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Assessing Structural Racism Measures on Health Outcomes of Asian Americans, Native Hawaiians, and Pacific Islanders: A Scoping Review

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Abstract

Background Limited literature exists on structural racism measures on health outcomes for Asian Americans, Native Hawaiians, and Pacific Islanders (AAs and NH/PIs). AAs and NH/PIs make up approximately 6.2% of the U.S. population and consist of diverse ethnic subgroups with distinct languages, cultures, religions, socioeconomic statuses, and historical backgrounds. The lack of disaggregated data collection and contextualized measures hinders our understanding of how structural racism affects health outcomes in these populations.

Methods We conducted a scoping review to assess the extent to which measures of structural racism are used in research with AAs and NH/PIs. Databases, including CINAHL, EBSCO, PsychINFO, PubMed, Scopus, and Social Science Citation Index, were searched for peer-reviewed articles on the measures of and empirical impacts of structural racism on AA and NH/PI health. We identified 23 full-text articles from a pool of 11,660 screened articles. Four articles were included in the final analysis.

Results Among the selected studies, two studies identified an association between racial segregation and mental and behavioral health outcomes within AAs and NH/PIs. The other two studies found redlining on chronic health outcomes in these communities. These studies uncovered associations between government systems and policies and AA and NH/PI health outcomes.

Discussion Existing measures may not adequately capture the complex relationships between structural racism and health outcomes in AAs and NH/PIs. Future research should contextualize and operationalize the multifaceted manifestations of structural racism unique to AAs and NH/PIs to achieve health equity.

Keywords Structural racism · Health outcomes · Asian Americans · Native Hawaiians · Pacific Islanders

Introduction

The legacy of deeply rooted and entrenched racism in the United States (U.S.) undeniably perpetuates economic, social, and health inequities for Black, Indigenous, and People of Color (BIPOC) communities. Reports of fatal police violence against Black and Brown individuals, as well as anti-Asian hate crimes, have significantly increased amidst the COVID-19 pandemic. These incidents have led to national and local protests condemning structural racism and igniting discourse among public health scholars on the role of structural racism in driving health inequities. While the definition of structural racism is not definitively agreed upon among public health scholars and has evolved since its conceptual introduction, Bailey et al.'s [1] definition is most widely regarded and accepted by academics. Structural racism, as defined by Bailey et al. [1], refers to

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"the totality of ways in which societies foster [racial] discrimination, via mutually reinforcing [inequitable systems… (e.g., in housing, education, employment, earnings, benefits, credit, media, health care, criminal justice, etc.)] that in turn, reinforce discriminatory beliefs, values, and distribution of resources, reflected in history, culture, and interconnected institutions" (p. 1455). Because the distribution of resources involving housing, education, employment, credit, criminal justice, and education is unequal among population segments (including racial/ethnic minorities), these patterns and practices reinforce social, political, and environmental conditions which lead to and perpetuate disported outcomes of health [1]. Just as the definition of structural racism is inconsistent and heterogeneous in the literature, so are its measurements. Examples of structural racism that have created racial inequities exist, such as racial residential segregation, discriminatory financial lending practices, and voting suppression. However, quantifying and operationalizing structural racism measures across populations are not agreed upon by public health scholars. Adding to the difficulty is the lack of disaggregated data by race and ethnicity and reporting of structural racism measures in medical and public health journals [2, 3]. The lack of standard measurement of structural racism poses challenges to addressing health inequities among BIPOC communities, as structural racism may manifest differently for racially minoritized groups, which the current measures may not appropriately capture. As emphasized by Dean and Thorpe [4], clear definitions of structural racism and methods of measuring structural racism are "imperative to conducting high-quality research on and dismantling [structural racism]" (p. 1522).

Several public health scholars have developed their own set of domains to measure structural racism in various studies. For instance, Lukachko et al.'s [5] seminal study examined structural racism and its association with an increased risk of myocardial infarction using ratio measures that compared Black and White populations in domains of political participation (i.e., registered to vote, voted, and state officials), employment and job status (i.e., civilian laborers, employed, executive or managerial positions, and professional specialties), educational attainment (i.e., bachelor's degree or higher), and judicial treatment (i.e., incarcerated, disenfranchised, and on death row). Wallace et al. [6] further contributed to the emerging field of structural racism measures by examining the relationship between structural racism and small-for-gestational-age birth. They used the domains and indicators of structural racism proposed by Lukachko et al. [5] and analyzed publicly available data. Additionally, Dougherty et al. [7] developed a five-domain scale to measure structural racism at the county level. This scale was used to evaluate the relationship between structural racism and body mass index among Black and White populations. Based on the National Research Council's discrimination framework, this scale of county structural racism (CRS) included housing (i.e., housing dissimilarity index), education (i.e., school dissimilarity index), employment (i.e., Black-White high school graduation ratio, Black-White poverty ratio), health care (i.e., Black-White primary care ratio, Black-White ambulatory care ratio), and criminal justice (i.e., Black-White incarceration ratio). Dougherty et al. [7] suggest that measures of Black-White CRS can be adapted for CRS in other racial and ethnic groups.

However, the burgeoning literature on measures of structural racism remains binary, concentrating on inequities between Black and White populations and neglecting the experiences of other racial groups. The exclusion of other racial populations implies that current measures of structural racism do not adequately capture the extent of structural racism in other racial groups with substantial heterogeneity in their ethnic subgroups. This is of particular concern for Asian Americans, Native Hawaiians, and Pacific Islanders (AAs and NH/PIs), two distinct racial populations that are frequently aggregated in federal, state, and local public health research. According to the U.S. Census, 24 million people identify as AAs and 1.6 million as NH/PIs, collectively constituting approximately 6.2% of the of U.S. population [8]. AAs and NH/PIs are often presented as a monolith. However, these groups are comprised of diverse ethnic subgroups, each with its distinct language, culture, religion, as well as socioeconomic status, and historical background [9, 10]. The importance of using appropriate measures of structural racism for this population must be understood within the context of AA experiences of racism in the U.S. Stereotypes such as yellow peril and the model minority perpetuate the contradicting valorization of AAs in that they are either a menace to society (e.g., bringing diseases and taking American jobs) or are to be a positive exemplar for other minorities (e.g., overachieving and being successful) [11, 12]. Asian American communities are seen as neither White nor Black, and some may even argue that members of this community are not a "minority" but rather the perpetual "foreigner" [11] and, thus, have been excluded from the Black-White discourse related to areas such as education [13, 14], research [15–17], and policy [13, 14]. For NH/PI communities, the legacies of colonialism on economic and civic disenfranchisement are clear [18].

In addition to being overlooked in the Black-White discourse, health outcome data for AA and NH/PIs are usually presented in the aggregate masking differences in health risks and disparate outcomes among diverse ethnic groups. For instance, Asian Americans bear a disproportionate burden of cancer compared to their White counterparts, with Korean Americans having the highest rate of stomach cancer [19] and Southeast Asian Americans having the highest rates of hepatocellular carcinoma (a primary risk factor for liver cancer) among all U.S. racial and ethnic groups

due to chronic hepatitis B virus infection rates [20]. These differences contribute to unique experiences of structural racism within each subgroup. Diversity among AAs and NH/PIs suggests that the current measures of structural racism such as education, incarceration, income, housing, and employment status may not be sufficient to fully capture the manifestation of structural racism in these communities. The paucity of research on sound measures for AAs and NH/PIs obscures understanding of how structural racism contributes to AA and NH/PI health disparities among these groups and impedes progress towards achieving health equity.

To our knowledge, a scoping review on the measures and impacts of structural racism on the health of AA and NH/PI populations has not been conducted. Accordingly, we aimed to conduct a scoping review of published literature to assess the extent to which measures of structural racism are used in research with AAs and NH/PIs. Moreover, we sought to understand which measures were used to assess the impacts of structural racism on AA and NH/PI health, and to assess if and how structural racism is appropriately measured for diverse AA and NH/PI communities, including its role in examining health disparities.

Methods

This review followed the scoping review methodology as outlined by Arksey and O'Malley [21]. Scoping reviews use a systematic approach to identify gaps in the existing literature and provide a broad overview of the research topic [22].

Search Strategy

The literature search was conducted in April 2022, following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses for Scoping Reviews (PRISMA-ScR) [23]. Databases including the Cumulative Index to Nursing and Allied Health Literature (CINAHL), EBSCO, PsychINFO, PubMed, Scopus, and Social Science Citation Index were searched for peer-reviewed articles that examined measures of and evaluated impacts of structural racism on the health of Asian American, Native Hawaiian, and Pacific Islander populations. For this review, along with structural racism, we included systemic racism and institutional racism in our keyword search of the existing literature. These terms are often used interchangeably, yet have contextual nuances [24] due to the ambiguous, unstandardized, and hodgepodge use of all three terms when applied to AA and NH/PI communities. Therefore, articles that examined the measures and impact of systemic racism and/or institutional racism on AA and NH/PI health were also included in the search. The measures of structural racism used as references to determine inclusion comprised of housing and neighborhood policies, segregation policies, immigration policies, socioeconomic discrimination, police brutality, criminal justice policies, and mass incarceration. The complete search string is available in the Appendix.

Inclusion and Exclusion Criteria

Studies included in the review had to meet the following inclusion criteria: (1) examined measures of structural racism; (2) include subgroups of Asian Americans, Native Hawaiians, or Pacific Islanders; (3) studies based in the U.S.; (4) peer-reviewed; (5) available in the English language; and (6) published before March 21, 2022. Gray literature, theses, dissertations, narratives, commentaries, reports, and essays were excluded. Reviews, including literature reviews, scoping reviews, and systematic reviews, were also excluded.

Review Process

The preliminary search of the databases identified 29,092 potentially relevant articles. After removing duplicate articles, 11,660 articles were found. Two independent reviewers (first and second authors) screened titles and abstracts using Covidence, a web-based, systematic review software (Veritas Health Innovation, Melbourne, Australia). Conflicts were resolved through consensus with input from a third reviewer (third author). Twenty-six ($n=26$) articles were included for full-text review. The full-text review resulted in four articles for the final thematic analysis.

Results

Figure 1, the PRISMA flowchart, illustrates the number of articles that were included and excluded at each stage of this review.

Table 1 reviews the studies included for data extraction. It includes two prospective cohort studies and two cross-sectional studies. The studies examined measures of structural racism related to housing systems in the U.S. These measures include residential segregation [25, 26] and redlining [27, 28]. These measures suggest that there are associations between government systems and policies and AA and NH/PI health outcomes. Two studies have specifically investigated the impact of structural racism on mental and behavioral health outcomes, including disparities in psychological distress [26] and mental health and distress [28]. The other two studies addressed chronic health outcomes, such as incident hypertension [25] and cardiovascular health [27].

The studies included in the review incorporated race and ethnicity in the following ways. Woo et al. used the National Latino and Asian American Study (NLAAS), a cross-sectional study conducted on the mental health of a nationally

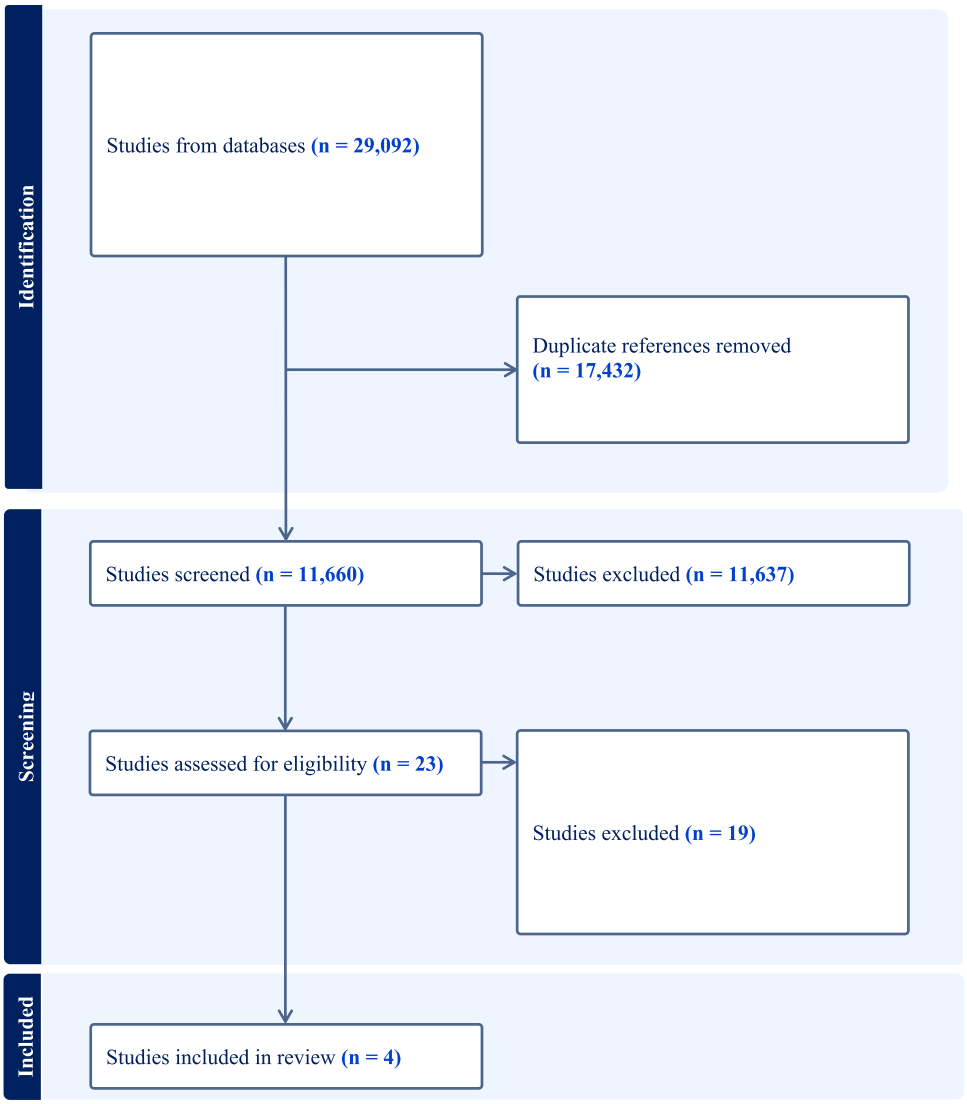

Fig. 1 PRISMA flow diagram

representative sample of Latinxs and Asians living in the U.S. Woo et al. also included a measure of nativity status (U.S.-born vs foreign-born). Gee used the data from the Chinese American Psychiatric Epidemiologic Study (CAPES), a population-based survey of Chinese Americans living in Los Angeles, CA, the 1990 census, and the 1995 Home Mortgage Disclosure Act (HMDA). Gee's study focused solely on Chinese Americans; thus, data were pulled for only Chinese in the census tract. Both Mujahid et al. and Gao et al. used data from the Multi-Ethnic Study of Atherosclerosis (MESA), a prospective study of individuals aged 45 to 84 years. The MESA study included only self-identified non-Hispanic Chinese participants.

Residential Segregation

Two articles [25, 26] examined the impact of residential segregation on health outcomes. Woo et al. analyzed the relationship between nativity status and mental and behavioral health outcomes among Asians by using a dissimilarity index. Woo et al. [26] examined the National Latino and Asian American Study (NLAAS) to describe residential segregation using two different dimensions: the evenness of groups (dissimilarity index) and exposure (interaction index). The study was based on self-reported racial identities of Asians and Latinx, separated by foreign-born vs. U.S.-born. The authors describe residential segregation as an uneven spatial distribution in different neighborhoods within a given area, evenness of groups (dissimilarity index) as the level of spatial distribution of different ethnic/racial groups neighborhoods, and exposure (interaction index) as the level of potential contact or interaction between minority and majority group members living in the same neighborhood. The authors found that lower rates of interaction among communities indicated higher rates of segregation. Woo et al. [26] concluded that racial residential

Table 1 Study characteristics including variables of interest ($n=4$)

Study (author, date)	Study design	Dataset	Sample description	Setting	Structural racism measure(s)	Health outcome measure(s)	Results
Gao et al., 2022	Prospective cohort	Multi-Ethnic Study of Atherosclerosis (MESA)	$n=1937$; Chinese Americans ($n=466$)	New York, New York; Baltimore, Maryland; Forsyth County, North Carolina; St. Paul, Minnesota; Chicago, Illinois; Los Angeles, California	Residential segregation: 1) Census tracts based on U.S. Census and American Community Survey data characterized the residential segregation status of neighborhoods 2) Neighborhood-level racial residential segregation is measured using the Getis-Ord Local Gi* statistic, based on the census tract of the geocoded addresses of MESA participants. Census tracts with Gi* statistics above 1.96 were categorized as segregated, while census tracts with Gi* statistics at or below 1.96 were categorized as nonsegregated 3) Racial residential segregation is defined as "the physical separation of the races in residential contexts," and systematically created through sociopolitical policies and economic programs such as mortgage redlining, urban renewal, and barriers to educational and economic opportunities	Incident hypertension	Over an average follow-up of 7.35 years, 48.1% Chinese American residents in segregated neighborhoods were more likely to develop hypertension relative to Chinese American residents in nonsegregated neighborhoods. However, this finding was not statistically significant

Table 1 (continued)

Study (author, date)	Study design	Dataset	Sample description	Setting	Structural racism measure(s)	Health outcome measure(s)	Results
Gee et al., 2002	Cross-sectional	Chinese American Psychiatric Epidemiologic Study (CAPES); 1990 Census; 1995 Home Mortgage Disclosure Act (HMDA)	($n = 1503$) Chinese Americans	Los Angeles, CA	Housing discrimination: 1) The dissimilarity index measured racial group segregation across neighborhoods via census tract characteristics (e.g., poverty percentages, median housing values). Index score from 0 to 100, with higher index scores indicating greater segregation of Chinese Americans within tracts 2) Redlined areas are defined as census tracts linked to HDMA data "… where Asian home mortgage loan applicants were disfavored by 40% in comparison with White applicants."	General health, mental health, and distress, measured by Global Severity Index (GSI) and Positive Symptom Total (PST)	Housing discrimination was found to be associated with better health outcomes. Redlining predicted better general health, better mental health, and lower distress levels among respondents who lived in redlined neighborhoods. Segregation marginally predicted lower psychological distress

Table 1 (continued)

Study (author, date)	Study design	Dataset	Sample description	Setting	Structural racism measure(s)	Health outcome measure(s)	Results
Woo et al., 2019	Cross-sectional	2022–2003 National Latino and Asian American Study (NLAAS)	U.S.-born Asians ($n=399$); foreign-born Asians ($n=1607$) Asian subgroups include Chinese, Vietnamese, Filipinos, and other Asians	27 states	Residential segregation 1) Evenness of groups (dissimilarity index) 2) Exposure (interaction index) Residential segregation describes uneven spatial distribution in different neighborhoods within a given area Evenness of groups (dissimilarity index) describes the level of spatial distribution of different ethnic/racial groups' neighborhoods Exposure (interaction index) describes the level of potential contact or interaction between minority and majority group members living the same neighborhood	Mental health (Kessler Psychological Distress Scale) Lower rates of interactions indicate higher rates of segregation	Racial residential segregation increases the psychological distress of racial discrimination among foreign-born Asians, but not U.S.-born Asians. Segregation functions as a protective factor for U.S-born Asians who have lower odds of psychological distress when segregated from Whites. Increased separation from non-Hispanic Whites decreases the odds of psychological distress among U.S.-born Asians due to fewer interaction with Whites and consequently less racial discrimination and better mental health. Authors conclude that residential desegregation would protect Asian immigrants from psychological distress and call for policies that promote residential desegregation for immigrants

Table 1 (continued)

Study (author, date)	Study design	Dataset	Sample description	Setting	Structural racism measure(s)	Health outcome measure(s)	Results
Mujahid et al., 2021	Prospective cohort	Multi-Ethnic Study of Atherosclerosis (MESA)	$n = 4779$; Chinese ($n = 634$)	Los Angeles, CA; New York City, NY; Chicago, IL; Saint Paul, MN; Minneapolis, MN; Winston-Salem, NC; Baltimore, MD	Redlining operationalized using Home Owners' Loan Corporation (HOLC) risk grades to show patterns of racial residential segregation, poverty, and income inequality	Cardiovascular health (overall CVH, health factors, cholesterol, fasting blood glucose, smoking, physical activity, diet, health behaviors, blood pressure, and BMI)	26% Chinese participants resided in historically redlined neighborhoods compared to 10.4% White participants. Chinese participants and White participants reside in the HOLC grade[a] A "best" neighborhoods. No association between HOLC grades and cardiovascular measures was found for Chinese participants

[a]HOLC grades (A: "Best;" B: "Still desirable;" C: "Declining;" D: "Hazardous")

segregation was positively associated with psychological distress caused by racial discrimination among foreign-born Asians (OR = 1.60, 95% CI 1.25, 2.05), but not U.S.-born Asians. Higher residential segregation increased the positive association between racial discrimination and psychological distress among foreign-born Asians (OR = 1.08, 95% CI 1.03,1.14) but not for U.S.-born Asians.

Gao et al. [25] identified a correlation between racial residential segregation and incident hypertension by examining residents living in urban areas using data from the MESA study. Gao et al. defined racial residential segregation as "the physical separation of the races in residential contexts." This separation is systematically created through sociopolitical policies and economic programs, such as mortgage redlining, urban renewal, and barriers to educational and economic opportunities. Neighborhood-level racial residential segregation was measured using the Getis-Ord Local Gi* statistic, based on the census tract from U.S. Census and American Community Survey data that characterized the residential segregation status of neighborhoods. Census tracts with Gi* statistics above 1.96 were categorized as segregated, while census tracts with Gi* statistics at or below 1.96 were categorized as nonsegregated.

Redlining

Two articles [27, 28] examined the impact of redlining, a measure of structural racism, on health outcomes. Mujahid et al.'s [27] study examined the impact of redlining on the risk of cardiovascular disease among minority populations, using data from the Multi-Ethnic Study of Atherosclerosis (MESA) study [29]. The authors describe redlining as a process used by the government to identify areas where high concentrations of Black, immigrant, and working-class communities reside by color coding and marking them as hazardous and unfavorable for investment. According to Mujahid et al., the practice of redlining was institutionalized in the federal Home Owners' Loan Corporation (HOLC) security maps which were used to grade neighborhood conditions and used to guide decisions related to mortgage financing. As a result, individuals residing in "undesirable" neighborhoods were prevented from obtaining mortgage financing and achieving home ownership. Mujahid et al. [27] found that a higher percentage of Chinese participants lived in historically redlined neighborhoods compared to their White counterparts. Study results showed that HOLC grades were not associated with cardiovascular health measures among Chinese participants. Gee [28] operationalized redlined areas based on home mortgage discrimination among Asian applicants, specifically Chinese Americans, based on data from the Home Mortgage Disclosure Act (HDMA). Results showed that living in redlined areas was a significant

predictor of improved general health status, including better mental health and lower distress, among Chinese Americans.

Discussion

The results of this scoping review found only four articles that address various dimensions of structural racism within and among AA and NH/PI communities. This relative paucity of literature suggests that there is a need for further inquiry and primary data collection to thoroughly examine the role of structural racism on health outcomes of AA and NH/PIs. This is particularly concerning, given the recent spate of anti-Asian American hate and the historical geopolitical relationship between the U.S. and NH/PI communities who have come under national jurisdiction. Our findings also confirm that there is a lack of consistency in collecting racial/ethnic data that uniformly disaggregates AA and NH/PI into important subgroup categories, as specified by the U.S. Office of Management and Budget (OMB) Statistical Policy Directive No. 15 (SPD 15): Standards for Maintaining, Collecting, and Presenting Federal Data on Race and Ethnicity. Data collection updates have only recently resurfaced to the forefront of federal priorities as indicated by the OMB Office of the Chief Statistician's call for comments on initial proposals, which include updating SPD 15's terminology, definitions, and question wording [30]. By intentionally collapsing these diverse communities into a singular category, the data masks unique key inequities in health and social indicators and conveys a depiction of homogeneity that is misleading at best, inaccurate at worst. This lack of disaggregation is a form of structural racism. It institutionalizes data collection in a manner that renders certain communities under the AA and NH/PI umbrella, invisible in terms of vulnerability, risk, and disparate health outcomes. As such, a primary recommendation is for all health and related entities to collect data in a manner consistent with the guidelines set forth by the OMB and in alignment with the U.S. Census.

Notwithstanding an obvious need for collection of disaggregated data, addressing data gaps in reporting has contributed to the lack of contextual measures investigating structural racism for diverse AA and NH/PI communities. Inconsistency in the measures used to describe structural racism contributes to the many challenges of characterizing the complex relationships between population-specific manifestations of structural racism and their impact on health. As put forth by Morey et al. [31], consistent collection of disaggregated data for communities, such as those comprising the NH/PI population, is necessary to address gaps in data collection, reduce oversampling, and avoid any aggregation in reporting. For instance, the White House has made federal recommendations to collect granular data among Asian Americans through the Office of Management and Budget's Directive 15 [32] whereas California requires public institutions of higher learning and the state's Department of Public Health and Department of Healthcare Services to disaggregate AA and NH/PI data into specific subgroups [33].

Accordingly, a relevant measure of structural racism for this population might assess legislative prescriptions regarding disaggregation, especially in regions where AA and NH/PI population size, density, and/or relative representation is known to be significant, and as a complementary measure, whether any mandates or recommendations are adhered to, especially by public agencies. For instance, ethnic enclaves are communities that form around a highly concentrated ethnic group within a larger society. While ethnic enclaves may provide benefits such as enhanced access to culturally tailored resources for community members' needs and improved health outcomes, other studies indicate mixed results [34]. For example, Mexican Americans living in barrios were found to have an elevated risk of cognitive impairment. However, studies examining the cognitive health of AA and NH/PI in ethnic enclaves are limited [35]. A study finding suggested that older Chinese immigrants residing in an ethnic enclave within Chinatown in Chicago were associated with poorer cognitive function and perceived greater social disorder in their surroundings [36]. Therefore, additional research is needed to assess the role that ethnic enclaves serve within AA and NH/PI populations. Without measures that are historically, socially, and culturally relevant, there continues to be a lack of compelling evidence to demonstrate the necessity and impact of policies written at the local, state, and federal levels to ensure equitable services are provided to AA and NH/PI communities. Incumbent to this effort is adequate representation of diverse AA and NH/PI scholars and practitioners in spheres of public health research, program planning, and policy-making efforts, with an emphasis on perspectives that are often excluded from studies that rely on aggregate data. A study examining the National Institutes of Health (NIH) funding trends over two decades showed that clinical research focused on AA and NH/PI participants made up only 0.17% of the total NIH budget further exacerbating the problem of underrepresentation of AA and NH/PI subgroups in research [17].

Measures of structural racism reported in this review were inconsistently defined and utilized, making it difficult to compare such studies with each other. While the measures used in the studies included in our review attempted to describe the direct impact of a specific construct on health, it was evident that each measure assessed a different concept within an overarching domain. For example, redlining and residential segregation were two different measures that attempted to examine the role of housing as a measure of structural racism. It is unclear how the health of various

communities of color, particularly AA and NH/PI communities, is being impacted by the broader definitions of measures used in studies of structural racism, such as redlining. For example, Mujahid et al. [27] identified historical redlining policies as an institutional antecedent of segregating Black and White Americans. However, the authors did not identify if this measure operated in a similar manner among other communities of color. In addition, the publications that were included in this scoping review included only Chinese Americans or immigrants, which reinforces the purpose of this review, which is to assess if and how structural racism is appropriately measured for diverse AA and NH/PI populations.

Throughout U.S. history, AA and NH/PI populations have experienced racism and discrimination, which have manifested differently across various subgroups. The model minority myth continues to dominate mainstream narratives, which portrays AA and NH/PIs as having achieved success in society solely through their merit despite facing discrimination. These harmful stereotypes continue to flourish under the umbrella of an AA/NH/PI monolith, which masks the impact of structural racism on these diverse communities and their health outcomes. Contesting this dominant portrayal, U.S. policies have targeted various Asian subgroups which were influenced by U.S. public sentiment and perception towards immigrants and communities of color. The history of U.S. colonization and immigration policies affecting Asian subgroups is the most evident indicator of how structural racism manifests for these groups. Although not a comprehensive list, several examples illustrate the policies that affected Filipinos, Chinese, South Asians inclusive of Indian Americans, and Japanese Americans. For example, the U.S. occupied the Philippines after the Spanish-American War until the Philippines gained independence in 1946 [37]. Furthermore, the Chinese Exclusion Act of 1882 was the first federal law to specifically target an ethnic group and restrict U.S. immigration. In 1923, the Supreme Court denied Indian Americans eligibility for citizenship in the case of *United States v. Bhagat Singh Thind* [38]. During World War II, in 1942, Executive Order 9066 forcibly removed over 110,000 Japanese Americans into large-scale concentration camps, effectively imprisoning Japanese citizens solely based on their ancestry [39]. Similarly, xenophobic rhetoric has disproportionately impacted racialized populations, specifically South Asians, Arabs, and Muslims in the U.S. post-September 11 [40]. In response to the terrorist attack on 9/11, the U.S. implemented anti-immigration policies targeting and detaining nonimmigrant South Asian, Arab, and Muslim individuals without charge [40]. Recent heightened immigration enforcement and rising deportation rates have resulted in negative impacts on health [41]. Immigration policies have consequences on access to health care access and the quality of care individuals receive, which further drives health inequities among immigrant populations [41, 42]. For NH/PI communities, it has been posited that policies resulting in overrepresentation in the military and carceral system are related to adverse outcomes; however, no specific measures have been used to assess this relationship [18]. The measures of structural racism identified in this review did not assess domains of immigration, government surveillance, or curtailment of liberties and their relationship with persistent disparities among specific AA and NH/PI communities. To fully understand the impact of structural racism on AA and NH/PI communities, it is essential to consider the legacy of U.S. colonization and immigration policies and its link to driving health disparities in these populations.

As noted, AA and NH/PI are vastly diverse, both culturally and linguistically. As such, another potential measure of structural racism to further be explored is language access. There are marked differences in English fluency among AA and NH/PIs. More than half (51% including 71% of Asian adults) are foreign-born, and only 57% of those who are foreign-born are proficient in English [43]. Limited English proficiency impacts health outcomes and the quality of patient-provider communication, decreased use of preventive services, lack of medical follow-up, and higher rates of hospitalization [44]. Language access is comprised of policies that require healthcare organizations to provide patients access to written, verbal, or visual materials or services in their preferred language [45, 46], for example, providing services to patients with limited English proficiency, including qualified interpreters and written translations. Not only is language access essential to individuals with limited English proficiency to access and receive quality care, it is also the law.

Limitations

This study had some notable limitations. The articles included in our review were restricted to those written in English and conducted only in the U.S. Our focus was primarily on AA and NH/PIs in the U.S., which may limit our understanding of the association of structural racism and AA and NH/PI health in other geopolitical contexts. In addition, despite a thorough systematic search of the literature, we may have missed articles that were relevant to our review which were not included.

Conclusion

In summary, this scoping review is the first to our knowledge to review structural racism measures as related to health outcomes specifically for Asian Americans, Native Hawaiians,

and Pacific Islanders in the U.S. Although there is a paucity of literature on this subject, our study provides evidence to support further investigation of structural racism on AA and NH/PI health. Greater attention is needed to investigate how structural, systemic, and institutional racism affect AA and NH/PI populations and apply concrete measures of these forms of racism specific to the contexts and lived experiences of AA and NH/PI populations.

Appendix

The complete search string was conducted with the following keywords:

- Structural Racism, Institutional Racism, Systematic Racism.
- Asian American, Native Hawaiian, Pacific Islander, Chinese, South Asian, Asian Indian, Filipinos/x, Korean, Vietnamese, Hmong, Japanese, Cambodian, Southeast Asian, Bruneian, Burmese, Cambodian, Filipino, Hmong, Indonesian, Laotian, Malaysian, Mien, Singaporean, Timorese, Thai, Vietnamese, South Asian, Bangladeshi, Bhutanese, Indian, Maldivians, Nepali (Nepalese), Pakistani, Sri Lankan, East Asian, Chinese, Japanese, Korean, Okinawan, Taiwanese, Tibetan, Carolinian, Chamorro, Chuukese, Fijian, Guamanian, Hawaiian, Kosraean, Marshallese, Native Hawaiian, Niuean, Palauan, Pohnpeian, Papua New Guinean, Samoan, Tokelauan, Tongan, Yapese.

  The two groups were combined using "AND." Within each group, the keywords were combined using "OR."

Author Contribution All authors contributed to the study conception and design. Material preparation, data collection, and analysis were performed by PR, CC, SC, AM, and JK. All authors contributed to the first draft of the manuscript and edited subsequent versions of the manuscript. All authors read and approved the final manuscript.

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Code Availability Not applicable.

Declarations

Ethics Approval Not applicable.

Consent to Participate Not applicable.

Consent for Publication Not applicable.

Competing Interests The authors declare no competing interests.

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