Race/ethnicity, Chronic stressors, and Hypertension

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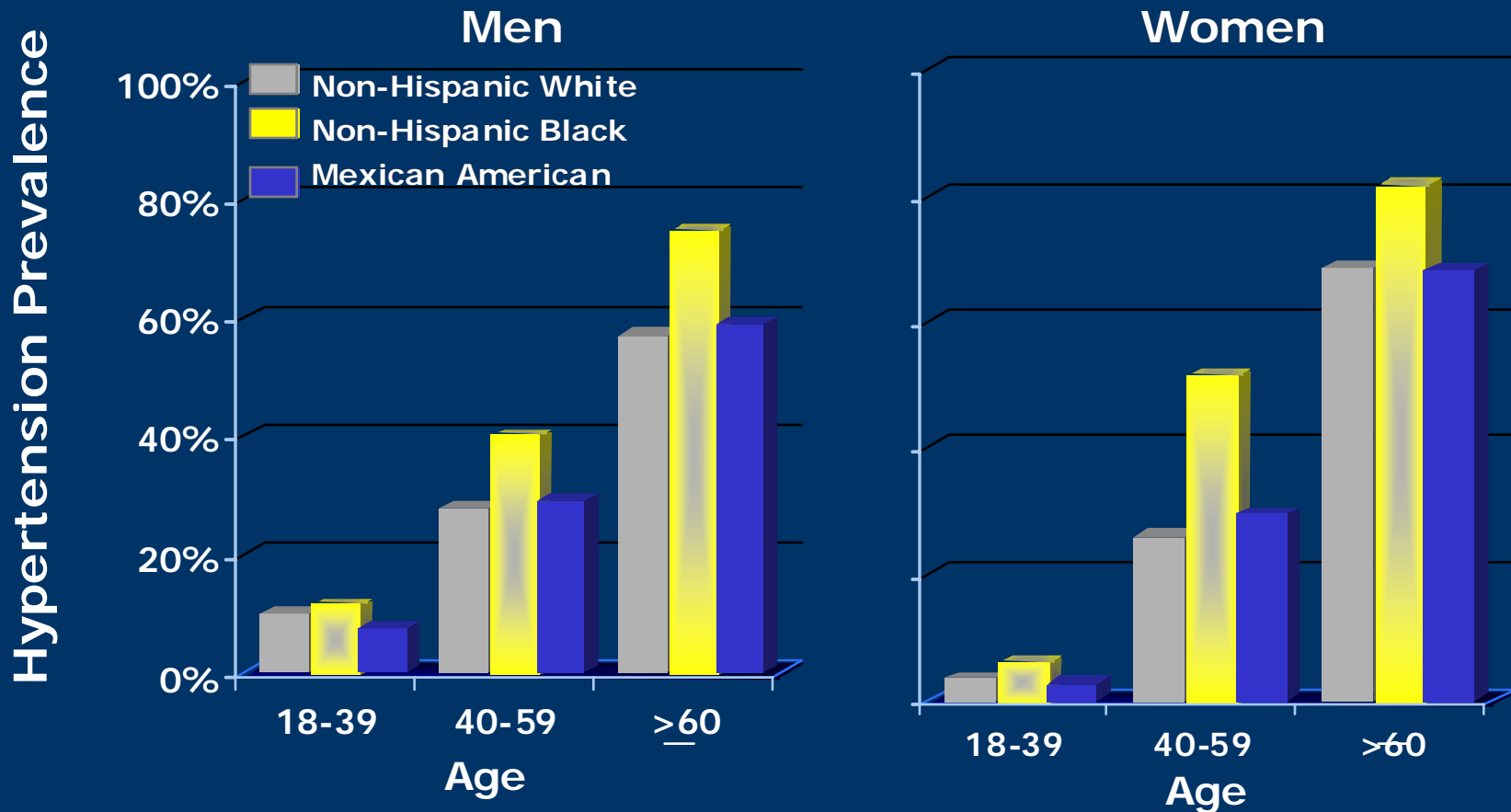
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Hypertension Prevalence by Age, Gender, and Race/ethnicity

Men

Hypertension Prevalence

- Non-Hispanic White
- Non-Hispanic Black
- Mexican American

100%
80%
60%
40%
20%
0%

18-39   40-59   >60

Age

Women

100%
80%
60%
40%
20%
0%

18-39   40-59   >60

Age

Based on NHANES 1999-2000.
Data are weighted to the US population.

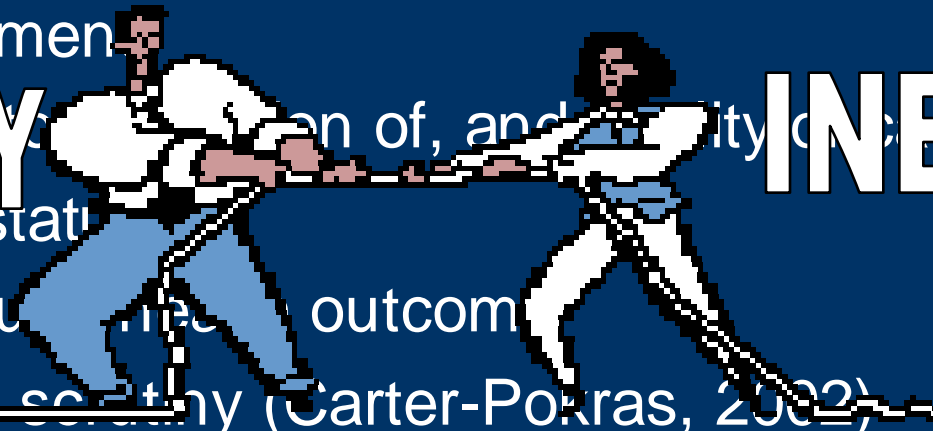Hajjar I, Kotchen TA. JAMA. 2003;290:199-206.

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Health disparities

a chain of events signified by a difference in:

    1) environment

    2) access to, utilization of, and quality of care

    3) health status

    4) a particular health outcome

that deserves scrutiny (Carter-Pokras, 2002)

INEQUALITY   **INEQUITY**

Race/ethnicity	→	Chronic stress	→	HTN

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Research aims

1. To examine associations between neighborhood-level stressors and HTN

2. To examine the contribution of chronic stressors (individual and neighborhood) to race/ethnic differences in HTN

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Study Population

- **<u>The Multi-Ethnic Study of Atherosclerosis (MESA)</u>**
  - A 10 year longitudinal study to identify risk factors for sub-clinical atherosclerosis.

  - 45-84 years at baseline; diverse race/ethnic backgrounds

  - Baltimore, MD; Forsyth County NC; New York, NY
    - Provided consent to use residential history
    - Complete information on all study measures (n=2550)

- **<u>The Neighborhoods Study</u>**
  - Ancillary study to MESA (N=5,988)

  - Reside in same neighborhoods (tracts) as MESA study participants

  - Representative "informants"

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Study variables

Hypertension

- Systolic/diastolic blood pressure > 140/90mmHG
- Use of anti-hypertensive medication

Race/ethnicity

- Hispanic, African American, White
    - Over 90% of whites and African Americans were US born
    - 9% of Hispanics US born (70% Puerto Rican and Dominican)

Sociodemographic variables

- Age, gender, education, income, study site, time lived in neighborhood

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Individual-level chronic stressors

Chronic burden (5 items)	Ongoing problems (yes/no)
Perceived discrimination (6 items)	Experiences of lifetime discrimination (yes/no)
Every day hassles (9 items)	Minor incidents of unfair treatment 5 point likert scale
Job demands (5 items)	Work conditions: workload 5 point likert scale
Decision latitude (9 items)	Work conditions: skills/decision authority 5 point likert scale

Neighborhood-level measures (informant sample)

- **Telephone survey**
  - 1 mile surrounding home

  - 7 neighborhood dimensions defined *apriori*
    - Aesthetic quality; Walking environment; Availability of healthy foods
    - Safety; Violent crime
    - Social cohesion; Activities w/neighbors

  - Responses range from:
    - 1-5 (agreement)
    - 1-4 (frequency)

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Mujahid (2007) American Journal of Epidemiology
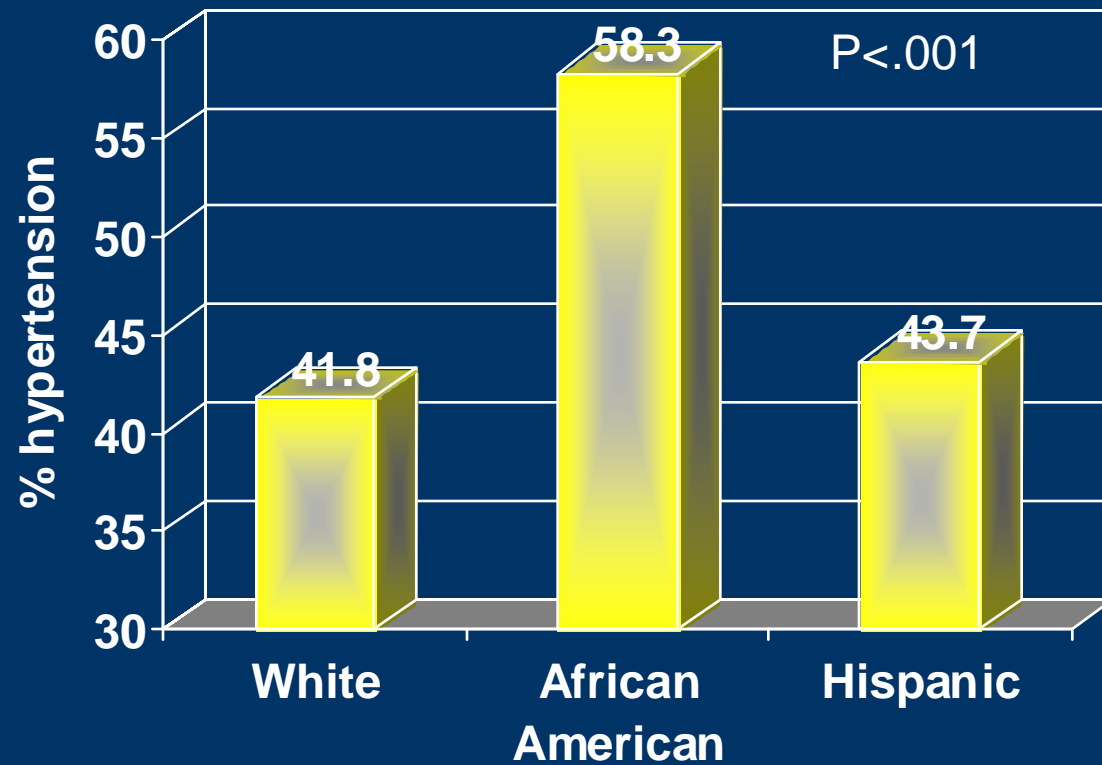
Neighborhood stressors

- Buildings well maintained

- Trash/litter

- Noise

- People get along

- People can be trusted

- Safe from crime/violence

- Safe to walk

- Violent crime
  – Gang fight
  – Robbery/mugging
  – Sexual assault/rape
  – Fight w/weapon

Items aggregated using unconditional empirical bayes estimation methods

Neighborhood stress measure linked to MESA study participants

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Prevalence of HTN
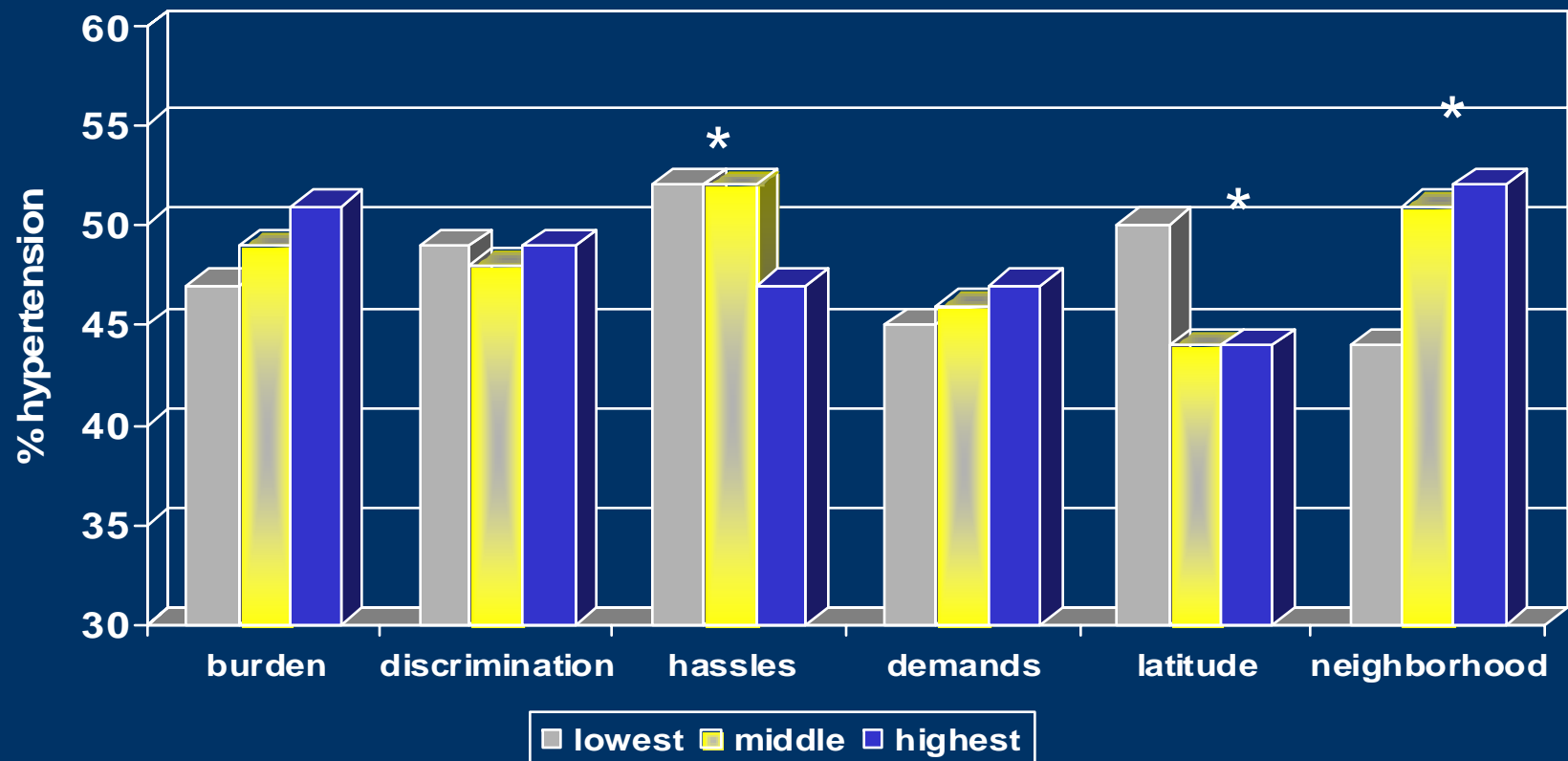
HTN is patterned by chronic stressors

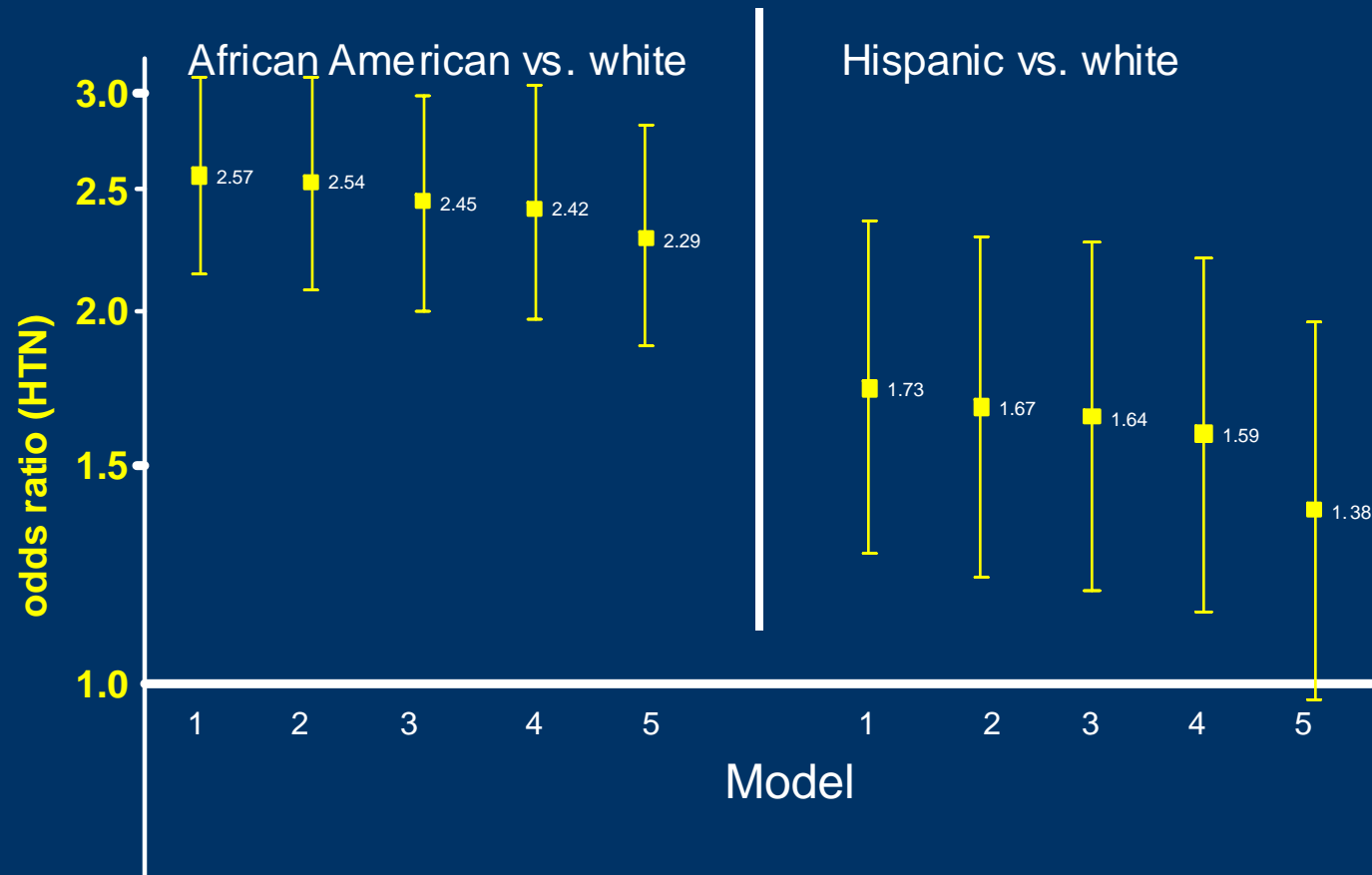Figure adjusts for age, gender   * Statistical significance (p<.05)   11

Chronic stressors are patterned by race/ethnicity

	White (n=1081)	African American (n=1087)	Hispanic (n=412)
Chronic burden			
0	42.9	48.8	50.4
1	33.6	25.2	26.8
2+	23.5	26.0	22.8
Perceived Discrimination			
0	64.1	42.1	62.9
1	22.7	26.8	21.3
2+	13.2	31.1	15.7
Everyday hassles			
Low	41.5	27.7	53.2
Medium	33.3	29.2	24.2
High	25.2	43.1	22.6
Job Demand			
Low	14.4	17.0	16.2
Medium	18.5	13.8	11.1
High	17.6	19.1	15.7
Job Decision Latitude			
Low	10.5	17.0	21.0
Medium	15.4	18.0	14.6
High	24.8	14.4	6.7
Neighborhood stressors			
Low	51.8	26.8	0.9
Medium	35.7	37.1	18.7
High	12.5	36.1	80.4

All p-values<0.001

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Chronic stressors contribute to race/ethnic differences in HTN

Model 1: site, age, gender; Model 2: + individual chronic stressors; Model 3: + neighborhood chronic stressors; Model 4: + all chronic stressors; Model 5: + individual SEP and other neighborhoods measures

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Limitations

- ## Usual suspects
  - cross-sectional; observational study
  - generalizability
  - relevant spatial scale

- ## Measurement of chronic stressors
  - Multidimensional, multi-level, over the life-course
  - Every day hassles

- ## Residual confounding

- ## Limited overlap in exposures by race/ethnicity

Conclusion

1. Neighborhood chronic stressors was positively associated with HTN, independent of individual and neighborhood-level covariates

2. Racial and ethnic disparities in hypertension were reduced upon adjustment for chronic stressors