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Neighborhood-level Asian American Populations, Social Determinants of Health, and Health Outcomes in 500 US Cities

Ben R. Spoer, PhD[1]; Filippa Juul, PhD[2]; Pei Yang Hsieh, MPH[1]; Lorna E. Thorpe, PhD[1]; Marc N. Gourevitch, MD[1]; Stella Yi, PhD[1]

Introduction: The US Asian American (AA) population is projected to double by 2050, reaching ~43 million, and currently resides primarily in urban areas. Despite this, the geographic distribution of AA subgroup populations in US cities is not well-characterized, and social determinants of health (SDH) and health measures in places with significant AA/AA subgroup populations have not been described. Our research aimed to: 1) map the geographic distribution of AAs and AA subgroups at the city- and neighborhood- (census tract) level in 500 large US cities (population ≥66,000); 2) characterize SDH and health outcomes in places with significant AA or AA subgroup populations; and 3) compare SDH and health outcomes in places with significant AA or AA subgroup populations to SDH and health outcomes in places with significant non-Hispanic White (NHW) populations.

Methods: Maps were generated using 2019 Census 5-year estimates. SDH and health outcome data were obtained from the City Health Dashboard, a free online data platform providing more than 35 measures of health and health drivers at the city and neighborhood level. T-tests compared SDH (unemployment, high-school completion, childhood poverty, income inequality, racial/ethnic segregation, racial/ethnic diversity, percent uninsured) and health outcomes (obesity, frequent mental distress, cardiovascular disease mortality, life expectancy) in cities/neighborhoods with significant AA/AA subgroup populations to SDH and health outcomes in cities/neighborhoods with significant NHW populations (significant was defined as top population proportion quintile). We analyzed AA subgroups including Indian, Chinese, Filipino, Japanese, Korean, Vietnamese, and Other AA.

Results: The count and proportion of AA/AA subgroup populations varied substantially across and within cities. When comparing cities with significant AA/AA subgroup populations vs NHW populations, there were few meaningful differences in SDH and health outcomes. However, when comparing neighborhoods within cities, areas with significant AA/AA subgroup vs NHW populations had less favorable SDH and health outcomes.

Conclusion: When comparing places with significant AA vs NHW populations, city-level data obscured substantial variation in neighborhood-level SDH and health outcome measures. Our findings emphasize the dual importance of granular spatial and AA subgroup data in assessing the influence of SDH in AA populations. *Ethn Dis*. 2021;31(3):433-444; doi:10.18865/ed.31.3.433

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[1] Department of Population Health, NYU Grossman School of Medicine, New York, NY
[2] Department of Epidemiology, NYU College of Global Public Health, New York, NY

Address correspondence to Ben R. Spoer, PhD, Department of Population Health, NY Grossman School of Medicine, 180 Madison Ave, New York, NY 10009; Benjamin.Spoer2@nyulangone.org

Introduction

Despite swift growth of the Asian American (AA) population in the United States, this population remains understudied. According to 2017 US Census data, AAs comprise 5.6% of the US population, yet only .17% of nationally funded health studies focus on AAs.[1] One reason for this disparity is small sample sizes driven by low US AA populations in previous years. Another reason is the model minority stereotype, ie, the belief that AAs perform as well as, or better than, non-Hispanic Whites (NHW) on social determinants of health (SDH) and related health outcomes, and therefore do not experience racial/ethnic health disparities.[2]

In aggregate, according to some data sources, AAs have higher income and educational attainment compared with the general US population,[3] leading to the perpetuation of the model minority stereotype. However, when data are examined by AA subgroup, compelling health disparities emerge.[3,4] The AA population includes East Asian (Chinese, Korean), South Asian (Bangladeshi,

Pakistani), Southeast Asian (Filipino, Cambodian), and sometimes Pacific Islander Americans (Native Hawaiians, Marshallese), encompassing diverse subpopulations with unique ethnic profiles. Aggregating these groups disguises substantial variation in health determinants and outcomes among AA subgroups, which may reduce the perceived urgency of public health issues faced by specific AA subgroup members.[3,5] This presents an important problem given that AAs face a number of health disparities, including a higher risk for cancer, particularly infection-related cancers such as cervical cancer, stomach cancer and liver cancer[6]; a high burden of metabolic disorders (eg, diabetes, non-alcoholic fatty liver disease, cholesterolemia) despite a low prevalence of obesity[7-10]; and mental and neurologic health conditions.[11-13] Where subgroup data are available, different profiles of risk emerge. For example, Filipino and South Asian groups experience a high burden of hypertension and heart disease, and Koreans face high suicide rates.[9,14]

According to 2017 US Census data, Asian Americans comprise 5.6% of the US population, yet only .17% of nationally funded health studies focus on AAs.[1]

Previous AA literature is also limited by its approach to place. The preponderance of population-level research on AA health uses large geographies such as states and counties, rendering geographically granular municipal- and neighborhood-level investigations impossible. However, multiple studies have shown that spatial differentiation of population groups by race/ethnicity across relatively small physical and social spaces within cities (frequently called racial residential segregation)[15,16] can be closely associated with important health determinants.[17] For example, AAs in NYC who reside in ethnic enclaves (geographic areas where a particular ethnic group is spatially clustered and socially and economically distinct from the majority group), have lower average income and educational attainment than AAs who do not live in such enclaves.[18]

Given documented associations between neighborhood population distributions, drivers of health, and health outcomes, the aims of our current study were to use data from the US Census and the City Health Dashboard ('the Dashboard') to: 1) map the geographic distribution of AAs and AA subgroups at the city- and neighborhood- (census tract[19]) level in 500 large US cities (population ≥66,000); 2) characterize SDH and health outcomes in places with significant AA or AA subgroup populations; and 3) compare SDH and health outcomes in places with significant AA or AA subgroup populations to SDH and health outcomes in places with significant non-Hispanic White (NHW) populations.

Methods

Data Sources

We conducted secondary data analyses using SDH and health outcome data from the Center for Disease Control and Prevention's (CDC) PLACES Project (formerly 500 cities project) (2018 one-year modeled estimate),[20] the US Census American Community Survey (ACS) (2019 5-year estimates),[21] the National Vital Statistics System Multiple Cause of Death Data (NVSS, 2015 – 2017 data)[22] and the US Small-area Life Expectancy Estimates Project Data (USALEEP 2010-2015 6-year modeled estimates).[23] All data for this analysis, with the exception of city- and neighborhood-level race/ethnicity data, were analyzed as posted on the Dashboard, a publicly available data resource. Dashboard project staff access, clean, parse, and provide for download public health data from various sources, including those listed above.[24-26] The analytic sample included the 500 cities selected by CDC's 500 Cities Project for inclusion in their public health data project. This included the 497 largest US cities, and to ensure all US states were represented in the sample, the largest city from three states that would not otherwise have been included in the sample were added by CDC: Burlington, Vermont; Cheyenne, Wyoming; and, Charleston, West Virginia.

Granular city- and neighborhood-level race/ethnicity data, including AA subgroup composition, were drawn from ACS 2019 5-year estimates.[21]

Geographic Distribution of AAs and AA Subgroups

The proportion of each city's and neighborhood's population composed of AAs and specific AA subgroup members was calculated relative to the total population of that city or neighborhood (ie, city AA population count/city population count), and proportions were sorted into quintiles. While group-specific segregation cut points are available for other racial/ethnic minority groups, cut points have not been established for AA populations.[27] For this analysis, cities and neighborhoods were considered to have a significant proportion of a given population group if the population proportion for the group in that city or neighborhood was in the top quintile. Maps of AAs/AA subgroup members by quintile at the city and neighborhood level were generated in ArcMAP version 10.7 (ESRI, Redlands, CA, USA) using ACS 2019 5-year estimates.

Health Outcomes

Neighborhood-level estimates of average life expectancy at birth were obtained from USALEEP. Population weighted city-level estimates were calculated by Dashboard analytic staff in consultation with CDC.[25] City-level age-adjusted cardiovascular disease (CVD) mortality rates (per 100,000 population) were calculated by Dashboard staff by combining 2015-2017 Multiple Cause of Death data.[25] Data regarding frequent mental distress and obesity were obtained from the CDC PLACES Project.[20] Analytic procedures are described in detail in the Dashboard's technical documentation.[25]

Social Determinants of Health

We examined data distributions of seven SDH: lack of health insurance among individuals aged 0-64 years (%); children living in households at or below the federal poverty line (%); high school completion (%); unemployment among individuals aged ≥16 years (%); income inequality (index ranging from -100 to 100); racial/ethnic diversity (index ranging from 0-100, using an entropy score method in which a more even distribution of racial/ethnic groups within a city results in higher scores); and neighborhood racial/ethnic segregation (index ranging from 0-100 using an entropy score method in which cities with a more even distribution of racial/ethnic groups across neighborhood have lower segregation scores). Data were obtained from, or calculated using, ACS 2019 5-year estimates.[21] High school completion was defined as the percent of residents aged ≥25 years of

Table 1. Demographic characteristics of US cities with high population densities of Asian Americans (AA), non-Hispanic Whites (NHW), or other groups in 2019[a]

Geographic Unit[b]	N	Median age (years)[c]	Female (%)	Median income ($)	Impoverished (%)	High school completion (%)	AA (%)[d]	NHOPI (%)[d]	NHW (%)[d]	Black (%)	Hispanic/ Latino (%)
Cities high[e] in AA	97	36.9	50.4	89198.40	10.6	87.8	23.5	.6	38.1	8.1	26.0
Cities high in NHW	98	36.6	51.0	64658.00	13.8	92.7	4.0	.2	77.5	5.7	8.9
Cities neither high in AA nor NHW	394	34.7	51.1	56654.80	17.5	84.6	4.2	.2	42.2	20.9	30.0
Cities high in Black	100	34.7	52.1	48383.30	21.2	85.9	3.4	.1	37.9	42.3	14.1
Cities high in Hispanic/ Latino	99	33.6	50.7	57021.20	17.7	76.7	6.1	.2	23.1	10.0	59.2

a. American Community Survey. 2019; https://www.census.gov/programs-surveys/acs.
b. As groups compared must be mutually exclusive, cities with significant AA or other groups and NHW populations were excluded.
c. All values in the table are calculated averages.
d. AA, Asian American; NHOPI, Native Hawaiian and Other Pacific Islander; NHW, Non-Hispanic White.
e. Cities were considered 'high' in population for a given group or sub-group if the city total population of that group was in the top population quintile for that group across cities included in the sample.

Table 2. Proportion Asian American (AA) and AA subgroup residents in the 10 US cities with the highest proportion of AA residents in 2019

City, State	Total City Population	AA, %	Indian, %	Chinese, %	Filipino, %	Japanese, %	Korean, %	Vietnamese, %	Other, %
Milpitas, CA	79,517	66.9	18.3	15.5	14.2	.7	1.9	12.9	3.3
Fremont, CA	235,740	59.4	26.3	17.8	6.8	.8	1.4	2.4	3.9
Daly City, CA	106,677	58.1	1.5	19.2	31.5	.7	.5	1.0	3.8
Union City, CA	74,722	53.4	14.6	12.2	18.0	.5	1.2	3.5	3.4
Alhambra, CA	84,647	51.2	.8	36.0	2.5	1.2	1.4	4.2	5.1
Westminster, CA	91,137	48.4	.4	2.0	1.3	1.2	.4	41	2.1
San Ramon, CA	75,648	46.7	21.3	13.1	4.5	.8	3.1	1.0	2.8
Sunnyvale, CA	152,770	46.7	19.0	15.6	4.0	1.8	1.9	1.9	2.6
Santa Clara, CA	127,721	43.2	17.8	10.2	6.3	1.6	2.4	2.9	2.1
Irvine, CA	273,157	43.1	5.9	17.0	3.2	2.9	7.3	3.6	3.2

age who have earned at least a high school diploma (or equivalent).[25] Income inequality was measured by the Index of Concentration at the Extremes (ICE) developed by Krieger et al[28] Higher or lower ICE scores are considered less desirable as they represent concentration of higher or lower income households; an ICE score of 0 represents equal distribution of wealthy and impoverished households. The racial/ethnic diversity index measures the distribution of the population by race/ethnicity group within a city or neighborhood; higher values indicate greater diversity. The neighborhood racial/ethnic segregation index describes population distribution by race/ethnicity group within a neighborhood relative to the distribution across the city; higher values indicate greater racial/ethnic segregation. Each measure is explained in detail in the Dashboard's technical documentation.[25]

Statistical Analyses

Descriptive statistics were calculated to assess the distribution of health outcomes and SDH among the total population in cities and neighborhoods with significant AA, AA subgroup, and NHW populations. Distributions of health outcomes and SDH in cities and tracts with significant AA or AA subgroup populations were compared with distributions in cities and tracts with significant NHW populations using independent sample t-tests. A small number of cities and tracts were in the top quintile for both AA or a given AA subgroup *and* NHW populations; these cities and tracts were excluded to avoid: a) the potential for SDH and health outcome measures in these places to reflect the effect of significant NHW resident populations; and b) violating the independence requirement of the independent-sample t-test. Because the cities and neighborhoods with a high population proportion of AA subgroup members differed across subgroups, different cities and tracts were excluded based on the AA subgroup in question. As a sensitivity analysis we performed an additional t-test to determine if health outcomes and SDH differed significantly between the excluded and included places.

Results

Geographic Distribution of AAs and AA Subgroups in United States

Demographic characteristics of cities with significant racial/ethnic group populations are displayed in Table 1. Populations in cities with significant AA populations were slightly older, had higher median income, and lower high school completion than populations in cities

Table 3. Social determinants of health among the total population in cities with a high population proportion Asian American, Asian American subgroup, and non-Hispanic White residents

Geographic unit (Minimum population percentage required for a city to be in the top quintile for specified demographic group	N	Children in Poverty, %		High school completion, %		Income inequality (-100 to 100)		Neighborhood racial/ethnic segregation (0-100)		Racial diversity (0-100)		Unemployment, %		Lack of health insurance, %	
		Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
Cities high[a] in all AA (>11.3)	195	14.1[b]	.8	87.1	.8	15.9[c]	1.7	9.4	.5	76.7[c]	.9	5.5[c]	.2	8.1	.4
Cities high in NHW (>68.7)		16.6	.9	85.0	.4	-2.0	1.7	8.4	.4	47.0	.9	4.9	.1	8.6	.3
Cities high in Indian (>2.1)	178	13.5[c]	.9	87.7[b]	.6	16.4[c]	1.9	9.9	.5	75.0[b]	.9	5.3	.2	8.5	.5
Cities high in NHW		17.2	.9	84.9	.4	-3.6	1.6	8.4	.4	46.6	.9	5.0	.2	9.0	.4
Cities high in Chinese (>1.9)	174	13.8[b]	.9	85.6	.8	16.6[c]	2.0	10.4[b]	.8	75.5[c]	1.0	5.3	.2	7.5[c]	.4
Cities high in NHW		16.8	.9	85.0	.4	-2.3	1.7	8.5	.4	46.5	.9	4.9	.2	8.9	.4
Cities high in Filipino (>2.0)	195	15.0	.7	86.2	.8	12.9[c]	1.5	8.8	.5	75.5[c]	1.0	6.0[c]	.2	9.0	.4
Cities high in NHW		16.3	.9	85.3	.4	-1.8	1.7	8.4	.4	47.1	.8	4.8	.1	8.5	.4
Cities high in Japanese (>.4)	169	12.7[c]	.8	86.9	.7	17.7[c]	1.7	8.9	.5	74.0[c]	1.2	5.3[b]	.2	7.7	.5
Cities high in NHW		17.0	.9	85.3	.4	-2.8	1.7	8.5	.4	46.7	.9	4.9	.2	8.8	.4
Cities high in Korean (>.7)	174	13.1[c]	.7	85.8	.7	17.2[c]	1.8	9.3	.6	74.7[c]	.9	5.1	.1	8.3	.4
Cities high in NHW		17.1	.9	85.3	.4	-3.1	1.6	8.4	.4	46.6	.9	4.9	.2	8.9	.4
Cities high in Vietnamese (>1.0)	180	18.1	1.0	84.3	.8	7.0[c]	1.9	10.9[c]	.6	75.5[c]	1.0	5.7[c]	.2	10.5[c]	.6
Cities high in NHW		16.5	1.0	85.3	.4	-1.5	1.8	8.5	.4	46.3	.9	4.8	.2	8.5	.4
Cities high in Other (>1.8)	175	18.6	1.1	83.9	.7	7.1[b]	2.1	10.7[c]	.7	76.5[c]	1.0	5.9[c]	.2	9.0	.5
Cities high in NHW		16.0	.9	85.3	.4	-.7	1.8	8.4	.4	46.7	.9	4.8	.2	8.7	.4

AA, Asian American; NHW, non-Hispanic White.
a. Cities were considered 'high' in population for a given group or sub-group if the city total population of that group was in the top population quintile for that group across cities included in the sample.
b. Significantly different from cities with a high population proportion non-Hispanic whites at $p<.05$.
c. Significantly different from cities with a high population proportion non-Hispanic whites at $p<.01$.
P-values for between-group differences calculated by independent sample t-tests.

with substantial NHW populations.

The 10 cities with the highest proportion AA residents are presented in Table 2. All 10 cities are in California. AAs made up the majority of the population in five of these cities. Maps of three cities with a high proportion of AA/AA subgroup residents (San Francisco, CA, Houston, TX, and New York, NY), including the neighborhood-level distribution of AAs and the three AA subgroups that comprise the largest percentage of the total AA population in each city are available from the corresponding author. The maps depict substantial differences in the distribution and density of AA/AA subgroup members both within and across cities. Similar maps for all AA subgroup populations in cities

Table 4. Health outcomes among the total population in cities with a high population proportion of Asian Americans, Asian Americans subgroup, and non-Hispanic White residents

Geographic unit (Minimum population percentage required for a city to be in the top quintile for specified demographic group)	N	Obesity, %		Frequent mental distress, %		CVD mortality rate (a)		Life expectancy, years	
		Mean	SE	Mean	SE	Mean	SE	Mean	SE
Cities high[b] in all AA (>11.3)	195	25.0[c]	.4	12.1[c]	.2	183.1	4.6	80.9[c]	.2
Cities high in NHW (>68.7)		28.9	.4	13.8	.2	19.1	4.6	79.3	.2
Cities high in Indian (>2.1)	178	26.2[c]	.5	12.2[c]	.2	179.0	5.6	80.7[c]	.2
Cities high in NHW		29.1	.5	13.9	.2	193.0	4.6	79.2	.2
Cities high in Chinese (>1.9)	174	24.3[c]	.4	12.0[c]	.2	174.4[c]	4.5	81.1[c]	.2
Cities high in NHW		29.4	.4	13.7	.2	193.7	4.9	79.1	.2
Cities high in Filipino (>2.0)	195	25.9[c]	.4	12.7[c]	.2	205.7[d]	5.9	80.4[c]	.2
Cities high in NHW		28.8	.4	13.7	.2	189.2	4.6	79.4	.2
Cities high in Japanese (>.4)	169	23.8[c]	.5	11.9[c]	.2	185.0	5.9	81.4[c]	.2
Cities high in NHW		29.2	.4	13.9	.2	191.8	4.8	79.2	.2
Cities high in Korean (>.7)	174	24.7[c]	.5	12.0[c]	.2	176.3*	4.3	81.1[c]	.2
Cities high in NHW		29.2	.5	13.8	.2	193.2	4.7	79.2	.2
Cities high in Vietnamese (>1.0)	180	27.7	.7	13.2	.2	195.9	5.0	79.9	.2
Cities high in NHW		28.8	.5	13.8	.3	189.0	4.9	79.4	.2
Cities high in Other (>1.8)	175	27.6	.7	13.0	.3	196.5	5.5	79.8	.2
Cities high in NHW		28.8	.5	13.7	.2	189.6	4.9	79.4	.2

AA, Asian American; NHW, non-Hispanic White.

a. Deaths due to CVD per 100,000 population; The downloadable data tables shared on the City Health Dashboard website were not released as a micro-level downloadable datasets from NCHS/RDC, rather .csv aggregated data tables whose analyses were conducted per NCHS disclosure requirements in a secure environment and released as approved output. The findings and conclusions on this website are those of the author(s) and do not represent the views of the Research Data Center, the National Center for Health Statistics, or the Centers for Disease Control and Prevention. NCHS does not recommend further analysis of these tables because linking them to individually identifiable data from other NCHS or non-NCHS datasets could potentially cause disclosure. If you believe a disclosure has occurred, please contact info@cityhealthdashboard.com and RDCA@cdc.gov.

b. Cities were considered 'high' in population for a given group or sub-group if the city total population of that group was in the top population quintile for that group across cities included in the sample. Quantiles may be less than 20% of the sample because ties are automatically sent to the lower quintile.

c. Significantly different from cities with a high population proportion non-Hispanic whites at P<.01.

d. Significantly different from cities with a high population proportion non-Hispanic whites at P<.05.

P-values for between-group differences calculated by independent sample t-test.

represented on the Dashboard are available on the Dashboard's website in the City Overview section.

Distribution of Social Determinants of Health and Health Outcomes Across Cities

Table 3 displays the distribution of SDH in cities with significant AA or AA subgroup populations, compared with distributions in cities with significant NHW population. Compared with NHW cities, cities with significant AA/AA subgroup populations were more socioeconomically privileged and more racially diverse yet had higher levels of unemployment (P<.01). Cities with significant Indian, Japanese, and Korean populations had lower childhood poverty rates compared with NHW cities (P<.01), while no statistically significant difference was observed for AAs overall or other AA subgroups. Likewise, high school completion was higher in cities with significant Indian AA populations than in cities with significant NHW populations (87.7 vs 85.0%, respectively, P<.05). Proportion of residents lacking health insurance was higher in cities with significant Vietnamese AA populations compared with cities with significant NHW populations (10.5 vs 8.5%, respectively, P<.01). Within-city neighborhood racial/ethnic segregation was significantly greater in cities with significant

Table 5. Social determinants of health among the total population in neighborhoods with a high population proportion Asian American, Asian American subgroup, and non-Hispanic White residents

Geographic unit	N	Children in Poverty, %		High School Completion		Income inequality (-100 to 100)		Racial diversity (0-100)		Unemployment, %		Lack of health insurance, %	
		Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE	Mean	SE
CTs high[a] in all AA (>11.4)	11,284	15.7[c]	.2	86.5[c]	.2	9.6[c]	.4	72.4[c]	.2	5.8[c]	.0	9.0[c]	.1
CTs high in NHW (>74.5)		10.5	.2	94.3	.1	11.2	.3	37.5	.2	4.2	.0	6.8	.1
CTs high in Indian (>1.8)	9,778	15.0[c]	.2	89.4[c]	.1	9.9	.4	70.5[c]	.2	5.7[c]	.1	9.0[c]	.1
CTs high in NHW		11.0	.2	94.1	.1	9.5	.3	36.8	.2	4.3	.0	7.0	.1
CTs high in Chinese (>2.1)	10,047	15.2[c]	.2	88.0[c]	.2	10.4	.4	69.6[c]	.2	5.7[c]	.0	8.4[c]	.1
CTs high in NHW		10.9	.2	94.1	.1	9.9	.3	36.9	.2	4.2	.0	7.0	.1
CTs high in Filipino (>1.6)	10,822	16.0[c]	.2	85.6[c]	.2	7.6[c]	.3	70.7[c]	.2	6.3[c]	.0	10.1[d]	.1
CTs high in NHW		10.5	.2	94.4	.2	11.5	.3	37.4	.2	4.2	.0	6.7	.1
CTs high in Japanese (>.4)	9,188	14.6[c]	.2	89.2[c]	.2	11.4[b]	.4	69.0[c]	.2	5.7[c]	.1	8.4[c]	.1
CTs high in NHW		10.8	.2	94.0	.1	10.2	.4	37.1	.2	4.2	.0	6.9	.1
CTs high in Korean (>.7)	9,646	15.3[c]	.2	89.0[c]	.2	9.1	.4	69.1[c]	.2	5.7[c]	.1	9.2[c]	.1
CTs high in NHW		10.9	.2	94.0	.1	9.9	.4	37.0	.2	4.3	.0	7.0	.1
CTs high in Vietnamese (>.9)	10,246	18.9[c]	.2	84.8[c]	.2	3.2[c]	.4	69.5[c]	.2	6.2[c]	.1	11.6[c]	.1
CTs high in NHW		10.5	.2	94.3	.1	11.3	.4	37.2	.2	4.3	.0	6.7	.1
CTs high in Other (>1.8)	10,545	20.5[c]	.3	84.4[c]	.2	.4[c]	.4	71.3[c]	.2	6.5[c]	.1	10.8[d]	.1
CTs high in NHW		10.3	.2	94.4	.1	11.8	.3	37.2	.2	4.2	.0	6.7	.1

Geographic unit is the minimum population percentage required for a census tract (CT) to be in the top quintile for specified demographic group.
CT, census tract; AA, Asian American; NHW, non-Hispanic White.
a. Neighborhoods were considered 'high' in population for a given group or sub-group if the city total population of that group was in the top population quintile for that group across cities included in the sample. Quantiles may be less than 20% of the sample because ties are automatically sent to the lower quintile.
b. Significantly different from cities with a high population proportion non-Hispanic Whites at P<.05.
c. Significantly different from cities with a high population proportion non-Hispanic Whites at P<.01.
P-values for between-group differences calculated by independent sample t-test.

Chinese AA (P<.05), Vietnamese AA, and 'Other AA' populations compared to cities with significant NHW population (P<.001).

With respect to health outcomes, cities with significant AA populations had lower obesity rates (25.0 vs 28.9%), lower prevalence of frequent mental distress (12.1 vs 13.8%) and longer life expectancy (80.9 vs 79.3 years) than cities with significant NHW population (P<.01) (Table 4). Similar patterns were observed for cities with significant AA subgroup populations,

Table 6. Health outcomes among the total population in neighborhoods with a high population proportion Asian American, Asian American subgroup, and non-Hispanic White residents

Geographic unit	N	Obesity, %		Frequent mental distress, %		Life expectancy, years	
		Mean	SE	Mean	SE	Mean	SE
CTs high[a] in all AA (>11.4)	11,284	24.8[c]	.1	12.3[c]	.0	80.8[c]	.0
CTs high in NHW (>74.5)		27.6	.1	12.2	.0	80.0	.1
CTs high in Indian (>1.8)	9,778	26.0[c]	.1	12.5	.0	80.4[c]	.1
CTs high in NHW		27.9	.1	12.3	.0	79.8	.1
CTs high in Chinese (>2.1)	10,047	24.3[c]	.1	12.2	.0	80.9[c]	.1
CTs high in NHW		28.0	.1	12.3	.0	79.7	.1
CTs high in Filipino (>1.6)	10,822	26.5[c]	.1	12.9[c]	.0	80.1[b]	.0
CTs high in NHW		27.5	.1	12.2	.0	80.0	.1
CTs high in Japanese (>.4)	9,188	24.9[c]	.1	12.2	.0	80.7[c]	.1
CTs high in NHW		27.9	.1	12.3	.0	79.8	.1
CTs high in Korean (>.7)	9,646	25.4[c]	.1	12.5[c]	.0	80.5[c]	.1
CTs high in NHW		27.9	.1	12.3	.0	79.8	.1
CTs high in Vietnamese (>.9)	10,246	28.3[c]	.1	13.5[c]	.0	79.4[c]	.1
CTs high in NHW		27.4	.1	12.2	.0	80.0	.1
CTs high in Other (>1.8)	10,545	28.2[c]	.1	13.6[c]	.0	79.4[c]	.1
CTs high in NHW		27.4	.1	12.1	.0	80.0	.1

Geographic unit is the minimum population percentage required for a census tract (CT) to be in the top quintile for specified demographic group.
CT, census tract; AA, Asian American; NHW, non-Hispanic White.
a. Neighborhoods were considered 'high' in population for a given group or sub-group if the city total population of that group was in the top population quintile for that group across cities included in the sample. Quantiles may be less than 20% of the sample because ties are automatically sent to the lower quintile.
b. Significantly different from cities with a high population proportion non-Hispanic Whites at P<.05.
c. Significantly different from cities with a high population proportion non-Hispanic Whites at P<.01.
P-values for between-group differences calculated by independent sample t-test.

with some discrepancies; prevalence of frequent mental distress, obesity, and life expectancy was not significantly different in cities with significant Vietnamese AA and 'Other AA' populations when compared with cities high in NHWs. Compared with cities with significant NHW populations, CVD mortality was higher in cities with a significant Filipino AA population (205.7 vs 189.2, P<.05), and lower in cities with significant Chinese (174.4 vs 193.7, P<.05) or Korean AA population (176.3 vs 193.2, P<.05), while no difference was observed for cities with significant overall AA population or other subgroups (Table 4).

Social Determinants of Health and Health Outcomes among the Total Population in Neighborhoods High in AAs

The distributions of SDH and health outcomes in neighborhoods with significant AA/AA subgroup populations, compared with distributions in neighborhoods with significant NHW populations, are presented in Tables 5 and 6. In contrast to municipal-level trends, neighborhoods with significant AA/AA subgroup populations had higher levels of childhood poverty, unemployment, and individuals lacking health insurance than did neighborhoods with significant NHW populations (P<.01). These neighborhoods were also more racially/ethnically diverse and had lower high school completion. Neighborhoods with significant AA populations, or significant Filipino, Vietnamese, or Other AA populations, also had a lower concentration of economically privileged households than did neighborhoods high in NHW (ICE: 9.6 vs. 11.2 for neighborhoods high

in all AA vs NHW, P<.01). Compared with neighborhoods with significant NHW populations, the prevalence of frequent mental distress was higher in neighborhoods with significant AA populations, or significant Filipino, Korean, Vietnamese, or Other AA populations (12.3 vs 12.2 for neighborhoods high in all AA vs NHW, P<.01). With the exception of neighborhoods high in Vietnamese AA and 'Other AA,' obesity rates were lower and life expectancy was longer in neighborhoods with significant AA/ AA subgroup populations than in neighborhoods with significant NWH populations (obesity: 24.8% vs 27.6%, life expectancy: 80.8 vs 80.0 years for neighborhoods high in all AA vs. NHW, P<.01). Notably, obesity rates were higher and life expectancy shorter in neighborhoods with significant Vietnamese AA and 'Other AA' populations than in neighborhoods with significant NHW populations (P<.01)

Discussion

The present research described and mapped the geographic distribution of AAs/AA subgroups across US cities. It then compared SDH and health outcomes in places with significant AA/AA subgroup populations with the same measures in places with significant NHW populations. City-level results generally demonstrated that cities with significant AA/AA subgroup populations performed as well as, or better than, cities high in NHWs on SDH and health outcomes. However, within cities, neighborhoods with significant AA or AA subgroup populations frequently had less desirable SDH exposures and health outcomes. These results describe notable variations in the neighborhoods where different AA subgroups live and variations in risk of poor health outcomes owing to negative social determinants of health, and in doing so reinforce the importance of granular geographic and Asian subgroup data. In neighborhoods in which the population is primarily AAs or AA subgroup members, these results demonstrate where and how the model minority stereotype does not hold. Select cities (n=2, 1%) and neighborhoods (159, 1%) were censored because they had substantial AA and NHW populations. These places differed in important ways from places that were high in AAs only, meaning they do not represent the places of interest to this analysis, which intends to capture health conditions in typical places in which AAs reside (data not shown).

City-level maps of AAs/AA subgroups display substantial variation in the distribution of AAs/AA subgroups across and within US cities. Maps for each AA subgroup for all cities on the Dashboard are freely available from the Dashboard's City Overview page (http://www.cityhealthdashboard.com). These maps can be used to better understand the distribution of AAs/AA subgroups in US cities to target outreach and interventions intended to reach these populations, and to guide future AA research.

These findings provide insights into health outcomes in places where specific AA subgroups reside. Though cities in the top quintile for AAs/AA subgroup members had consistently lower obesity rates, we found that neighborhoods in the top quintile for Vietnamese and for the category of Other AAs had higher obesity rates, higher rates of frequent mental distress, and lower life expectancy than did neighborhoods in the top quintile for NHWs, as well as higher rates of children in poverty and adults who lack health insurance. When taken together, these results indicate that neighborhoods in the top quintile for Vietnamese and for the category of Other AAs may be particularly high-need areas that might benefit from focused, tailored interventions.

These findings correspond to other published results. Aggregated national data show AAs have higher income and are more likely to have a college education than other racial/ethnic minority groups. The Pew Research Center reported that among adults aged ≥25 years, 49% of Asians, compared with 31% of Whites, 18% of Blacks, and 13% of Hispanics attained a college education or higher degree.[29] However, substantial variation exists when these data are disaggregated by Asian subgroup: 70% of Asian Indians compared with 26% of Vietnamese adults have a bachelor's degree or more. Median household income for Asians is $72,000/year, while the national average is approximately $53,000/year.[30] However, there is substantial variation in income across Asian subgroups; Asian Indians have the highest annual household income at $95,000,

while Bangladeshis have the lowest at $46,950. Our results expand upon these individual-level findings.

Although city-level data portrays cities high in AA and some AA subgroup populations as economically similar to NHWs, neighborhood data show neighborhoods in the highest quintile for AA populations/specific AA subgroups are less economically advantaged compared with neighborhoods in the highest quintiles for NHWs. This indicates that aggregated data on AAs obscures important variation by Asian subgroup and neighborhood, making an urgent case for the use of granular data in future research.

Within cities, neighborhoods with significant Asian American or Asian American subgroup populations frequently had less desirable social determinant of health exposures and health outcomes.

City-level data that combines all AA subgroups into a single category would see measures of central tendency skewed by positive outliers in privileged AA communities. However, disaggregated geographic and subgroup data reveal that some subgroups living in specific neighborhoods are thriving, while other subgroups in different neighborhoods face substantial challenges. Furthermore, privileged members of AA subgroups may choose to settle in cities and neighborhoods that have positive SDH and health outcomes, further contributing to both the right-hand side skew of city-level data and to the concentration of desirable SDH and health outcomes in specific neighborhoods. This distinction underscores the importance of disaggregated data. When using city-level, aggregated Asian American data, it is accurate to say cities with a high proportion of AA residents perform as well as, or better than, cities with a high proportion of NHWs on many SDH and health outcomes. However, to the extent that more granular geographic and population data more accurately capture SDH and health outcomes, the present findings suggest that disaggregated data may more accurately capture public health conditions in places where AA subgroup members live.

Strengths and Limitations

This research has important strengths. Few published manuscripts have used population-level data to examine AA subgroup health disparities at the city and neighborhood level. The analyses described here utilized large, publicly available secondary datasets. The maps, available from the corresponding author and from the Dashboard, provide an important resource for public health practitioners and community-based organizations targeting interventions toward AAs and AA subgroup members.

This research also has limitations. These data are drawn from cross-sectional population-based surveys, so cannot produce causal inferences or inferences about individuals. Also, the SDH and health outcomes examined here are from the total population of cities or neighborhoods, not the AA/AA subgroup population within them. This could bias outcomes depending on the type and size of other population groups co-residing in the places in question. To that point, cities and neighborhoods that had significant AA/AA subgroup populations also had larger Hispanic and non-Hispanic Black populations than did cities and neighborhoods with significant NHW populations. This fits with our finding that cities and neighborhoods high in AAs were more racially diverse than cities and neighborhoods with significant NHW populations. Finally, some of the data sources utilized here gathered data in different years.

Conclusion

Our findings offer new insights into SDH and health outcome patterns where AAs/AA subgroup members live, suggesting some AA subgroups live in neighborhoods with poor health indicators that may adversely impact their own health. These health impacts may in

turn undermine the model minority myth. These findings underscore the importance of using granular geographic and demographic subgroup data in future research focused on AAs and AA subgroups.

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Conflict of Interest

No conflicts of interest to report.

Author Contributions

Research concept and design: Spoer, Thorpe, Gourevitch, Yi; Acquisition of data: Spoer, Hsieh, Thorpe; Data analysis and interpretation: Spoer, Juul, Hsieh, Thorpe, Gourevitch, Yi; Manuscript draft: Spoer, Juul, Hsieh, Thorpe, Gourevitch, Yi; Statistical expertise: Spoer, Juul, Hsieh, Thorpe, Yi; Acquisition of funding: Spoer, Thorpe, Gourevitch, Yi; Administrative; Spoer, Juul, Hsieh, Thorpe, Gourevitch; Supervision: Spoer, Thorpe, Gourevitch, Yi

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