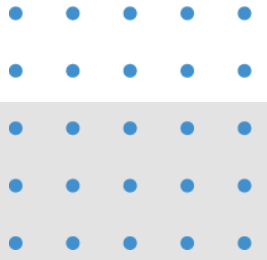# Alternative Race and Ethnicity Categorization of COVID-19 Vaccine Recipients

Joshua Quint, PhD, MPH

Elizabeth Reosti, MS

California Department of Public Health

Immunization Branch

Background

2020 U.S. Population More Racially and Ethnically Diverse Than Measured in 2010

United States® Census Bureau

CNN Census release shows America is more diverse and more multiracial than ever

'We're talking about a big, powerful phenomenon': Multiracial Americans drive change

The Washington Post

https://www.cnn.com/2021/08/12/politics/us-census-2020-data/index.html

https://www.washingtonpost.com/nation/2021/10/08/mixed-race-americans-increase-census/

https://www.census.gov/library/stories/2021/08/2020-united-states-population-more-racially-ethnically-diverse-than-2010.html (accessed 4/11/2023)

Background

The Diversity Index measures the probability that two people chosen at random will be from different racial and ethnic groups.

- California ranks 2nd in racial and ethnic diversity in the United States

3
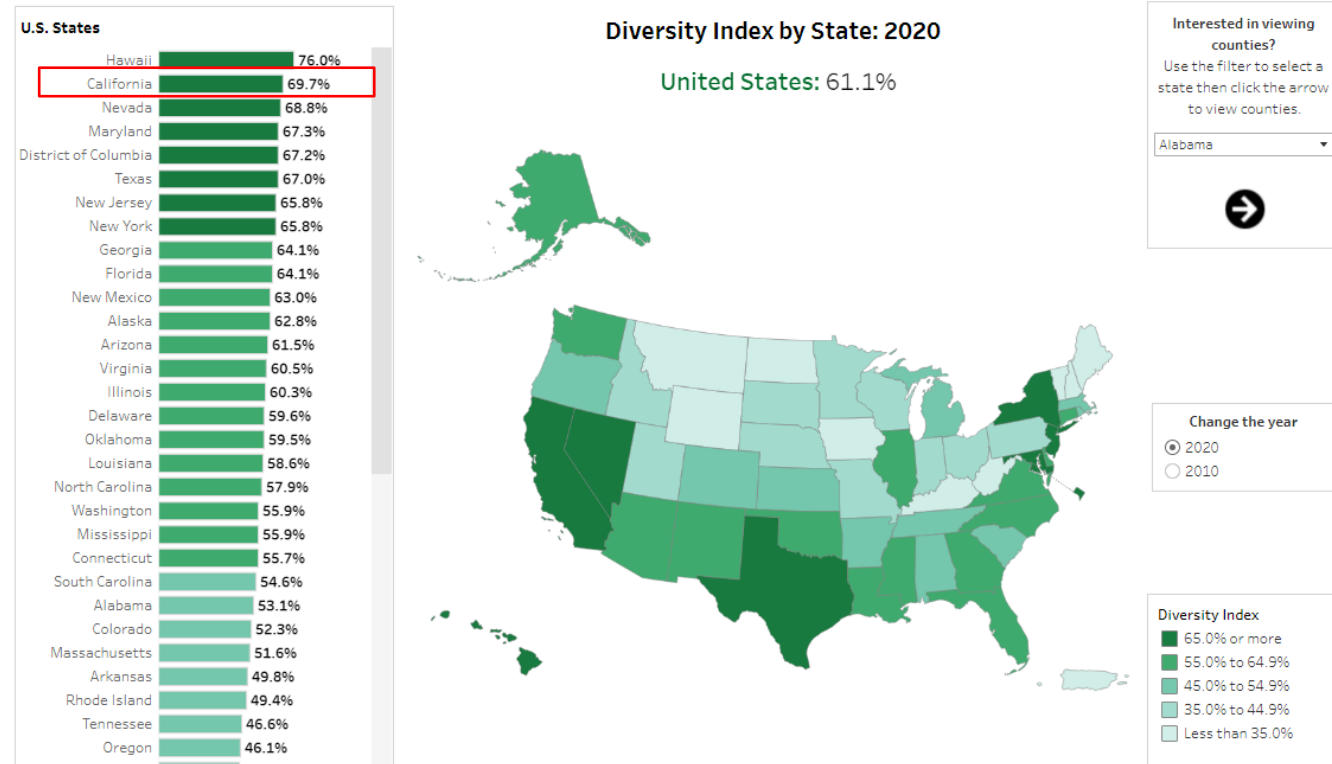
Background

- The California Immunization Registry (CAIR2) meets the Office of Management and Budget (OMB) minimum race and ethnicity standards[1].

- Accepts up to six (6) distinct HL7 codes for a recipient's race and three (3) possible HL7 codes for a recipient's ethnicity.

- Recipient race is additive across doses/encounters

OMB Minimum categories

CAIR2 User interface

HL7 message

PID|1||PA123456^^^MYEMR^MR||JONES^GEORGE^M^JR^^^L|MILLER^MARTHA^G^^^^M|20140227|M||2106-3^WHITE^CDCREC|1234 W FIRST ST^^BEVERLY HILLS^CA^90210^^H||^PRN^PH^^^555^5555555||ENG^English^HL70296||||||2186-5^not Hispanic or Latino^CDCREC||Y|2

1. Office of Management and Budget. Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity (1997) https://obamawhitehouse.archives.gov/omb/fedreg_1997standards
Image Source: https://www.federalregister.gov/documents/2023/01/27/2023-01635/initial-proposals-for-updating-ombs-race-and-ethnicity-statistical-standards

Background

- California's reporting of vaccination rates combines race with ethnicity to create mutually exclusive groups

- Hispanic/Latino status is first top-coded and the remaining non-Hispanic/Latino persons are separated into single race categories or a multiple-race category

- Population estimates provided by Department of Finance

Primary Series Status by Race/Ethnicity

Race/Ethnicity	Percent Vaccinated	People Vaccinated
AI/AN	58.3%	91,512
Asian American	79.8%	4,811,762
Black	61.1%	1,307,290
Latino	56.9%	9,028,892
Multi-Race	55.1%	906,108
NHPI	90.2%	125,420*
White	72.6%	10,148,715
* Other Race		1,885,084
* Unknown		782,099
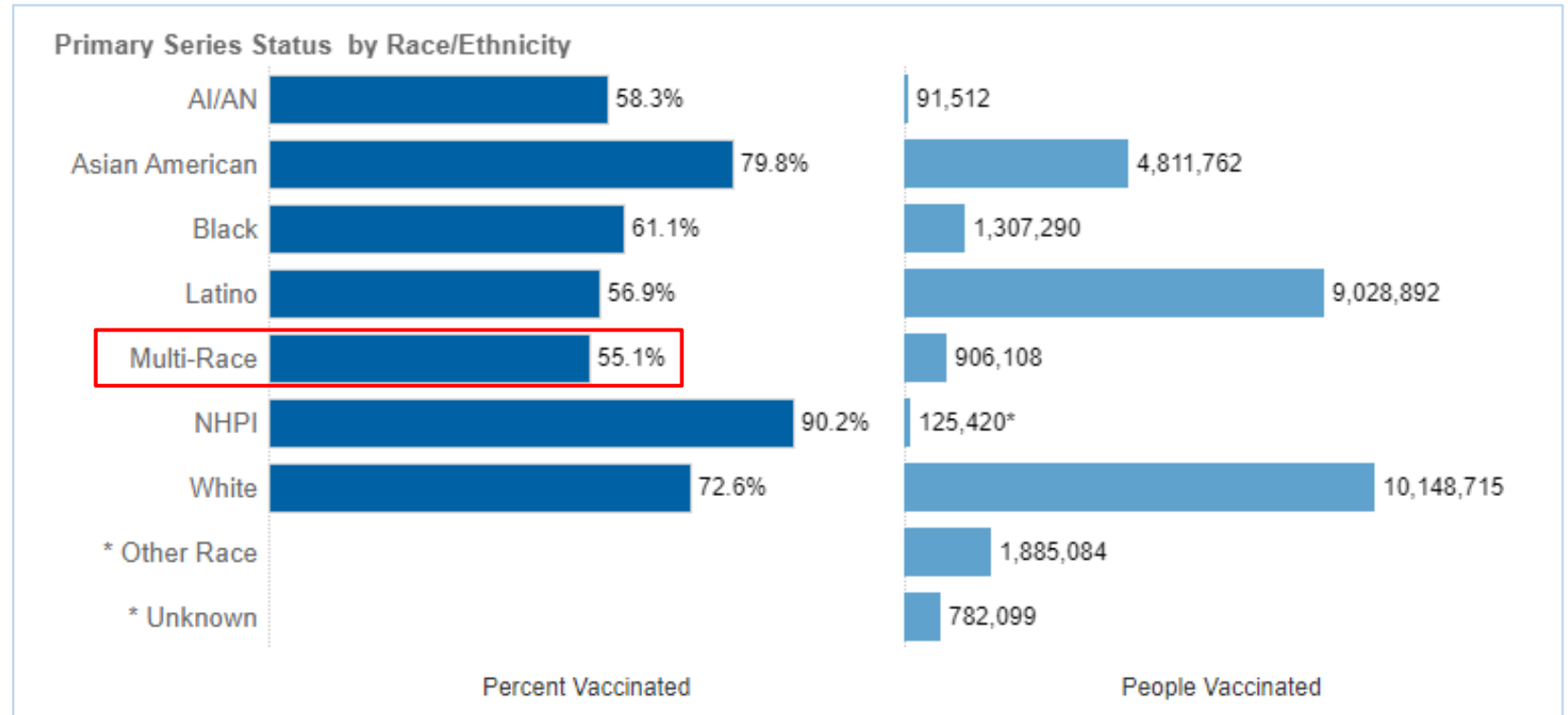
Source: https://covid19.ca.gov/vaccination-progress-data/ (accessed 4/11/2023)
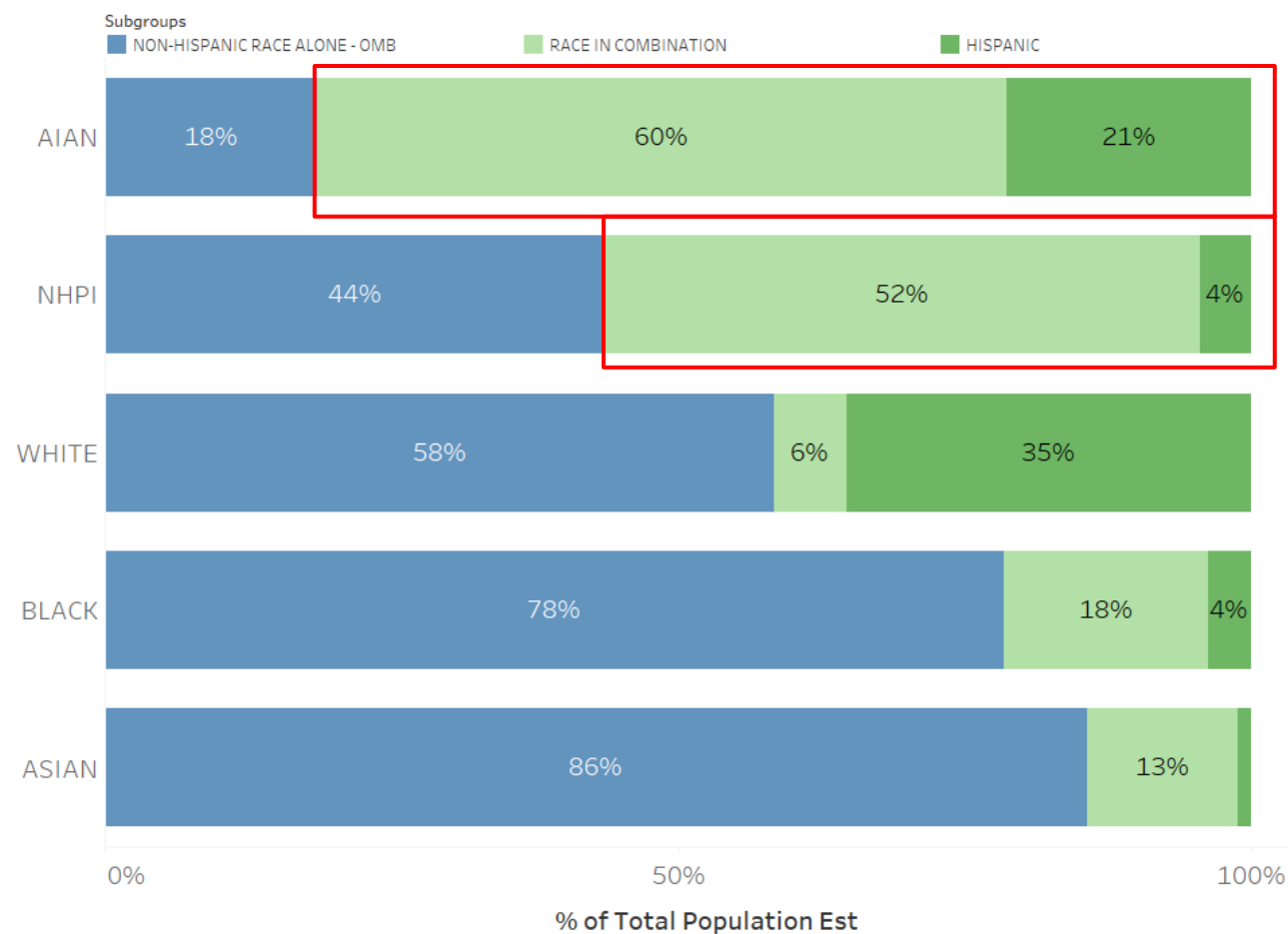
Background

- Current method classifies many American Indian or Alaska Native (AIAN) and Native Hawaiian or Pacific Islander (NHPI) populations as multiracial or Latino[1,2].

81% of **AIAN** persons and

56% of **NHPI** persons are represented in other categories by the current method

Percent of Population by Race and Ethnicity Categorization Subgroups*
Source: American Community Survey 2015-2019

Subgroups
- NON-HISPANIC RACE ALONE - OMB
- RACE IN COMBINATION
- HISPANIC

	NON-HISPANIC RACE ALONE - OMB	RACE IN COMBINATION	HISPANIC
AIAN	18%	60%	21%
NHPI	44%	52%	4%
WHITE	58%	6%	35%
BLACK	78%	18%	4%
ASIAN	86%	13%	

% of Total Population Est

1. Becker, T., Babey, S.H., Dorsey, R. *et al.* Data Disaggregation with American Indian/Alaska Native Population Data. *Popul Res Policy Rev* 40, 103–125 (2021). https://doi.org/10.1007/s11113-020-09635-2
2. Kauh, T.J., Read, J.G. & Scheitler, A.J. The Critical Role of Racial/Ethnic Data Disaggregation for Health Equity. Popul Res Policy Rev 40, 1–7 (2021). https://doi.org/10.1007/s11113-020-09631-6

* May not add to 100% due to rounding

Objectives

To understand vaccination coverage among groups defined by race and ethnicity and identify potential disparities

- How do vaccination rates differ when using non-mutually exclusive race and ethnicity categories or alternative sources of population estimates?

- Do observed disparities in vaccination coverage depend on methods of classifying race/ethnicity?

- Which classification method is a more accurate representation of group-specific vaccination coverage?

Design

Race and ethnicity categorizations

- **Single Race and Ethnicity (mutually exclusive):**
  Hispanic or Latino ethnicity categorized first
  All others (non-Hispanic) categorized as single or multiple race

- **Race alone or in Combination (non-mutually exclusive):**
  Each race and ethnicity group includes all persons who identify with that category label (whether alone or in combination with other categories)

Population denominator estimate sources

- 2021 Department of Finance

- 2019 American Community Survey

- 2020 Census

Results

Table 1. Primary Series Vaccine Recipients		
	Classification and Measure	
Race/Ethnicity	Single Race	Combination Race
Latino	9,029,461	9,029,461
AIAN	91,504	513,121
Asian	4,811,921	5,578,055
Black	1,307,331	1,586,239
NHPI	125,417	402,596
White	10,148,796	15,701,276
Multi-Race	906,354	n/a
Total	26,420,784	32,810,748

Single Race = Single race or ethnicity alone (mutually exclusive);
Combination Race = race alone or in combination (non-mutually exclusive)
AIAN = American Indian or Alaska Native;
NHPI = Native Hawaiian or Pacific Islander

Results

Table 2. Population Estimates

Race/Ethnicity	Classification and Measure				
	Single Pop DOF	Single Pop ACS	Single Pop Census	Combination Pop ACS	Combination Pop Census
Latino	15,867,358	15,327,688	15,579,652	15,327,688	15,579,652
AIAN	156,918	140,831	156,085	762,733	1,409,609
Asian	6,033,448	5,610,931	5,978,795	6,551,732	7,045,163
Black	2,139,212	2,169,155	2,119,286	2,766,478	2,825,293
NHPI	139,020	140,788	138,167	323,042	337,617
White	13,971,549	14,605,312	13,714,587	25,048,942	21,597,610
Multi-Race	1,645,764	1,188,673	1,627,722	n/a	n/a
Total	39,953,269	39,183,378	39,314,294	50,780,615	48,794,944

Single = Single race or ethnicity alone (mutually exclusive); Combination = race alone or in combination (non-mutually exclusive)
DOF = California Department of Finance; Pop = Population estimate; ACS = American Community Survey 2015-2019
AIAN = American Indian or Alaska Native; NHPI = Native Hawaiian or Pacific Islander

Results

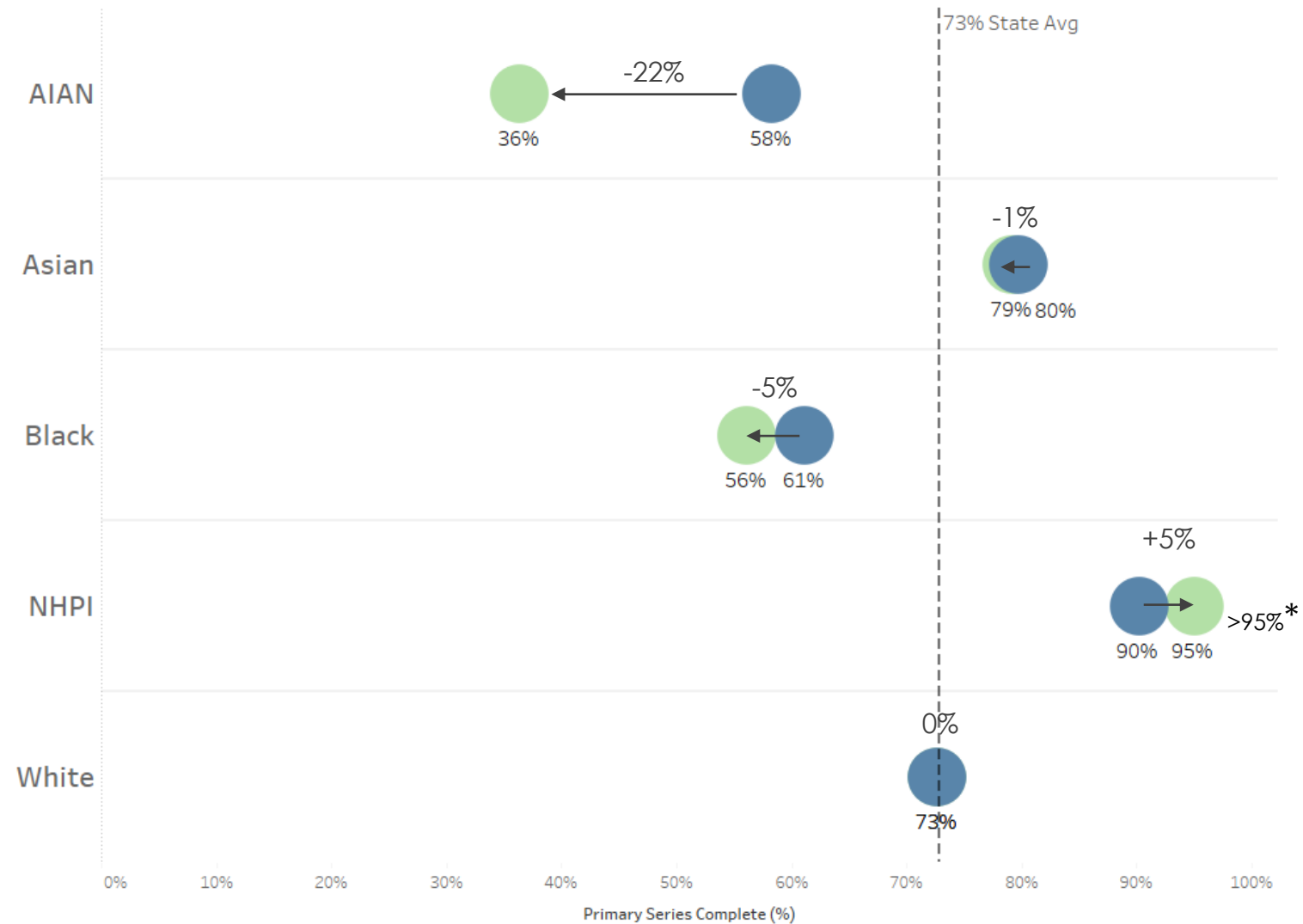| Table 3. Vaccination Population Coverage Rate Estimates					
	Classification and Measure				
Race/Ethnicity	Single DOF 2021	Single ACS 2019	Single Census 2020	Combination ACS 2019	Combination Census 2020
Latino	57%	59%	58%	59%	58%
AIAN	58%	65%	59%	67%	36%
Asian	80%	86%	80%	85%	79%
Black	61%	60%	62%	57%	56%
NHPI	90%	89%	91%	125%	119%
White	73%	69%	74%	63%	73%
Multi-Race	55%	76%	56%	n/a	n/a
Total	66%	67%	67%	67%	67%

Single = Single race or ethnicity alone (mutually exclusive); Combination = race alone or in combination (non-mutually exclusive)
DOF = California Department of Finance; Pop = Population estimate; ACS = American Community Survey 2015-2019
AIAN = American Indian or Alaska Native; NHPI = Native Hawaiian or Pacific Islander

Results

Comparison of Primary Series Completion Rates by Method

• **2021 DOF Non-Hispanic Race Alone** | • **2020 Census Alone or in Combination**

73% State Avg

AIAN — -22% — 36% ← 58%

Asian — -1% — 79% 80%

Black — -5% — 56% 61%

NHPI — +5% — 90% 95% >95%*
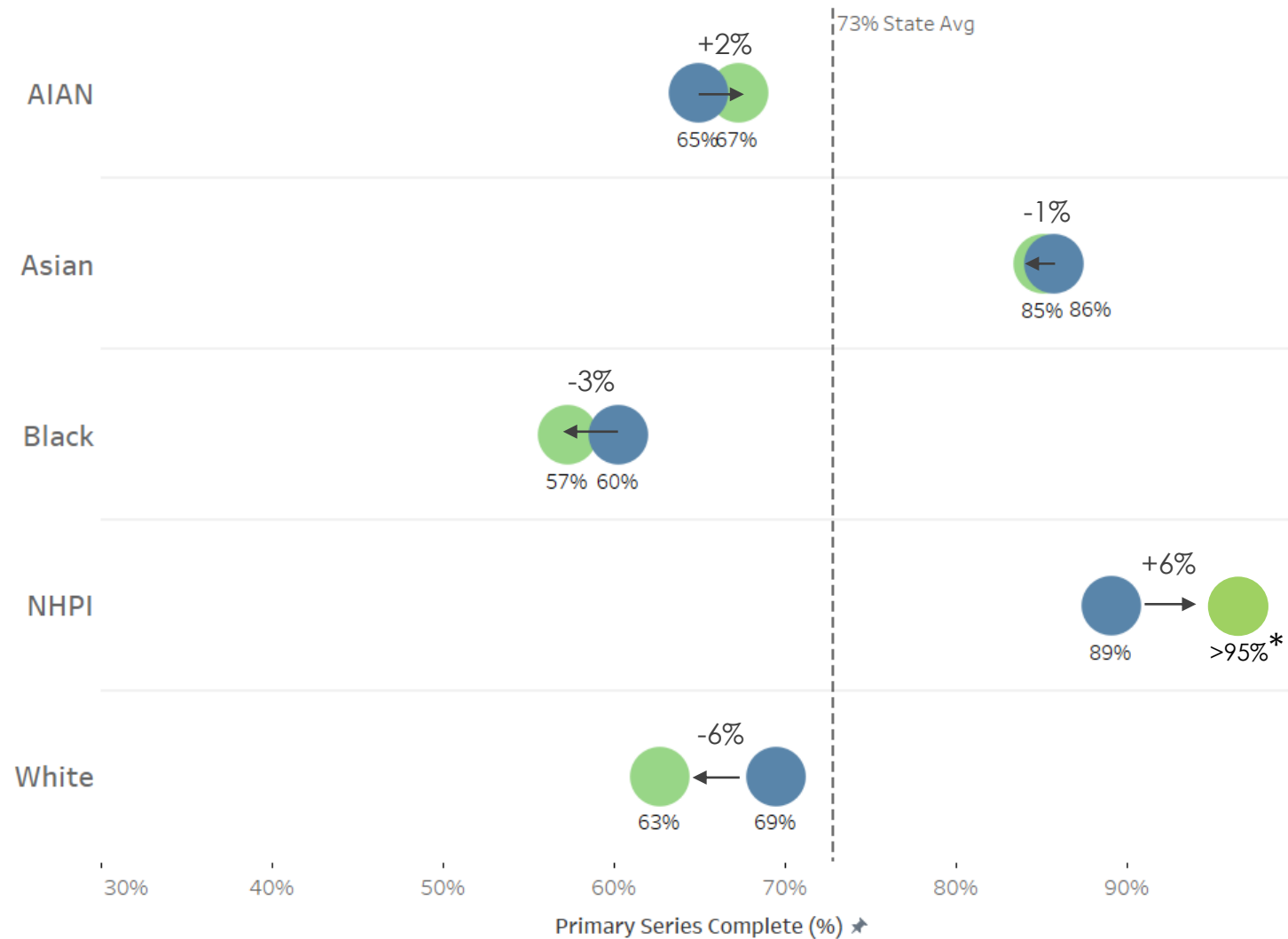
White — 0% — 73%

Primary Series Complete (%)

- vaccination rates capped at 95%;
- DOF = California Department of Finance; ACS = American Community Survey;
- AIAN = American Indian or Alaska Native; NHPI = Native Hawaiian or Pacific Islander

12

Comparison of Primary Series Completion Rates by Method

- **2019 5yr ACS Alone** | - **2019 5 yr ACS Race Alone or in Combination**

Results

73% State Avg

AIAN — +2% 65% 67%

Asian — -1% 85% 86%

Black — -3% 57% 60%

NHPI — +6% 89% >95%*

White — -6% 63% 69%

Primary Series Complete (%)

30% 40% 50% 60% 70% 80% 90%

- vaccination rates capped at 95%;
- DOF = California Department of Finance; ACS = American Community Survey;
- AIAN = American Indian or Alaska Native; NHPI = Native Hawaiian or Pacific Islander

13

Limitations/ Discussion

- Race is a social construct and can be categorized in different ways depending on social context.

- Race or ethnicity "unknown" or "other" for 9% of all vaccine recipients.

- Data completeness and quality can impact accuracy of estimates.

- Caution needed when interpreting race-specific vaccination coverage calculated by comparing registry data to census population estimates (e.g., indications NHPI rates may be inaccurate).

Conclusions

California Immunization Registry (CAIR) successfully records multiracial identities for many but not all COVID-19 vaccine recipients

---

- Changes in vaccination rate estimates ranged from 1% (Asian) to 6% (White, NHPI) between 2019 ACS 5yr estimates (alone vs combination)

- Census 2020 changes resulted in much lower estimates for non-mutually exclusive AIAN race alone or in combination compared to CA Department of Finance denominators

- Disparities in vaccination rates minimally impacted using pre-2020 population data, potential data issues for post-2020 "in combination" approach

Future Work

- Explore impact of methodological changes and shifting demographics

- Examine of booster rates using internal denominators

- Assess accuracy of estimates by comparing registry based rate estimates to independent sources (e.g., health surveys)

- Evaluate effectiveness of equity-focused interventions

Acknowledgements

- Elizabeth Reosti
- Hailey Maeda
- Celeste Romano
- Cynthia Yen
- Cora Hoover
- CAIR Team

END