# Racial Differences in Social Determinants of Health and Outcomes Among Hispanic/Latino Persons with HIV—United States, 2015–2020

Mabel Padilla[1,2] · Ruth E. Luna-Gierke[1] · Tamara Carree[3] · Mariana Gutierrez[1] · Xin Yuan[3] · Sharoda Dasgupta[1]

## Abstract

**Background** Hispanic/Latino people with HIV (PWH) experience disparities in health outcomes compared with other racial and ethnic groups. Disaggregated data based on race for Hispanic/Latino PWH in the United States are rarely reported, potentially masking inequities.

**Methods** The Medical Monitoring Project (MMP) is a complex sample survey of adults with diagnosed HIV. We used weighted interview and medical record data collected from June 2015–May 2021 to examine differences in social determinants of health (SDH) and health outcomes by self-reported race among Hispanic/Latino adults with diagnosed HIV.

**Results** Compared with White Hispanic/Latino PWH, Black Hispanic/Latino PWH were more likely to be unemployed (PR, 1.4; CI, 1.2–1.8), have a disability (PR, 1.3; CI, 1.2–1.5), have experienced homelessness (PR, 1.8; CI, 1.2–2.6), and have been incarcerated (PR, 2.6; CI, 1.5–4.5). American Indian/Alaska Native (AI/AN) (PR, 1.8; CI, 1.1–2.7) and multiracial (PR, 2.0; CI, 1.4–2.9) Hispanic/Latino PWH were more likely to have experienced homelessness than White Hispanic/Latino PWH. Black (PR, 1.3; CI, 1.2–1.5) and multiracial (PR, 1.2; CI, 1.1–1.5) Hispanic/Latino PWH were more likely to be virally unsuppressed than White Hispanic/Latino PWH.

**Conclusion** Black, multiracial, and AI/AN Hispanic/Latino PWH experience disparities in SDH and HIV outcomes. Lumping Hispanic/Latino people into one racial and ethnic category obscures health disparities, which might limit our progress towards reaching national HIV goals. Future studies should consider disaggregating by other factors such as Hispanic origin, place of birth, immigration status, and primary language. Doing so recognizes the diversity of the Hispanic/Latino population.

**Keywords** HIV · Social determinants of health · Race and ethnicity · Hispanic/Latino

## Introduction

The federal government defines "Hispanic or Latino" as "persons of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin regardless of race. [1]" The terms "Hispanic" and "Latino" are relatively new: the federal government first used the term "Hispanic" in 1980 and introduced the term "Latino" into the United States census in 1997 [2, 3]. Thus, people with

diverse and distinct national origins, cultures, and histories were lumped into one group for policy making purposes. "Latino" and "Hispanic" are often used interchangeably though nuanced differences exist. For instance, "Hispanic" may refer to people in the Americas and Spain who speak Spanish or descend from Spanish-speaking communities while "Latino" may refer to ancestry in Latin American countries [4]. Despite their differences, the terms "Hispanic" and "Latino" were given meaning in the United States. Thus, the Hispanic/Latino ethnic identity was constructed socially and historically. Furthermore, race is also a socially constructed category with no biological or genetic basis. As an example, in the 1930 United States census, "Mexican" was listed as a race. Further, since 1790, the U.S. Census racial categories have changed in every decade [5, 6]. Today, "Hispanic/Latino" is considered an ethnicity, and not a race. Despite this, many studies reporting racial and ethnic data will include "Hispanic/Latino" alongside the other racial

✉ Mabel Padilla
  mpadilla@cdc.gov

1   Division of HIV Prevention, Centers for Disease Control and Prevention, Atlanta, GA, USA

2   DHAP/NCHHSTP/CDC, 1600 Clifton Road NE MS E-46, Atlanta, GA 30333, USA

3   DLH Corporation, Atlanta, GA, USA

categories that are part of the federal data collection standard (e.g., Black, White, Asian). In the United States, as in other societies, race and ethnicity can affect many aspects of a person's life, including their health [7].

In 2020, of all adults and adolescents with diagnosed HIV in the United States, 27% were Hispanic/Latino persons [8]. In 2019, the percentage of Hispanic/Latino persons who received HIV medical care, were retained in care, and were virally suppressed was lower than among non-Hispanic White persons [9]. The National HIV/AIDS Strategy aims to reduce HIV-related disparities and inequities and recognizes the importance of addressing social and structural drivers of health among populations disproportionally affected by HIV, including Hispanic/Latino persons [10].

Hispanic/Latino persons have differing life experiences based on factors like race, primary language, and place of birth. Reports on Hispanic/Latino PWH in the United States rarely disaggregate data according to these factors, potentially masking inequities. Furthermore, few studies report differences in health determinants and outcomes by race. One study found that Black Hispanic/Latino men had a greater HIV prevalence than White Hispanic/Latino men and another study found that Black Hispanic/Latino PWH had an increased mortality risk compared with White Hispanic/Latino PWH [11, 12]. In another study, there were no differences in retention in care between Black and White Hispanic/Latino PWH [13]. These studies have their limitations, including being typically conducted in one city and only including Black and White Hispanic/Latino PWH. To our knowledge, differences in social determinants of health (SDH) and clinical outcomes by race of Hispanic/Latino PWH in the United States have not been assessed using recent, nationally representative data.

According to the National Commission to Transform Public Health Data Systems, collecting granular data across groups (including racial and ethnic groups) that can be aggregated and disaggregated and reporting these data is key to achieving health equity [14]. Our main objective was to disaggregate ethnicity data by race to understand the experiences of Hispanic/Latino PWH more fully. Specifically, we examined differences in demographic characteristics, SDH, and clinical outcomes among Hispanic/Latino PWH, by self-reported race using HIV surveillance data from a national probability sample. Race is considered a proxy measure for social stratification and experiences of racism, which affects the inequitable distribution of resources, contributing to health disparities [15]. Hispanic/Latino people are racially diverse and may have different experiences based on (self-identified or socially ascribed) race. In examining differences in SDH and clinical outcomes among Hispanic/Latino PWH by race, we hope to elucidate disparities that otherwise remain hidden when Hispanic/Latino PWH are analyzed as a monolith. Our approach is crucial for identifying and addressing health disparities among Hispanic/Latino PWH and is an important step towards describing Hispanic/Latino persons using characteristics reflecting their diversity. It is also an important step towards assessing whether the pan-ethnic label of Hispanic/Latino meaningfully groups people according to shared experiences based on race and ethnicity.

## Methods

The Medical Monitoring Project (MMP) is an annual cross-sectional survey designed to produce nationally representative estimates of behavioral and clinical characteristics of adults with diagnosed HIV in the United States. MMP methods are described in detail elsewhere [16]. Briefly, MMP used a two-stage sampling method. First, 16 states and one territory were sampled from U.S. states, the District of Columbia, and Puerto Rico. Then, simple random samples of persons with diagnosed HIV aged ≥ 18 years were drawn for each participating state or territory from the National HIV Surveillance System (NHSS), a census of persons with diagnosed HIV in the United States. Health department staff in participating project areas located and recruited sampled persons using information in their local health department NHSSS records and other sources available [16]. Health department staff recruited people through a combination of phone, text messaging, mail, and in person contact attempts.

We included data from the 2015–2020 MMP cycles. Data collection—via phone or in-person interviews and medical record abstractions—began in June of each cycle until the following May. Bilingual staff or interpreters interviewed monolingual Spanish speakers using a Spanish-translated questionnaire. Data were weighted based on known probabilities of selection at state/territory and person levels. Additionally, data were weighted to adjust for person nonresponse and post-stratified to known population totals by age, race, ethnicity, and sex at birth from NHSS [16].

MMP data collection is part of routine public health surveillance and thus determined to be non-research. Participating jurisdictions obtained local institutional review board approval to collect data, when required. Informed consent was obtained from all participants.

### Measures

Participants were asked "Do you consider yourself to be of Hispanic, Latino/a, or Spanish origin?" and "Which racial group or groups do you consider yourself to be in? You may choose more than one option." The response options were based on OMB Directive No. 15: American Indian or Alaska Native (AI/AN), Asian, Black or African American (Black), Native Hawaiian or other Pacific Islander, or White [17]. We categorized Hispanic/Latino participants as White if they

reported being White and said "no" to all other races. We categorized Black and AI/AN Hispanic/Latino persons similarly. We categorized participants who reported ≥ 2 races as multiracial. Participants who answered "no" to all races, refused to identify with any race, or had some combination of these were classified as "race not selected." Final racial identity categories among Hispanic/Latino people for this analysis included White, Black, AI/AN, multiracial, and race not selected.

Participants who spoke a language other than English at home and spoke English less than "very well" were classified as having limited English proficiency (LEP). Participants residing in Puerto Rico at the time of interview were excluded from the LEP analysis because English is not the primary language there. Participants were asked about country or territory of birth. Participants born in Puerto Rico were classified as not born in the United States for this analysis since cultural conceptions of race in Puerto Rico are different from those in the continental United States [18]. We asked participants to report their Hispanic/Latino origin, allowing for > 1 category: Mexican, Mexican American or Chicano/a; Puerto Rican; Cuban; or another Hispanic, Latino/a, or Spanish origin. We categorized participants who selected multiple Hispanic origins as "another Hispanic, Latino/a, or Spanish origin(s)."

We asked participants with ≥ 1 HIV care visit in the past 12 months if they experienced health care discrimination using an adapted version of a validated scale [19]. Participants who reported experiencing ≥ 1 form of discrimination were categorized as having experienced discrimination. Unmet need for ancillary services was defined as needing, but not receiving, ≥ 1 services that support positive health outcomes (e.g., HIV case management, mental health counseling) [20]. Antiretroviral therapy (ART) adherence was defined as not missing any doses during the past 30 days. Sustained viral suppression was defined as all documented viral loads as undetectable or < 200 copies/mL during the past 12 months.

Data on demographic characteristics (e.g., gender, age, country of birth) and SDH (e.g., health insurance, employment, incarceration) were obtained from the interview. Percentage of the federal poverty level (FPL) was based on the participant's household income during the prior calendar year. Clinical data on ART prescription and sustained viral suppression were abstracted from participants' medical records for the year prior to interview. All measures were based on the past 12 months unless otherwise indicated.

### Data Analysis

We limited this analysis to Hispanic/Latino participants who identified as White, Black, AI/AN, multiracial, or did not select a race (n = 5,181). Asian and Native Hawaiian, or other Pacific Islander participants were excluded based on small sample sizes (n = 45, 0.7%). We reported weighted percentages with 95% confidence intervals (CIs) for all characteristics, and calculated prevalence ratios with predicted marginal means to quantify differences by race ($P < 0.05$ considered significant). We performed all analyses using SAS survey procedures and SAS-callable SUDAAN.

## Results

Sixty-five percent of Hispanic/Latino PWH identified as White, 13% as Black, 9% as multiracial, and 4% as AI/AN. Ten percent did not select a race. Compared with White Hispanic/Latino PWH, Black (PR, 0.5; CI, 0.4–0.6) and multiracial (PR, 0.7; CI, 0.6–0.8) Hispanic/Latino PWH were less likely to have LEP while PWH who did not select a race were more likely to have LEP (PR, 1.2; CI, 1.1–1.4). AI/AN Hispanic Latino PWH were the only racial group more likely to be born in the United States (PR, 1.7; CI, 1.4–1.9) compared with White Hispanic/Latino PWH. On the other hand, PWH who did not select a race were less likely to be born in the United States (PR, 0.7; CI, 0.5–0.8) compared with White Hispanic/Latino PWH. Black (PR, 2.0; CI, 1.8–2.3) and multiracial (PR, 1.8; CI, 1.4–2.2) Hispanic/Latino PWH were more likely to be born in Puerto Rico than White Hispanic/Latino PWH.

Black Hispanic/Latino PWH (PR, 2.3; CI, 2.0–2.7) were more likely to identify as Puerto Rican, AI/AN Hispanic/Latino PWH were more likely to identify as Mexican or Chicano (PR, 1.3; CI, 1.1–1.6), and multiracial Hispanic/Latino PWH were more likely to identify as another Hispanic/Latino origin (PR, 1.3; CI, 1.2–1.5) than White Hispanic/Latino PWH. No AI/AN Hispanic/Latino PWH identified as Cuban (Table 1).

Demographic characteristics and SDH among Hispanic/Latino PWH varied by race. Black Hispanic/Latino PWH were more likely than White Hispanic/Latino PWH to be female (PR, 1.6; CI, 1.4–1.8), 18–29 years old (PR, 1.8; CI, 1.3–2.5), and unemployed (PR, 1.4; CI, 1.2–1.8). Black Hispanic/Latino PWH were also more likely to live in households with incomes that were < 100% of the FPL (PR, 1.4; CI, 1.3–1.6), have any disability (PR, 1.3; CI, 1.2–1.5), have experienced homelessness (PR, 1.8; CI, 1.2–2.6), and to have been incarcerated in the past 12 months (PR, 2.6; CI, 1.5–4.5), than White Hispanics/Latino PWH. AI/AN Hispanic/Latino PWH were more likely than White Hispanic/Latino PWH to have less than a high school education (PR, 1.4; CI, 1.1–1.7) and to have experienced homelessness (PR, 1.8; CI, 1.1–2.7). Multiracial Hispanic/Latino PWH were more likely than White Hispanic/Latino PWH to live in households with incomes that were < 100% of the FPL (PR, 1.3; CI, 1.2–1.5), have any disability (PR, 1.3; CI, 1.2–1.4)

**Table 1** English proficiency, country of birth, and Hispanic/Latino origin among Hispanics/Latino adults with diagnosed HIV, by race—United States, 2015–2020 (N = 5.181)

| | White[a] | | | | Black | | | | American Indian/Alaska Native | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | n[b] | % (95% CI)[c] | PR (95% CI) | p-value | n[b] | % (95% CI)[c] | PR (95% CI) | p-value | n[b] | % (95% CI)[c] | PR (95% CI) | p-value |
| Total | 3,276 | 64.5 | | | 674 | 12.7 | | | 181 | 3.6 | | |
| **Limited English proficiency[d]** | | | | | | | | | | | | |
| Yes | 1,209 | 43.3 (40.9–45.8) | 0.5 (0.4–0.6) | <0.01 | 94 | 20.6 (16.5–24.8) | 0.7 (0.6–0.8) | <0.01 | 67 | 34.6 (26.8–42.5) | 0.8 (0.6–1.0) | 0.04 |
| No | 1,570 | 56.7 (54.2–59.1) | — | — | 345 | 79.4 (75.2–83.5) | — | — | 112 | 65.4 (57.5–73.2) | — | — |
| **Born inside the U.S.[e]** | | | | | | | | | | | | |
| Yes | 1,146 | 37.5 (34.1–40.8) | 1.3 (1.0–1.6) | 0.05 | 301 | 47.7 (35.5–59.9) | 1.2 (1.0–1.4) | 0.06 | 103 | 62.7 (54.8–70.6) | 1.7 (1.4–1.9) | 0.00 |
| No, born in Puerto Rico | 690 | 17.5 (10.3–24.7) | 2.0 (1.8–2.3) | 0.00 | 256 | 35.6 (21.6–49.6) | 1.8 (1.4–2.2) | 0.00 | 15 | 6.7 (3–10.3) | 0.4 (0.2–0.7) | 0.01 |
| No, born outside the U.S. or Puerto Rico | 1,410 | 45.0 (40.1–50) | 0.4 (0.3–0.5) | 0.00 | 113 | 16.7 (12.8–20.5) | 0.5 (0.4–0.6) | 0.00 | 63 | 30.7 (23.2–38.1) | 0.7 (0.5–0.9) | 0.00 |
| **Country or region of birth** | | | | | | | | | | | | |
| United States | 1,146 | 37.5 (34.1–40.8) | 1.3 (1.0–1.6) | 0.05 | 301 | 47.7 (35.5–59.9) | 1.3 (1.0–1.6) | 0.05 | 103 | 62.7 (54.8–70.6) | 1.7 (1.4–1.9) | <0.01 |
| Puerto Rico | 690 | 17.5 (10.3–24.7) | 2.0 (1.8–2.3) | <0.01 | 256 | 35.6 (21.6–49.6) | 2.0 (1.8–2.3) | <0.01 | 15 | 6.7 (3.0–10.3) | 0.4 (0.2–0.7) | 0.01 |
| Mexico | 719 | 23.3 (20.0–26.6) | — | — | — | — | — | — | 41 | 19.5 (13.1–25.8) | 0.8 (0.6–1.2) | 0.27 |
| Central America | 265 | 8.4 (6.9–9.9) | 0.4 (0.2–0.6) | <0.01 | 22 | 3.1 (1.4–4.7) | 0.4 (0.2–0.6) | <0.01 | — | — | — | — |
| South America | 262 | 8.0 (6.7–9.3) | — | — | — | — | — | — | — | — | — | — |
| Caribbean (excludes Puerto Rico) | 136 | 4.4 (3.5–5.3) | 2.5 (1.8–3.4) | <0.01 | 74 | 11.0 (8.3–13.7) | 2.5 (1.8–3.4) | <0.01 | — | — | — | — |
| Another country or region | 28 | 0.9 (0.5–1.3) | — | — | — | — | — | — | 0 | 0 | — | — |
| **Hispanic origin** | | | | | | | | | | | | |
| Mexican or Chicano | 1,247 | 43.0 (38.2–47.9) | 0.1 (0.1–0.2) | <0.01 | 32 | 5.1 (2.6–7.5) | 0.1 (0.1–0.2) | <0.01 | 100 | 56.9 (48.3–65.6) | 1.3 (1.1–1.6) | 0.01 |
| Puerto Rican | 1,008 | 26.9 (20.2–33.5) | 2.3 (2.0–2.7) | <0.01 | 418 | 61.9 (54.1–69.8) | 2.3 (2.0–2.7) | <0.01 | 34 | 16.8 (11.0–22.5) | 0.6 (0.4–0.9) | 0.02 |
| Cuban | 116 | 3.8 (3.0–4.7) | 1.2 (0.7–1.9) | 0.58 | 28 | 4.5 (2.2–6.7) | 1.2 (0.7–1.9) | 0.58 | 0 | 0 | — | — |
| Another or multiple Hispanic origins[f] | 846 | 26.3 (23.6–28.9) | 1.1 (0.9–1.3) | 0.35 | 185 | 28.6 (22.9–34.2) | 1.1 (0.9–1.3) | 0.35 | 44 | 26.3 (18.1–34.5) | 1.0 (0.7–1.4) | 1.0 |

| | Multiracial | | | | Race not selected | | | |
|---|---|---|---|---|---|---|---|---|
| | n[b] | % (95% CI)[c] | PR (95% CI) | p-value | n[b] | % (95% CI)[c] | PR (95% CI) | p-value |
| Total | 533 | 9.4 | | | 517 | 9.8 | | |
| **Limited English proficiency[d]** | | | | | | | | |
| Yes | 122 | 29.7 (24.6–34.9) | 0.7 (0.6–0.8) | <0.01 | 197 | 53.3 (47.0–59.5) | 1.2 (1.1–1.4) | <0.01 |
| No | 257 | 70.3 (65.1–75.4) | — | — | 174 | 46.7 (40.5–53.0) | — | — |
| **Born inside the U.S.[e]** | | | | | | | | |
| Yes | 214 | 45.4 (35.3–55.4) | 1.2 (1.0–1.4) | 0.06 | 126 | 25.2 (18.9–31.4) | 0.7 (0.5–0.8) | 0.00 |
| No, born in Puerto Rico | 187 | 31.2 (17.8–44.7) | 1.8 (1.4–2.2) | 0.00 | 170 | 31.9 (18.6–45.2) | 1.8 (1.5–2.2) | 0.00 |
| No, born outside the U.S. or Puerto Rico | 129 | 23.4 (17.7–29.1) | 0.5 (0.4–0.6) | 0.00 | 219 | 42.9 (33.1–52.7) | 1.0 (0.8–1.1) | 0.56 |
| **Country or region of birth** | | | | | | | | |
| United States | 214 | 45.4 (35.3–55.4) | 1.2 (1.0–1.4) | 0.06 | 126 | 25.2 (18.9–31.4) | 0.7 (0.5–0.8) | <0.01 |
| Puerto Rico | 187 | 31.2 (17.8–44.7) | 1.8 (1.4–2.2) | <0.01 | 170 | 31.9 (18.6–45.2) | 1.8 (1.5–2.2) | <0.01 |

**Table 1** (continued)

|  | Multiracial | | | | Race not selected | | | |
|---|---|---|---|---|---|---|---|---|
|  | n[b] | % (95% CI)[c] | PR (95% CI) | p-value | n[b] | % (95% CI)[c] | PR (95% CI) | p-value |
| Mexico | 32 | 5.4 (3.1–7.7) | 0.2 (0.2–0.3) | <0.01 | 123 | 23.8 (17.4–30.2) | 1.0 (0.8–1.3) | 0.87 |
| Central America | 20 | 3.7 (1.9–5.5) | 0.4 (0.3–0.7) | <0.01 | 40 | 7.8 (4.2–11.3) | 0.9 (0.6–1.4) | 0.71 |
| South America | 29 | 5.5 (3.1–7.9) | 0.7 (0.4–1.0) | 0.04 | 22 | 4.7 (2.0–7.3) | 0.6 (0.3–1.0) | 0.02 |
| Caribbean (excludes Puerto Rico) | 41 | 7.5 (5–10) | 1.7 (1.2–2.5) | 0.02 | 33 | 6.5 (4.2–8.9) | 1.5 (1.0–2.2) | 0.08 |
| Another country or region | — | — | — | — | — | — | — | — |
| Hispanic origin |  |  |  |  |  |  |  |  |
| Mexican or Chicano | 97 | 20.0 (14.3–25.6) | 0.5 (0.4–0.6) | <0.01 | 161 | 34.1 (25.7–42.5) | 0.8 (0.7–1.0) | 0.01 |
| Puerto Rican | 223 | 42.2 (33.5–51) | 1.6 (1.3–1.8) | 0.01 | 210 | 39.7 (27.7–51.8) | 1.5 (1.3–1.7) | <0.01 |
| Cuban | — | — | — | — | 0 | 0 | — | — |
| Another or multiple Hispanic origins[f] | 192 | 35.1 (29.8–40.3) | 1.3 (1.2–1.5) | <0.01 | 138 | 26.2 (20.0–32.4) | 1.0 (0.8–1.2) | 1.0 |

Abbreviations: *CI* Confidence interval; *PR* Prevalence ratio

Note: Estimates with a coefficient of variation (CV) ≥ 0.30 were considered to be unstable and were therefore suppressed. Estimates of 0% should be interpreted with caution

[a] White is the referent category

[b] Numbers are unweighted

[c] Percentages are weighted column percentages and CIs incorporate weighted percentages

[d] People who spoke a language other than English at home and spoke English less than "very well." Excludes people currently residing in Puerto Rico because English is not the primary language there

[e] People born in Puerto Rico were classified as being born outside the U.S. for the purpose of this analysis since cultural conceptions of race in Puerto Rico vary from those in U.S. states

[f] Selected "another Hispanic, Latino/a, or Spanish origin" or multiple Hispanic/Latino, or Spanish origins (e.g., Mexican, Puerto Rican, Cuban)

and have experienced homelessness (PR, 2.0; CI, 1.4–2.9). Hispanic/Latino PWH who did not select a race were more likely than White Hispanic/Latinos PWH to have less than a high school education (PR, 1.3; CI, 1.1–1.5) (Table 2).

Compared with White Hispanic/Latino PWH, AI/AN (PR, 1.6; CI, 1.3–2.0) and Black (PR, 1.3; CI, 1.1–1.5) Hispanic/Latino PWH were more likely to have missed ≥ 1 HIV care appointments in the past 12 months. Black (PR, 1.3; CI, 1.1–1.6) and multiracial (PR, 1.4; CI, 1.1–1.7) Hispanic/ Latino PWH were more likely to have experienced discrimination in an HIV care facility and have an unmet need for ancillary services (PR, 1.2; CI, 1.1–1.4 and PR, 1.3; CI, 1.1–1.5, respectively) than White Hispanic/Latino PWH. Black (PR, 1.2; CI, 1.1–1.3) and AI/AN (PR, 1.2; CI, 1.1 – 1.4) PWH were more likely to not be adherent to antiretroviral therapy than White Hispanic/Latino PWH. Black (PR, 1.3; CI, 1.2–1.5) and multiracial (PR, 1.2; CI, 1.1–1.5) Hispanic/Latino PWH were more likely to be virally unsuppressed than White Hispanic/Latino PWH. We found no differences in prescription of ART, currently taking ART, and stage 3 classification (AIDS) by race (Table 3).

## Discussion

Our results demonstrate that Hispanic/Latino PWH in the United States are not a monolith and have diverse backgrounds and health care experiences. Health disparities remain hidden when Hispanic/Latino PWH are placed into one racial and ethnic category that disregards differences in racial identity.

Our results show the diverse backgrounds and experiences of Hispanic/Latino PWH regarding English proficiency, country of birth, and Hispanic origin. About one in five Black Hispanic/Latino PWH had LEP, compared with over half of Hispanic/Latino PWH who did not select a race. Black and multiracial Hispanic/Latino PWH were more likely to be born in Puerto Rico, and Black Hispanic/ Latino PWH were more likely to identify as Puerto Rican than White Hispanic/Latino PWH. Natural disasters, and dire political and socioeconomic conditions have created a precarious public health environment in Puerto Rico [21]. For instance, after Hurricanes Irma and Maria, Puerto Rico's power grid, communications infrastructure, and water treatment plants were damaged, which had downstream effects on people's physical and emotional health and SDH, such as poverty, unstable housing, and unemployment [22, 23]. Future studies should examine differences in SDH and health outcomes of Puerto Rican PWH in Puerto Rico and Puerto Rican PWH living in the United States. It is also important to intervene on the structural factors that have led to inadequate SDH in Puerto Rico.

AI/AN Hispanic/Latino PWH were more likely to identify as Mexican or Chicano and more likely to have been born in the United States compared with White Hispanic/ Latino PWH. In fact, 63% of AI/AN Hispanic/Latino PWH were born in the United States. PWH who did not identify with any race were less likely to have been born in the United States than White Hispanic/Latino PWH. One study found that non-U.S. born Hispanic/Latino PWH were more likely to be virally suppressed than Hispanic/Latino PWH born in the 50 U.S. states or the District of Columbia [24]. However, other studies have found mixed results in associations between birth country and viral suppression [25, 26]. Another study found greater disparities when comparing U.S-born Black and White Hispanic/Latinos than non-US-born Black and White Hispanic/Latinos [12]. Researchers have posited that while non-U.S. born Hispanic/Latinos are still racialized in their birth countries, there may be a distinct form and expression of racialization and discrimination in the United States that exerts an often-negative effect on the health of Hispanic/Latino once in the United States [27, 28]. Future studies should examine how place of birth and race affect the health of Hispanic/Latino persons.

Black, AI/AN, and multiracial Hispanic/Latino PWH experienced substantial disparities in SDH compared with White Hispanics/Latino PWH. Our findings support those found in the literature. For instance, more Black than White Hispanic/Latino PWH lived in poverty; and Black Hispanic/ Latino PWH were more likely to be unemployed than White Hispanic/Latino PWH [12, 13]. Another study found that the effect of poverty on mortality risk was stronger for Black than White Hispanic/Latino PWH [12]. We are not aware of studies that have compared SDH among AI/AN or multiracial and White Hispanic/Latino PWH. We found that more AI/AN and multiracial than White Hispanic/Latino PWH experienced homelessness. AI/AN populations are disproportionately affected by homelessness and the SDH that are associated with it [29].

The prevalence of disability was higher among Black and multiracial than White Hispanic/Latino PWH. Furthermore, the prevalence of disability was higher among Black (56%) and multiracial (53%) Hispanic/Latino PWH than the general U.S. adult population (26%) [30]. Hispanic/Latino PWH, especially Black and multiracial Hispanic/Latino PWH, experience high levels of disability, which could lead to experiences of ableism and racism—and subsequently systemic inequality [31].

We found that Black Hispanic/Latino PWH were more likely to be younger and female than White Hispanic/ Latino PWH. Studies have found that young people are less likely to be linked to and retained in care, and virally suppressed than older people [32, 33]. Additionally, studies have shown that women had lower levels of viral suppression compared to all PWH, and non-Hispanic Black

**Table 2** Demographic characteristics and social determinants of health among Hispanics/Latinos with diagnosed HIV, by race—United States, 2015–2020 (N=5,181)

| | White[a] | | Black | | | | American Indian/Alaska Native | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | n[b] | % (95% CI)[c] | n[b] | % (95% CI)[c] | PR (95% CI) | p-value | n[b] | % (95% CI)[c] | PR (95% CI) | p-value |
| **Gender[d]** | | | | | | | | | | |
| Male | 2,529 | 81.4 (79.8–83.0) | 437 | 71.1 (67.4–74.7) | — | — | 145 | 84.8 (79.3–90.4) | — | — |
| Female | 680 | 18.6 (17.0–20.2) | 217 | 28.9 (25.3–32.6) | 1.6 (1.4–1.8) | <0.01 | 28 | 15.2 (9.6–20.7) | 0.8 (0.6–1.2) | 0.26 |
| **Age, in years** | | | | | | | | | | |
| 18 – 29 | 261 | 7.8 (6.7–8.9) | 89 | 14.1 (10.0–18.2) | 1.8 (1.3–2.5) | <0.01 | 20 | 13.4 (6.2–20.5) | 1.7 (1.0–3.0) | 0.13 |
| 30 – 39 | 600 | 19.5 (17.7–21.4) | 136 | 20.2 (15.9–24.5) | 1.0 (0.8–1.3) | 0.76 | 32 | 18.7 (11.9–25.4) | 1.0 (0.7–1.4) | 0.81 |
| 40 – 49 | 868 | 27.6 (25.7–29.5) | 118 | 18.4 (15.0–21.8) | 0.7 (0.5–0.8) | <0.01 | 50 | 26.5 (19.0–33.9) | 1.0 (0.7–1.3) | 0.77 |
| >=50 | 1,547 | 45.1 (42.4–47.8) | 331 | 47.3 (41.1–53.6) | 1.1 (0.9–1.2) | 0.40 | 79 | 41.5 (33.3–49.6) | 0.9 (0.7–1.1) | 0.41 |
| **Educational attainment** | | | | | | | | | | |
| <High school | 849 | 25.3 (23.4–27.1) | 167 | 24.7 (20.9–28.5) | 1.0 (0.8–1.2) | 0.80 | 64 | 34.3 (26.6–42.1) | 1.4 (1.1–1.7) | 0.03 |
| High school diploma or GED | 762 | 23.5 (21.8–25.3) | 169 | 25.3 (21.5–29.0) | 1.1 (0.9–1.3) | 0.41 | 55 | 30.4 (22.0–38.8) | 1.3 (1.0–1.7) | 0.11 |
| >High school | 1,646 | 51.2 (48.9–53.6) | 337 | 50.0 (44.3–55.7) | 1.0 (0.9–1.1) | 0.70 | 62 | 35.3 (27.5–43.0) | 0.7 (0.6–0.9) | <0.01 |
| **Employment status** | | | | | | | | | | |
| Employed | 1,673 | 53.1 (50.5–55.7) | 274 | 38.8 (34.2–43.4) | 0.7 (0.6–0.8) | <0.01 | 83 | 47.9 (39.6–56.2) | 0.9 (0.8–1.1) | 0.24 |
| Unemployed | 475 | 14.7 (13.3–16.2) | 138 | 21.0 (17.0–25.1) | 1.4 (1.2–1.8) | <0.01 | 30 | 18.0 (10.5–25.4) | 1.2 (0.8–1.9) | 0.41 |
| Other[e] | 1,111 | 32.2 (29.6–34.8) | 259 | 40.2 (34.5–45.8) | 1.3 (1.1–1.4) | 0.01 | 68 | 34.2 (26.8–41.6) | 1.1 (0.8–1.3) | 0.62 |
| **Household income with respect to the federal poverty level (FPL)** | | | | | | | | | | |
| <100% FPL | 1,374 | 42.8 (39.8–45.9) | 376 | 60.8 (54.5–67.2) | 1.4 (1.3–1.6) | <0.01 | 81 | 45.4 (36.6–54.3) | 1.1 (0.9–1.3) | 0.59 |
| ≥100% –<139% FPL | 368 | 12.2 (10.7–13.7) | 65 | 10.2 (7.8–12.7) | 0.8 (0.6–1.1) | 0.20 | 16 | 11.1 (5.1–17.2) | 0.9 (0.5–1.6) | 0.73 |
| ≥139% –<400% FPL | 996 | 34.1 (31.8–36.4) | 154 | 24.9 (19.2–30.6) | 0.7 (0.6–0.9) | <0.01 | 61 | 37.5 (29.2–45.8) | 1.1 (0.9–1.4) | 0.43 |
| ≥400% FPL | 291 | 10.9 (9.1–12.6) | 29 | 4.0 (2.0–6.0) | 0.4 (0.2–0.6) | <0.01 | — | — | — | — |
| **Food insecurity, past 12 months[f]** | | | | | | | | | | |
| Yes | 665 | 19.7 (18.1–21.4) | 171 | 25.4 (21.3–29.5) | 1.3 (1.1–1.5) | 0.01 | 49 | 25.9 (18.2–33.7) | 1.3 (1.0–1.8) | 0.13 |
| No | 2,591 | 80.3 (78.6–81.9) | 501 | 74.6 (70.5–78.7) | — | — | 132 | 74.1 (66.3–81.9) | — | — |
| **Health insurance, past 12 months** | | | | | | | | | | |
| Any private insurance | 1,056 | 33.4 (31.1–35.6) | 152 | 21.4 (16.7–26.1) | 0.6 (0.5–0.8) | <0.01 | 54 | 31.9 (24.1–39.6) | 1.0 (0.7–1.2) | 0.72 |
| Public insurance only | 1,689 | 49.8 (46.3–53.4) | 456 | 67.6 (61.7–73.6) | 1.4 (1.3–1.5) | <0.01 | 101 | 51.2 (42.9–59.5) | 1.0 (0.9–1.2) | 0.76 |
| Ryan White program coverage only or uninsured | 465 | 16.8 (14.1–19.5) | 58 | 11.0 (7.2–14.7) | 0.7 (0.5–0.9) | <0.01 | 26 | 16.9 (9.4–24.5) | 1.0 (0.6–1.6) | 0.98 |
| **Any disability[g]** | | | | | | | | | | |
| Yes | 1,421 | 41.8 (39.3–44.3) | 368 | 55.8 (50.7–60.9) | 1.3 (1.2–1.5) | <0.01 | 92 | 50.4 (42.0–58.8) | 1.2 (1.0–1.4) | 0.06 |
| No | 1,836 | 58.2 (55.7–60.7) | 304 | 44.2 (39.1–49.4) | — | — | 89 | 49.6 (41.2–58.0) | — | — |
| **Experienced homelessness, past 12 months** | | | | | | | | | | |
| Yes | 219 | 6.3 (5.3–7.3) | 65 | 11.1 (7.1–15.1) | 1.8 (1.2–2.6) | 0.02 | 28 | 11.0 (6.6–15.5) | 1.8 (1.1–2.7) | 0.04 |
| No | 3,044 | 93.7 (92.7–94.7) | 608 | 88.9 (84.9–92.9) | — | — | 153 | 89.0 (84.5–93.4) | — | — |

**Table 2** (continued)

| | White [a] | | Black | | | | Multiracial | | | | Race not selected | American Indian/Alaska Native | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | n [b] | % (95% CI) [c] | n [b] | % (95% CI) [c] | PR (95% CI) | p-value | n [b] | % (95% CI) [c] | PR (95% CI) | p-value | n [b] | % (95% CI) [c] | PR (95% CI) | p-value |
| **Incarcerated > 24 h, past 12 months** | | | | | | | | | | | | | | |
| Yes | 82 | 2.5 (1.9–3.2) | 32 | 6.5 (3.2–9.7) | 2.6 (1.5–4.5) | 0.02 | — | — | — | — | — | — | — | — |
| No | 3,179 | 97.5 (96.8–98.1) | 641 | 93.5 (90.3–96.8) | — | — | — | — | — | — | — | — | — | — |
| **Gender [d]** | | | | | | | | | | | | | | |
| Male | | | | | | | 403 | 82.2 (78.8–85.5) | — | 0.02 | 382 | 77.2 (72.9–81.5) | — | — |
| Female | | | | | | | 115 | 17.8 (14.5–21.2) | 1.0 (0.8–1.2) | 0.67 | 123 | 22.8 (18.5–27.1) | 1.2 (1.0–1.5) | 0.08 |
| **Age, in years** | | | | | | | | | | | | | | |
| 18–29 | | | | | | | 52 | 11.4 (7.8–15) | 1.5 (1.1–2.0) | 0.05 | 34 | 5.9 (3.5–8.3) | 0.8 (0.5–1.2) | 0.16 |
| 30–39 | | | | | | | 96 | 19.3 (15.1–23.6) | 1.0 (0.8–1.2) | 0.94 | 96 | 19.5 (15.5–23.5) | 1.0 (0.8–1.2) | 1.00 |
| 40–49 | | | | | | | 134 | 25.1 (20.4–29.8) | 0.9 (0.7–1.1) | 0.31 | 128 | 26.3 (21.7–30.8) | 1.0 (0.8–1.2) | 0.59 |
| > =50 | | | | | | | 251 | 44.1 (38.8–49.4) | 1.0 (0.9–1.1) | 0.71 | 259 | 48.3 (43.2–53.5) | 1.1 (1.0–1.2) | 0.27 |
| **Educational attainment** | | | | | | | | | | | | | | |
| <High school | | | | | | | 118 | 21.1 (17.2–25) | 0.8 (0.7–1.0) | 0.05 | 163 | 32.9 (27.6–38.1) | 1.3 (1.1–1.5) | 0.01 |
| High school diploma or GED | | | | | | | 149 | 27.9 (23.6–32.2) | 1.2 (1.0–1.4) | 0.07 | 114 | 22.9 (18.3–27.5) | 1.0 (0.8–1.2) | 0.80 |
| >High school | | | | | | | 265 | 51.0 (46.3–55.7) | 1.0 (0.9–1.1) | 0.94 | 237 | 44.3 (38.5–50) | 0.9 (0.8–1.0) | 0.02 |
| **Employment status** | | | | | | | | | | | | | | |
| Employed | | | | | | | 239 | 45.4 (40.4–50.3) | 0.9 (0.8–1.0) | 0.01 | 238 | 47.7 (42.2–53.2) | 0.9 (0.8–1.0) | 0.08 |
| Unemployed | | | | | | | 93 | 19.1 (15.1–23.1) | 1.3 (1.0–1.6) | 0.04 | 89 | 17.4 (13.8–21.1) | 1.2 (0.9–1.5) | 0.18 |
| Other [e] | | | | | | | 200 | 35.5 (30.5–40.6) | 1.1 (0.9–1.3) | 0.27 | 190 | 34.9 (29.4–40.3) | 1.1 (0.9–1.3) | 0.37 |
| **Household income with respect to the federal poverty level (FPL)** | | | | | | | | | | | | | | |
| <100% FPL | | | | | | | 265 | 56.3 (50.6–62) | 1.3 (1.2–1.5) | <0.01 | 236 | 47.8 (42.4–53.1) | 1.1 (1.0–1.3) | 0.08 |
| ≥100%–<139% FPL | | | | | | | 47 | 9.9 (6.9–12.9) | 0.8 (0.6–1.1) | 0.21 | 62 | 15.1 (10.9–19.3) | 1.2 (0.9–1.7) | 0.20 |
| ≥139%–<400% FPL | | | | | | | 127 | 26.1 (21–31.1) | 0.8 (0.6–0.9) | <0.01 | 135 | 29.8 (25.1–34.4) | 0.9 (0.7–1.0) | 0.10 |
| ≥400% FPL | | | | | | | 31 | 7.7 (4.4–11.1) | 0.7 (0.5–1.1) | 0.08 | 43 | 7.4 (4.5–10.3) | 0.7 (0.5–1.0) | 0.03 |
| **Food insecurity, past 12 months [f]** | | | | | | | | | | | | | | |
| Yes | | | | | | | 147 | 29.1 (24.6–33.7) | 1.5 (1.2–1.8) | <0.01 | 90 | 18.4 (14.2–22.5) | 0.9 (0.7–1.2) | 0.54 |
| No | | | | | | | 385 | 70.9 (66.3–75.4) | — | — | 427 | 81.6 (77.5–85.8) | — | — |
| **Health insurance, past 12 months** | | | | | | | | | | | | | | |
| Any private insurance | | | | | | | 127 | 25.1 (20.8–29.4) | 0.8 (0.6–0.9) | <0.01 | 129 | 22.5 (18.6–26.4) | 0.7 (0.6–0.8) | <0.01 |
| Public insurance only | | | | | | | 356 | 66.6 (61.3–71.8) | 1.3 (1.2–1.4) | <0.01 | 328 | 63.6 (57.8–69.5) | 1.3 (1.2–1.4) | <0.01 |
| Ryan White program coverage only or uninsured | | | | | | | 42 | 8.3 (5.3–11.4) | 0.5 (0.4–0.7) | <0.01 | 53 | 13.8 (8.6–19.1) | 0.8 (0.6–1.2) | 0.23 |

*(Multiracial and American Indian/Alaska Native columns appear under the heading "Race not selected".)*

**Table 2** (continued)

| | Multiracial | | | | Race not selected | | | |
|---|---|---|---|---|---|---|---|---|
| | n[b] | % (95% CI)[c] | PR (95% CI) | p-value | n[b] | % (95% CI)[c] | PR (95% CI) | p-value |
| Any disability[g] | | | | | | | | |
| Yes | 297 | 53.4 (48.2–58.6) | 1.3 (1.2–1.4) | <0.01 | 236 | 44.5 (39.6–49.5) | 1.1 (0.9–1.2) | 0.32 |
| No | 232 | 46.6 (41.4–51.8) | — | — | 280 | 55.5 (50.5–60.4) | — | — |
| Experienced homelessness, past 12 months | | | | | | | | |
| Yes | 61 | 12.8 (8.5–17.2) | 2.0 (1.4–2.9) | <0.01 | 45 | 9.5 (5.8–13.2) | 1.5 (1.0–2.2) | 0.09 |
| No | 471 | 87.2 (82.8–91.5) | — | — | 472 | 90.5 (86.8–94.2) | — | — |
| Incarcerated > 24 h, past 12 months | | | | | | | | |
| Yes | 21 | 3.8 (1.9–5.6) | 1.5 (0.9–2.6) | 0.19 | — | — | — | — |
| No | 510 | 96.2 (94.4–98.1) | — | — | — | — | — | — |

Abbreviations: *CI* Confidence interval; *PR* Prevalence ratio; *GED* General educational development

Note: Estimates with a coefficient of variation (CV) ≥ 0.30 were considered to be unstable and were therefore suppressed

[a] White is the referent category

[b] Numbers are unweighted

[c] Percentages are weighted column percentages and CIs incorporate weighted percentages

[d] Excluded Hispanic/Latino transgender persons because of small sample size

[e] Other employment includes homemaker, student, retired, and unable to work

[f] Defined as experiencing hunger because there wasn't enough money for food in the past 12 months

[g] Includes physical, mental, and emotional disabilities

**Table 3** Health care and clinical characteristics among Hispanics/Latinos with diagnosed HIV, by race—United States, 2015–2020 ($N=5,181$)

| | White[a] | | Black | | | | American Indian/Alaska Native | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | n[b] | % (95% CI)[c] | n[b] | % (95% CI)[c] | PR (95% CI) | p-value | n[b] | % (95% CI)[c] | PR (95% CI) | p-value |
| **Missed ≥ 1 HIV care appointment in past 12 months** | | | | | | | | | | |
| Yes | 828 | 25.3 (23.6–27.1) | 208 | 31.9 (27.6–36.2) | 1.3 (1.1–1.5) | 0.01 | 67 | 40.9 (32.2–49.5) | 1.6 (1.3–2.0) | <0.01 |
| No | 2,413 | 74.7 (72.9–76.4) | 462 | 68.1 (63.8–72.4) | — | — | 113 | 59.1 (50.5–67.8) | — | — |
| **Experienced discrimination in a health care setting** | | | | | | | | | | |
| Yes | 343 | 20.8 (18.5–23.2) | 85 | 27.7 (23–32.5) | 1.3 (1.1–1.6) | 0.01 | 26 | 24.7 (15.8–33.5) | 1.2 (0.8–1.7) | 0.41 |
| No | 1,274 | 79.2 (76.8–81.5) | 244 | 72.3 (67.5–77) | — | — | 71 | 75.3 (66.5–84.2) | — | — |
| **≥ 1 unmet need for ancillary services[d]** | | | | | | | | | | |
| Yes | 666 | 40.6 (37.7–43.6) | 168 | 48.8 (42.2–55.4) | 1.2 (1.1–1.4) | 0.01 | 49 | 49.2 (38.5–59.8) | 1.2 (1.0–1.5) | 0.13 |
| No | 1,012 | 59.4 (56.4–62.3) | 181 | 51.2 (44.6–57.8) | — | — | 52 | 50.8 (40.2–61.5) | — | — |
| **Received care at Ryan White HIV/AIDS Program-funded facility** | | | | | | | | | | |
| Yes | 2,417 | 76.3 (73.0–79.6) | 561 | 85.7 (80.7–90.6) | 1.1 (1.1–1.2) | <0.01 | 135 | 79.0 (71.9–86.0) | 1.0 (0.9–1.1) | 0.50 |
| No | 712 | 23.7 (20.4–27.0) | 81 | 14.3 (9.4–19.3) | — | — | 37 | 21.0 (14.0–28.1) | — | — |
| **Prescribed ART[e]** | | | | | | | | | | |
| Yes | 2,914 | 84.9 (83.1–86.8) | 595 | 84.2 (79.8–88.7) | 1.0 (0.9–1.1) | 0.78 | 161 | 85.0 (77.5–92.5) | 1.0 (0.9–1.1) | 0.98 |
| No | 362 | 15.1 (13.3–16.9) | 79 | 15.8 (11.3–20.2) | — | — | 20 | 15.0 (7.5–22.5) | — | — |
| **Currently taking ART** | | | | | | | | | | |
| Yes | 3,156 | 94.9 (93.6–96.2) | 645 | 93.3 (90.4–96.3) | 1.0 (1.0–1.0) | 0.32 | — | — | — | — |
| No | 96 | 5.1 (3.8–6.4) | 27 | 6.7 (3.7–9.6) | — | — | — | — | — | — |
| **ART dose adherence, past 30 days** | | | | | | | | | | |
| Yes | 1,425 | 45.4 (43.2–47.6) | 254 | 35.9 (31.1–40.7) | — | — | 60 | 34.9 (27.0–42.8) | — | — |
| No | 1,719 | 54.6 (52.4–56.8) | 390 | 64.1 (59.3–68.9) | 1.2 (1.1–1.3) | <0.01 | 114 | 65.1 (57.2–73.0) | 1.2 (1.1–1.4) | 0.01 |
| **Sustained viral suppression[f]** | | | | | | | | | | |
| Yes | 2,374 | 67.9 (65.5–70.4) | 408 | 57.8 (51.6–63.9) | — | — | 124 | 63.0 (54.3–71.6) | — | — |
| No | 902 | 32.1 (29.6–34.5) | 266 | 42.2 (36.1–48.4) | 1.3 (1.1–1.5) | <0.01 | 57 | 37.0 (28.4–45.7) | 1.2 (0.9–1.5) | 0.28 |
| **Stage 3 classification (AIDS)[g]** | | | | | | | | | | |
| Yes | 1,838 | 54.5 (52.5–56.5) | 377 | 53.9 (49.3–58.5) | 1.0 (0.9–1.1) | 0.81 | 103 | 53.2 (44.6–61.8) | 1.0 (0.8–1.2) | 0.78 |
| No | 1,436 | 45.5 (43.5–47.5) | 296 | 46.1 (41.5–50.7) | — | — | 78 | 46.8 (38.2–55.4) | — | — |

| | Multiracial | | | | Race not selected | | | |
|---|---|---|---|---|---|---|---|---|
| | n[b] | % (95% CI)[c] | PR (95% CI) | p-value | n[b] | % (95% CI)[c] | PR (95% CI) | p-value |
| **Missed ≥ 1 HIV care appointment in past 12 months** | | | | | | | | |
| Yes | 149 | 30.2 (24.9–35.4) | 1.2 (1.0–1.4) | 0.09 | 139 | 27.7 (22.2–33.2) | 1.1 (0.9–1.3) | 0.41 |
| No | 380 | 69.8 (64.6–75.1) | — | — | 374 | 72.3 (66.8–77.8) | — | — |
| **Experienced discrimination in a health care setting** | | | | | | | | |
| Yes | 72 | 28.7 (22.3–35) | 1.4 (1.1–1.7) | 0.02 | 40 | 22.7 (15.6–29.7) | 1.1 (0.8–1.5) | 0.63 |
| No | 195 | 71.3 (65–77.7) | — | — | 157 | 77.3 (70.3–84.4) | — | — |
| **≥ 1 unmet need for ancillary services[d]** | | | | | | | | |
| Yes | 143 | 52.9 (46.5–59.4) | 1.3 (1.1–1.5) | <0.01 | 79 | 40.3 (33.1–47.4) | 1.0 (0.8–1.2) | 0.92 |
| No | 139 | 47.1 (40.6–53.5) | — | — | 127 | 59.7 (52.6–66.9) | — | — |
| **Received care at Ryan White HIV/AIDS Program-funded facility** | | | | | | | | |
| Yes | 400 | 77.0 (70.3–83.8) | 1.0 (0.9–1.1) | 0.81 | 377 | 81.3 (75.5–87.0) | 1.1(1.0–1.1) | 0.05 |
| No | 101 | 23.0 (16.2–29.7) | — | — | 114 | 18.7 (13.0–24.5) | — | — |
| **Prescribed ART[e]** | | | | | | | | |
| Yes | 468 | 83.6 (79–88.3) | 1.0 (0.9–1.0) | 0.60 | 471 | 88.8 (84.9–92.7) | 1.1 (1.0–1.1) | 0.07 |
| No | 65 | 16.4 (11.7–21) | — | — | 46 | 11.2 (7.3–15.1) | — | — |
| **Currently taking ART** | | | | | | | | |
| Yes | 503 | 92.0 (88.1–95.9) | 1.0 (0.9–1.0) | 0.16 | 502 | 96.6 (94.9–98.4) | 1.0 (1.0–1.0) | 0.13 |
| No | 28 | 8.0 (4.1–11.9) | — | — | 13 | 3.4 (1.6–5.1) | — | — |

**Table 3**  (continued)

|  | Multiracial | | | | Race not selected | | | |
|---|---|---|---|---|---|---|---|---|
|  | n[b] | % (95% CI)[c] | PR (95% CI) | p-value | n[b] | % (95% CI)[c] | PR (95% CI) | p-value |
| ART dose adherence, past 30 days | | | | | | | | |
| Yes | 209 | 39.6 (34.5–44.8) | 0.9 (0.8–1.0) | 0.05 | 219 | 43.5 (38.19–48.77) | — | — |
| No | 292 | 60.4 (55.2–65.5) | — | — | 281 | 56.5 (51.2–61.8) | 1.0 (0.9–1.2) | 0.51 |
| Sustained viral suppression[f] | | | | | | | | |
| Yes | 351 | 60.0 (53.9–66.2) | — | — | 383 | 72.9 (68.2–77.7) | — | — |
| No | 182 | 40.0 (33.8–46.1) | 1.2 (1.1–1.5) | 0.01 | 134 | 27.1 (22.3–31.8) | 0.8 (0.7–1.0) | 0.05 |
| Stage 3 classification (AIDS)[g] | | | | | | | | |
| Yes | 295 | 53.4 (47.4–59.4) | 1.0 (0.9–1.1) | 0.74 | 312 | 60.3 (54.0–66.5) | 1.1 (1.0–1.2) | 0.09 |
| No | 238 | 46.6 (40.6–52.6) | — | — | 203 | 39.7 (33.5–46.0) | — | — |

Abbreviations: *CI* Confidence interval; *ART* Antiretroviral therapy; *PR* Prevalence ratio

Note: Estimates with a coefficient of variation (CV) ≥ 0.30 were considered to be unstable and were therefore suppressed

[a] White is the referent category

[b] Numbers are unweighted

[c] Percentages are weighted column percentages and CIs incorporate weighted percentages

[d] Unmet need for services was self-reported and defined as needing, but not receiving a particular service in the past 12 months. Services include HIV case management, patient navigation services, HIV peer group support, dental care, mental health services, drug or alcohol counseling or treatment, domestic violence services, transportation assistance, meal or food services, and shelter or housing

[e] ART prescription documented in medical record; persons with no medical record abstraction were considered to have no documentation of ART prescription

[f] Sustained viral suppression defined as having all viral load tests in the past 12 months < 200 copies/mL or undetectable

[g] HIV infection, stage 3 (AIDS): documentation of an AIDS-defining condition or either a CD4 count of < 200 cells/μL or a CD4 percentage of total lymphocytes of < 14. Documentation of an AIDS-defining condition supersedes a CD4 count or percentage that would not, by itself, be the basis for a stage 3 (AIDS) classification

women were less likely to be virally suppressed than Hispanic/Latina and White women; however, these studies did not examine the intersectional identities of gender, race, and ethnicity [34, 35]. Doing so, might further elucidate health disparities.

Black and multiracial Hispanic/Latino PWH experienced challenges with HIV care. For instance, compared with White Hispanic/Latino PWH, Black and multiracial Hispanic/Latino PWH more likely experienced discrimination while getting care, and had an unmet need for ancillary services. Experiencing health care discrimination has been associated with suboptimal ART adherence and viral unsuppression [36, 37]. Experiencing health care discrimination might lead to unmet needs for ancillary services, which has been associated with adverse health outcomes [20].

We found that Black and AI/AN Hispanic/Latino PWH were less likely to adhere to HIV medications, and Black and multiracial Hispanic/Latino PWH were less likely to be virally suppressed than White Hispanic/Latino PWH. Previous literature supports the finding on differences in viral suppression by race of Hispanic/Latinos; however, this association became null after adjusting for several factors [13]. Future studies should explore differences in viral suppression by race of Hispanic/Latino PWH while adjusting for important factors.

To our knowledge, there is a dearth of literature comparing health outcomes between AI/AN Hispanic/Latino people (who might prefer to identify as indigenous or with their indigenous ethnic group [e.g., Maya, Nahua]) and White Hispanic/Latino people. Thus, we are unable to note how our findings are similar or different from the literature in the United States. Nevertheless, we can look towards literature on Latin America, which shows that indigenous communities are disproportionately affected by SDH associated with poor health outcomes. The indigenous population of Latin America—most of whom live in Mexico, Guatemala, Peru, and Bolivia—consists of between 42–53 million people who belong to between 655–774 different ethnic groups [38]. Indigenous people have worse health outcomes than the non-indigenous, settler descendant community in Latin America. They are also less likely than non-indigenous people to receive adequate health care in part because of barriers like lack of transportation, language (many indigenous communities do not speak Spanish), discrimination, and geographic isolation [38, 39]. These disparities can be attributed to the historical, economic, and social exclusion of indigenous communities in the region. Like in the United States, there is a lack of data among indigenous populations in Latin America, which is a barrier to understanding their health and the health determinants contributing

to disparities. For instance, according to a 2019 literature review, only six countries in Latin America had HIV and STI case reporting or surveillance data disaggregated by ethnic origin and there was variability in the methods used for determining ethnic origin among indigenous populations [40]. Thus, these issues are not unique to the United States.

The prevalence of LEP is higher among Hispanic/Latino PWH than among all PWH [41]. Thus, more Spanish-speaking clinicians and other personnel are needed. Interpreter services and translated materials should be readily available in HIV care clinics and hospitals. Persons with LEP should also be informed of their rights to access language services under Title VI of the Civil Right Act. Public health data collection systems should also collect granular data on language spoken in the home, as some Hispanic/Latino people may speak indigenous languages like Quechua, Guarani, and Aymara. Last, engaging Hispanic/Latino communities in HIV service delivery, research, and policymaking, and creating public health opportunities for them is key to reducing health disparities [10].

Racism—not race—is a "driving force" of SDH and a barrier to health equity. Racism may explain some of the differences in this analysis [42]. Studies show that Hispanic/Latino persons who are perceived as White by others self-report better health and better health outcomes than Hispanic/Latinos who are perceived as belonging to a racial or ethnic minority group [43, 44]. Other studies have found that Black Hispanic/Latino persons resemble non-Hispanic Black persons in income, insurance coverage, and having seen a doctor in the past year [45]. Some posit that racial identification among Hispanic/Latino persons may be a proxy for experiencing racism and discrimination, leading to the same negative health exposures that non-Hispanic Black persons face [46]. Cuevas et al. 2016 similarly posits that Black Hispanic/Latino persons might experience more health disparities than other Hispanic/Latino persons because of experiences of race-based discrimination [47]. Thus, racism may exert a more negative effect on the health of Black, multiracial, and AI/AN Hispanic/Latino persons than White Hispanic/Latino persons and Hispanic/Latinos who do not select a race.

Experiencing racism and discrimination can be traumatic. Providers should consider incorporating a trauma-informed approach in HIV health care settings. This approach creates safety, transparency, trust, and respect; prioritizes shared decision making; empowers patients; and addresses cultural biases [48]. Furthermore, systemic racism—which "refers to the processes and outcomes of racial inequality and inequity in life opportunities and treatment"—affects SDH [49]. Systemic racism operates on many levels and is present in institutional structures (e.g., policies, practices), social structures (e.g., culture, laws), individuals (e.g., attitudes, beliefs, values), and everyday interactions [49]. Thus, interventions

to address the health of Hispanic/Latino PWH can focus on SDH like poverty, unemployment, immigration, education, stigma, homophobia, racism, and language-based inequity.

Public health data and data systems are key to achieving health equity, as these data tell a story of the health of populations [14]. However, structural racism also affects the collection and analysis of data on racial and ethnic groups, like Hispanic/Latino PWH [50]. To combat the structural racism present in data collection and analysis, it is important to collect granular data across population groups that can be aggregated and disaggregated. This allows us to gain a better understanding of health disparities within and between racial and ethnic groups. HIV surveillance systems can assess current gaps in the reporting of race and ethnicity data (along with other key data), as these gaps might limit the ability to report these data using a health equity lens and renders diverse populations invisible when "policies are made, resources are allocated, and programs are designed and implemented" [51]. It is also important to consider recruitment and data collection approaches and how they might exclude the participation of Hispanic/Latino persons. For instance, recruitment and data collection materials should be translated into Spanish for monolingual Spanish-speaking Hispanic/Latino persons. Further, bilingual data collectors with Spanish language and cultural proficiency are needed to collect data among monolingual Spanish-speaking populations, who are often underrepresented in data collection activities. Collecting granular data about languages spoken in the home, might also signal local interpreter or translation needs for recruitment and data collection.

We used OMB directive No.15 race and ethnicity categories, which Hispanic/Latino persons do not identify with, as exemplified by the 2020 census which showed that "other" was the most reported race among Hispanic/Latino persons [52]. In one study, Hispanic/Latino persons preferred to describe their race as "Hispanic," "Latino," "Latinx" or using the country or region of ancestry. Additionally, more Hispanic/Latino persons identified as "Afro-Latino" or "Afro-Caribbean," than Black or African American, and more identified as AI/AN when researchers added examples like "Maya," "Nahua," or "Taino" than when AI/AN was used alone [53]. We found that PWH who did not select a race were more likely to be non-U.S. born and to have LEP than White Hispanic/Latino PWH, which supports the finding that non-U.S. born Hispanic/Latino persons generally do not identify with the standard race and ethnicity categories used in the United States. To identify and address health disparities accurately, we need measures of race that are meaningful to Hispanic/Latino persons. Our findings might differ if we used more appropriate measures of race.

Our study was subject to limitations. Racial identification is influenced by many factors, including birthplace, immigration status, primary language, and politics [47].

However, we did not know why people self-reported the race they did (or did not). We also asked about self-identified race. Thus, we might not have captured the experiences of people whose self-identified race differs from the race others perceive them to be. Our sample size of A/AN persons was small, yielding some unstable estimates and estimates with wide CIs: these findings should be interpreted with caution. Our analysis excluded Asian and Native Hawaiian and other Pacific Islander persons because of small sample sizes. Future studies should examine these populations to better understand their health outcomes and tailor interventions accordingly. Sociodemographic, and behavioral data collected were self-reported and subject to social desirability and recall bias. Our data are cross-sectional; thus, causality cannot be inferred. Last, our data our descriptive and did not assess for confounding factors.

## Conclusions

This is the first study to elucidate how race affects the health of Hispanic/Latino PWH in the United States using nationally representative data. We found that Black, multiracial, and AI/AN Hispanic/Latino PWH have a higher prevalence of SDH associated with adverse health outcomes and suboptimal HIV clinical outcomes than White Hispanic/Latino PWH. Researchers should disaggregate by other factors like Hispanic origin, place of birth, and primary language thereby recognizing the diversity of Hispanic/Latino persons. Surveys should include alternative measures of race along with the standard racial categories. Last, more strategies and interventions that address the SDH that contribute to health disparities are needed.

## Declarations

## References

1. United States Census Bureau. About the Hispanic population and its origin. Census.gov. https://www.census.gov/topics/population/hispanic-origin/about.html. Accessed 1 Feb 2023.
2. The White House. Revisions to the standards for the classification of federal data on race and ethnicity. Revisions-to-the-Standards-for-the-Classification-of-Federal-Data-on-Race-and-Ethnicity-October30–1997.pdf (whitehouse.gov). Published October 30, 1997. Accessed 1 Feb 2023.
3. Gershon L. Where Did the Term "Hispanic" Come From? JSTOR. https://daily.jstor.org/where-did-the-term-hispanic-come-from/. Published September 15, 2020. Acessed 1 Feb 2023.
4. Lopez MH, Krogstad JM, Passel JS. Who is Hispanic? https://www.pewresearch.org/fact-tank/2022/09/15/who-is-hispanic/. Published September 15, 2022. Accessed 1 Feb 2023.
5. Measuring America: the decennial censuses from 1790 to 2000. https://www.census.gov/history/pdf/measuringamerica.pdf. Published September 2000. Accessed 1 Feb 2023.
6. United States Census Bureau. History. Census.gov. https://www.census.gov/history/www/through_the_decades/index_of_questions/1930_1.html. Accessed 1 Feb 2023.
7. Orr JY, Shaw MS, Bland R, Hobor G, Plough AL. Addressing racism in research can transform public health. AJPH. 2021;111(s3):s182–4. https://doi.org/10.2105/AJPH.2021.306542.
8. Centers for Disease Control and Prevention. HIV Surveillance Report, 2020;vol. 33. https://www.cdc.gov/hiv/library/reports/hiv-surveillance/vol-33/index.html. Published May 2022. Accessed May 2022.
9. Centers for Disease Control and Prevention. Monitoring selected national HIV prevention and care objectives by using HIV surveillance data—United States and 6 dependent areas, 2019. HIV Surveillance Supplemental Report 2021;26(2). http://www.cdc.gov/hiv/library/reports/hiv-surveillance.html. Published May 2021. Accessed May 2022
10. U.S. Department of Health and Human Services. National HIV/AIDS Strategy (2022–2025). HIV.gov. https://www.hiv.gov/federal-response/national-hiv-aids-strategy/national-hiv-aids-strategy-2022-2025. Accessed 11 Feb 2022.
11. Birkett M, Neray B, Janulis P, Phillips G II, Mustanski B. Intersectional identities and HIV: race and ethnicity drive patterns of

sexual mixing. AIDS Behav. 2019;23(6):1452–9. https://doi.org/10.1007/S10461-018-2270-7.

12. Sheehan DM, Trepka MJ, Fennie KP, Prado G, Cano MÁ, Maddox LM. Black–White Latino racial disparities in HIV survival, Florida, 2000–2011. Int J Environ Res Public Health. 2016;13(1). https://doi.org/10.3390/IJERPH13010009.

13. Sheehan DM, Mauck DE, Fennie KP, et al. Black-White and country of birth disparities in retention in HIV care and viral suppression among Latinos with HIV in Florida, 2015. Int J Environ Res Public Health. 2017;14(2):120. https://doi.org/10.3390/IJERPH14020120.

14. Charting a course for an equity-centered data system: recommendations from the National Commission to Transform Public Health Data Systems. Robert Wood Johnson Foundation. 2021. https://www.rwjf.org/en/insights/our-research/2021/10/charting-a-course-for-an-equity-centered-data-system.html. Accessed 23 Jan 2023.

15. World Health Organization. A conceptual framework for action on the social determinants of health. https://www.who.int/publications/i/item/9789241500852. Published July 2010. Accessed Jan 2023.

16. Beer L, Johnson CH, Fagan JL, et al. A national behavioral and clinical surveillance system of adults with diagnosed HIV (the Medical Monitoring Project): protocol for an annual cross-sectional interview and medical record abstraction survey. JMIR Res Protoc. 2019;8(11):e15453. https://doi.org/10.2196/15453.

17. Centers for Disease Control and Prevention. Office of Management and Budget (OMB) Directive 15: Race and ethnic standards for federal statistics and administrative reporting. Wonder.cdc.gov. https://wonder.cdc.gov/wonder/help/populations/bridged-race/directive15.html. Accessed 11 Feb 2022.

18. Allen R. Investigating the cultural conception of race in Puerto Rico: residents' thoughts on the U.S. Census, discrimination, and interventionist policies. Lat Am Carribb Ethn Stud. 2017;12(3):201–26. https://doi.org/10.1080/17442222.2016.1273855.

19. Peek ME, Nunez-Smith M, Drum M, Lewis TT. Adapting the everyday discrimination scale to medical settings: reliability and validity testing in a sample of African American patients. Ethn Dis. 2011;21(4):502–9.

20. Dasgupta S, Tie Y, Beer L, Weiser J. Unmet needs for ancillary care services are associated with HIV clinical outcomes among adults with diagnosed HIV. AIDS Care. 2021;34(5):606–14. https://doi.org/10.1080/09540121.2021.1946001.

21. Gelpi-Acosta C, Rodriguez-Diaz CE, Aponte-Meléndez Y, Abadie R. Puerto Rican syndemics: opiates, overdoses, HIV, and the hepatitis C virus in a context of ongoing crises. Am J Public Health. 2020;110(2):176–7. https://doi.org/10.2105/AJPH.2019.305487.

22. Chandra A, Marsh T, Madrigano J, et al. Health and social services in Puerto Rico before and after hurricane Maria. Rand Health Q. 2021;9(2):10.

23. Guerra Velazquez GR. Hurricane Maria and public health in Puerto Rico: lessons learned to increase resiliency and prepare for future distasters. Ann Glob Health. 2022;88(1):82. https://doi.org/10.5334/aogh.3869.

24. Demeke HB, Luo Q, Luna-Gierke RE, et al. HIV care outcomes among Hispanic/Latinos with diagnosed HIV in the United States by place of birth-2015–2018, Medical Monitoring Project. Int J Environ Res Public Health. 2019;17(1):171. https://doi.org/10.3390/ijerph17010171.

25. Myers TR, Lin X, Skarbinski J. Antiretroviral therapy and viral suppression among foreign-born HIV-infected persons receiving medical care in the United States: a complex sample, cross-sectional survey. Medicine (Baltimore). 2016;95(11):e3051. https://doi.org/10.1097/MD.0000000000003051.

26. Levison JH, Regan S, Khan I, Freedberg KA. Foreign-born status as a predictor of engagement in HIV care in a large US metropolitan health system. AIDS Care. 2017;29(2):244. https://doi.org/10.1080/09540121.2016.1210077.

27. Misra S, Kwon SC, Abraído-Lanza AF, Chebli P, Trinh-Shevrin C, Yi SS. Structural racism and immigrant health in the United States. Heal Educ Behav. 2021;48(3):332–41. https://doi.org/10.1177/10901981211010676.

28. Abraído-Lanza AF, Echeverría SE, Flórez KR. Latino immigrants, acculturation, and health: promising new directions in research. Annu Rev Public Health. 2016;37:219–36. https://doi.org/10.1146/annurev-publhealth-032315-021545.

29. United States Interagency Countil on Homelessness. Expert panel on homelessness among American Indians, Alaska Natives, and Native Hawaiians. Expert_Panel_on_Homelessness_among_American_Indians,_Alaska_Natives,_and_Native_Hawaiians.pdf (usich.gov) Published May 2022. Accessed May 2022.

30. Okoro CA, Hollis ND, Cyrus AC, Griffin-Blake S. Prevalence of disabilities and health care access by disability status and type among adults—United States, 2016. MMWR Morb Mortal Wkly Rep. 2021;67(32):882–7. https://doi.org/10.15585/MMWR.MM6732A3.

31. National Disability Institute. *Race, Ethnicity, and Disability: The financial impact of systemic inequality and intersectionality*. https://www.nationaldisabilityinstitute.org/wp-content/uploads/2020/08/race-ethnicity-and-disability-financial-impact.pdf. Published August 2020. Accessed March 2022.

32. Hall IH, Frazier EL, Rhodes P, et al. Differences in human immunodeficiency virus care and treatment among subpopulations in the United States. JAMA Intern Med. 2013;173(14):1337–44. https://doi.org/10.1001/JAMAINTERNMED.2013.6841.

33. Sullivan PS, Knox J, Jones J, et al. Understanding disparities in viral suppression among Black MSM living with HIV in Atlanta Georgia. J Int AIDS Soc. 2021;24(4):e25689. https://doi.org/10.1002/JIA2.25689.

34. Centers for Disease Control and Prevention. HIV and women: Viral Suppression and Barriers to Care. cdc.gov. https://www.cdc.gov/hiv/group/gender/women/viral-suppression.html. Accessed 11 Feb 2022.

35. Nwangwu-Ike N, Saduvala N, Watson M, Panneer N, Oster AM. HIV diagnoses and viral suppression among US women in rural and nonrural areas, 2010–2017. J Rural Heal. 2020;36(2):217–23. https://doi.org/10.1111/jrh.12384.

36. Turan B, Rogers AJ, Rice WS. Association between perceived discrimination in healthcare settings and HIV medication adherence: Mediating psychosocial mechanisms. AIDS Behav. 2017;21:3431–9. https://doi.org/10.1007/s10461-017-1957-5.

37. Kay ES, Rice WS, Crockett KB, Atkins GC, Batey DS, Turan B. Experienced HIV-related stigma in health care and community settings: mediated associations with psychosocial and health outcomes. J Acquir Immune Defic Syndr. 2018;77(3):257–63. https://doi.org/10.1097/QAI.0000000000001590.

38. Congressional Research Service. Indigenous peoples in Latin America: Statistical information. https://crsreports.congress.gov/product/pdf/R/R46225. Published December 2021. Accessed Jan 2023.

39. Ruano AL, Rodriguez D, Rossi PG, Maceira D. Understanding inequities in health and health systems in Latin America and the Caribbean: a thematic series. Int J Equity Health. 2021;20:94. https://doi.org/10.1186/s12939-021-01426-1.

40. Russell NK, Nazar K, del Pino S, Alonso Gonzalez M, Diaz Bermudes XP, Ravasi G. HIV, syphilis, and viral hepatitis among Latin American indigenous peoples and Afro-descendants: a systematic review. Rev Panam Salud Publica. 2019;43:e17. https://doi.org/10.26633/RPSP.2019.17.

41. Padilla M, Fagan J, Tie Y, Weiser J, Demeke HB, Shouse RL. Limited English proficiency among adults with HIV in the United States—Medical Monitoring Project, 2015–2018. AIDS Care. 2021;33(2):1603–7. https://doi.org/10.1080/09540121.2020. 1838428.

42. American Public Health Association. Racism and health. apha. org. https://www.apha.org/topics-and-issues/health-equity/racism-and-health. Accessed 11 Feb 2022.

43. Vargas ED, Sanchez GR, Kinlock BL. The enhanced self-reported health outcome observed in Hispanics/Latinos who are socially-assigned as White is dependent on nativity. J Immigr Minor Health. 2015;17(6):1803. https://doi.org/10.1007/ S10903-014-0134-4.

44. Macintosh T, Desai MM, Lewis TT, Jones BA, Nunez-Smith M. Socially-assigned race, healthcare discrimination and preventive healthcare services. PLoS One. 2013;8(5):e64522. https://doi.org/ 10.1371/journal.pone.0064522.

45. LaVeist-Ramos TA, Galarraga J, Thorpe RJ, Bell CN, Austin CJ. Are black Hispanics black or Hispanic? Exploring disparities at the intersection of race and ethnicity. J Epidemiol Community Heal. 2012;66(7):e21–e21. https://doi.org/10.1136/JECH.2009. 103879.

46. Borrell LN, Crawford ND. Race, ethnicity, and self-rated health status in the behavioral risk factor surveillance system survey. Hisp J Behav Sci. 2006;28(3):387–403. https://doi.org/10.1177/ 0739986306290368.

47. Cuevas AG, Dawson BA, Williams DR. Race and skin color in Latino health: an analytic review. Am J Public Health. 2016;106(12):2131. https://doi.org/10.2105/AJPH.2016.303452.

48. Substance Abuse and Mental Health Services Administration. SAMHSA's concept of trauma and guidance for a trauma-informed approach. HHS Publication No. (SMA) 14–4884. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2014.

49. Banaji MR, Fiske ST, Massey D. Systemic racism: individuals and interactions, institutions and society. Cogn Res Princ Implic. 2021;6:82. https://doi.org/10.1186/s41235-021-00349-3.

50. Knight HE, Deeny SR, Dreyer K, et al. Challenging racism in the use of health data. Lancet. 2021;3(3):e144–6. https://doi.org/10. 1016/S2589-7500(21)00019-4.

51. Braveman PA, Arkin E, Proctor D, Kauh T, Holm N. Systemic and structural racism: definitions, examples, health damages, and approaches to dismantling. Health Affairs. 2022;41(2). https://doi. org/10.1377/hlthaff.2021.01394.

52. Jones N, Marks R, Ramirez R, Rios-Vargas M. 2020 Census illuminates racial and ethnic composition of the country. Census.gov. https://www.census.gov/library/stories/2021/08/improved-race-ethnicity-measures-reveal-united-states-population-much-more-multiracial.html. Accessed 19 May 2022.

53. Noe-Bustamante L, Gonzalez-Barrera A, Edwards K, Mora L, Hugo Lopez M. Measuring the racial identity of Latinos. Pew Research Center. https://www.pewresearch.org/hispanic/2021/11/ 04/measuring-the-racial-identity-of-latinos/. Accessed 11 March 2022.