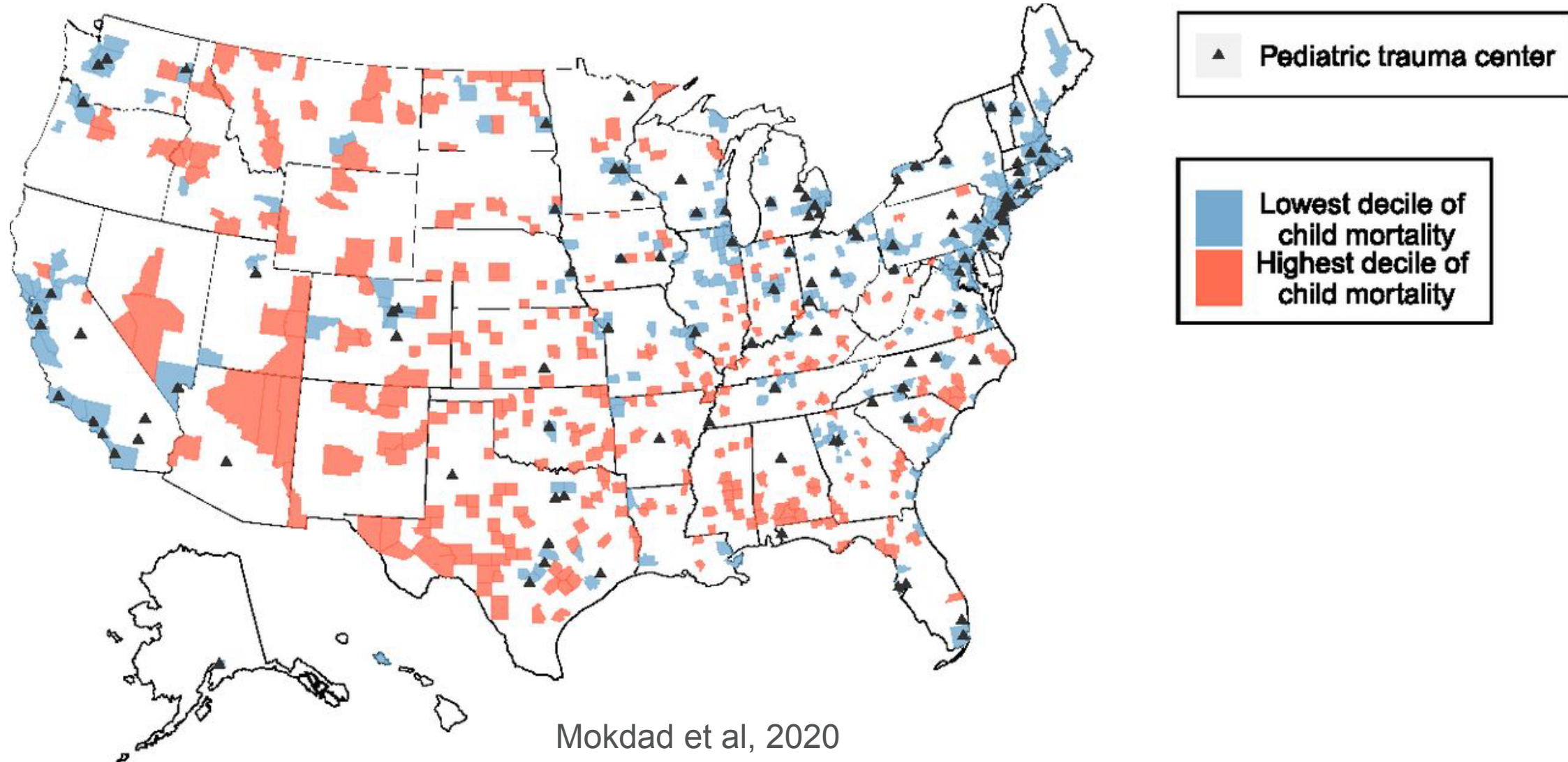
- **Higher case fatality ratio:**
 - Children <17: Odds ratio (OR) for Black children 1.34, Hispanic 1.20 compared with White children
 - Children with severe TBI: OR for White children 0.78 compared to all others
 - Children <1 year: OR for Black children 3.48 compared with White children
 - Children with abdominopelvic trauma: OR for Black children 1.94, for Hispanic children 1.99, other race 2.02 compared with White children.
- **Digit replantation:** Odds ratio for Black children 0.47, for Hispanic children 0.47 compared with White children.



Access to pediatric trauma care in US counties.



Geographic distribution of pediatric trauma centers overlaying counties with the highest and lowest deciles of child injury mortality.



EMS transport time in Chicago before and after opening of new Trauma Center in south side

Characteristic	Transport time, mean (SD), min		
	Opening		P value
	Before	After	
Black			
Total	8.9 (6.4)	7.4 (5.1)	<.001
Low-income zip			
No	8.3 (5.9)	6.9 (4.6)	<.001
Yes	9.2 (6.6)	7.5 (5.3)	<.001
Hispanic			
Total	8.6 (6.1)	8.4 (5.3)	.30
Low-income zip			
No	8.4 (5.4)	8.2 (5.2)	.47
Yes	8.7 (6.8)	8.5 (5.4)	.47
White non-Hispanic			
Total	6.9 (4.7)	7.1 (4.8)	.09
Low-income zip			
No	6.6 (4.5)	6.9 (4.7)	.03
Yes	7.7 (5.3)	7.5 (5.2)	.48

Abbasi et al, 2020

Likelihood of being seen in specialty clinic for concussion compared with being seen for fracture

White	Reference
Asian	0.61
Black	0.59
Native Hawaiian/PI	0.70
Hispanic	0.83
Needing an interpreter vs not	0.28

Copley et al Journal of Racial and Ethnic Health Disparities (2020) 7:571–576



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Athletic trainers at high schools in Washington State

	Proportion with Athletic trainers on staff	
School location		P<.0001
Rural	38%	
Urban	88%	
Subsidized school lunch		P=.0051
<25%	96%	
25-49%	73%	
50-74%	59%	
>=75%	33%	



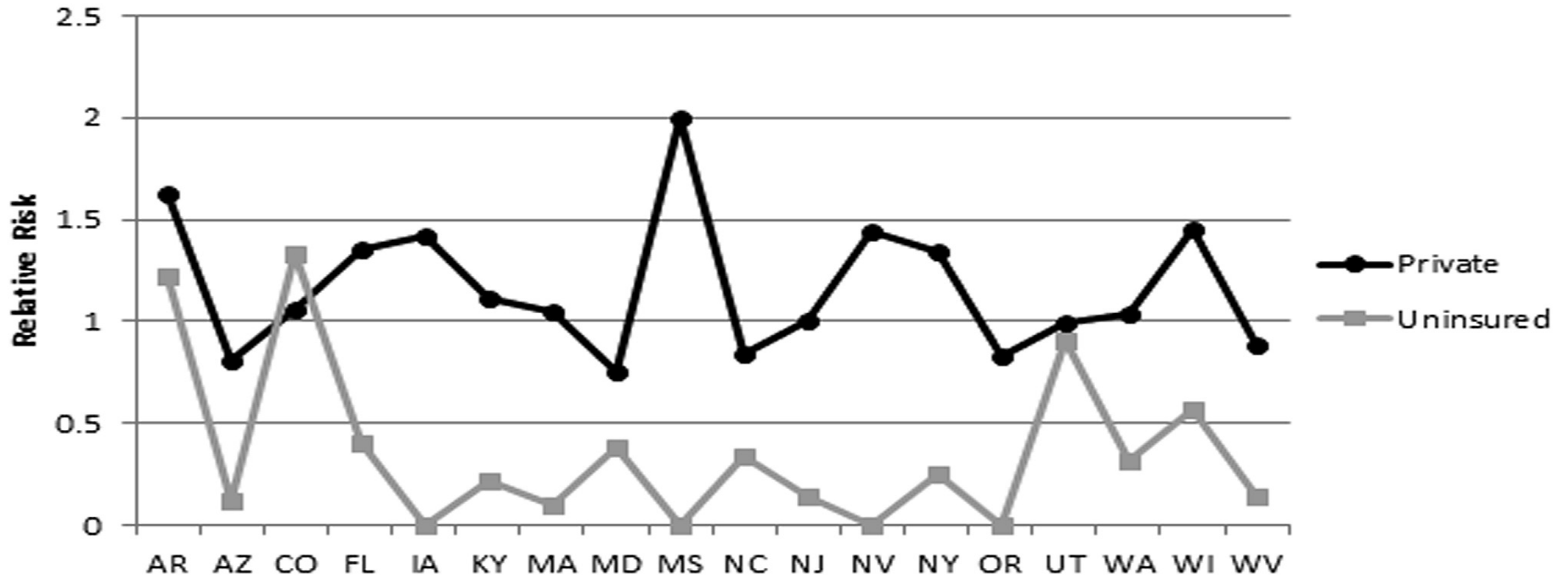
Disparities in time to surgery >60 days for ACL repair in pediatric patients

Factor	Adjusted Odds Ratio (95% CI)
Low vs high Child Opportunity index	2.1 (1.1-4.0)
Public vs private insurance	3.6 (2.2-5.9)
Black vs White race	2.1 (0.9-4.7)
Asian vs White race	3.8 (0.9-12.0)

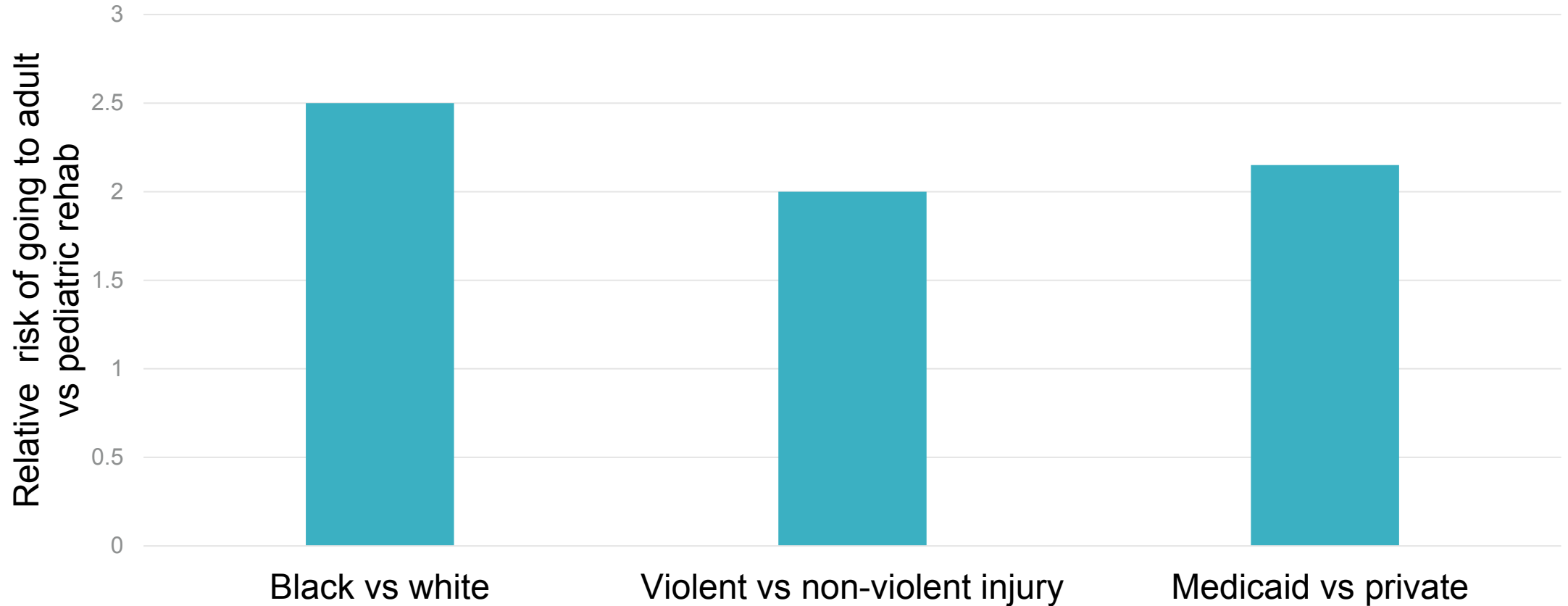


Hospital disposition of children after TBI

Adjusted RR of Rehabilitation Discharge
Insurance Status by State



Likelihood of pediatric patients with TBI or SCI going to adult vs pediatric inpatient rehab



Barnett et al, 2022



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What can we do? What must we do?

- **Commit ourselves to viewing these differences as unacceptable and a national disgrace.**
- **Start with the belief that injuries are preventable and the disparities in healthcare are changeable.**
- **Ensure that all children receive quality education, starting with early childhood education.**
- **Advocate for keeping youth out of jail.**
- **Honestly look at our hospitals and clinical programs and identify the structural racism that is there and work to eliminate it.**



For injuries, what if:

Black and American Indian/Alaskan Native children had the same death rates as White children over the last 20 years:

- 24,400 more Black children would be alive today
- 2,457 more AI/AN children would be alive today

For injuries, what if:

Black and American Indian/Alaskan Native children had the same death rates as White children over the last 20 years:

- 24,400 more Black children would be alive today
- 2,457 more AI/AN children would be alive today

White children had the same death rates as Black children over the last 20 years:

- 108,622 more White children would have died



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