Mindy C Hébert-DeRouen, PhD, MPH
Department of Epidemiology and Biostatistics
Helen Diller Family Comprehensive Cancer Center
University of California, San Francisco

Addressing Cancer Health Disparities in California:
Social Determinants & Multilevel Research

California Dialogue on Cancer | April 26, 2019

Social determinants and Multilevel research

- Relevance of social determinants of health
  - Multilevel disparities research
  - Role of neighborhoods
- Examples of multilevel disparities research
  - Measuring neighborhoods—Neighborhood archetypes
  - Intersectionality of social determinants of health
- Advancing multilevel disparities research
  - Data collection—Sexual gender and minority status
  - Methods—Small populations
  - Recommendations

" SDOH are the conditions in which people are born, grow, work, live, and age, and the wider set of forces and systems shaping the conditions of daily life. "

Word Health Organization

Relevance of social determinants of health

Social Determinants of Health (SDOH)

Kaiser Family Foundation

Beyond Health Care: The Role of Social Determinants in Promoting Health and Health Equity, Artiga and Hinton 2018

Economic Stability	Neighborhood and Physical Environment	Education	Food	Community and Social Context	Health Care System
Employment	Housing	Literacy	Hunger	Social integration	Health coverage
Income	Transportation	Language	Access to healthy options	Support systems	Provider availability
Expenses	Safety	Early childhood education		Community engagement	Provider linguistic and cultural competency
Debt	Parks	Vocational training		Discrimination	Quality of care
Medical bills	Playgrounds	Higher education			
Support	Walkability				

Health Outcomes

Mortality, Morbidity, Life Expectancy, Health Care Expenditures, Health Status, Functional Limitations

http://www.kff.org/disparities-policy/issue-brief/beyond-health-care-the-role-of-social-determinants-in-promoting-health-and-health-equity/

Social Determinants of Health (SDOH)

Meta-analysis of ~50 studies found that social factors accounted for **1/3 of total deaths** in US

S. Galeo. AJPH 2010

"Combining clinical, basic, and social science research to examine the relationships between policy, the social and physical environment, and disparities in health outcomes."

Warnecke et al. AJPH

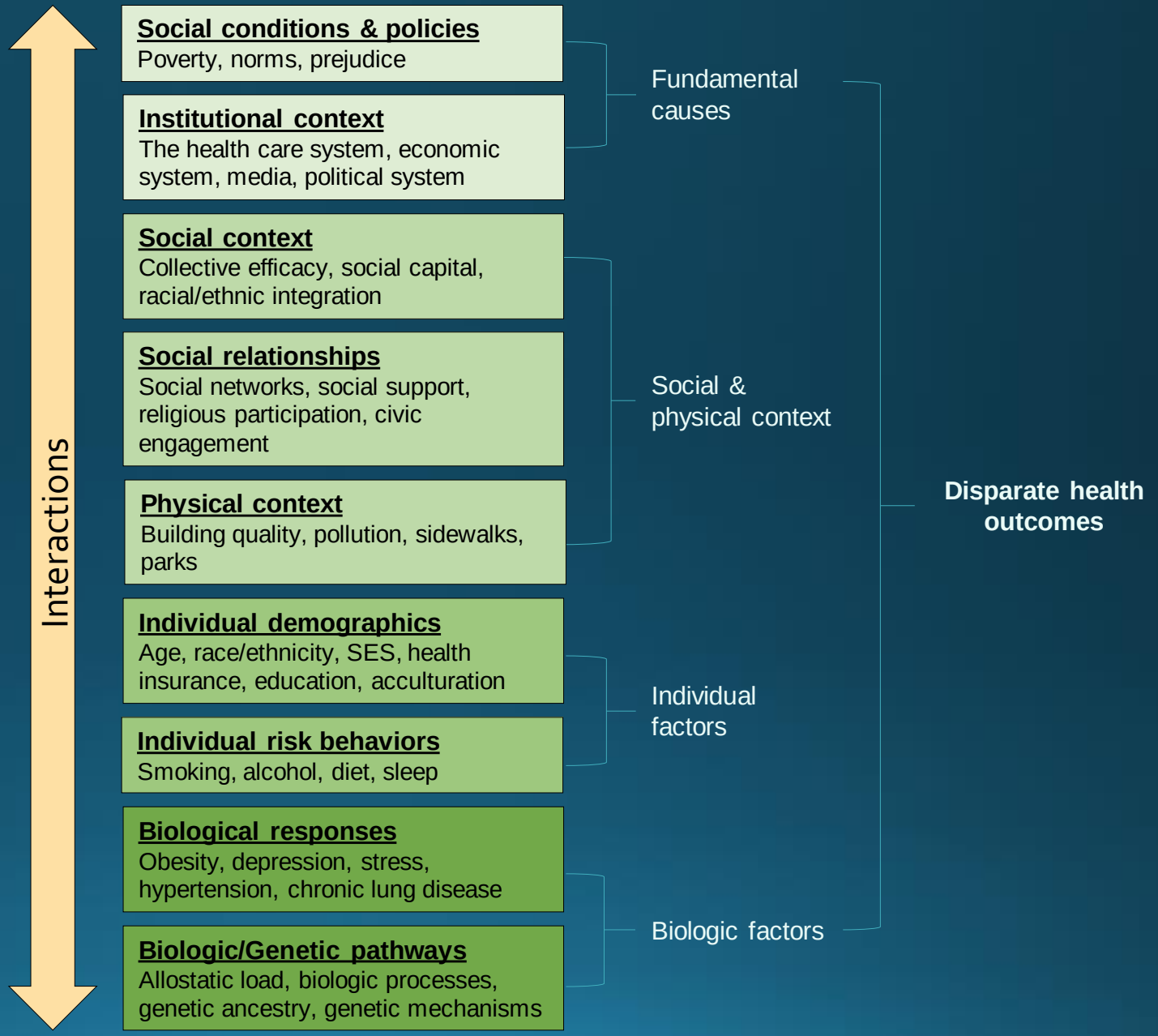
Centers for Population Health and Health Disparities, NIH

Multilevel disparities research

Cells-to-Society model

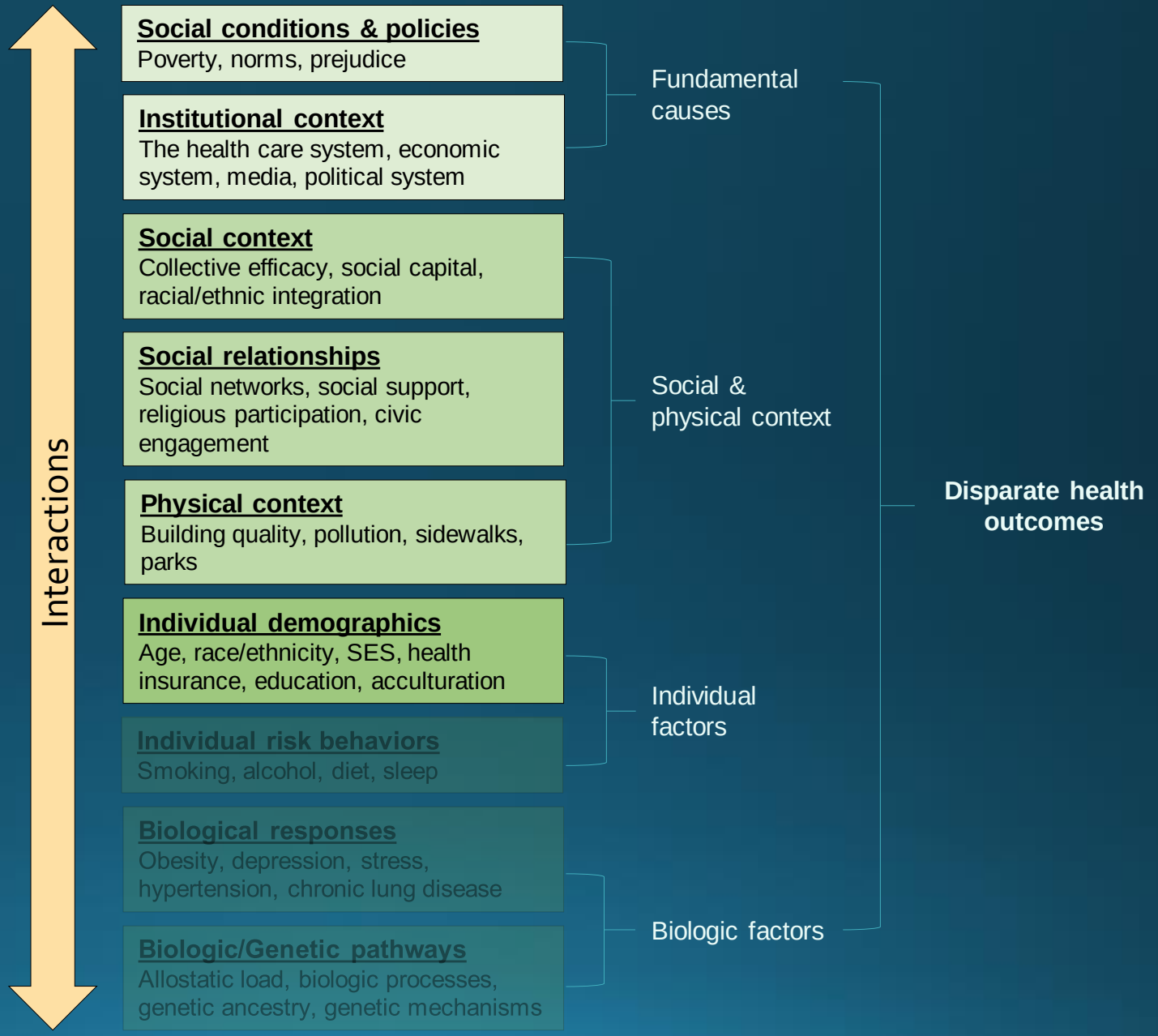
A framework for multilevel research

Centers for Population Health and Health Disparities, NIH



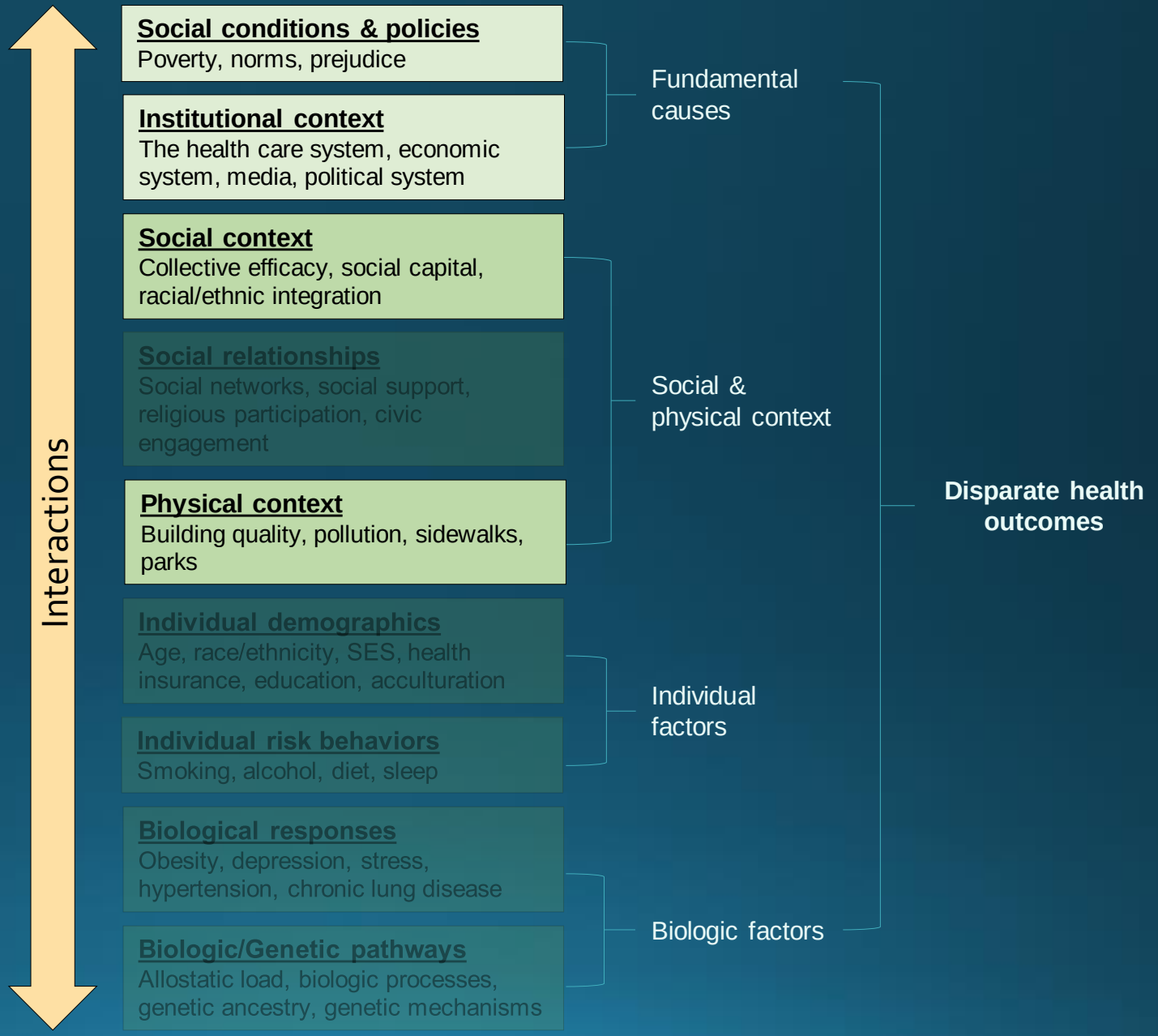
Warnecke et al. AJPH 2008

Social determinants



Warnecke et al. AJPH 2008

Neighborhood context



Warnecke et al. AJPH 2008

Neighborhood context in cancer control

When we think about health, we usually think about health care and access to health care and the quality of care. But what research clearly shows is that health is embedded in the larger conditions in which we live and work….

Sometimes, we naively think of improving health by simply changing behaviors. But the choices of individuals are often limited by the environments in which they live."

-David Williams

"Unnatural Causes. Place Matters." (PBS documentary, 2008)

Neighborhood context: Social environment

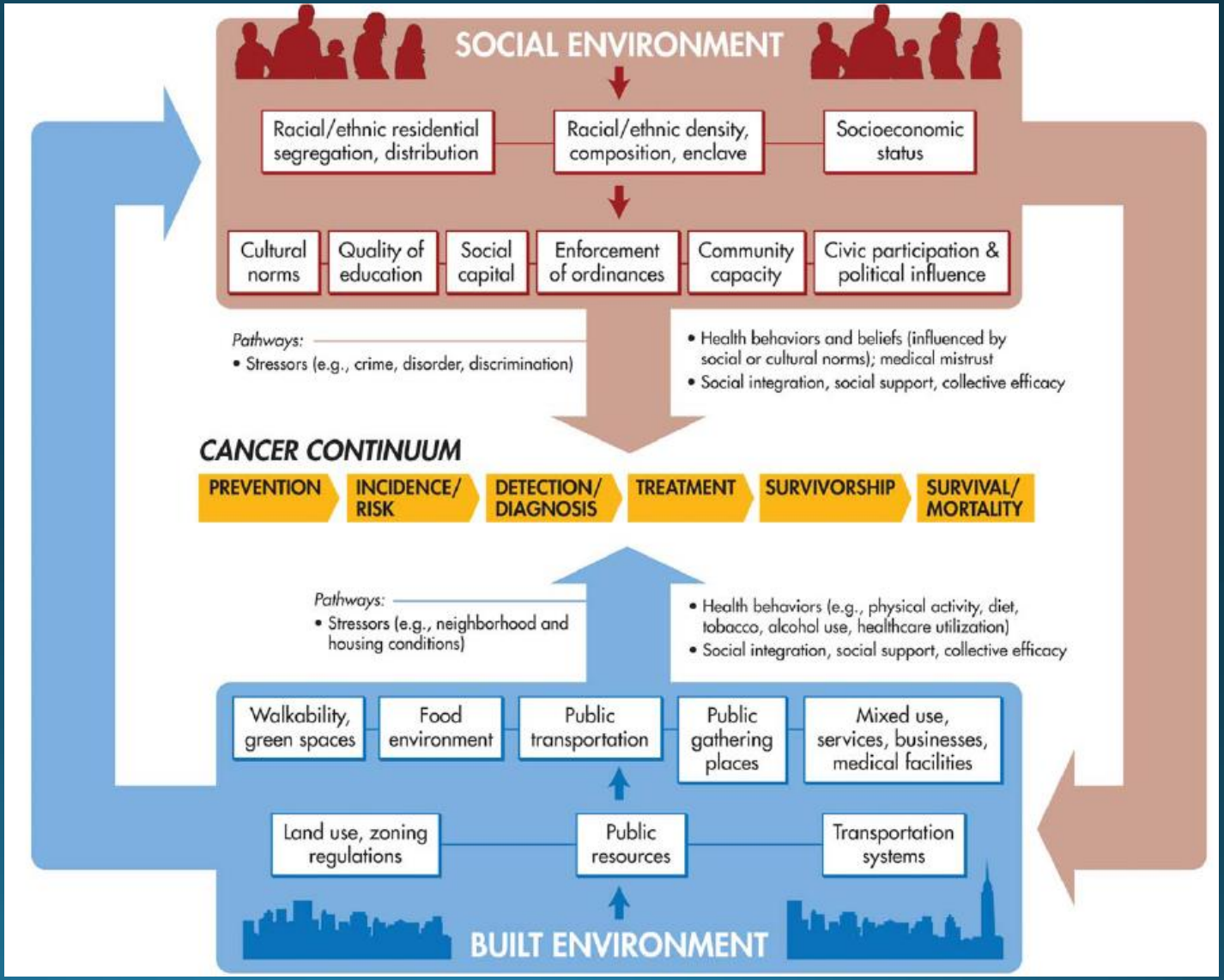


Neighborhood context: Built environment



Neighborhood context in cancer control

Gomez, DeRouen, et al. The impact of neighborhood social and built environment across the cancer continuum: current research, methodologic considerations, and future directions. Cancer 2015.



Measuring neighborhoods: Implications for cancer control

Identify neighborhood characteristics that work together to influence health—positively or negatively.

Design scalable, cost-effective interventions that address modifiable contextual factors with changes to policies or healthcare systems.

Examples of multilevel disparities research

Measuring neighborhoods

Measuring neighborhoods

DeRouen et al. *Cancer Epidemiology* 2018.

Specific social and built environment attributes associated with prostate cancer survival

Limited understanding of interactions among attributes

A single classification system can draw upon multiple attributes of social and built environments

Measuring neighborhoods: Archetypes

Neighborhoods archetypes for understanding disparities in prostate cancer mortality

39 neighborhood attributes measuring multiple neighborhood dimensions for CA Census tracts

- California Neighborhoods Data System
- Gomez et al. Cancer Causes Control. 2011.

9-class archetype model

- Census tracts
- 2000

Funding: NCI

Shariff Marco et al. Unpublished results

DeRouen et al. Unpublished results

Measuring neighborhoods: Archetypes

Neighborhoods archetypes for understanding disparities in prostate cancer mortality

	Urbanicity	SES	Demographics	Age and households	Land use	Commuting and streets	Food
Upper middle-class suburb		High	White/API	Midlife Fewer female HH	Greenspace Recreation	Low connectivity	
High status		High	White	Older	Greenspace Recreation		Healthy
New urban/ Pedestrian	Downtown		Diverse (non-Hispanic)	Young, Singles	Mixed use	High traffic	
Mixed SES class suburb				Families	Some mixed use Recreation	Commuting Low connectivity	Healthy
Suburban pioneer	City	Middle	Diverse	Families, Owning	Mixed use		
Rural/ Micropolitan	Rural	Low	White	Older Single HH		Low traffic	
City pioneer	City	Lower-middle	Diverse	Older Single, female HH Rentals	Mixed use	High traffic	
Hispanic small towns		Lower-middle	Hispanic		Some mixed use Less greenspace	Less commuting Low traffic	Unhealthy
Inner city	Urban	Low	Black, Hispanic	Rentals, Vacants			Unhealthy

Measuring neighborhoods: Archetypes

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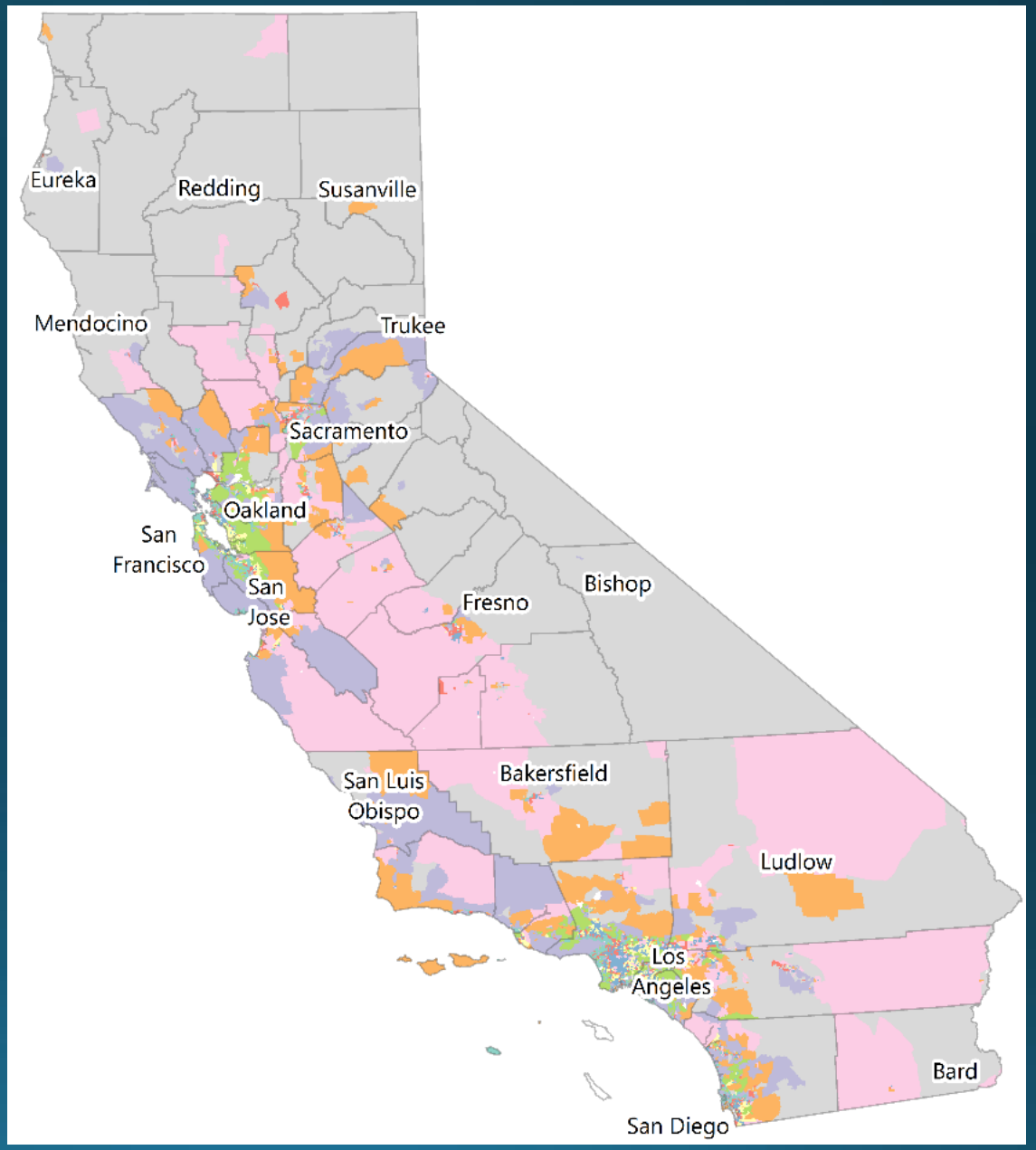
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Neighborhood Archetypes

- Inner City
- City Pioneer
- New Urban/Pedestrian
- Suburban Pioneer
- Mixed SES Class Suburb
- Upper Middle-Class Suburb
- High Status
- Hispanic Small Towns
- Rural/Micropolitan

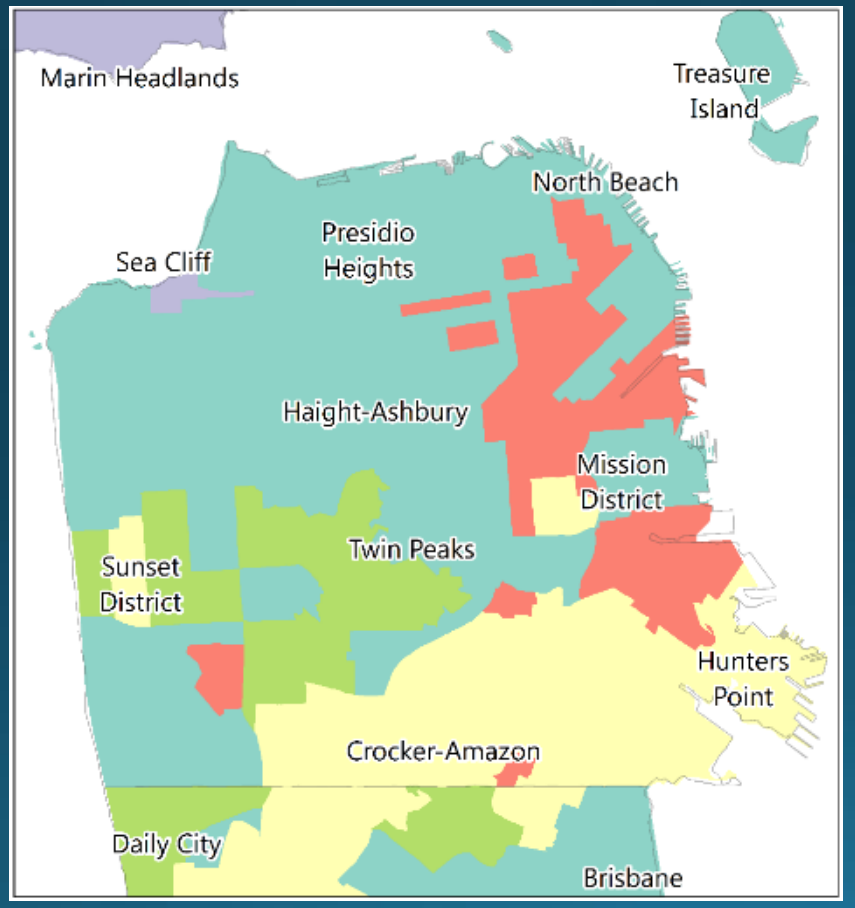


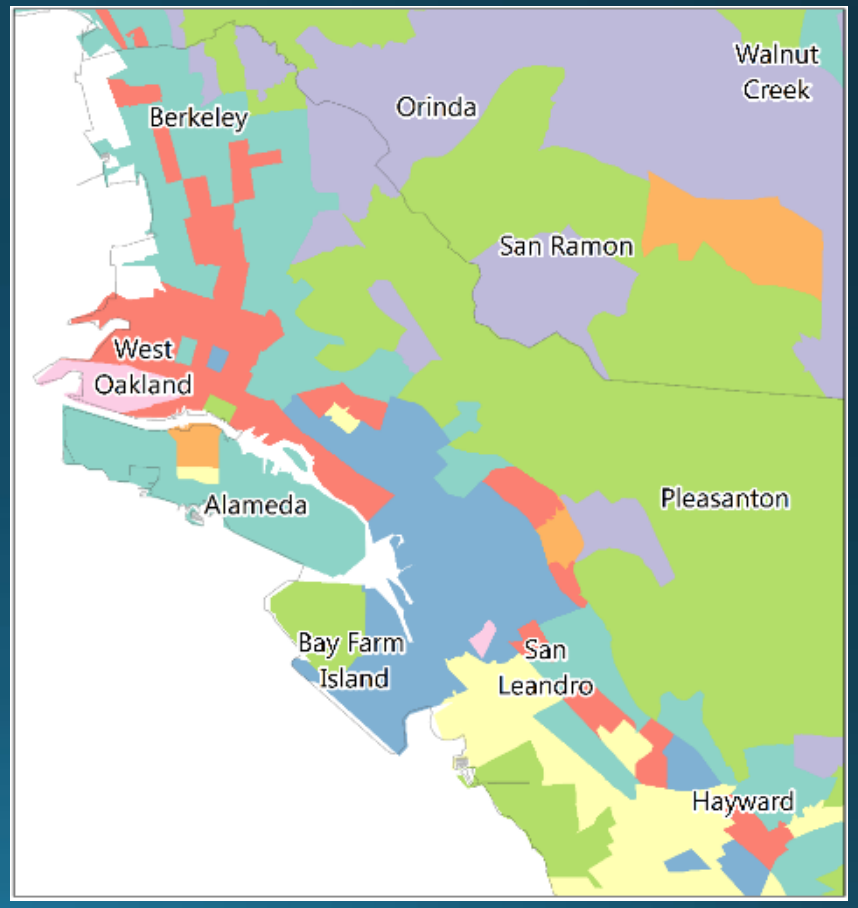
Shariff Marco et al. Unpublished results

DeRouen et al. Unpublished results

Neighborhood Archetypes

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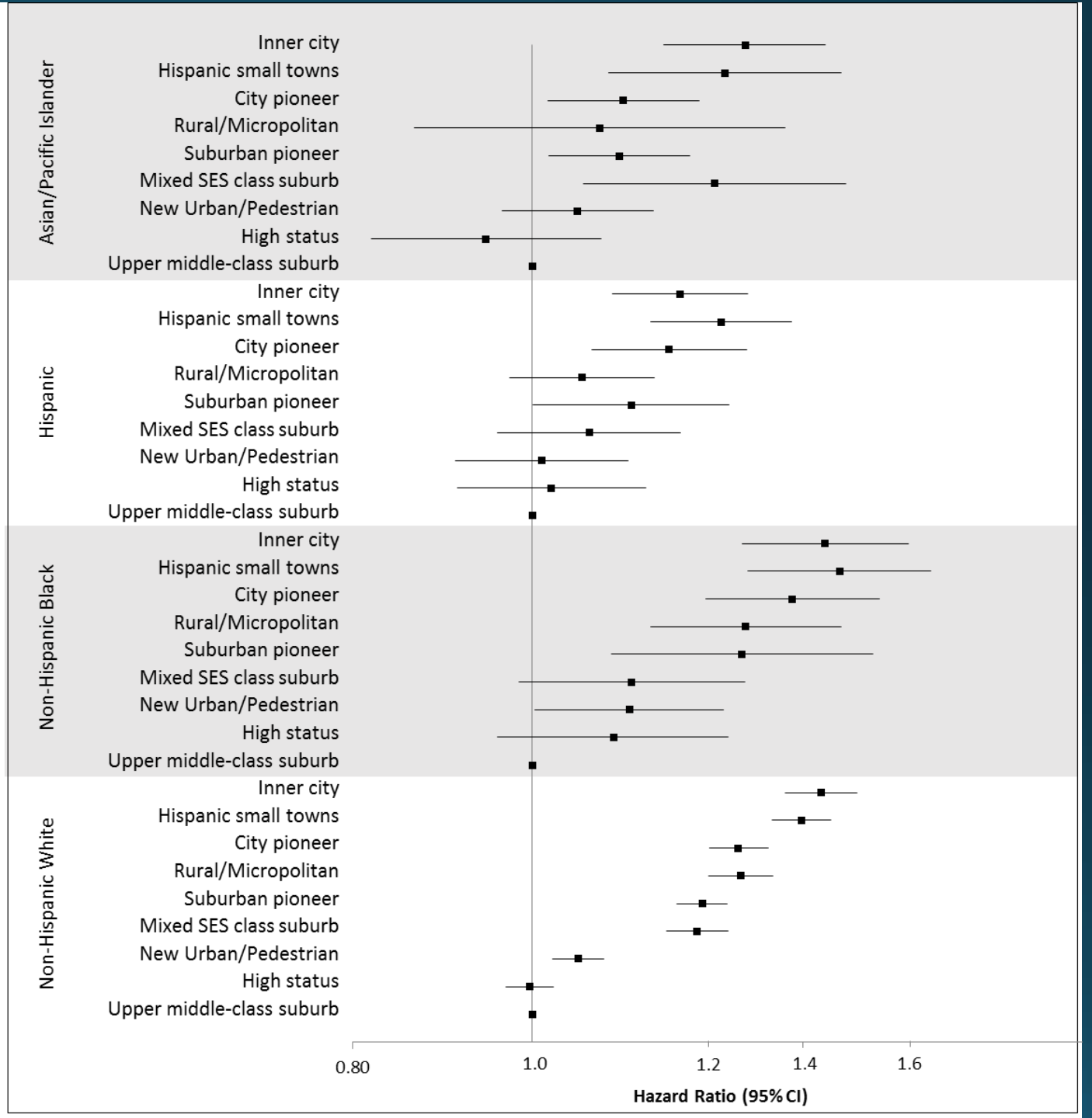


Shariff Marco et al. Unpublished results
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Archetypes & prostate cancer survival

Prostate cancer cases
- CCR, 1996-2005

Survival analyses adjusted for
- Age
- Marital status
- Year of diagnosis
- Stage
- Grade
- Tumor factors
- Treatment
- Clustering at census tract

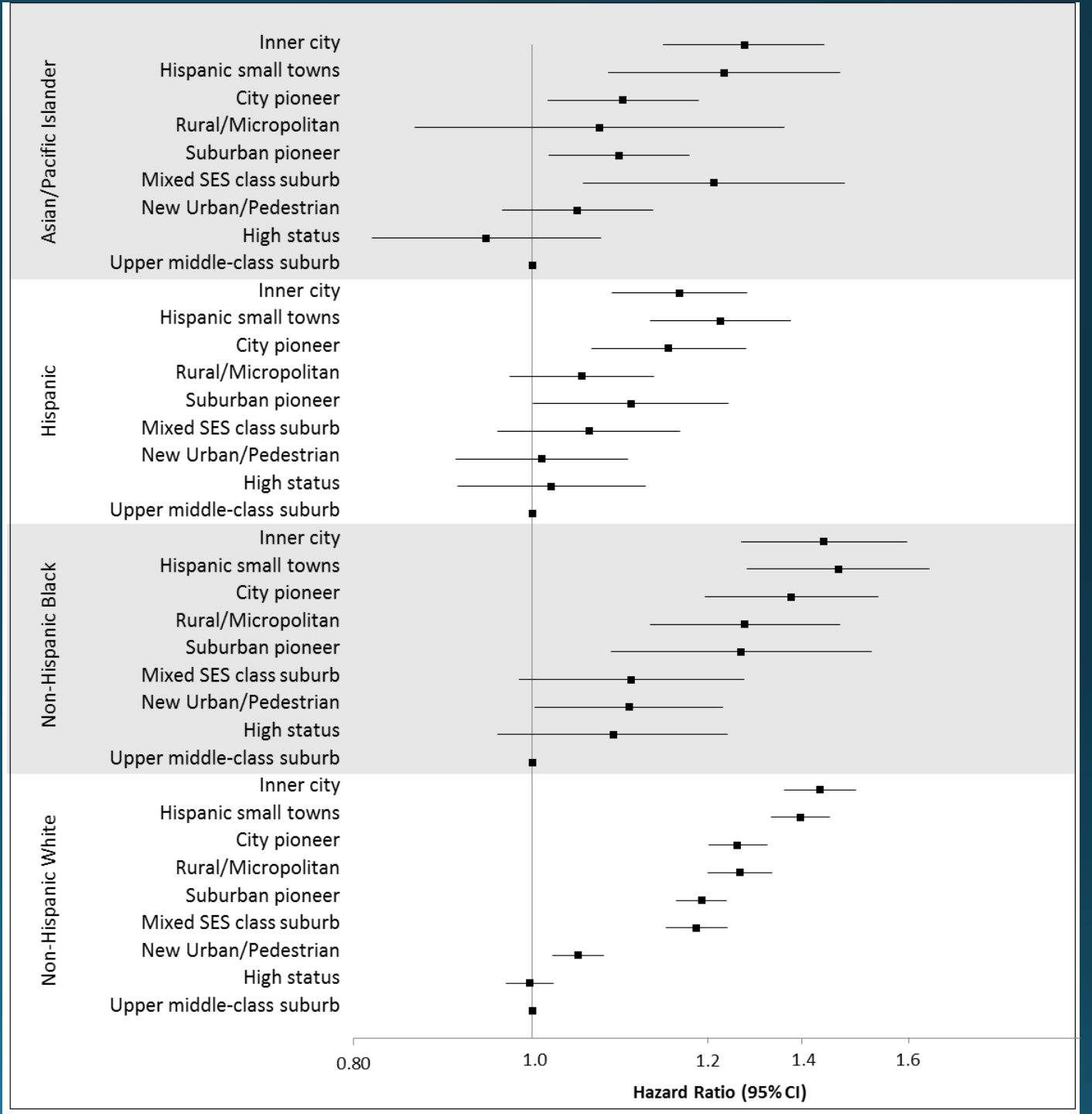


Archetypes & prostate cancer survival

Survival differs by archetype

Patterns vary across race/ethnicity

Indicates differences in mortality over multiple neighborhood dimensions



Measuring neighborhoods: Future directions

- Life-course perspective
- Integration of secondary and self-report data
- Neighborhood environments at work
- Develop necessary analytical approaches and tools
  - Causal inference
  - Difference-in-difference

Examples of multilevel disparities research

Intersectionality of social determinants of health

Intersectionality: Social determinants of health

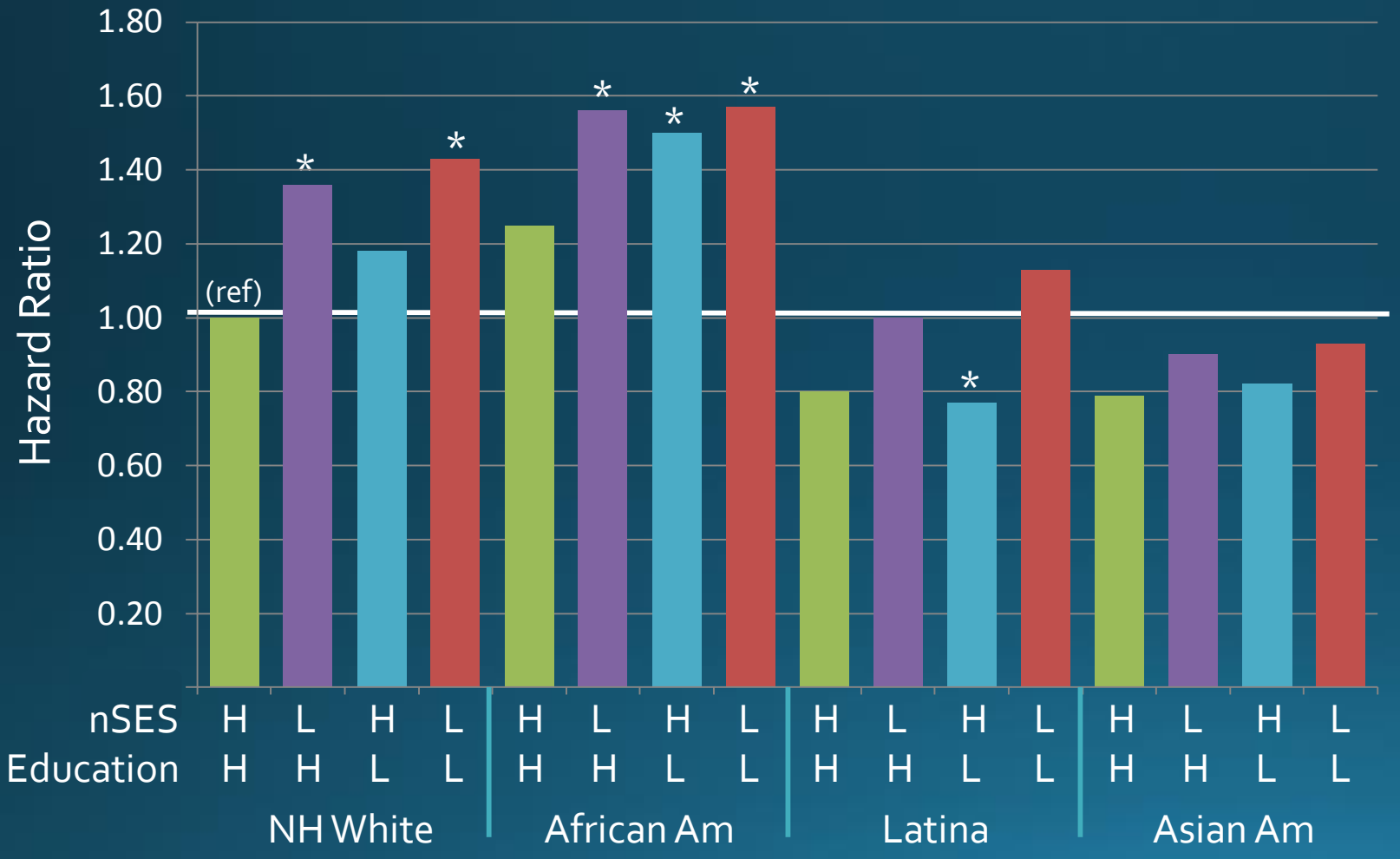
- Multiple axes of social injustice
  - Originating from Black feminist literature
- Multiple social statuses shape life experiences and restrict upward mobility
- Social statuses upheld by institutional policies

Health inequities research: interactions between dimensions of social status

Green, Evans, Subramanian. Social Sci Med 2017
Williams et al. Health Services Research 2012
Crenshaw, K. In Critical race theory. 1993

Intersectionality: Breast cancer survival

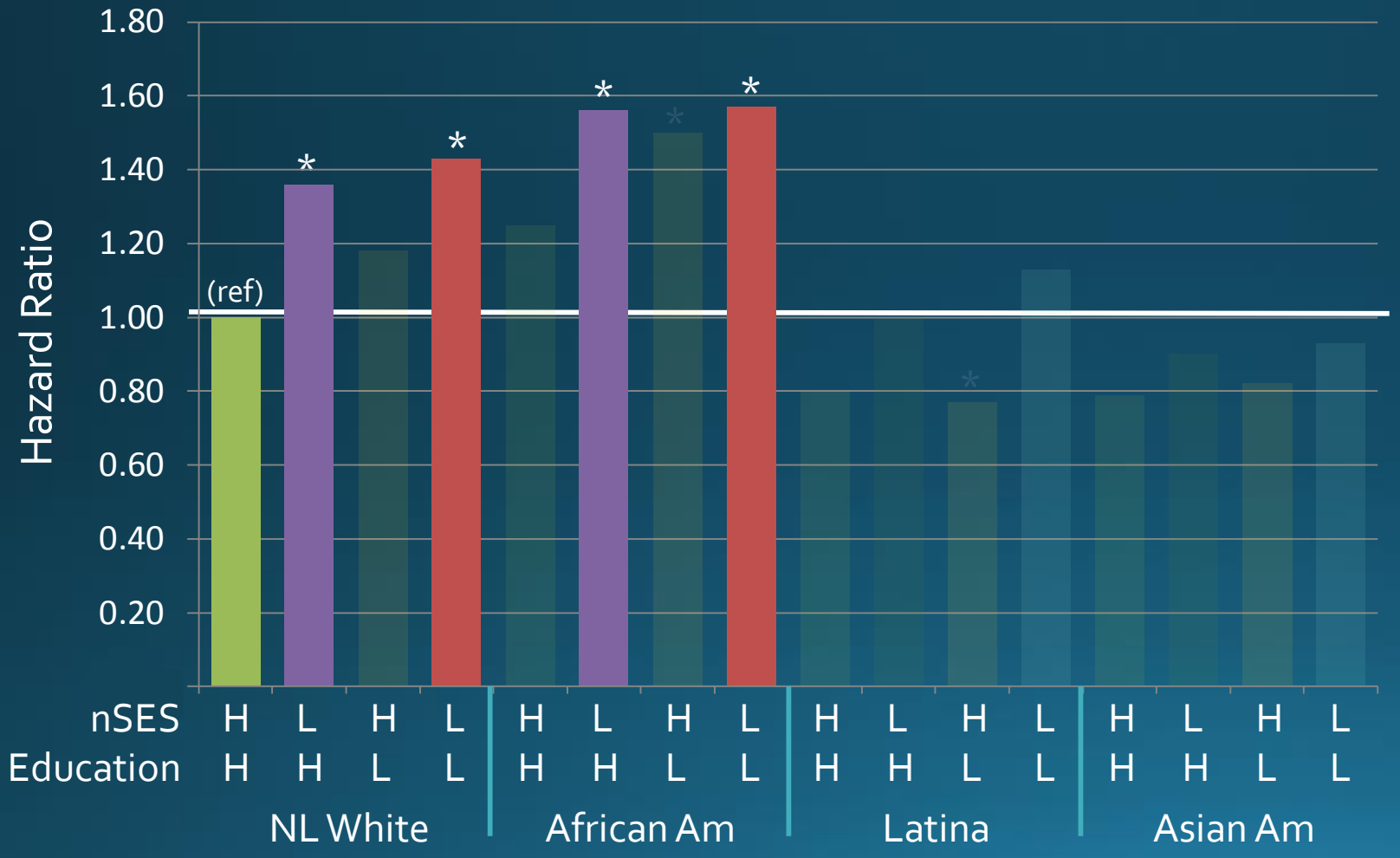
California Breast Cancer Survivorship Consortium



Shariff-Marco et al. J Comm Health 2015

Intersectionality: Breast cancer survival

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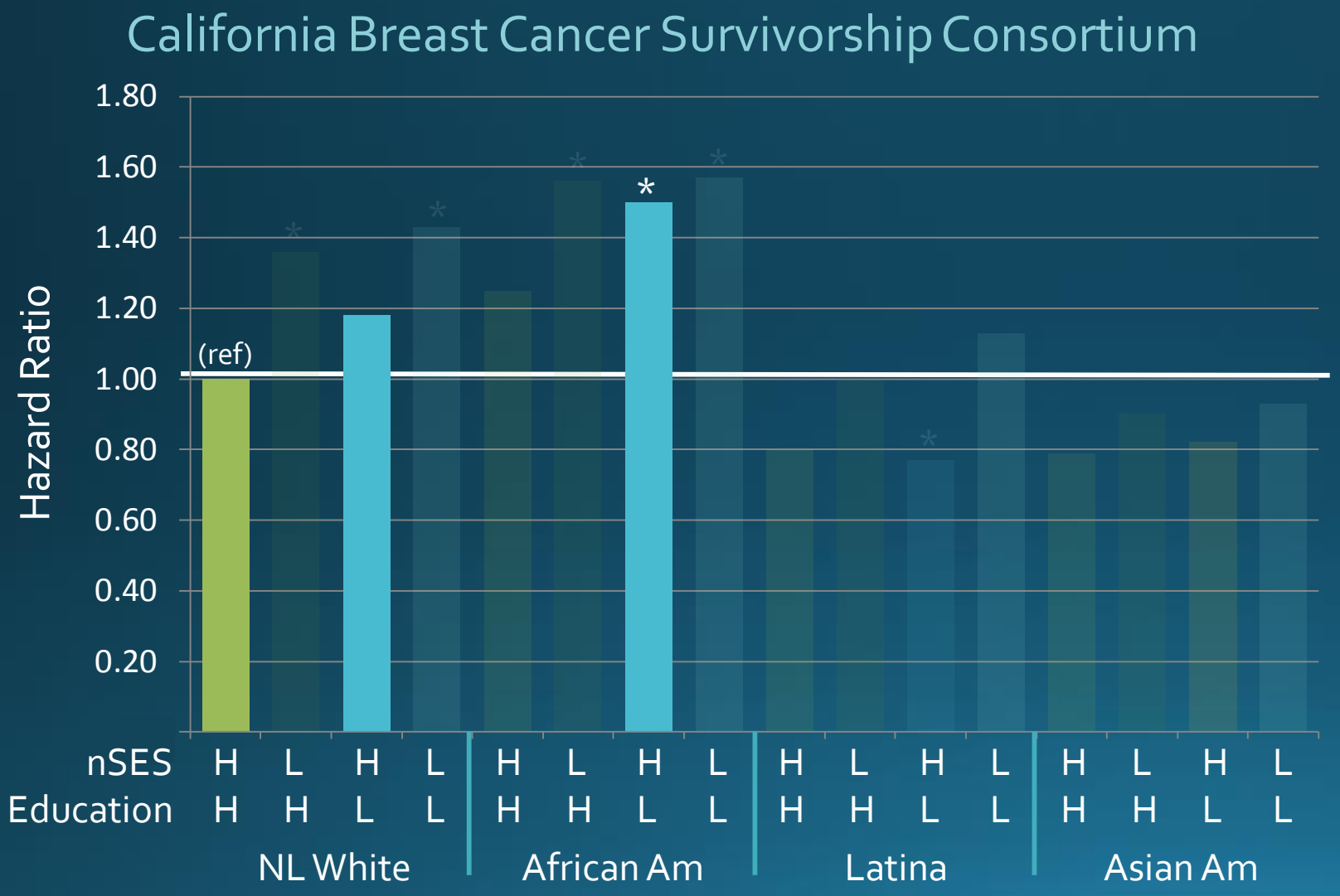


Among Whites & African Americans with low nSES

- Worse survival
- Regardless of education
- Regardless of race

Shariff-Marco et al. J Comm Health 2015

Intersectionality: Breast cancer survival



Among Whites & African Americans with <u>low nSES</u>

Worse survival

Regardless of education

Regardless of race

African Americans with <u>low education & high nSES</u>

Worse survival

Shariff-Marco et al. J Comm Health 2015

Applying an intersectional approach

Challenges

Little quantitative research

Fixed effects models do not address within-group variations

Requires large samples

Opportunities

Consider multilevel SDOH

Multilevel random effects models

Consider contexts in which SDOH operate

Green, Evans, Subramanian. Soc Sci Med 2017

Advancing multilevel disparities research

Charting the Future of Cancer Health Disparities Research: A Position Statement From the American Association for Cancer Research, the American Cancer Society, the American Society of Clinical Oncology, and the National Cancer Institute

Blase N. Polite, Lucile L. Adams-Campbell, Otis W. Brawley, Nina Bickell, John M. Carethers, Christopher R. Flowers, Margaret Foti, Scarlett Lin Gomez, Jennifer J. Griggs, Christopher S. Lathan, Christopher I. Li, J. Leonard Lichtenfeld, Worta McCaskill-Stevens, and Electra D. Paskett

2017 Position Statement

Advancing multilevel disparities research

Polite et al. JCO, Cancer Res, CA Cancer J Clin 2017

2017 Position Statement

High quality tools and most granular data possible

Consortia gathering multilevel data for adequately-powered, hypothesis-driven research

Best-practice strategies to include underserved

Inclusion and support for community-engaged research

Health care systems accountable for serving underserved patients and intervening on system inadequacies

Polite et al. JCO, Cancer Res, CA Cancer J Clin 2017

2017 Position Statement

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Polite et al. JCO, Cancer Res, CA Cancer J Clin 2017

High quality tools and granular data: Collecting sexual and gender minority status

Institute of Medicine (2011)
- State of knowledge regarding health disparities among SGM

Association of American Medical Colleges (2014)
- Report to advance healthcare of SGM

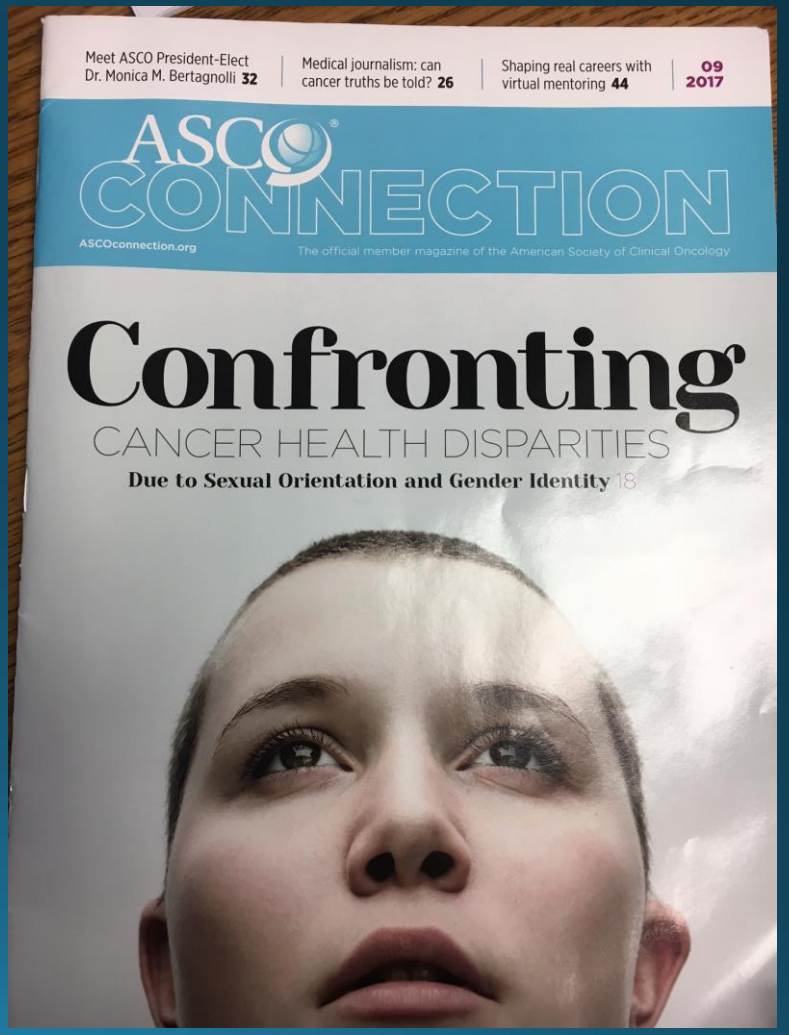
American College of Physicians (2015)
- Policy position paper

American Society of Clinical Oncology (2017)
- Position statement, J Clin Oncol

National Institutes of Health (2013)
- FY 2016-2020 SGM Strategic Plan

National Institute of Minority Health and Health Disparities (2016)
- Designated as health disparity population

Inclusion in Meaningful Use Guidelines
- Cahill et al., LGBT Health (2016)



High quality tools and granular data: Collecting sexual and gender minority status

In a nationwide survey of emergency department patients and clinicians.....

Patients

10% would refuse to provide

Individual care main benefit

Education of providers important

Clinicians

78% thought patients would refuse to provide

Improved patient-provider interactions main benefit

Maragh-Bass LGBT Health 2017, Haider JAMA Int Med 2017

High quality tools and granular data: Collecting sexual and gender minority status

Current landscape of data collection		
	Hospitals	**Physician offices**
Gender identity		
Sexual orientation		

Funding: National Cancer Institute

Gomez et al. Surveillance of cancer among sexual and gender minority populations: where are we and where do we need to go? Cancer in press.

High quality tools and granular data: Collecting sexual and gender minority status

Current landscape of data collection		
	Hospitals	**Physician offices**
Gender identity	52% only collect M/F	51% only collect M/F
Sexual orientation		

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34% response rate

Funding: National Cancer Institute

Gomez et al. Surveillance of cancer among sexual and gender minority populations: where are we and where do we need to go? Cancer in press.

High quality tools and granular data: Collecting sexual and gender minority status

Hospitals

This needs to be collected more systematically

Our facility just recently began

Will soon begin collecting these data

We need questions like this added to our patient intake/registration form

High quality tools and granular data: Collecting sexual and gender minority status

Hospitals

- This needs to be collected more systematically
- Our facility just recently began
- Will soon begin collecting these data
- We need questions like this added to our patient intake/registration form

Physician offices

- irrelevant
- not necessary for my patients' care
- too intrusive
- Only recorded if it is related to the patient's medical condition

High quality tools and granular data: Collecting sexual and gender minority status

https://cancerregistry.ucsf.edu/demographic-toolkit

Funding: National Cancer Institute

Gomez et al. Surveillance of cancer among sexual and gender minority populations: where are we and where do we need to go? Cancer in press.

High quality tools and granular data

- Standard set of SDOH measures
  - All research, registries
  - Including home address for neighborhood & geospatial factors
- Self-report
  - Race & ethnicity
  - Gender and sexual orientation
- Education on importance and rationale of collecting SDOH
- Reporting standards

Polite et al., JCO 2017

Multilevel consortia: Small populations

In research of small subpopulations…

"…the size, dispersion, or accessibility of the population of interest makes it difficult to obtain adequate sample sizes to test specific research questions"

-Srinivasan. AJPH 2015. "Small is essential"

Srinivasan. AJPH 2015. "Small is essential".

Multilevel consortia: Lung cancer among AANHPI

70% of cases are lung cancers in never-smokers (LCINS)

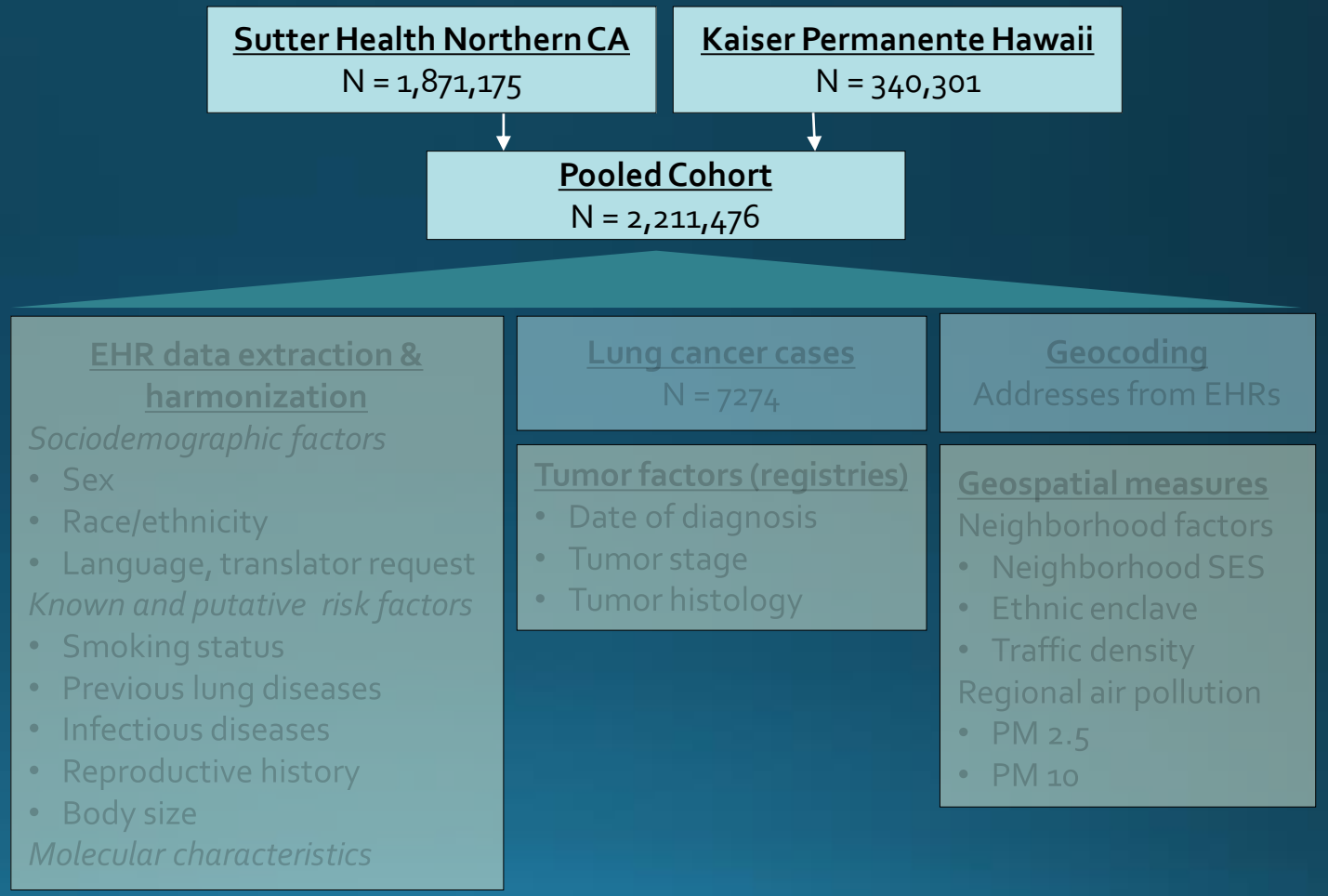
Risk factors for LCINS are largely unknown

No sufficiently large data source

- to document incidence by smoking status among AANHPI females ethnic groups
- to examine exame etiology

Multilevel consortia: Lung cancer among AANHPI

Health systems with large AANHPI representation

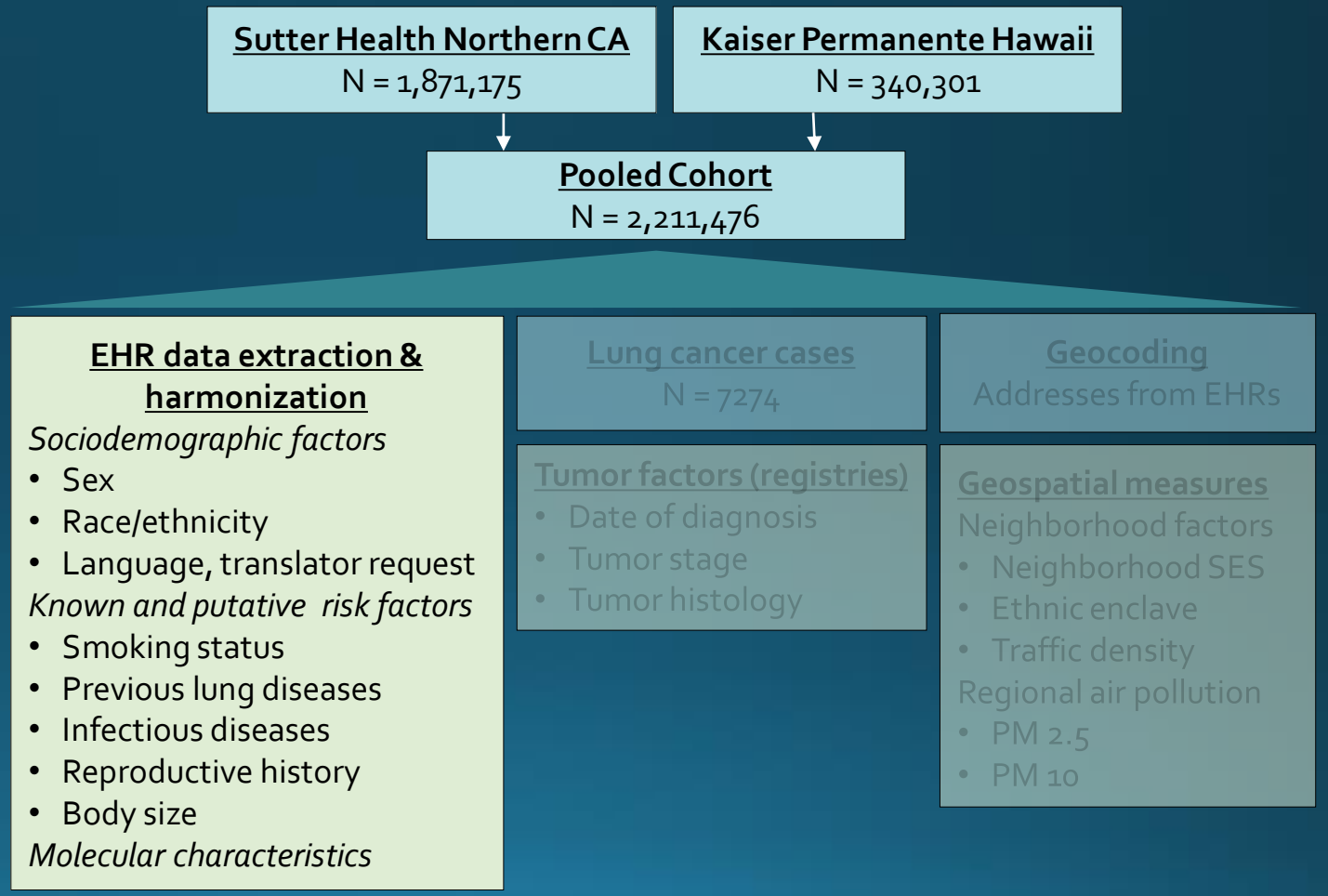


Funding: National Cancer Institute

Multilevel consortia: Lung cancer among AANPHI

Health systems with large AANHPI representation

Integration of EHR for common individual-level data elements



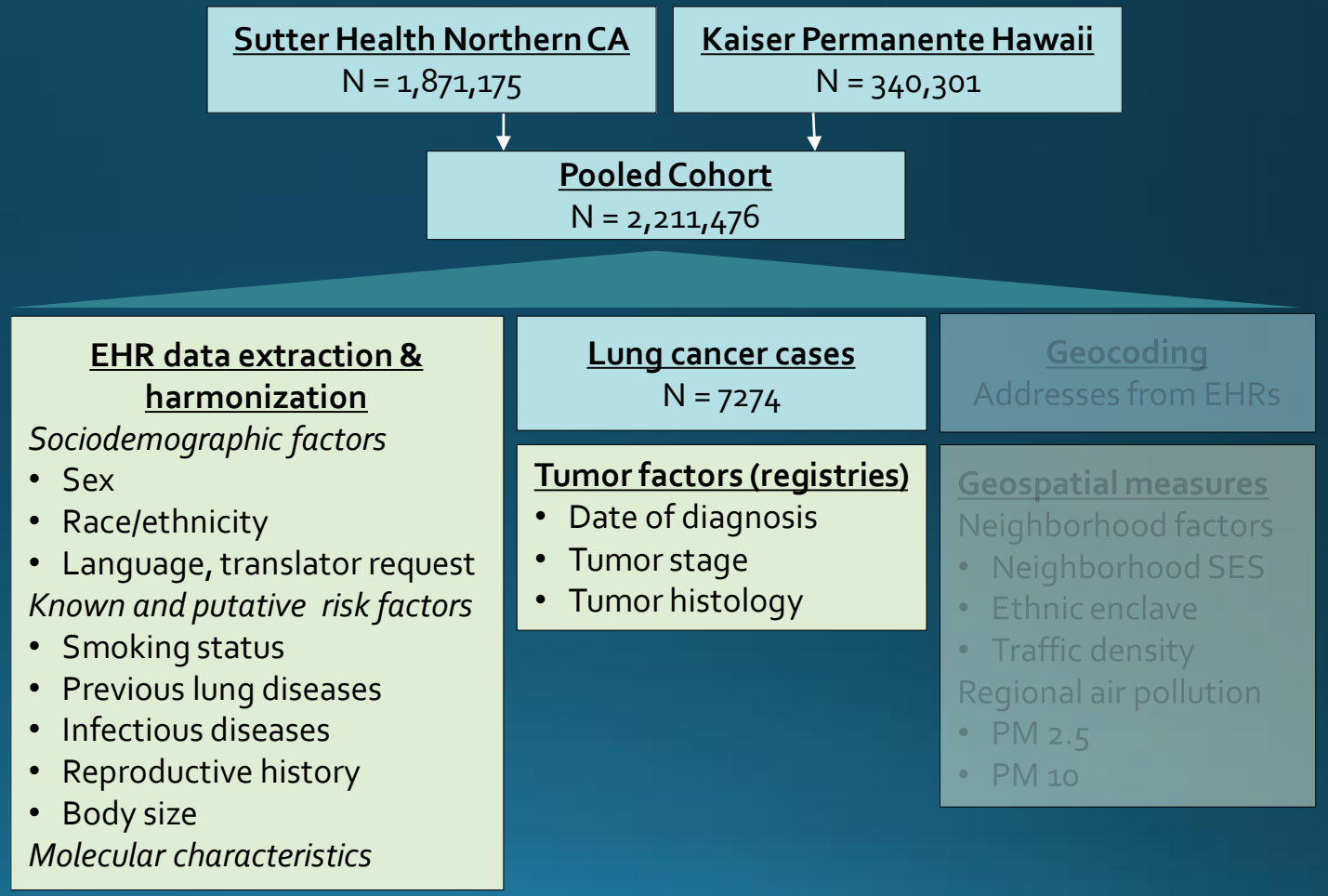
Funding: National Cancer Institute

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Linkage to cancer registries



Funding: National Cancer Institute

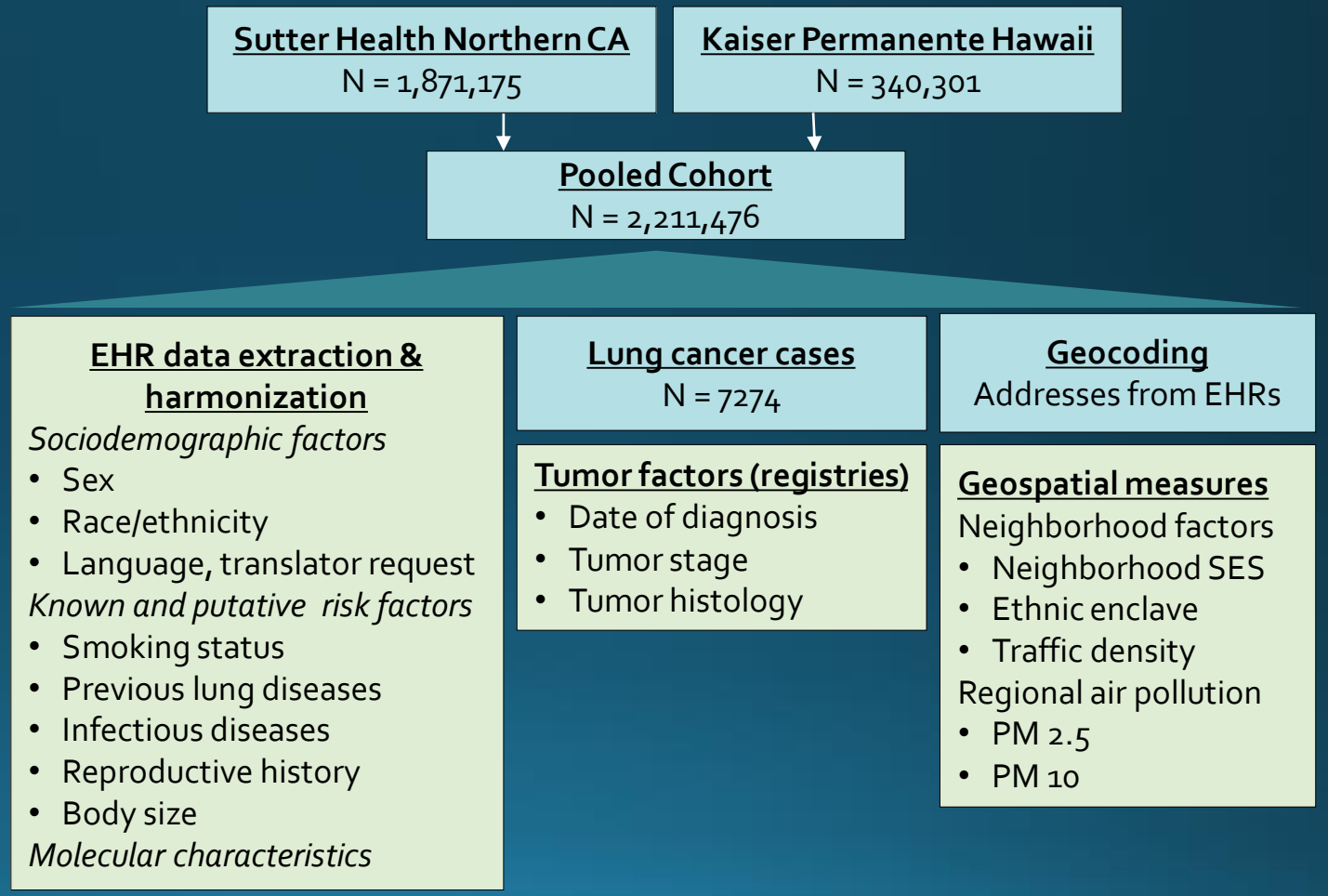
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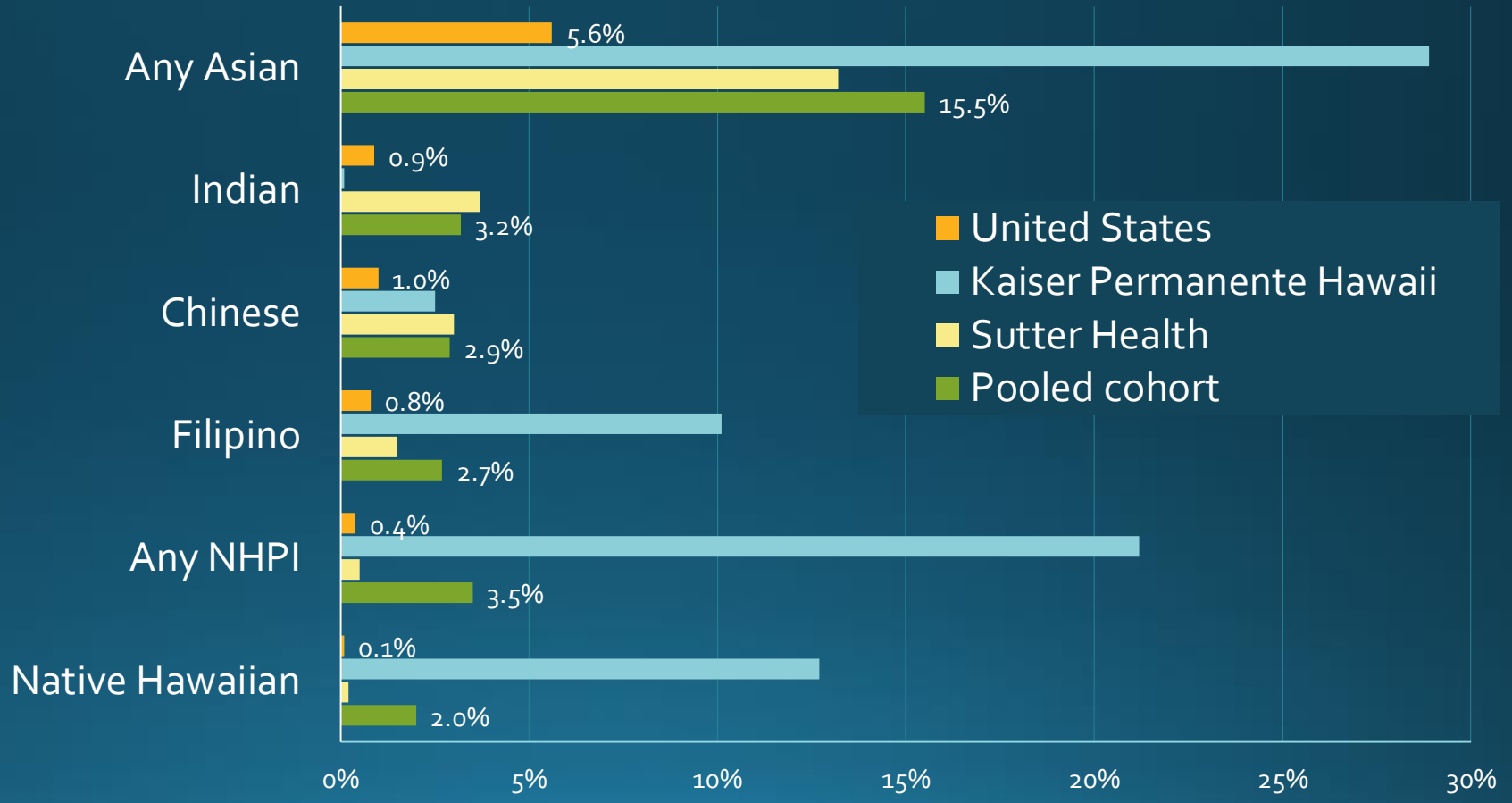
Neighborhood factors via geocoded addresses



Funding: National Cancer Institute

Multilevel consortia: Lung cancer among AANHPI

Increased representation of small groups



Funding: National Cancer Institute

Multilevel consortia: Lung cancer among AANHPI

Increased representation of small groups

Detailed ethnic groups of sufficient size for study

AANHPI females in cohort	(N)
NHPI	43,409
Native Hawaiian	26,760
Pacific Islander	16,649
Any Asian	206,644
Asian Indian	37,434
Chinese	38,950
Filipino	36,539
Japanese	19,804
Korean	6,611
Other Asian (single ethnicity)	32,193
Multiple, Asian only	10,338
Multiple, Asian and non-Asian	24,775
Non-Hispanic White	535,007

Funding: National Cancer Institute

Advancing multilevel disparities research of SDOH: Recommendations

- Cancer disparities arise from multilevel factors, including multilevel SDOH
  - Integrate neighborhood context
- Data needs
  - Standardized measures
  - Granular data
  - Training for healthcare professionals, Toolkits
- Consider small populations where appropriate
  - Multilevel consortia
  - Integrative data analysis

Final thoughts

Social status is a marker of institutional policies

- Addressing will require structural change

Resources & choices limited by social and built environment

- Need to recognize neighborhood contexts

Intersectionality of SDOH shape life experiences and restrict opportunities for upward mobility

- Recognize & assess intersectionality of multiple SDOH

"…it is our collective hope that in this period of cancer research when significant breakthroughs are being discovered, there will be opportunities to apply this new knowledge to all populations, and thus eliminate cancer health disparities for current and future generations."

Polite et al. JCO, Cancer Res, CA Cancer J Clin 2017

Thank You!

@MDeRouen4
mindy.hebert-derouen@ucsf.edu



DREA.I.I.LAB

DREAM Lab – Disparities research from environments and -omics