

Analysis of 2024 Extant Code.org Data for Indigenous Students

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Sponsored by Amazon Future Engineer

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Agenda

1. What is the Indigenous computer science (CS) study coalition?
2. What is the Code.org data analysis and its role in the study coalition?
3. Code.org analysis findings, focusing on the 2024 State of Computer Science Education report:
 - a. What does the state of Indigenous student access to CS look like in the US?
 - b. What does enrollment in foundational CS courses look like for Indigenous students in the US?
 - c. What does Advanced Placement (AP) CS course exam enrollment look like for Indigenous students in the US?
 - d. What does state policy related to CS look like?
4. What are some *considerations* and *limitations* related to the Code.org data analysis?

What is the Indigenous CS study coalition?

The Indigenous CS study coalition explores access to, and visions of, high-quality CS education centered on and for Indigenous students and tribal communities.

The study aims to better understand (a) how Indigenous youth and tribal communities are defining CS; and (b) what opportunities and barriers exist for Indigenous youth in pursuing computing-adjacent careers. The study coalition hopes the results from this study will improve CS educational pathways for Indigenous youth and tribal communities.



What is the Indigenous CS study coalition?

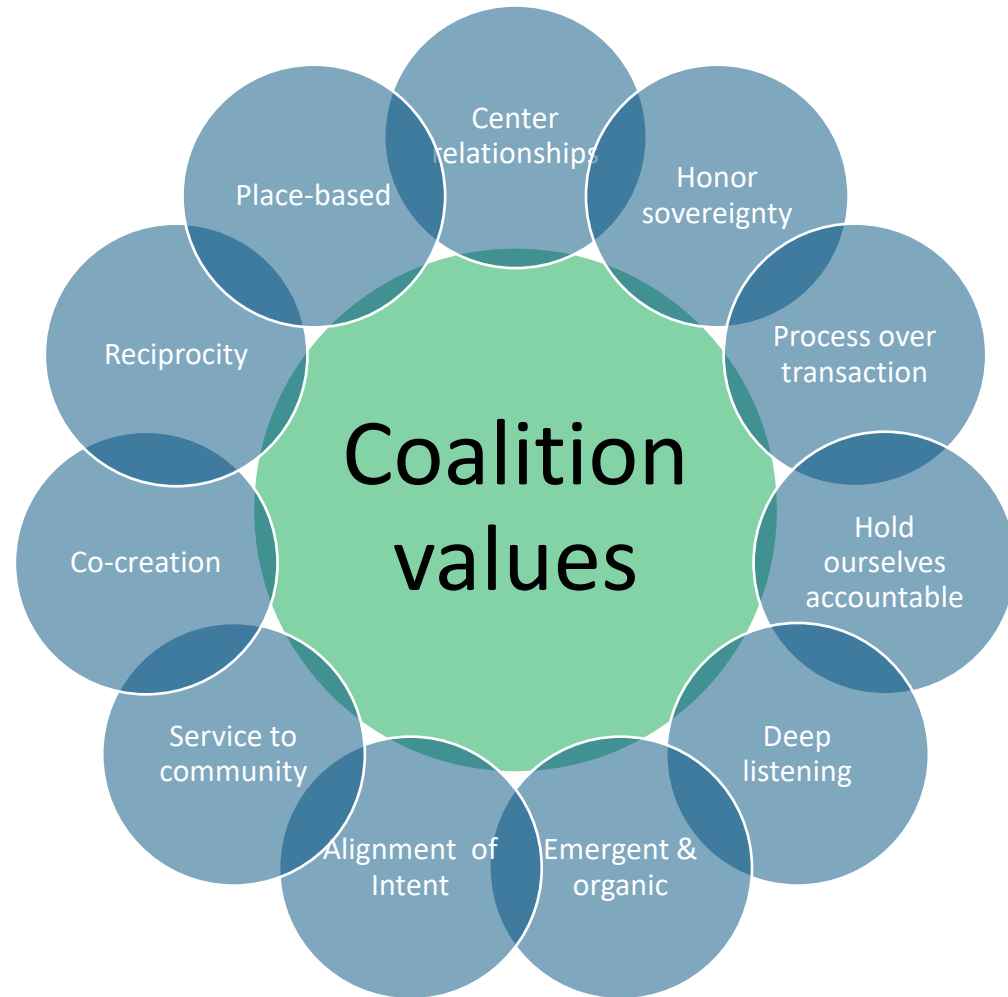
This study is being performed by a coalition of organizations that have assets, strengths, and capabilities at the intersections of Indigenous communities, computer science education, Western-based education research and evaluation methods, and Indigenous research and evaluation methods.



AIR®

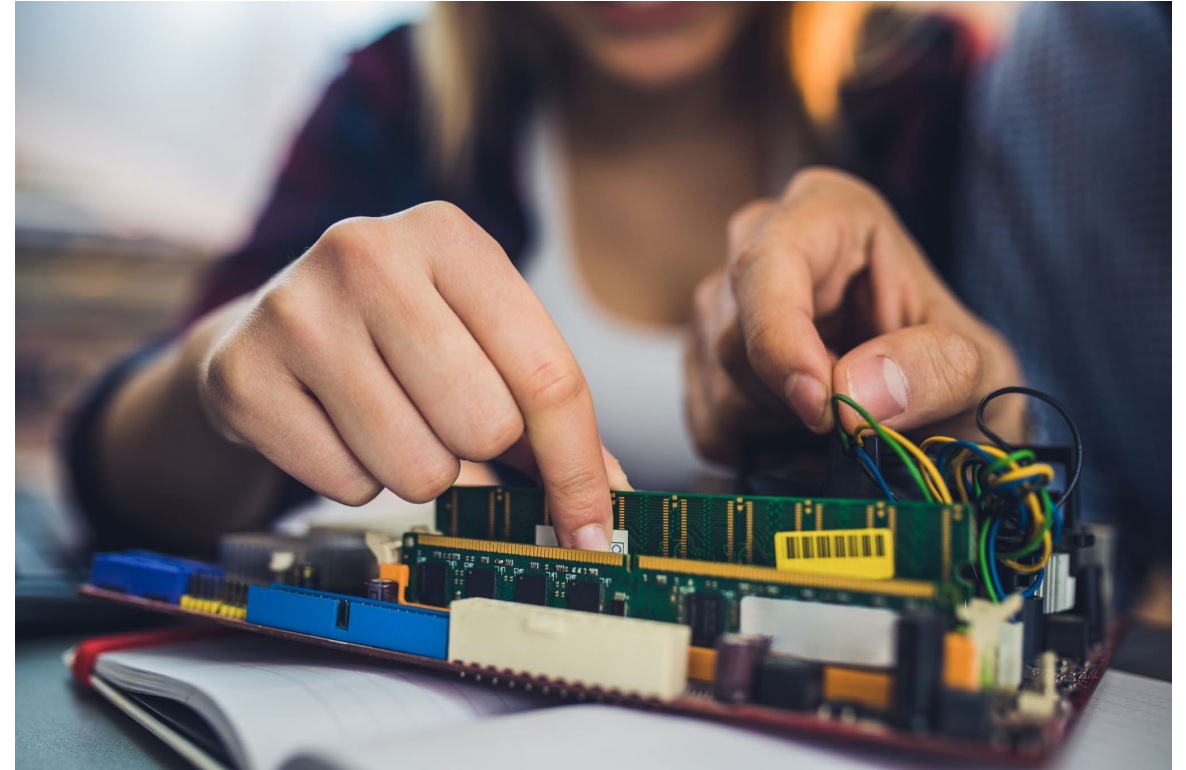


The Indigenous CS study coalition is guided by collectively defined core values



What are the goals of the Indigenous CS study coalition?

- To understand the forms of computer science education opportunities Indigenous students have access to across grade levels.
- To explore Indigenous students' interests in learning computer science.
- To explore how CS education and Indigenous communities intersect.



This coalition is using several approaches and a variety of data sources.



**Student, Parent,
and Community
Member Focus
Groups or
Interviews**



**Student,
Parent &
Teacher
Surveys**



**Code.org
Data**



Talk Stories

The overall CS study is guided by four primary research questions.

1. In what ways could computer science (CS) support Indigenous language revitalization, nation building, Tribal sovereignty, and self-determination, as well as other forms of Indigeneity?
2. What are Indigenous students' and their communities' interest in CS education and career pathways?
3. What does access to CS education and pathways look like for different Indigenous students and their communities?
4. What are the strengths (assets, resources, opportunities) that Indigenous students and their communities bring to computer science?

The Code.org data analysis focuses on addressing research question 3.



What is the Code.org data?

What is the Code.org data?

- Since 2019, Code.org has annually collected computer science access data for K–12 students across the United States. It summarizes the findings in a State of Computer Science Education [Annual Report](#).
- AIR conducted an analysis of the Code.org dataset used to produce the 2024 annual report—with a specific focus on the state of CS education access for Indigenous youth.



Why use Code.org data?

Code.org offers insights into Indigenous student interest and access to CS through its data for the 2024 report and its policy tracker. The following questions were asked using the data:

1. What does the state of Indigenous student access to CS courses look like in the US?
2. What does enrollment in foundational CS courses look like for Indigenous students in the US?
3. What do AP CS course exam enrollment rates look like for Indigenous students in the US?
4. What does the progress look like for CS policy in states with the highest concentrations of indigenous students?
5. What are known limitations and challenges of these existing data?

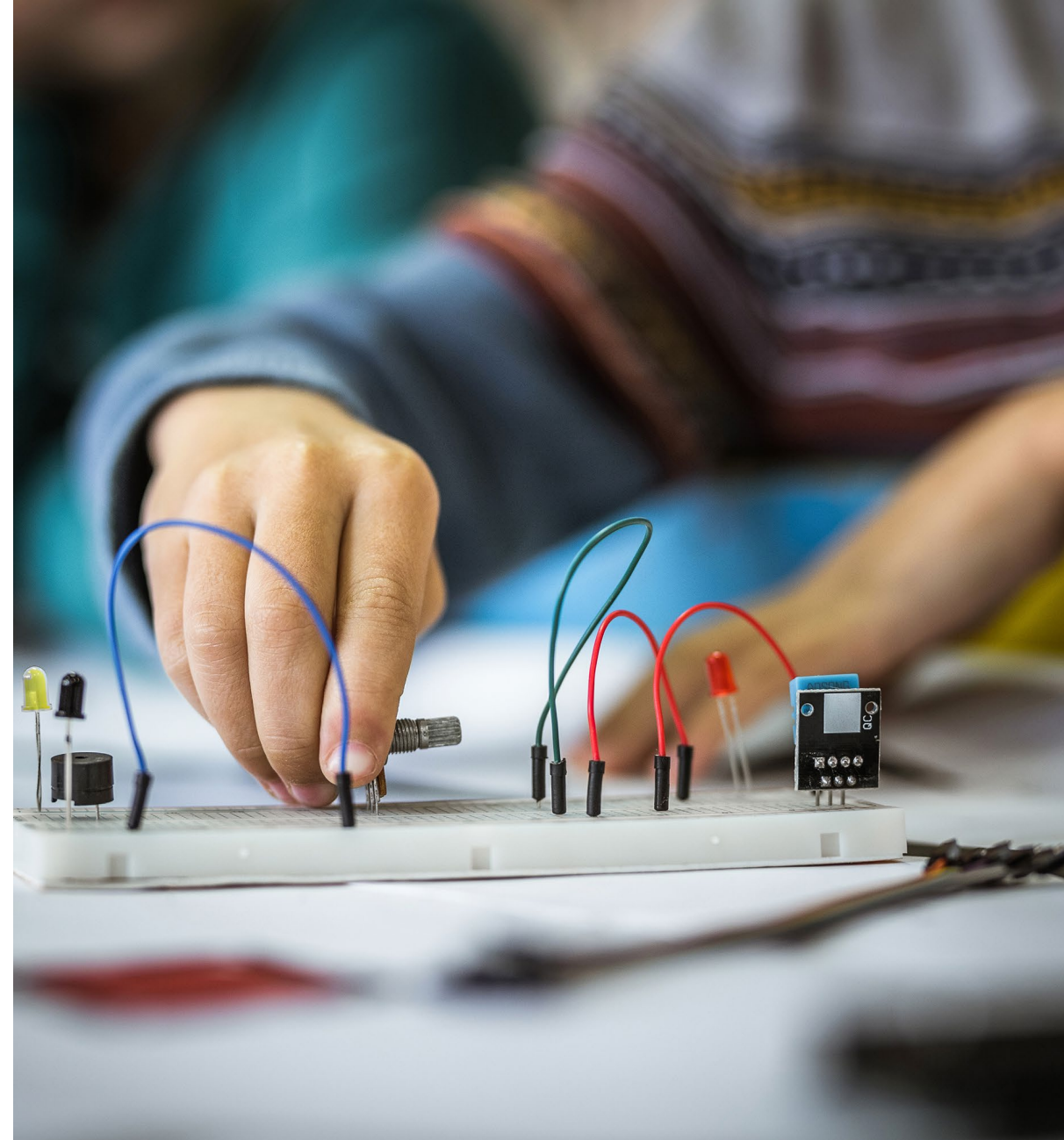
AIR analyzed existing data from Code.org and federal data.

Data	Source	Gathered By
Total number of K–12 students, by state or jurisdiction	U.S. Department of Education, NCES, Table 203.40 (fall 2022)	AIR
Percentage distribution of K–12 enrollment, by race/ethnicity and state or jurisdiction	U.S. Department of Education, NCES, Table 203.70 (fall 2022)	AIR
Number of K–12 students in the US, by grade and race/ethnicity	U.S. Department of Education, NCES, Table 203.65 (fall 2013 through fall 2023)	AIR
Course offerings per school	• State education agencies • National and state-specific organizations (College Board, CSTA, UT Austin) • District/school course catalogs • Survey responses from teachers and administrators at code.org/yourschool	Code.org
Course enrollment	State education agencies	Code.org
AP enrollment	College Board	Code.org

How are Indigenous students described in the Code.org data?

- **Native American/Alaska Native (NA/AN)** refers to a person having origins in any of the original peoples of North and South America (including Central America) who maintain cultural identification through tribal affiliation or community attachment.
- **Native Hawaiian/Pacific Islander (NH/PI)** refers to a person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands. They are tracked separately from NA/AN students.
- **The current analysis focuses only on NA/AN students.** (Note: The current analysis uses “Indigenous” and “NA/AN” interchangeably).

Source: [Code.org, 2024 State of CS Annual Access Report](#) and [NCES Definitions for New Race and Ethnicity Categories](#)
Note: Code.org uses NCES definitions for demographic categories.



What is a “foundational” computer science course?

Code.org used the following terminology within the data:

- Foundational refers to courses aligned to the K–12 Computer Science Framework.
- Must include a hands-on programming component:
 - ≥ 20 hours for grades 9–12
 - ≥ 10 hours for grades K–8
- Must be offered during the school day (extracurricular clubs or after-school program do not qualify).
- Virtual courses may count:
 - Must appear in the school’s official catalog
 - Must be delivered as part of the regular school day schedule

Source: [Code.org, 2024 State of CS Annual Access Report](#)

What are the metrics used in this analysis?

- **Access** is where students have the opportunity to enroll in a computer science course. AIR's analysis focuses on two kinds of access that Code.org reports:
 - The percentage of middle schools and high schools offering a foundational computer science course.
 - The percentage of NA/AN students who attend a school that offers such a course.
- **Participation**, or course taking, is when students choose to enroll in foundational courses. AIR uses these terms to describe participation:
 - *Parity* is when the percentage of NA/AN students participating in CS is equal or greater than the percentage NA/AN students in public K-12 schools.
 - *Underrepresentation* is when the percentage of NA/AN students participating in CS is less than the percentage NA/AN students in public K-12 schools.
- **AP participation** refers to the number of students who register and sit for the College Board's AP Computer Science exams. This metric captures *only those who take an exam*, not everyone who takes an AP class.
- **AP achievement** refers to earning a score of 3 or above on AP exams. AIR uses the threshold because a score of 3 often qualifies students for college credit and demonstrates proficiency in the subject matter.

Source: [Code.org, 2024 State of CS Annual Access Report](#)

Note: We rely on Code.org definitions for access and participation. However, the definitions for parity, underrepresentation, and AP achievement were developed by AIR specifically for this report and do not necessarily reflect official definitions used by Code.org.

What are the “Top 10” states?

- The 10 states where Native American/Alaska Native students have the highest proportion of total K–12 enrollment
 - Based on fall 2022 NCES data
 - Places where bolstering access, participation for NA/AN learners is critical.
- Whenever you see “top 10 states” in the title, it means we are spotlighting this cohort.

Note: AIR created the top 10 states for the Code.org analysis using the criteria of states that Native American/Alaska Native students have the highest proportion of total K–12 enrollment using fall 2022 NCES data.



Summary Key Findings from 2024 Code.org Data

What are the key findings from the 2024 Code.org data?



1. What does the state of Indigenous student access to *high school* CS look like in the US?
 - a. Nationally, NA/AN students have the least access to high schools that offer foundational CS courses in comparison to their peers are least likely to attend a high school offering a foundational CS course. Access to foundational CS is still out of reach for many NA/AN students.

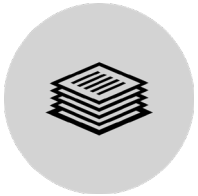


2. What does participation in foundational CS courses look like for Indigenous students in the US?
 - a. Nationally, participation in foundational CS course grew from 2020-2021 through 2023-2024, but participation for NA/AN students was flat.
 - b. However, in 2023-2024, NA/AN participation in foundational CS participation was equal or greater than the percentage NA/AN students in public K-12 schools

What are the key findings from the 2024 Code.org data?



3. What do AP CS course exam enrollment rates look like for Indigenous students in the US?
 - a. Nationally, Indigenous students are underrepresented in AP CS exam participation.
 - b. However, of those NA/AN students that took the AP CS exam, nearly half received a score of 3 or higher.



4. What does the progress look like for CS policy in states with the highest concentrations of Indigenous students?
 - a. States with more computer science access adopt more CS policies.
 - b. The 10 states where NA/ AN students have the highest proportion of total K–12 enrollment have lower rates of adoption of the Code.org 10 key CS policies—and lower access to foundational CS.

What are the limitations of the 2024 Code.org data?

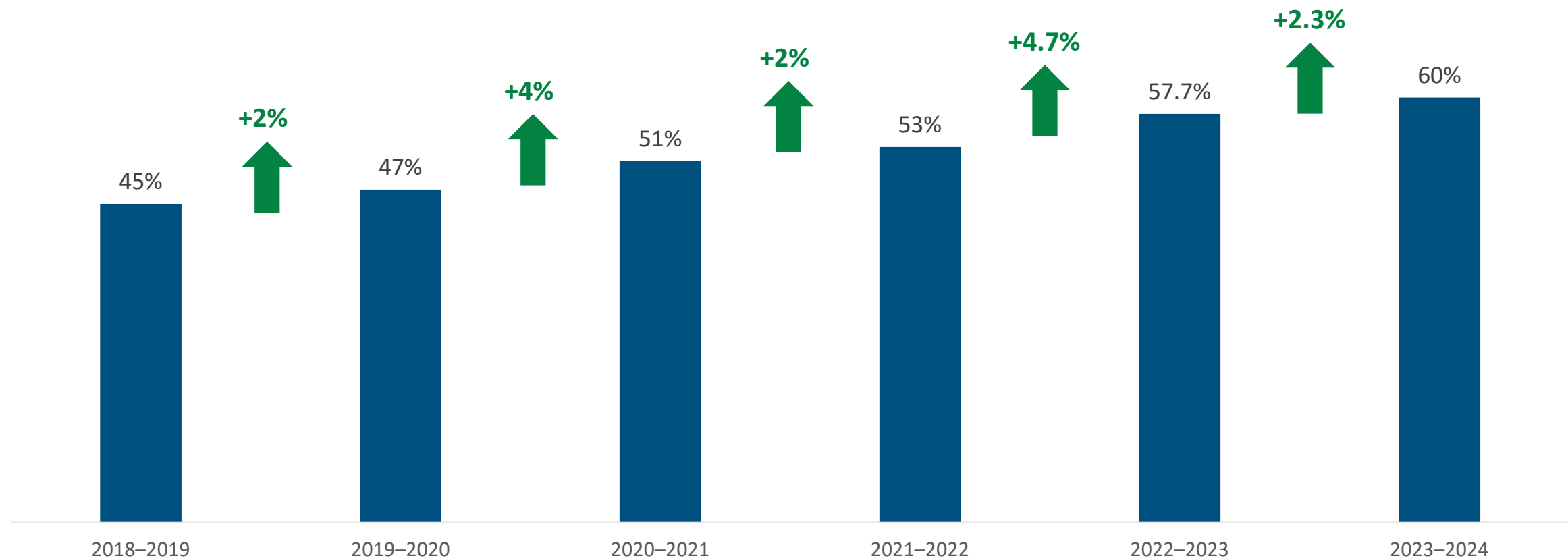
- Using extant data from multiple sources has limitations.
- Some key issues that must be taken into consideration when thinking about this analysis:
 - Indigenous Student Counts
 - Population Mismatches
 - Sample Sizes
 - Years of Data Available
 - Missing State Data
 - Inclusion and exclusion of Bureau of Indian Education/Affairs and Tribally-controlled schools

Note: More details on limitations and considerations can be found at the end of the analysis.



What does the state of Indigenous student access to *high school* CS look like in the US?

Nationally, the percentage of public high schools offering CS has steadily increased.



Source: [Code.org, 2024 State of Computer Science Education](#)
Note: Overall data for each report year are based on the most recent data from each state. Data for 2018–2019 is only from 39 states. The rest of the years have data from every state.

Nationally, NA/AN students have the least access to high schools that offer foundational CS courses in comparison to their peers.



Access to Foundational CS in High School by Race/Ethnicity

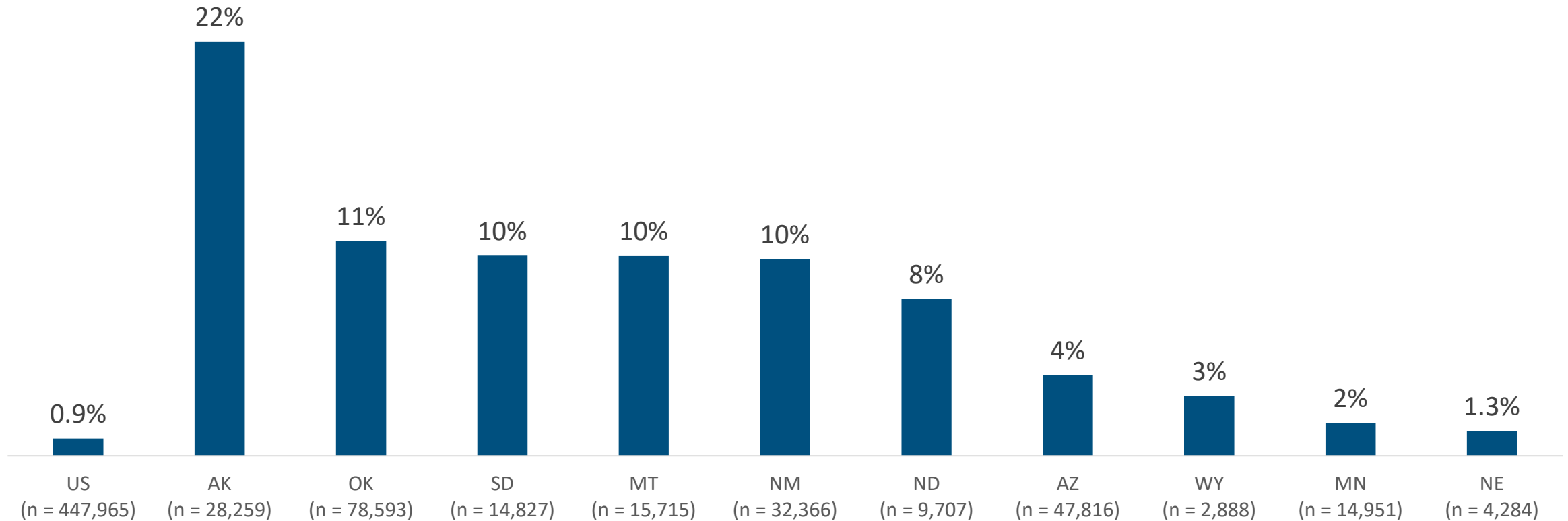


Source: [Code.org, 2024 State of Computer Science Education](https://code.org/2024-state-of-computer-science-education)

These 10 states have the highest percentage of students enrolled in public K–12 schools who identify as NA/AN.



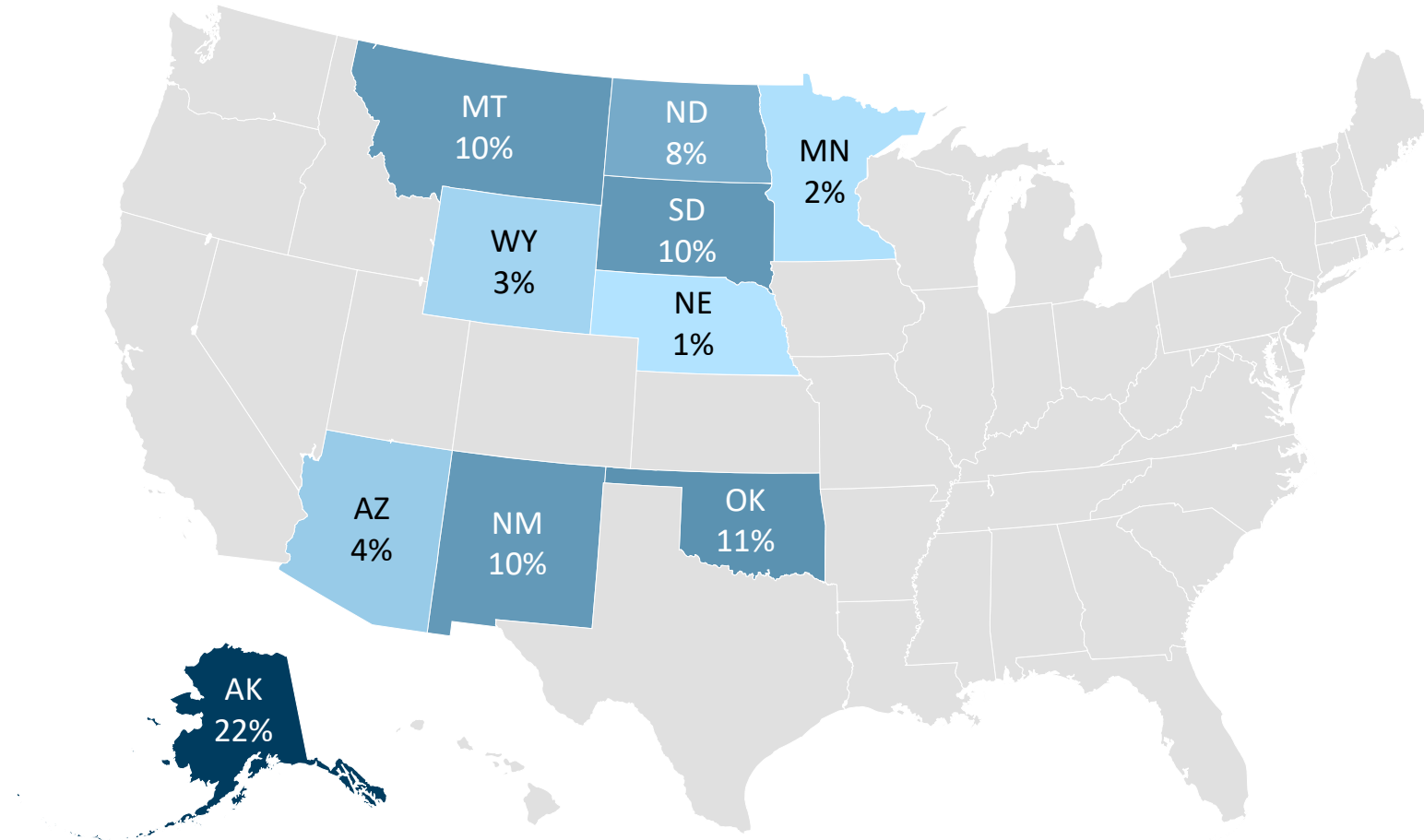
NA/AN Share of K–12 Enrollment by State (Fall 2022)



Source: U.S. Department of Education, NCES, [Table 203.40 \(2023\)](#) and [Table 203.70 \(2024\)](#)

Note: Fall 2022 is the most recent state-level enrollment data available. Values in parentheses below each state label represent the number of Native American students in each state.

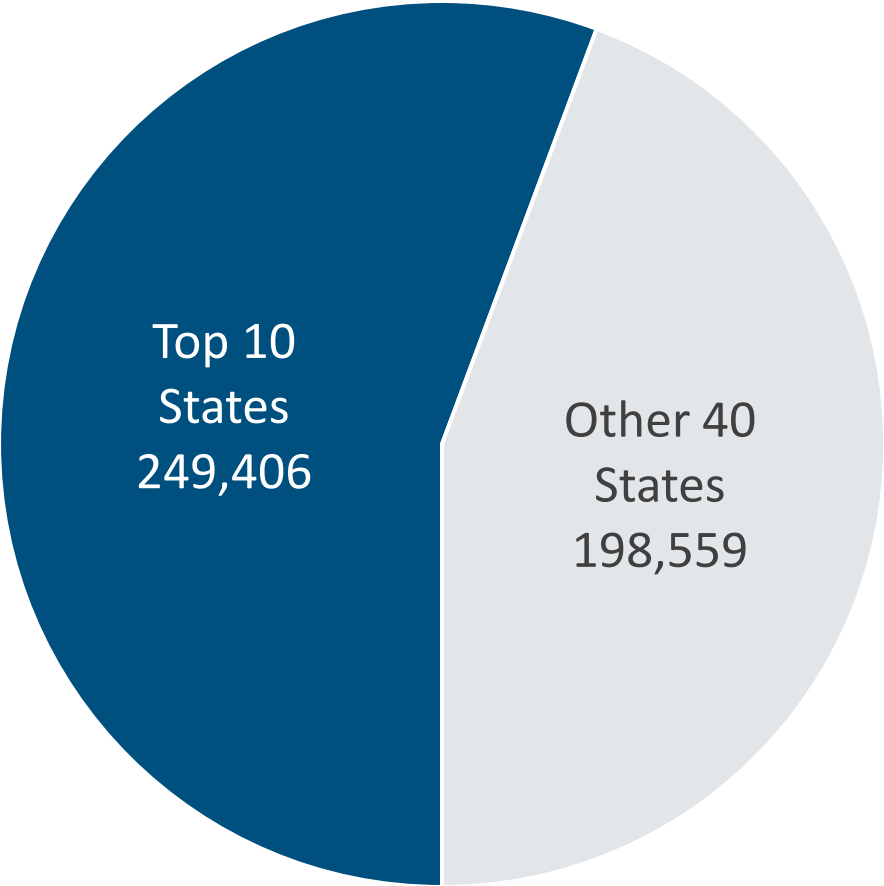
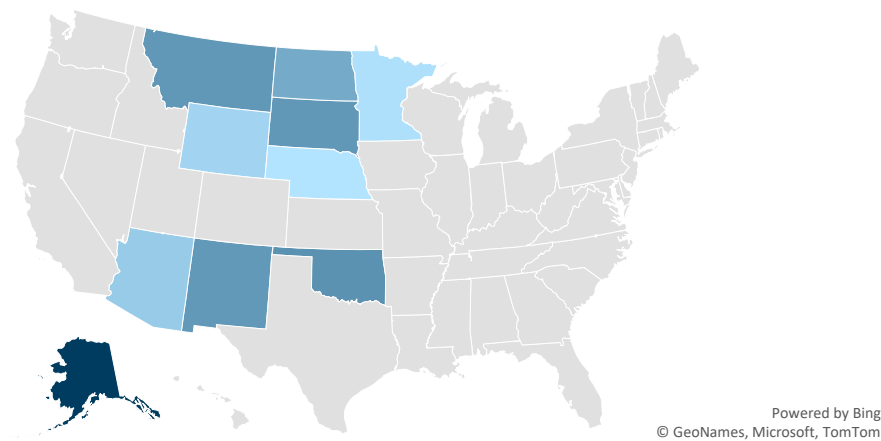
These 10 states have the highest proportion of NA/AN students in public K–12 schools.



Source: [U.S. Department of Education, NCES, Table 203.70 \(2024\)](#)
Note: Fall 2022 is the most recent state-level enrollment data available.

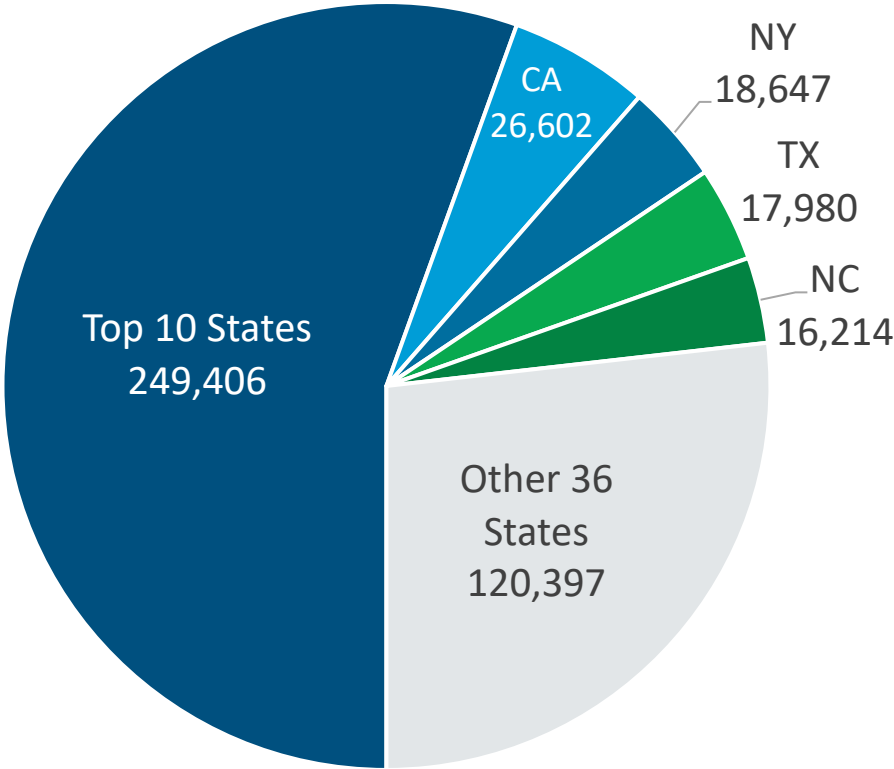
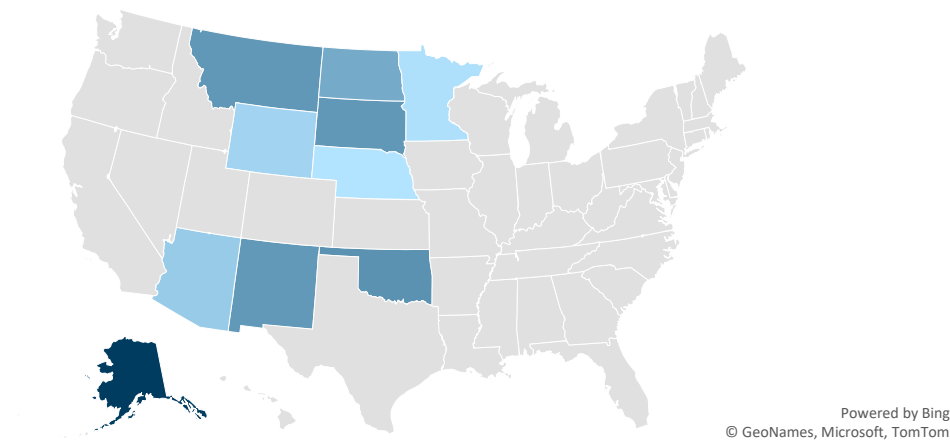
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Together, the top 10 states enroll nearly 250K Native American/Alaska Native K–12 students. That is 56% of the national total.



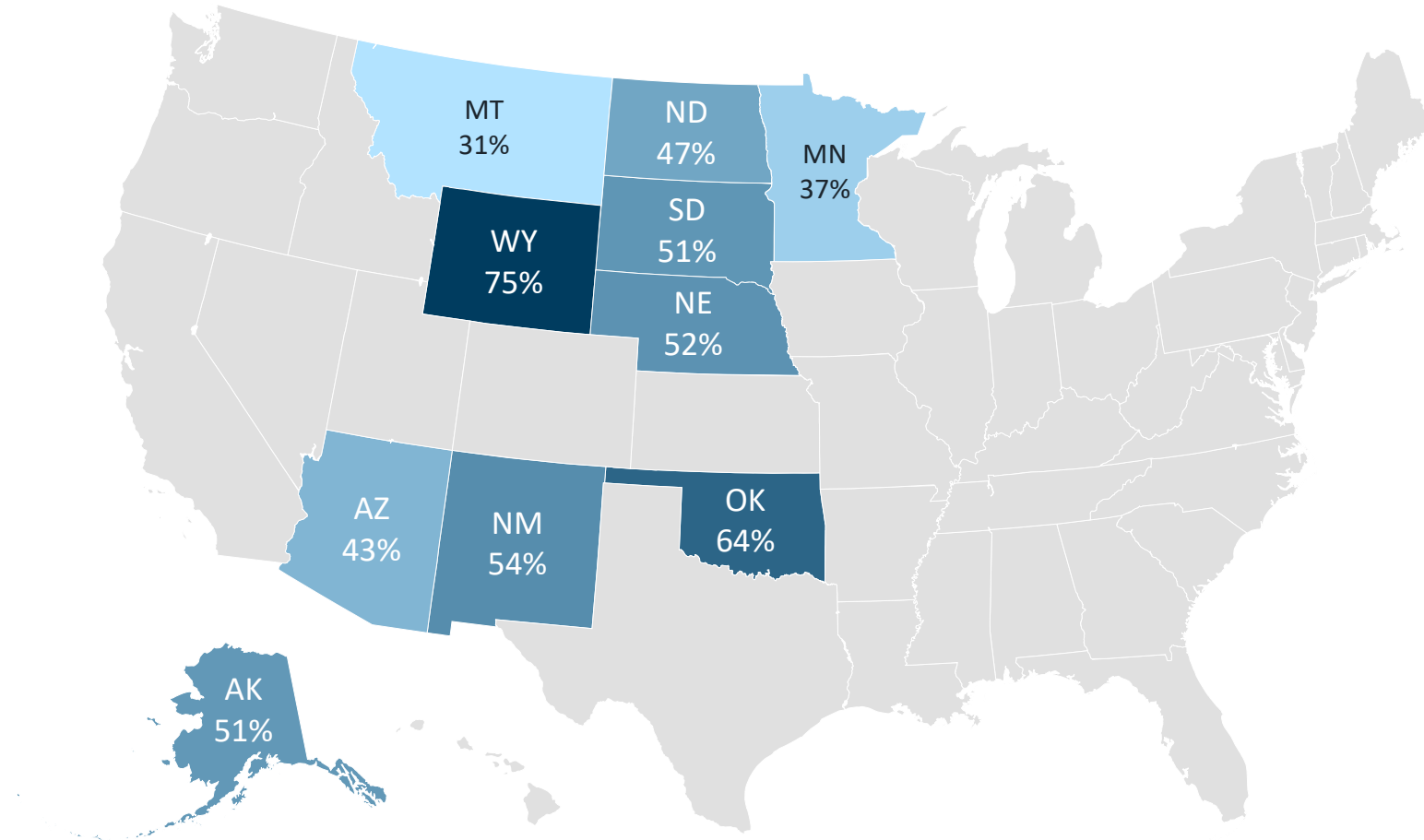
Source: [U.S. Department of Education, NCES, Table 203.70 \(2024\)](#)
Note: Fall 2022 is the most recent state-level enrollment data available.

California, New York, Texas, and North Carolina also have large populations of NA/AN students.



Source: [U.S. Department of Education, NCES, Table 203.70 \(2024\)](#)
Note: "Top 10 states" refers to the states with the greatest proportion of NA/AN K-12 students: AK, OK, SD, MT, NM, ND, AZ, WY, MN, NE.

In the top 10 states, the percentage of high schools offering foundational CS for all students ranges from 31% to 75%.



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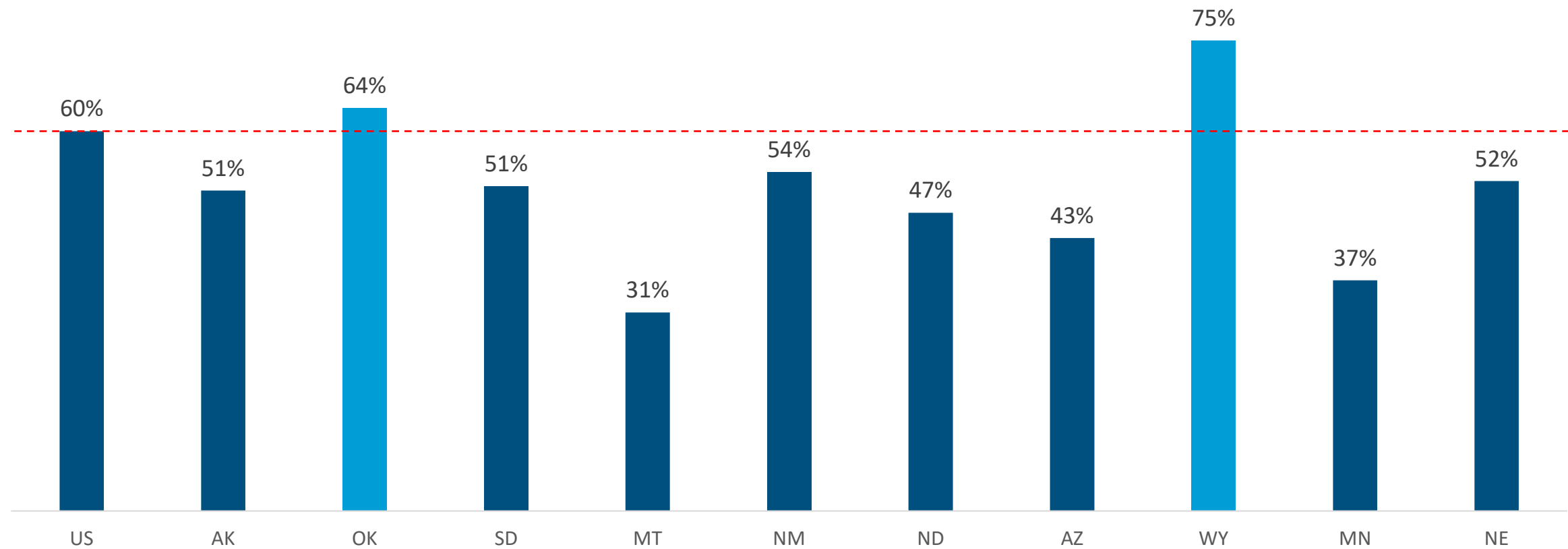
Source: [Code.org, 2024 State of Computer Science Education](https://code.org/2024-state-of-computer-science-education)

Note: This relies on the most recent access data reported by Code.org. AZ, MT, NM, WY data is from 2023-24; MN, ND, NE, SD data is from 2022-23; OK and AK data is from 2021-22.

Oklahoma and Wyoming exceed the national average of 60% of high schools offering foundational CS.



Percent of High Schools Offering Foundational CS, by State

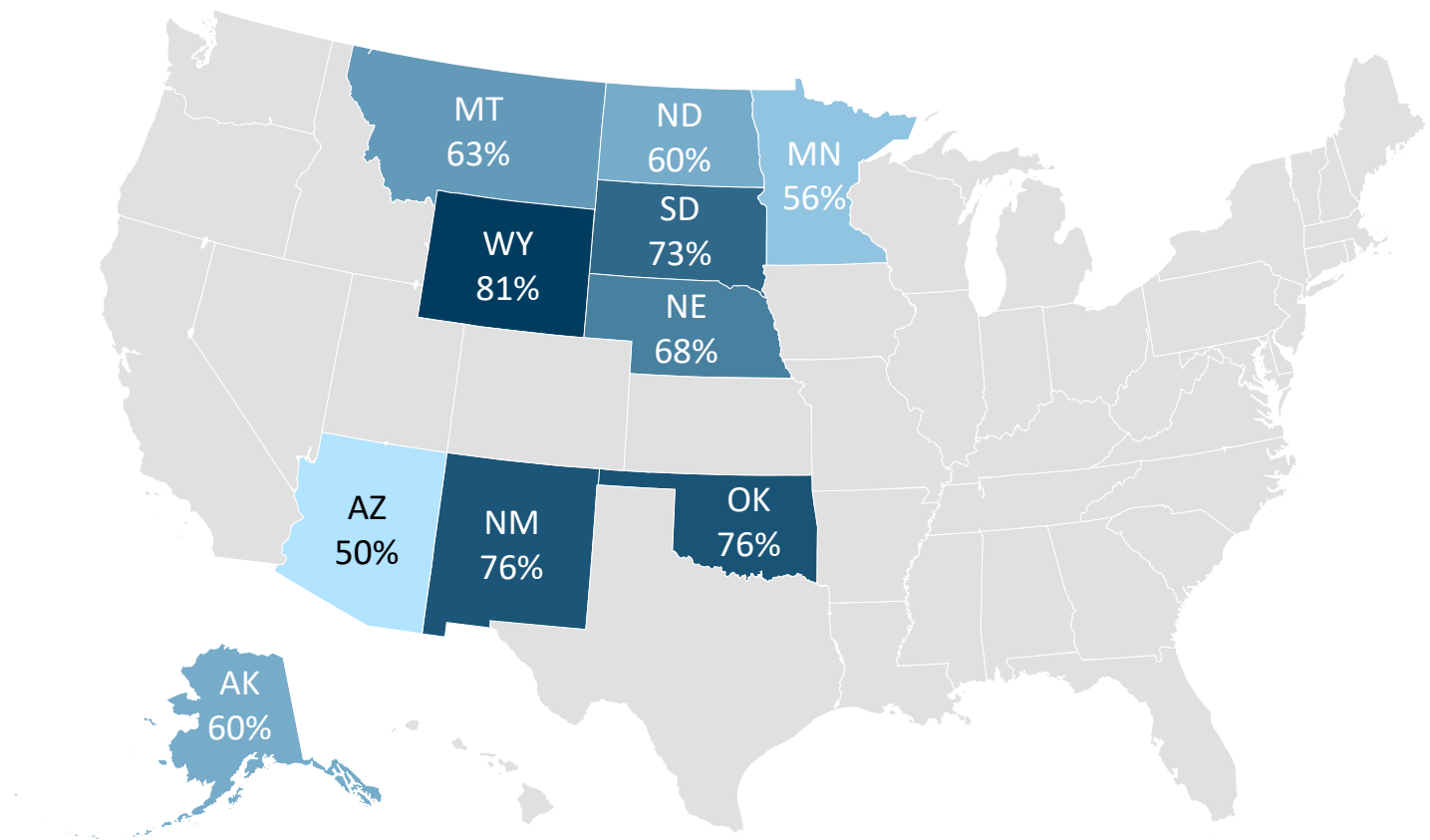


Source: [Code.org, 2024 State of Computer Science Education](#)
Note: This relies on the most recent access data reported by Code.org. AZ, MT, NM, WY data is from fall 2023-24; MN, ND, NE, SD data is from fall 2022-23; OK and AK data is from 2021-22.

In the top 10 states, foundational high school CS access for NA/AN students ranges from 50% to 80%.



Percentage of NA/AN Students Who Attend a Public High School Offering CS



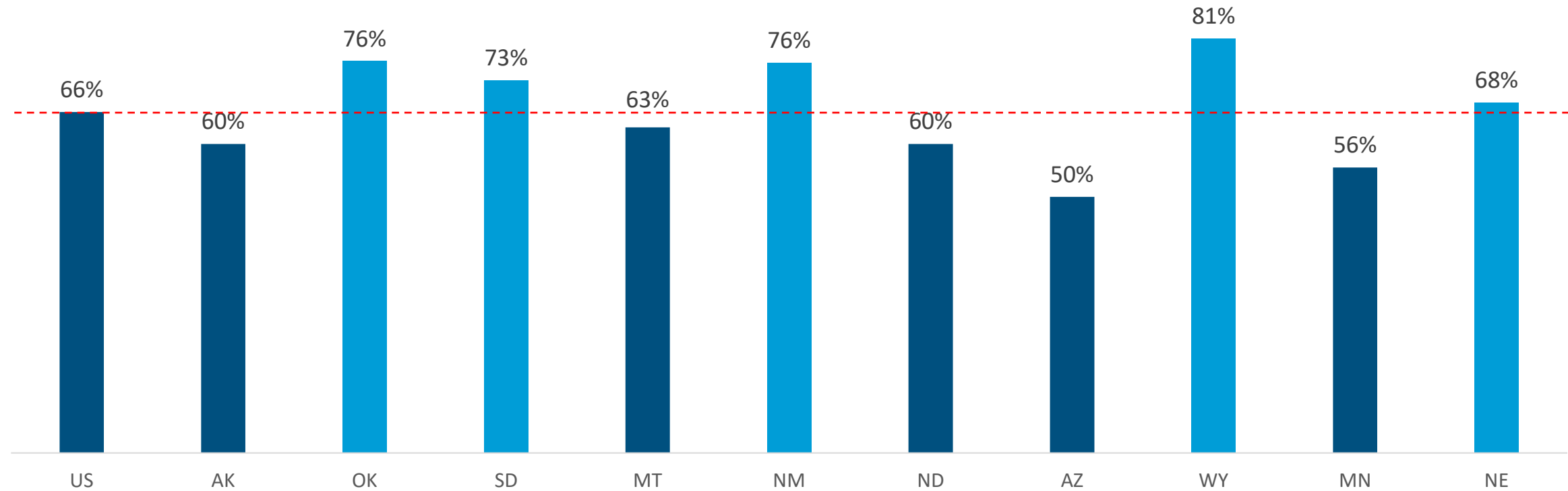
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Source: [Code.org, 2024 State of Computer Science Education](#)
Note: This relies on the most recent access data reported by Code.org. AZ, MT, NM, WY data is from fall 2023-24; MN, ND, NE, SD data is from fall 2022-23; OK and AK data is from 2021-22.

Five of the top 10 states (OK, SD, NM, WY, NE) are above the national average for NA/AN access to foundational CS.



Percentage of NA/AN Students Who Attend a Public High School Offering Foundational CS, by State

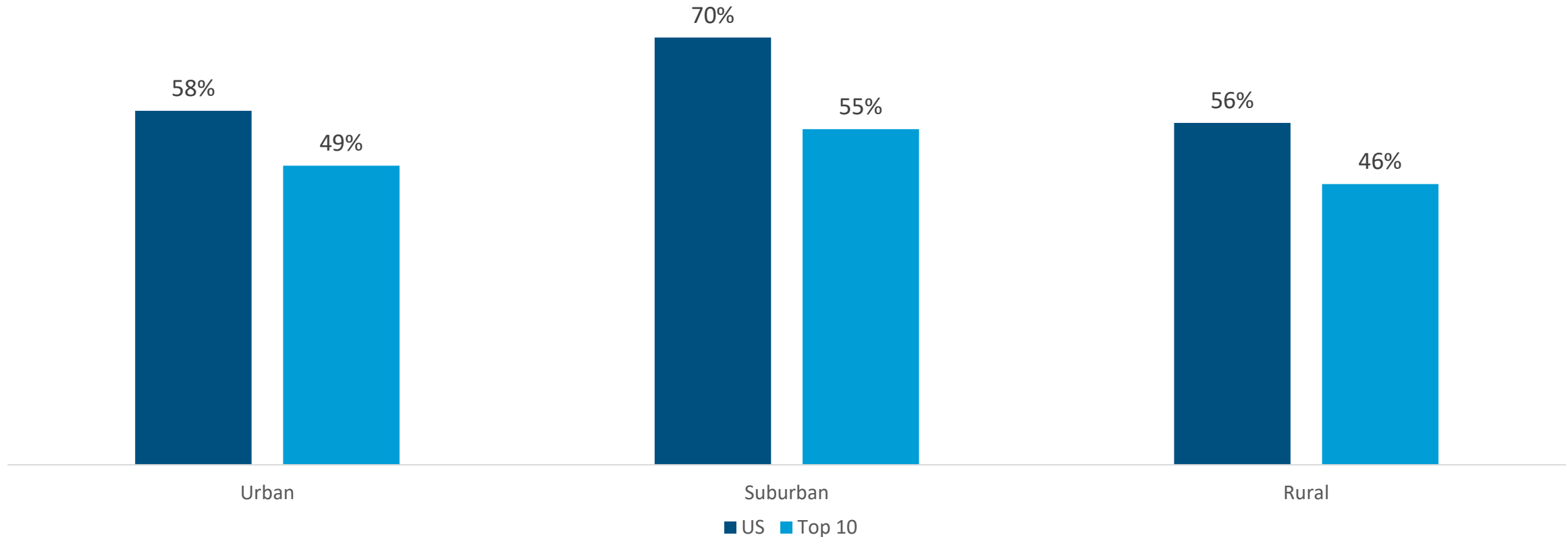


Source: [Code.org, 2024 State of Computer Science Education](#)
Note: This relies on the most recent access data reported by Code.org. AZ, MT, NM, WY data is from fall 2023-24; MN, ND, NE, SD data is from fall 2022-23; OK and AK data is from 2021-22.

Access is highest in suburban schools, and the top 10 states are collectively below the national average in all school settings.



High Schools Offering Foundational CS, by School Setting



Source: [Code.org, 2024 State of Computer Science Education](#)

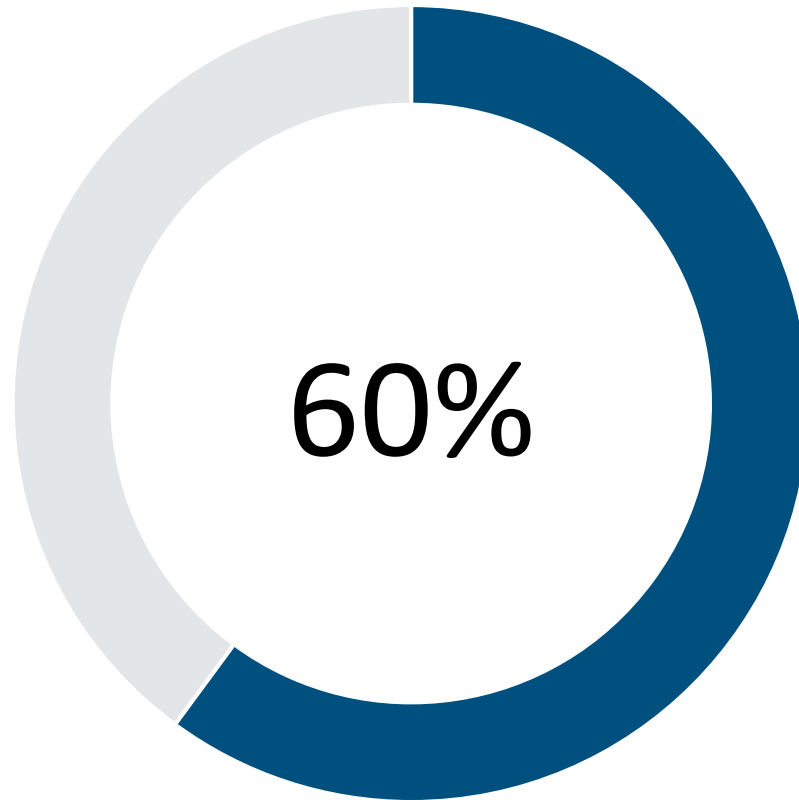
Note: Code.org uses the federal NCES locale framework to determine school setting.

What does the state of Indigenous student access to *middle school* CS look like in the US?

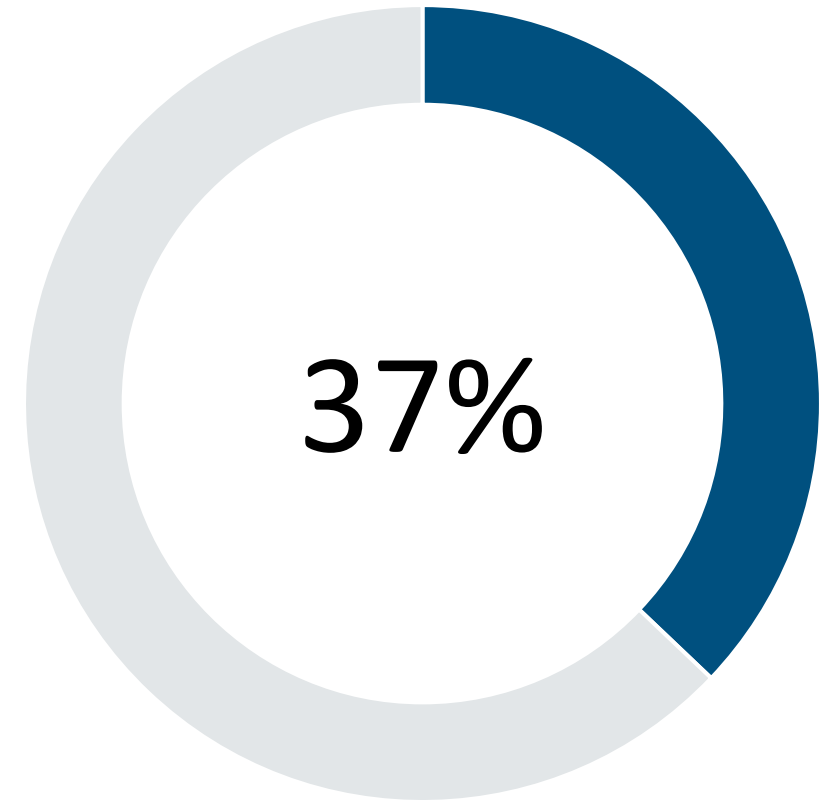
Nationally, high schools are more likely than middle schools to offer CS.



US High Schools

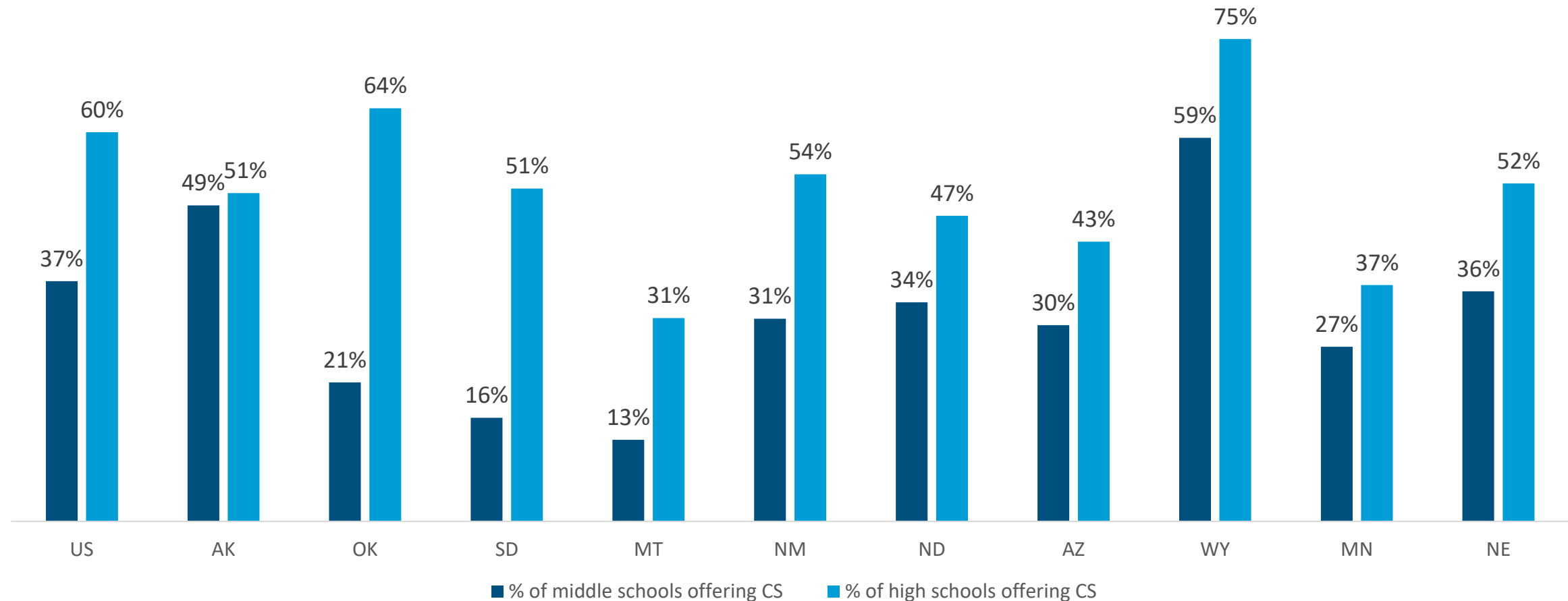


US Middle Schools



Source: [Code.org, 2024 State of CS Annual Access Report](#)

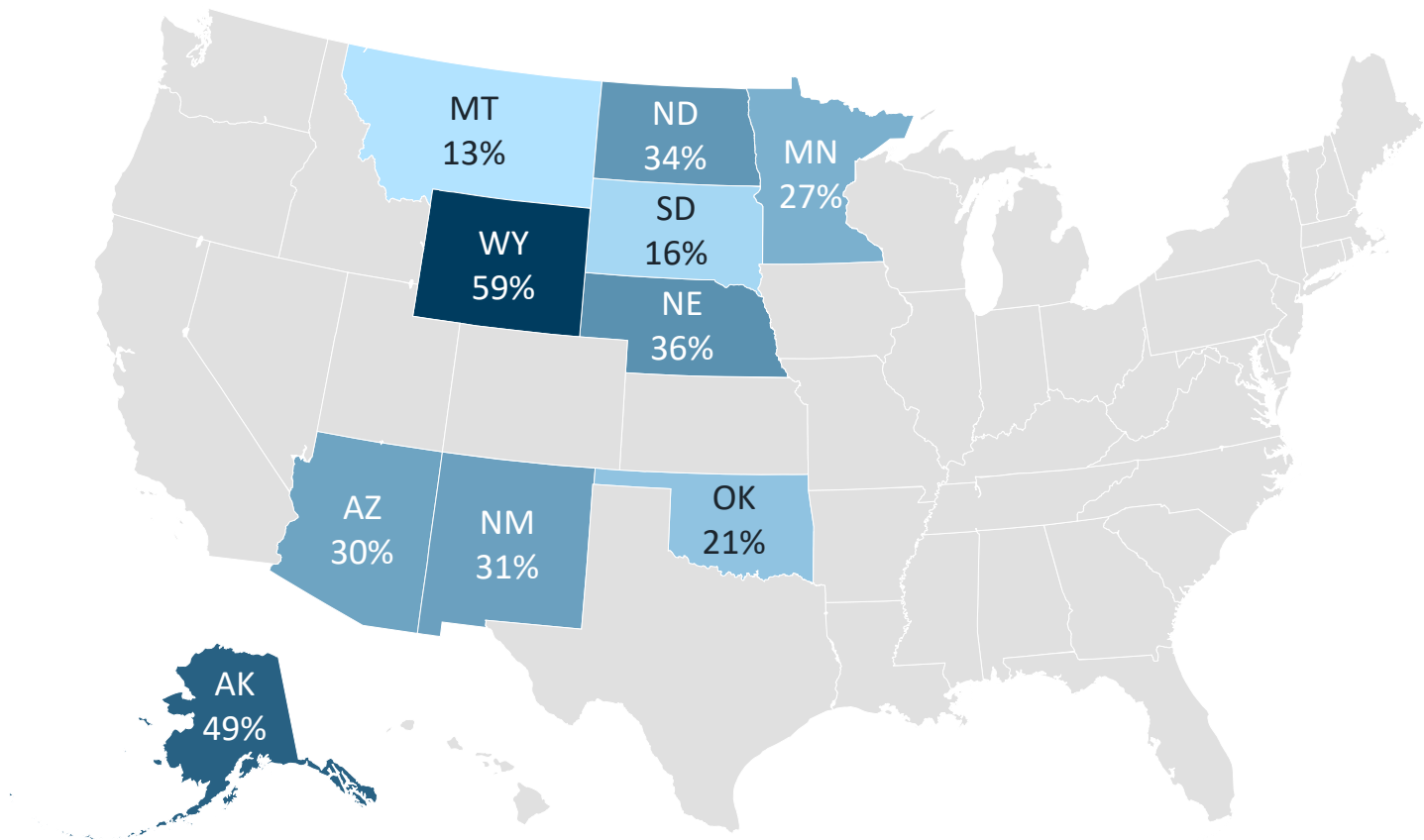
In the top 10 states, a smaller percentage of middle schools offer foundational computer science compared to high schools.



Source: [Code.org, 2024 State of CS Annual Access Report](#)
Note: These are the 10 states with the greatest proportion of NA/AN K–12 students, per National Center for Education Statistics (NCES) data. This relies on the most recent access data reported by Code.org. AZ, MT, NM, WY data is from fall 2023-24; MN, ND, NE, SD data is from fall 2022-23; OK and AK data is from 2021-22.

Of the top 10 states, AK and WY have the highest percentage of middle schools that offer foundational CS, exceeding the national average (37%).

Percent of Middle Schools Offering Foundational CS Courses



Source: [Code.org, 2024 State of CS Annual Access Report](#)
Note: These are the 10 states with the greatest proportion of NA/AN K-12 students, per NCES data.

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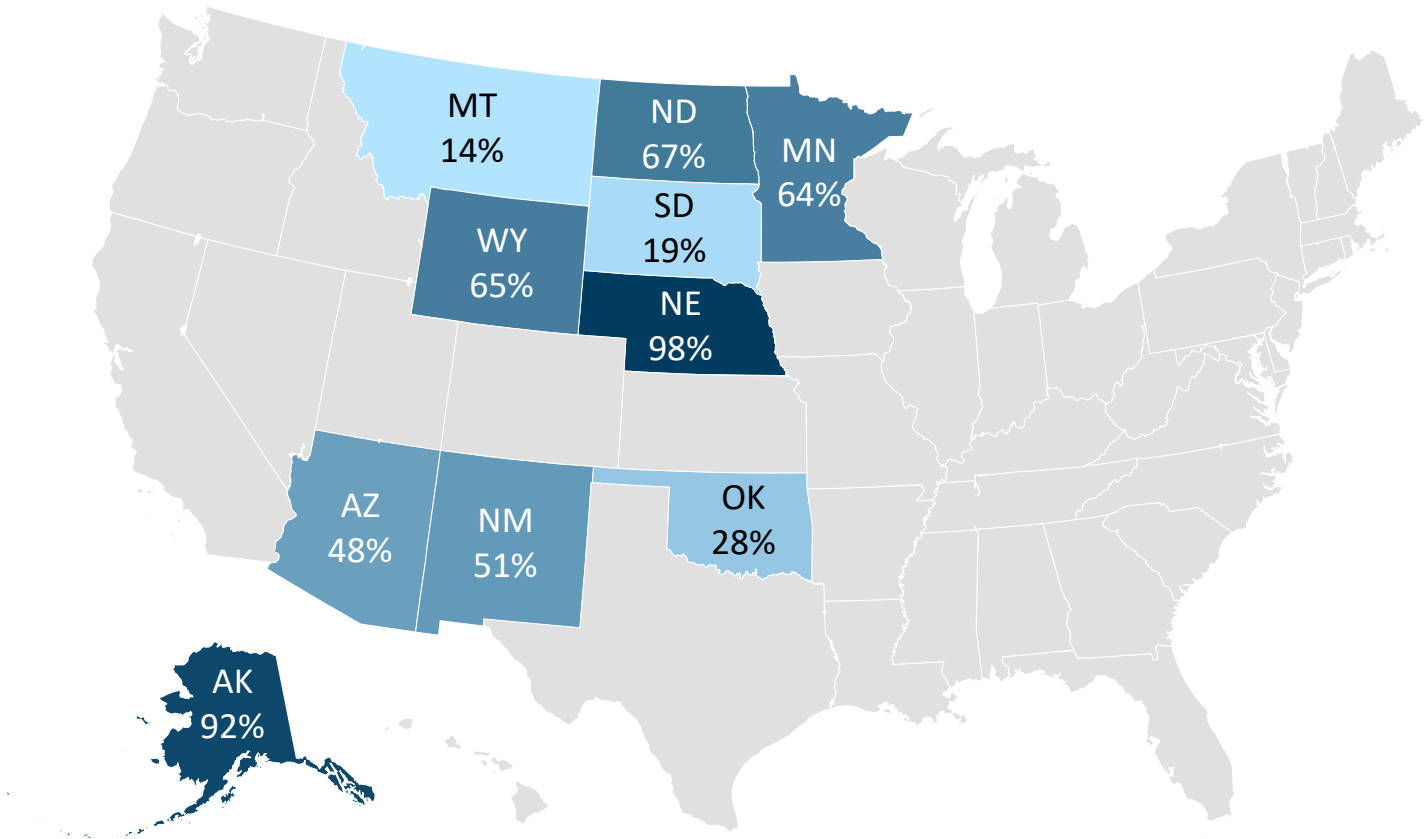
Not all middle schools reported data, so actual access may be higher. (Alaska and Nebraska had the most complete reporting.)



Percentage of Middle Schools Reporting Data to Code.org, by State

Most Recent Data Reported

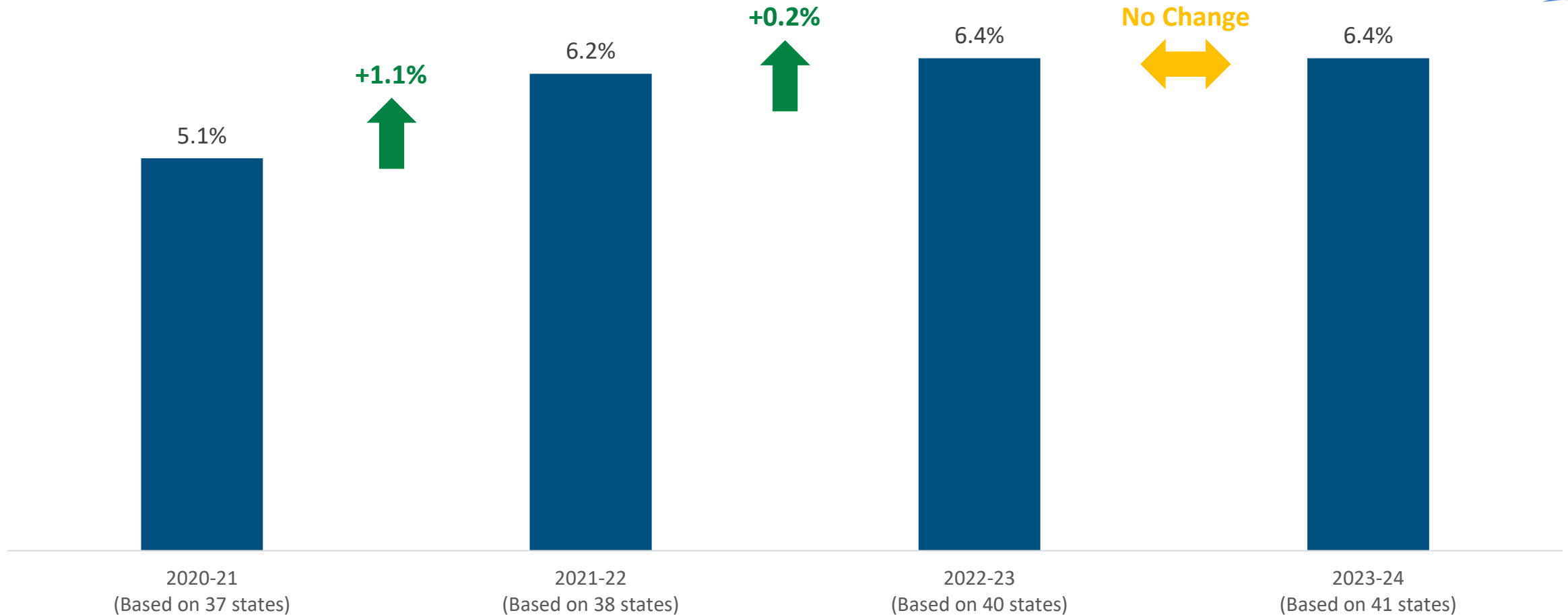
State	School Year
AK	2021–2022
AZ	2023–2024
MN	2022–2023
MT	2023–2024
NE	2022–2023
NM	2023–2024
ND	2022–2023
OK	2021–2022
SD	2022–2023
WY	2023–2024



Source: [Code.org, 2024 State of CS Annual Access Report](#)
Note: These are the 10 states with the greatest proportion of NA/AN K-12 students, per NCES data .

What does participation in foundational, high school CS courses look like for Indigenous students in the US?

Nationally, the percentage of high school students participating in foundational CS has stayed flat since 2022-23.

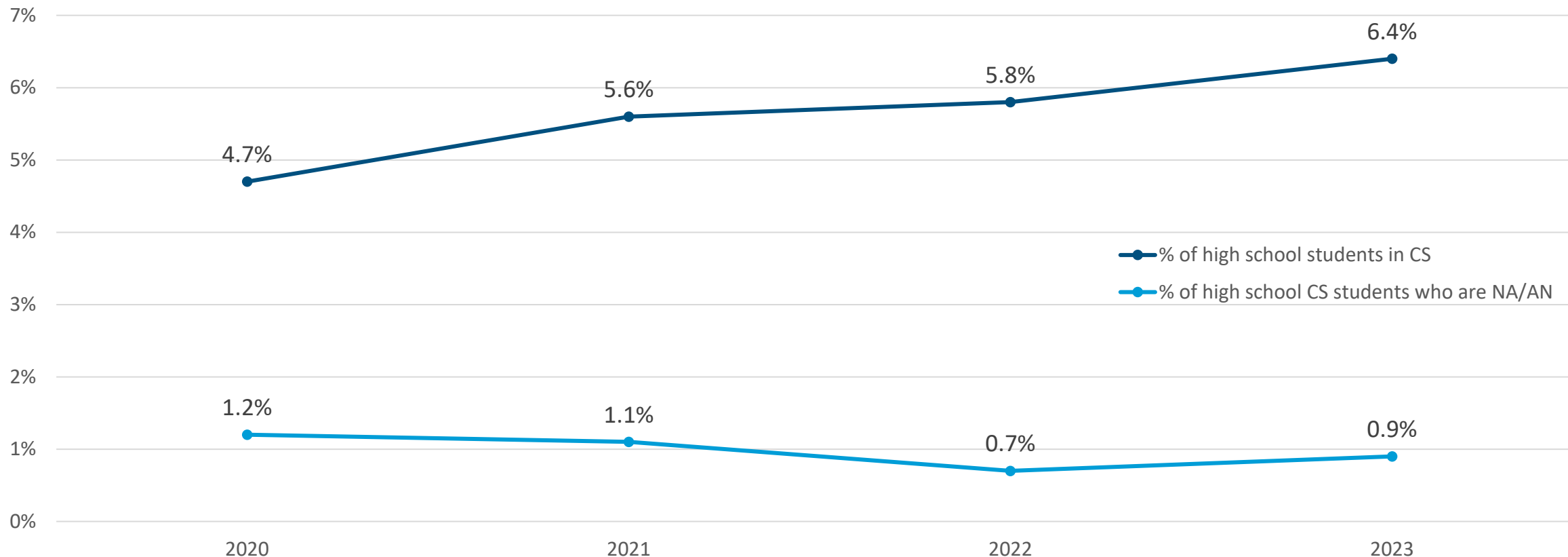


Source: [Code.org, 2024 State of Computer Science Education](https://code.org/2024-state-of-computer-science-education)

Looking at past Code.org data, we see the percentage of students in foundational CS has grown—but the share who are NA/AN has declined.



High School CS Participation (Fall 2020-2023)



Source: Code.org, 2021, 2022, 2023 and [2024 State of Computer Science Education](#)

Note: The 2024 Code.org report applied updated methodology and retroactively revised prior years' percentages (see previous slide). However, this was only applied to aggregate participation rates. Adjusted racial/ethnic breakdowns were not reported. This slide therefore uses the originally published 2021-2023 figures to illustrate year-over-year changes in the percentage of high school students who are Native American. Only 2023 uses the updated methodology.

From past Code.org data, we see NA/AN participation in high school foundational CS is flat. Participation for other groups has grown.

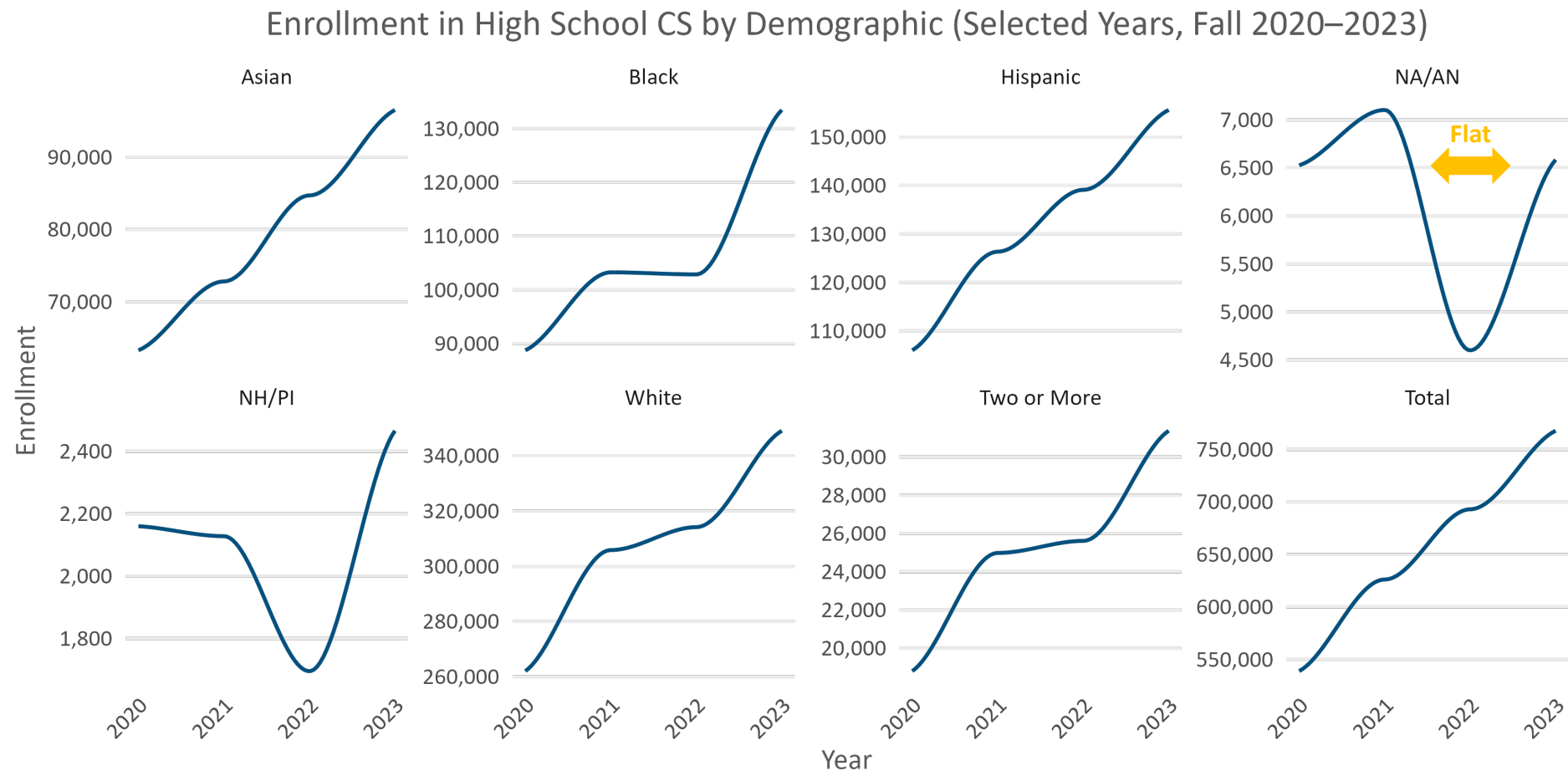


CS Student Enrollment	2020–2021	2021–2022	2022–2023	2023–2024
National	538,809	626,132	693,077	767,912
Asian	63,282 (11.6%)	72,806 (11.3%)	84,700 (13%)	96,518 (12.6%)
Black	88,742 (16.2%)	103,245 (16.1%)	102,861 (15%)	133,446 (17.4%)
Hispanic	105,941 (19%)	126,331 (19.7%)	139,114 (21%)	155,629 (20%)
Native American/Alaska Native	6,527 (1.2%)	7,104 (1.1%)	4,599 (0.7%)	6,585 (0.9%)
Native Hawaiian/Pacific Islander	2,160 (0.4%)	2,128 (0.3%)	1,695 (0.3%)	2,466 (0.3%)
Two or More	18,809 (3.4%)	24,986 (3.9%)	25,614 (4%)	31,369 (4.1%)
White	262,021 (48%)	305,856 (47.6%)	314,161 (47%)	349,059 (45.5%)

Source: Code.org, 2021, 2022, 2023 and [2024 State of Computer Science Education](#)

Note: The percentages in parentheses indicate the share of CS students who identify as that race/ethnicity for each year (e.g., 1.2% of all CS students identified as NA/AN in 2020-2021). Like the previous slide, this table displays originally published figures.

From past Code.org data, we see NA/AN participation in high school foundational CS is flat. Participation for other groups has grown.

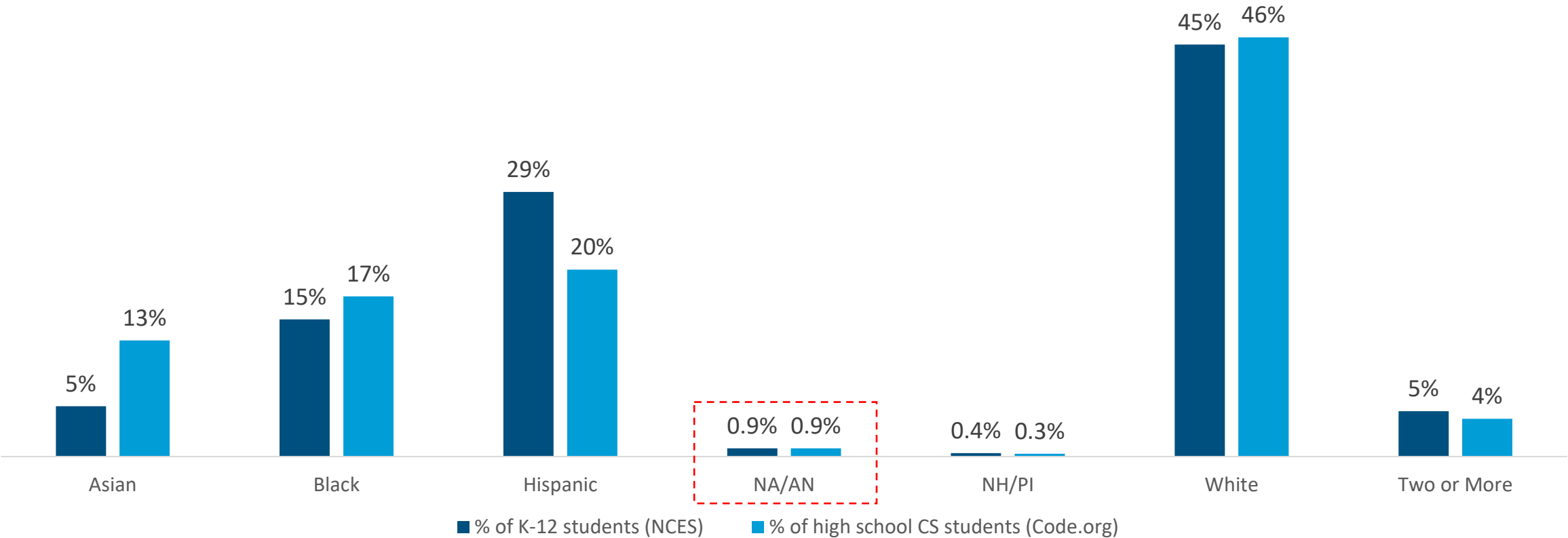


Source: Code.org, 2021, 2022, 2023 and [2024 State of Computer Science Education](#)

Nationally, there is parity for Native American/Alaskan Native participation in foundational, high school CS.



National High School CS Participation Gaps

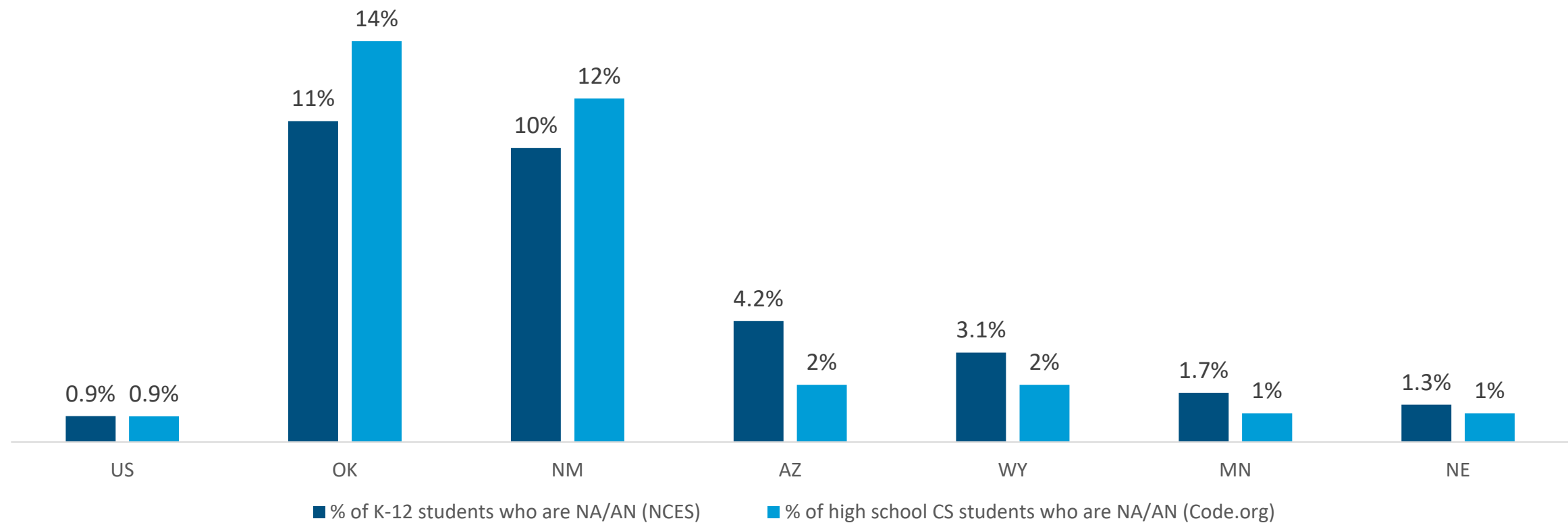


Source: [Code.org, 2024 State of CS Annual Access Report](#); [U.S. Department of Education, NCES, Table 203.70 \(2024\)](#)

In the top 10 states, we see both parity (OK, NM) and underrepresentation (AZ, WY, MN, NE).



State High School CS Participation Gaps



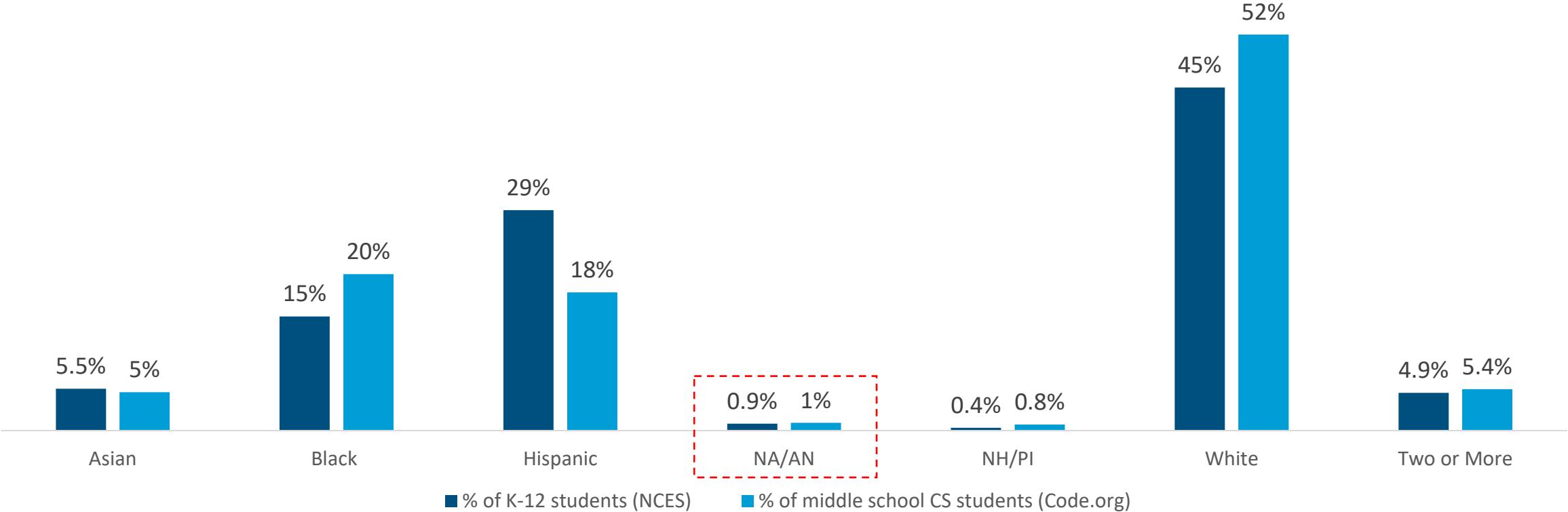
Source: [Code.org, 2024 State of CS Annual Access Report](#); [U.S. Department of Education, NCES, Table 203.70 \(2024\)](#)
Note: AK, SD, MD, and MT have never reported enrollment data disaggregated by race/ethnicity. NE and WY data is from fall 2023, MN and NM data is from fall 2022, and AZ and OK data is from fall 2021. The NCES K-12 enrollment data is all from fall 2022.

What does the state of Indigenous student participation in *middle school* CS look like in the US?



Nationally, NA/AN middle school participation also shows parity.

National Middle School CS Participation Gaps

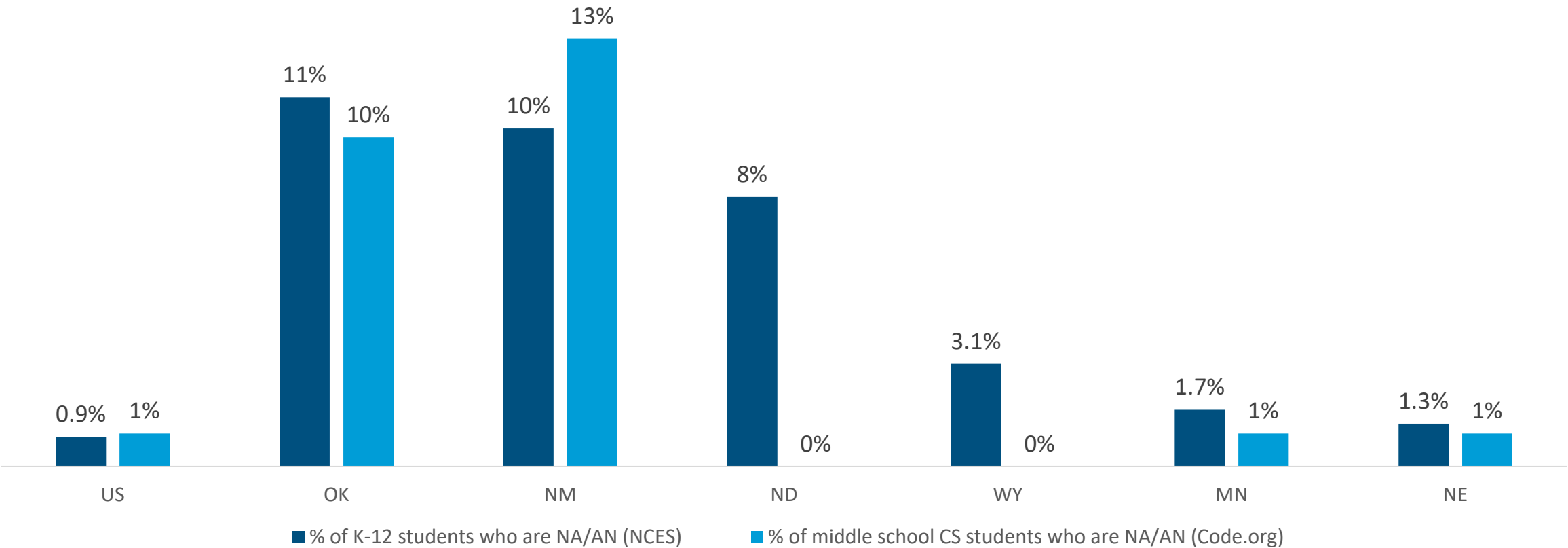


Source: [Code.org, 2024 State of CS Annual Access Report](#); [U.S. Department of Education, NCES, Table 203.70 \(2024\)](#)

In the top 10 states, we see both parity (NM) and underrepresentation (OK, ND, WY, MN, NE) in middle school.



State Middle School CS Participation Gaps



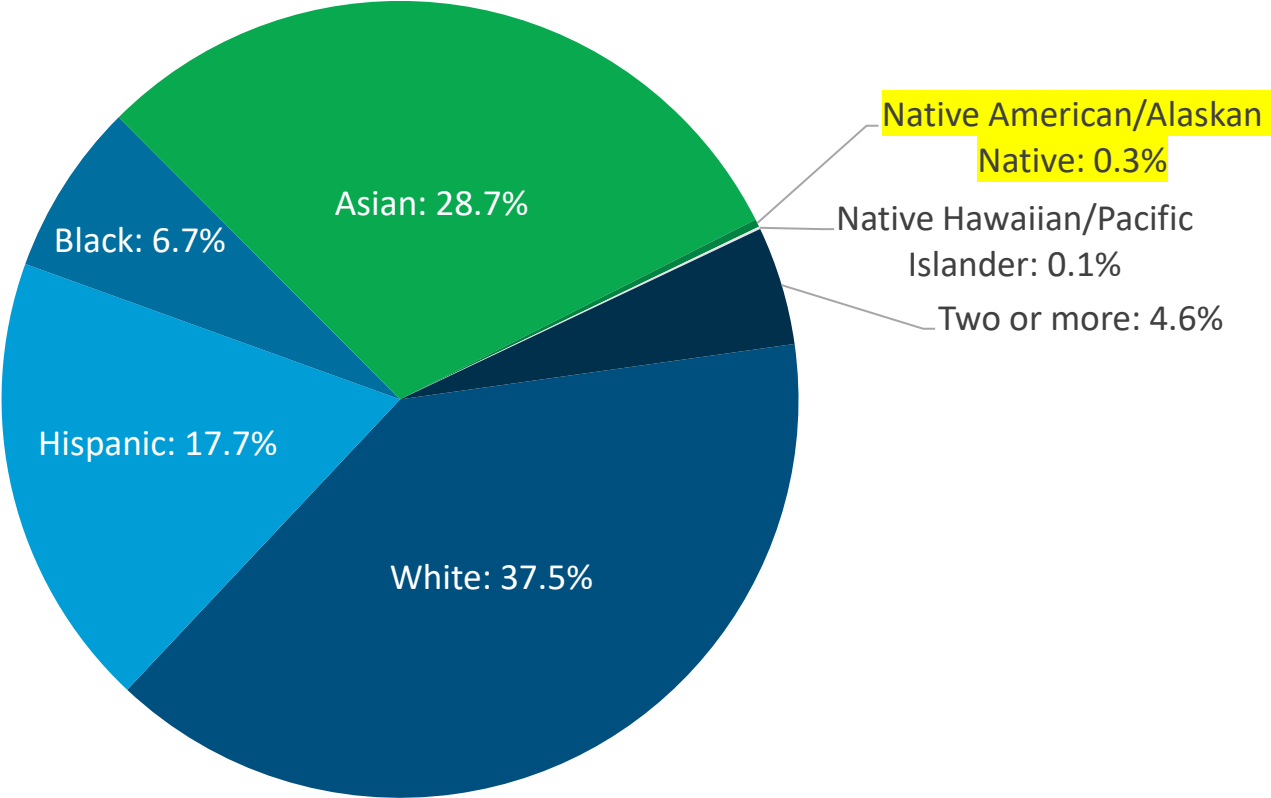
Source: [Code.org, 2024 State of CS Annual Access Report](#); [U.S. Department of Education, NCES, Table 203.70 \(2024\)](#)
Note: AK, SD, MT, and AZ have not reported any middle school enrollment data disaggregated by race/ethnicity. NM and WY data is from fall 2023; ND, MN, and NE data is from fall 2022; and OK data is from fall 2021. The NCES K-12 enrollment data is all from fall 2022.

What do AP CS course exam participation rates look like for Indigenous students in the US?

Nationally, NA/AN students represent 0.3% of AP CS exam participation.



AP CS Test Participation (2023)

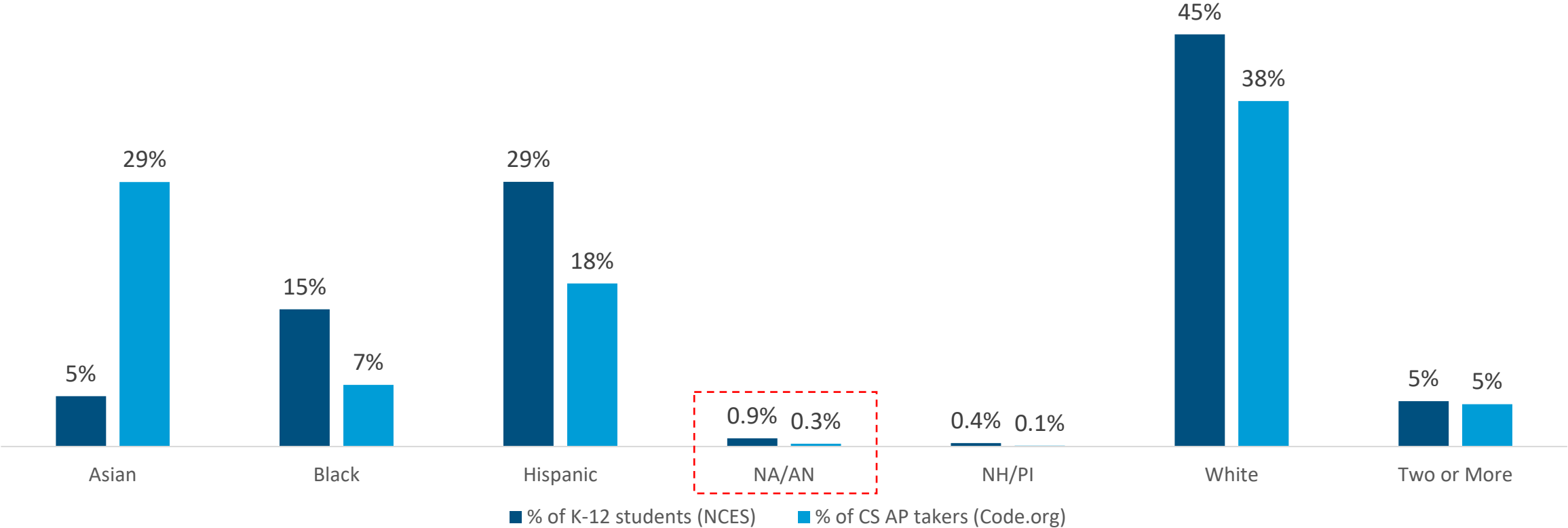


Source: [Code.org, 2024 State of CS Annual Access Report](#)
Note: This data is from the 2023 exam (AP CSP and AP CSA). Some barriers to CS exam participation by NA/AN students may include: costs of AP exam, AP exams often administered outside of regular school schedules, and students gaining access to knowledge that AP participation is important because scores of 3 or higher are considered equivalent to college-level coursetaking by many universities.

Nationally, Indigenous students are underrepresented in AP CS exam participation.



National AP CS Test Participation Gaps (2023)

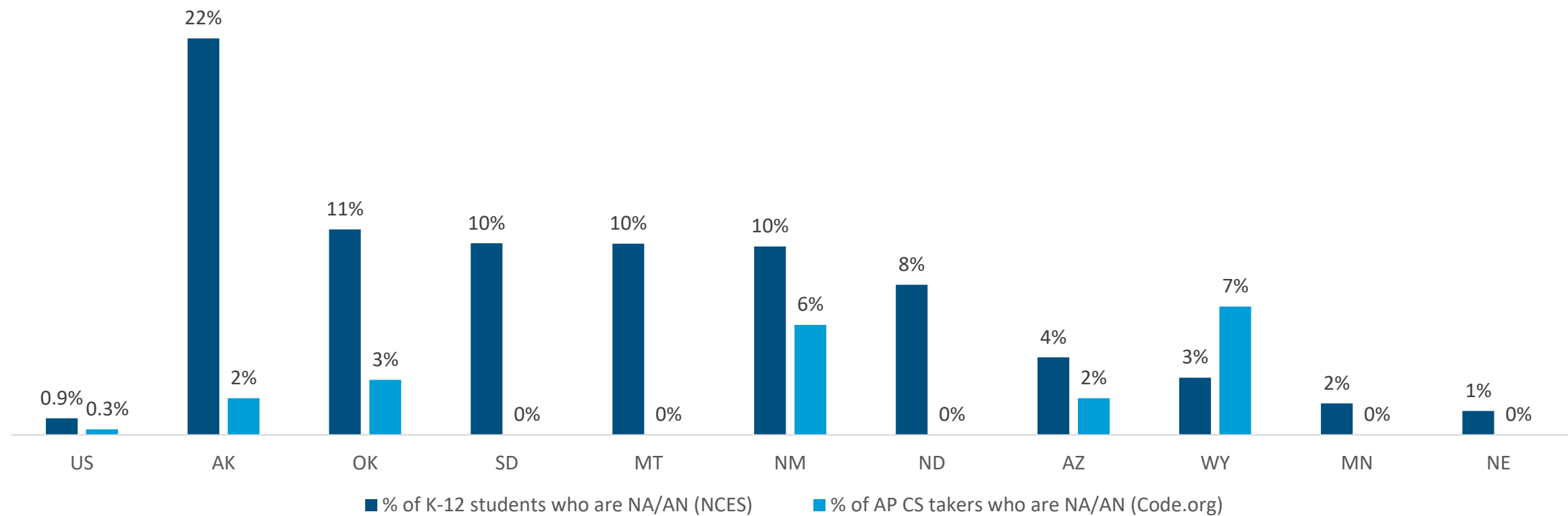


Source: [Code.org, 2024 State of CS Annual Access Report](#); [U.S. Department of Education, NCES, Table 203.70 \(2024\)](#)
Note: The Code.org AP enrollment data is from the 2023 exam (AP CSP and AP CSA). The NCES K-12 enrollment data is from fall 2022.

Of the top 10 states, Wyoming and New Mexico have the highest relative rate of NA/AN participation on AP exams.



AP CS Test Participation Gaps (2023)

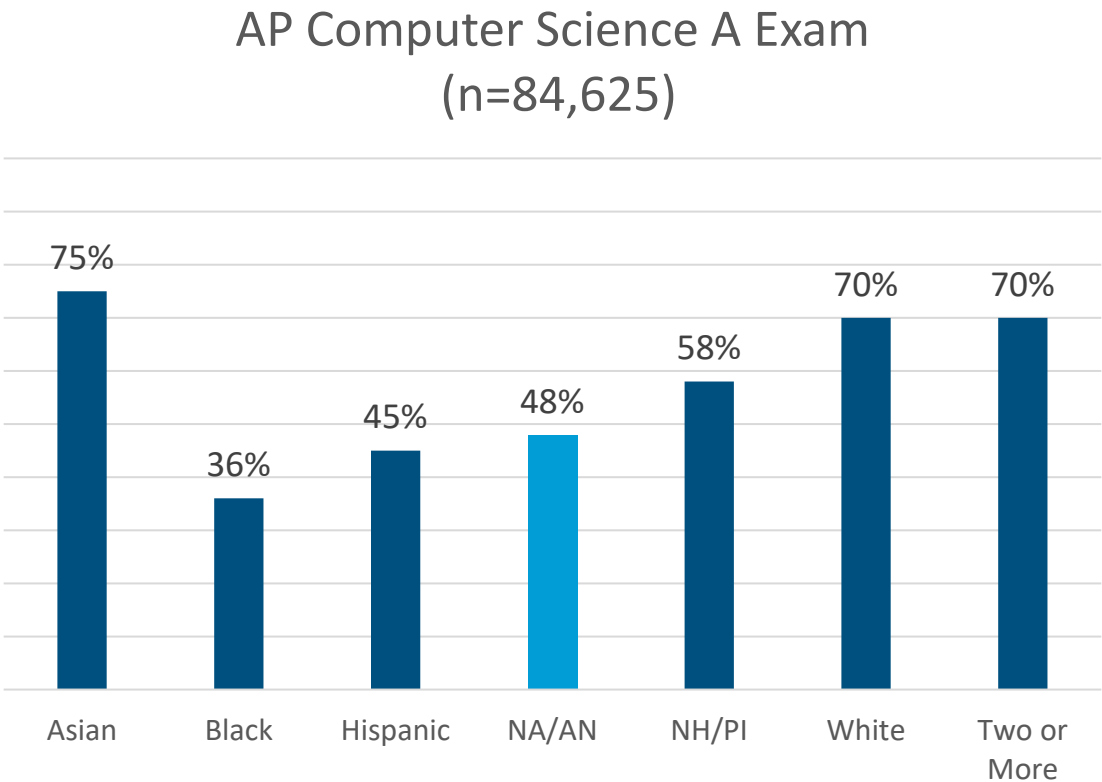
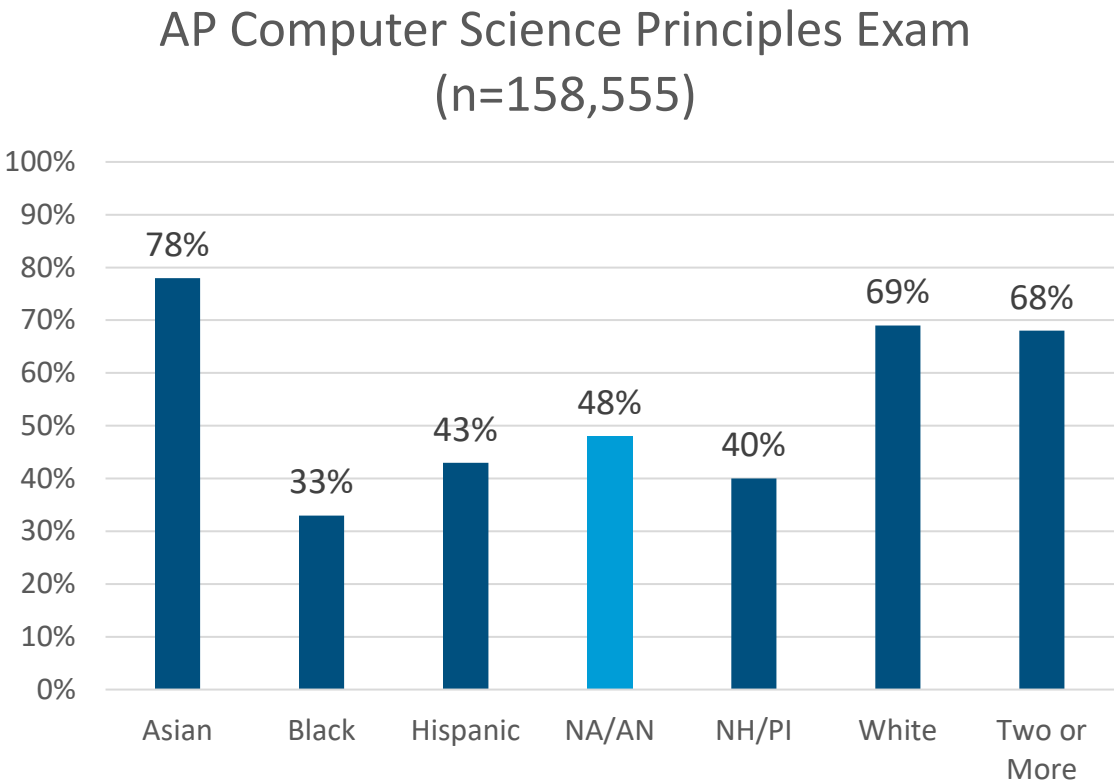


Source: [Code.org, 2024 State of CS Annual Access Report](#)
Note: These are the 10 states with the greatest proportion of NA/AN K-12 students, per NCES data.

Nearly half of AP participants who are NA/AN receive a score of 3 or higher.



Percent of Students Earning a Score of 3 or Higher (2023)



Source: [Code.org, 2024 State of CS Annual Access Report](#)
Note: A score of 3 or above on AP exams is important because it often qualifies students for college credit and demonstrates proficiency in the subject matter.

What does computer science education policy look like in states with high percentages of NA/AN students?

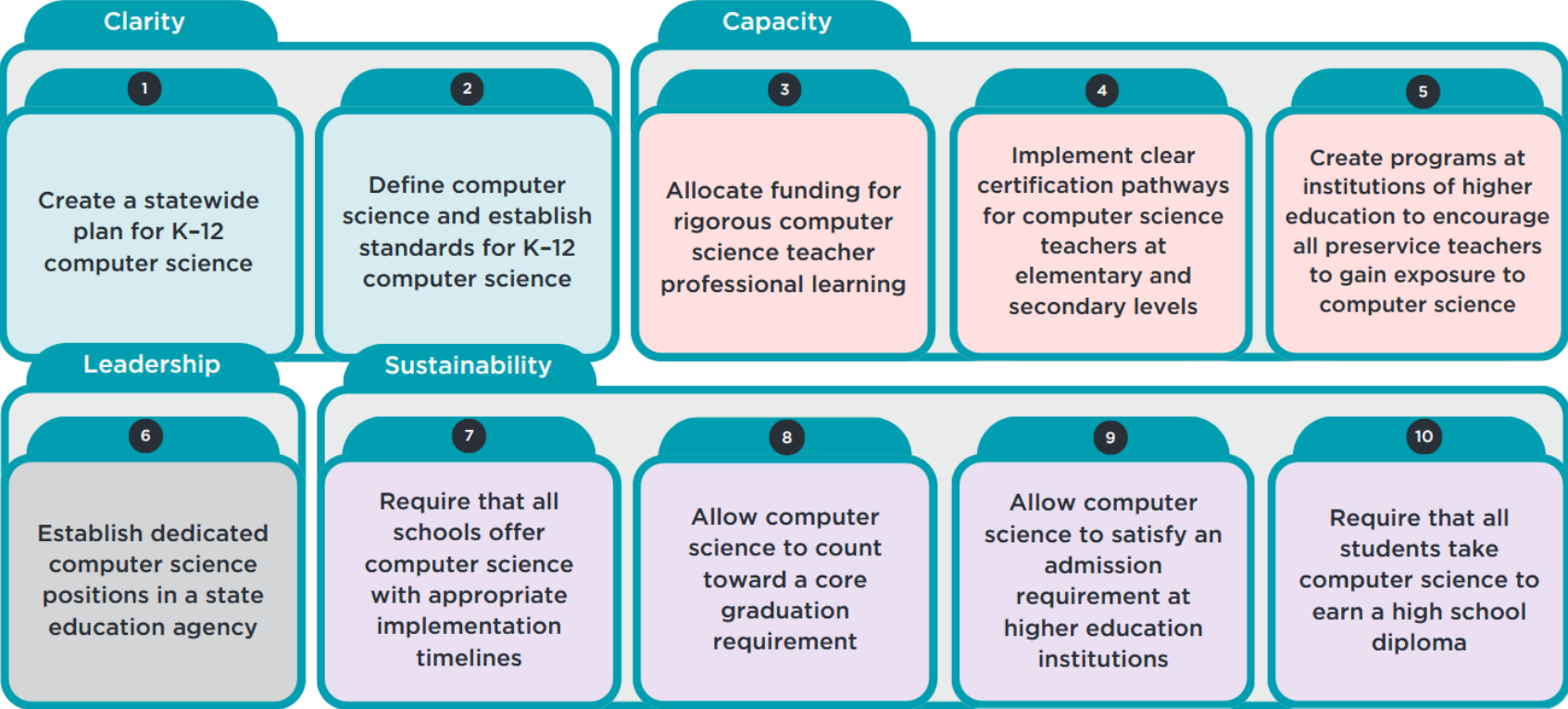
Code.org tracks state computer science education policies.



Code.org tracks state adoption of 10 key policies related to computer science using a [rubric](#) and summarizes findings in an [online tracker](#).

AIR reviewed the policy status of the 10 states with the highest percentage of NA/AN students using the most recent version of the tracker, accessed April 2025.

Code.org’s 10 Policy Ideas to Make Computer Science Foundational to K-12 Education



Source: [Code.org 10 Policy Ideas to Make Computer Science Foundational to K-12 Education](#)

Most of the top 10 have CS standards, offer teacher certification in CS, and allow CS courses to count for graduation requirements.

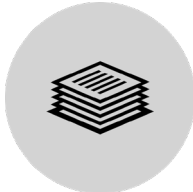


	1	2	3	4	5	6	7	8	9	10	
	State Plan	Standards	Funding	Certification	Preservice Incentives	State CS Position	Require HS to Offer	Satisfies Grad Requirement	Higher Ed Admission	Grad Requirement	Total # of Policies
Alaska	Yes	Yes	No	Yes	No	Yes	No	District Decision	No	No	5
Oklahoma	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	No	7
Montana	No	Yes	Yes	Yes	Incentives	No	No	District Decision	No	No	4.5
South Dakota	No	No	No	Yes	No	No	No	Yes	No	No	2
New Mexico	Yes	Yes	No	Yes	No	Yes	Yes	Yes	No	No	6
North Dakota	Yes	Yes	No	Yes	No	No	Yes	Required	No	Yes	6
Arizona	No	Yes	Yes	Yes	No	Yes	No	District Decision	No	No	5
Wyoming	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes	No	7
Minnesota	Yes	No	Yes	No	No	Yes	No	Yes	No	No	4
Nebraska	Yes	In Progress	Yes	No	No	Yes	Yes	Required	No	Yes	6.5

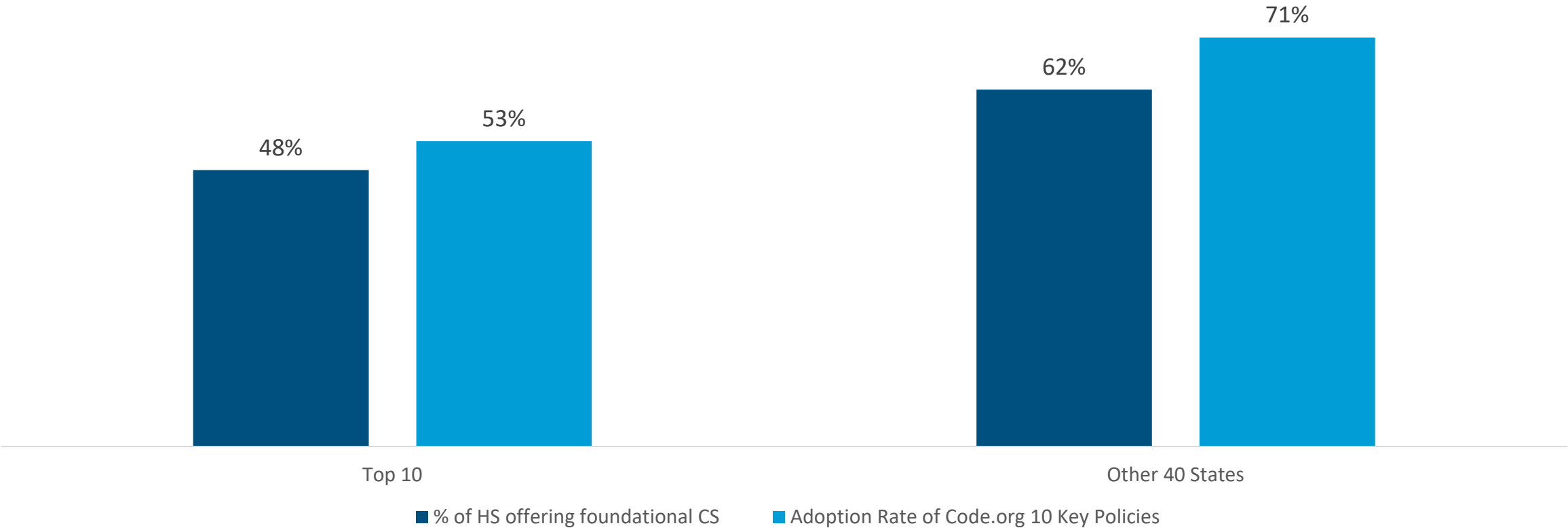
Source: [Code.org state tracker of 10 key policies](#)

Note: These are the 10 states with the greatest proportion of NA/AN K-12 students, per NCES data. In-progress or partially adopted policies are highlighted in light blue and counted as 0.5.

The top 10 states have lower rates of adoption of the Code.org 10 key policies—and lower access to foundational CS.

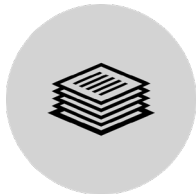


Foundational CS Access and Adoption Rate of Key Policies, Top 10 vs. Other 40 States



Source: [Code.org state tracker of 10 key policies](#); [Code.org, 2024 State of CS Annual Access Report](#)
Note: Top 10 states refers to the 10 states with the greatest proportion of NA/AN K-12 students, per NCES data.

Correlational analysis: States that have adopted more policies have greater access to foundational computer science courses.



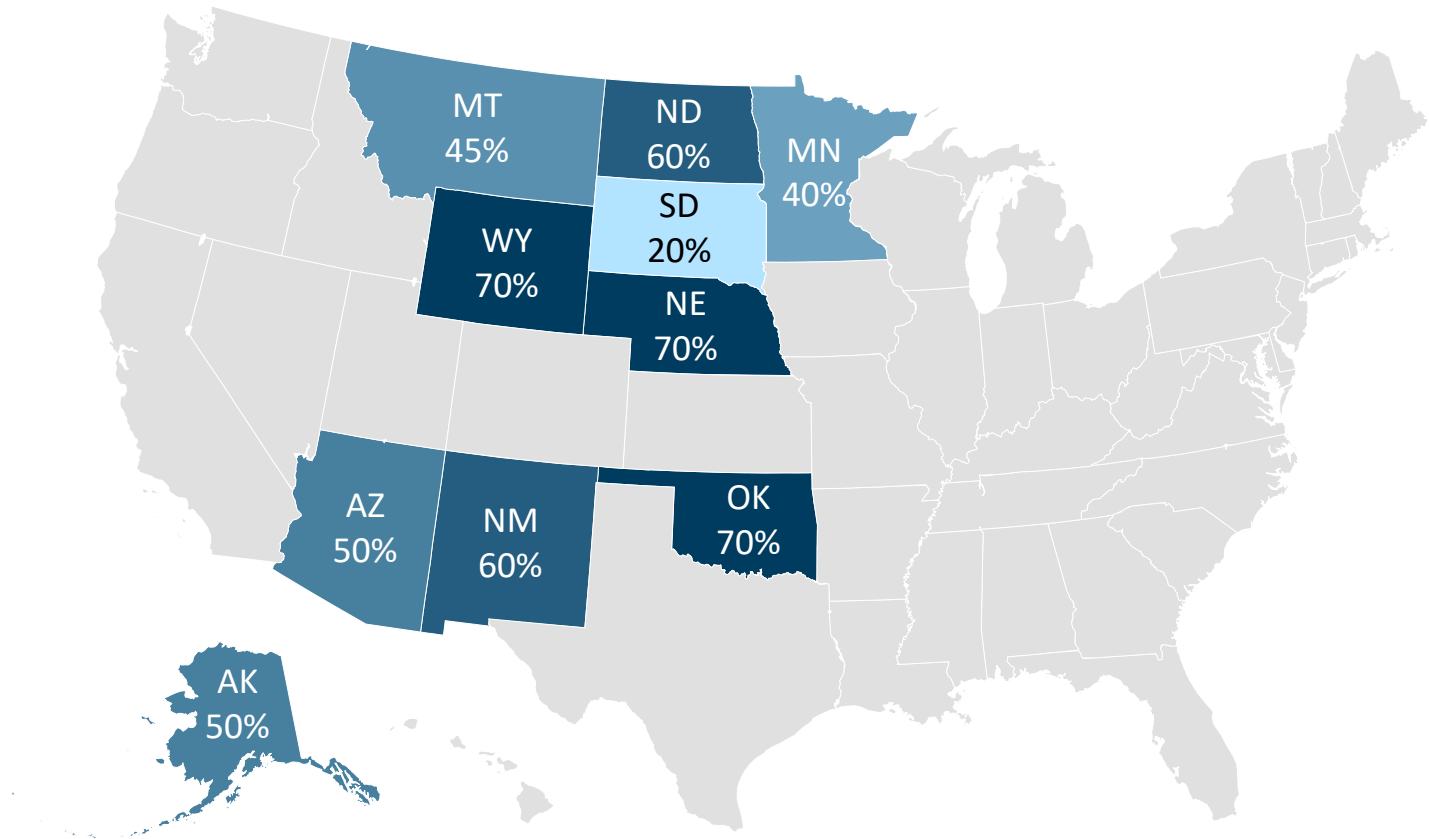
Variable	Correlation with Number of Key Policies Adopted (<i>r</i>)	Strength of Relationship	<i>p</i>
Percent of High Schools Offering Foundational CS	0.4972	Medium	0.0002
Percent of NA/AN Students who Attend a High School Offering Foundational CS	0.4276	Medium	0.002

Note: The Pearson correlation coefficient (*r*) indicates the strength and direction of the relationship between the number of policies and various CS education metrics. P-values (*p*) less than 0.05 suggest the correlations are statistically significant. Relationship strength is interpreted using [Cohen's \(1988\)](#) guidelines: small (*r* ≈ 0.1), medium (*r* ≈ 0.3), and large (*r* ≥ 0.5).

Of the top 10 states, Nebraska, Oklahoma, and Wyoming lead with 70% policy adoption.



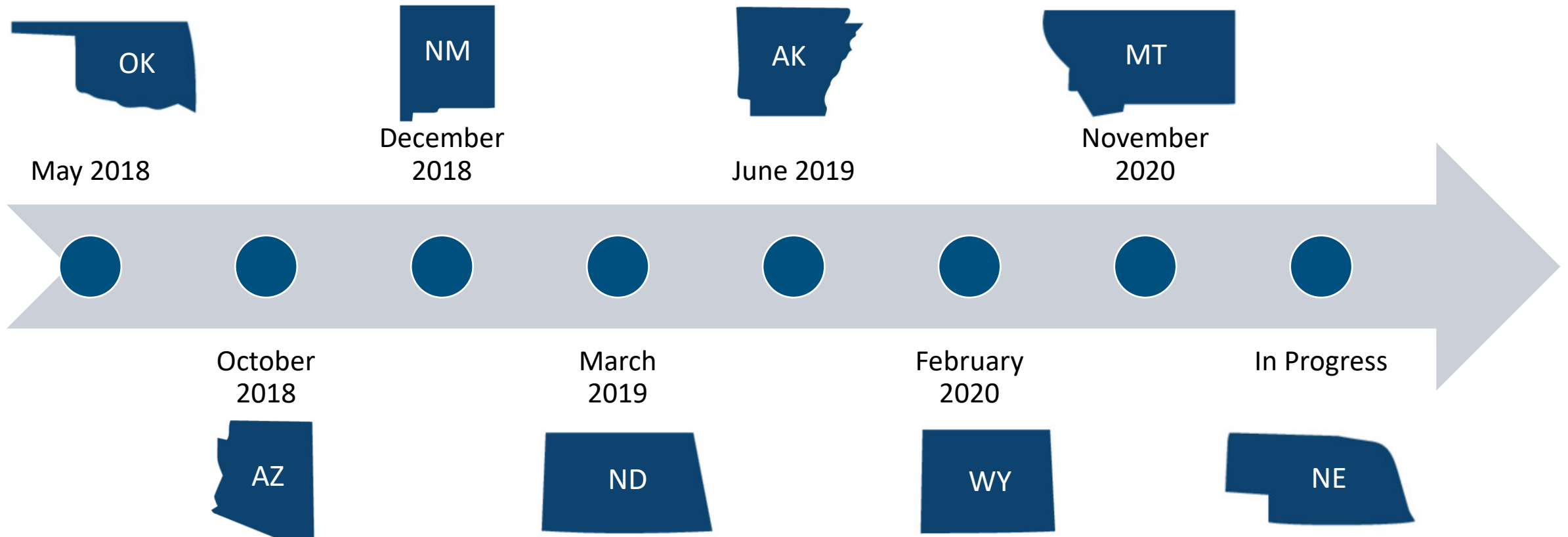
Percentage of Code.org Key Policies Adopted or In Progress (2025)



Source: [Code.org state tracker of 10 key policies](#)
Note: These are the 10 states with the greatest proportion of NA/AN K-12 students, per NCES data.

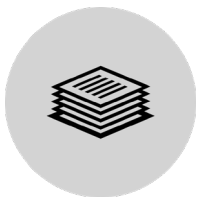
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Oklahoma was the first to adopt K-12 content standards for CS.



Source: [Code.org state tracker of 10 key policies](#)

Note: Along with SD and MN, these are the 10 states with the greatest proportion of NA/AN K-12 students, per NCES data. SD and MN have not adopted K-12 standards, according to the Code.org tracker.



Montana and Oklahoma lead in CS teacher certification.

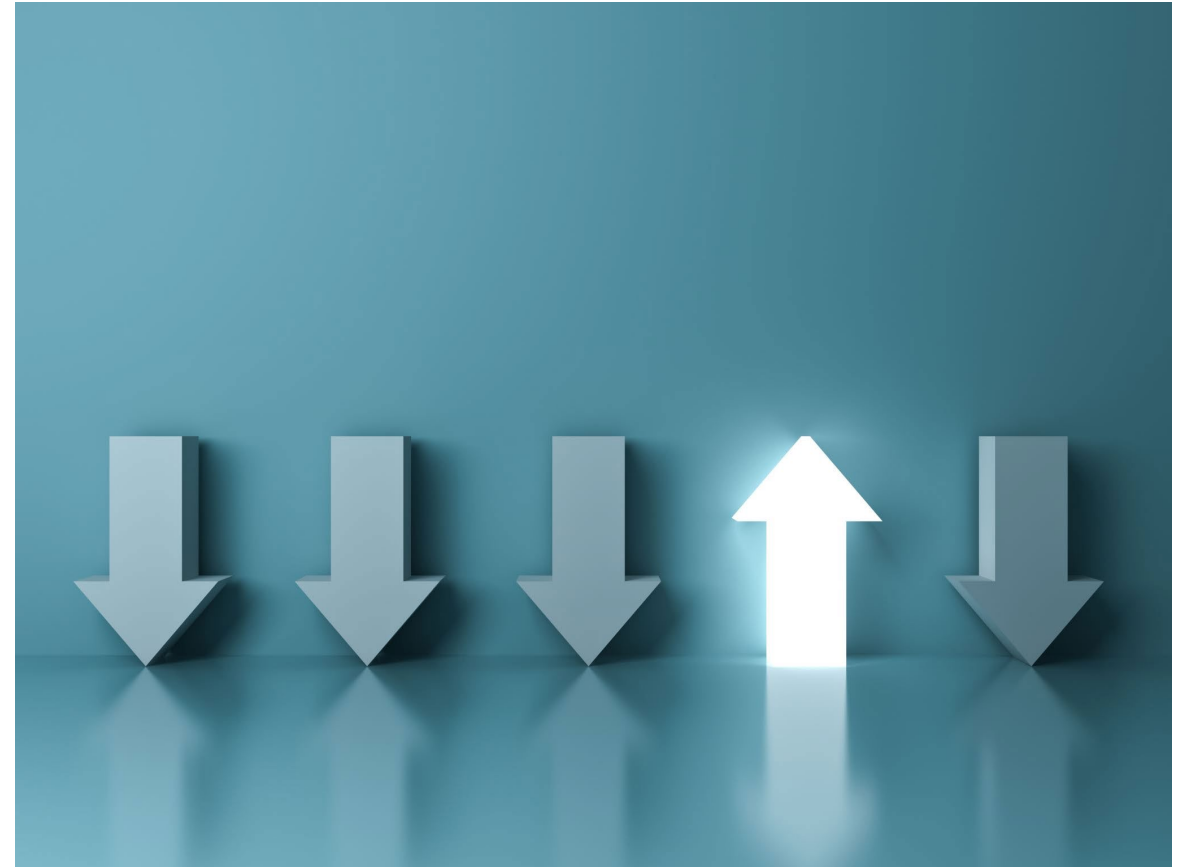
State	Certification (Yes/No)	Full or Endorsement	Academic or CTE	Grade Levels Covered
AK	Yes	Endorsement	-	9-12
OK	Yes	Full Certification	Academic	9-12
MT	Yes	Both	Academic	K-12
SD	Yes	Endorsement	Academic	K-6 and 7-12
NM	Yes	Endorsement	Academic	7-12
ND	Yes	Endorsement	Academic	5-12 and 9-12
AZ	Yes	Endorsement	Academic	PreK-12, PreK-8, 6-12
WY	Yes	Endorsement	Academic	6-12
MN	No	-	-	-
NE	No	-	-	-
IN	No	-	-	-

Source: [Code.org state tracker of 10 key policies](#)
Note: These are the 10 states with the greatest proportion of NA/AN K-12 students, per NCES data.

What are the key findings of the Code.org data analysis?

Finding 1: National CS access and enrollment numbers show bright spots and room for improvement.

- The percent of high schools **offering** foundational CS continues to increase.
- NA/AN students are still the least likely to have **access** to foundational CS.
- Total nationwide **participation** in computer science held steady from 2022-23 to 2023-24.
- NA/AN **participation** has been flat for the last four years, but parity is achieved.



Finding 2: Middle school access appears to be an area of opportunity, but more data is needed.

- There is a gap between middle school and high school access to foundational computer science courses.
 - A lack of data may be exaggerating the disparity.



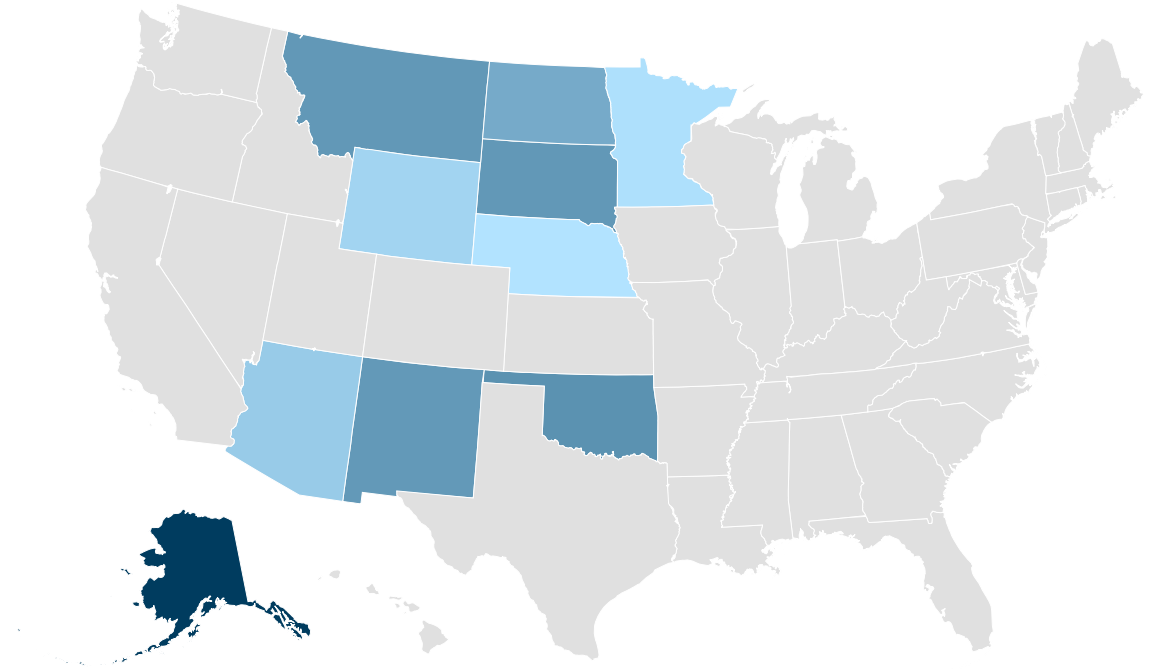
Finding 3: AP CS test participation is an area of opportunity.

- Native American/American Native students are underrepresented in AP CS test participation.
 - Despite this, nearly half of NA/AN exam takers earn a score of 3 or higher.
 - There are likely many barriers to CS exam participation for NA/AN students that educators and policymakers can find ways to address.



Finding 4: Nine of the top 10 states form two clusters in the middle of the U.S.

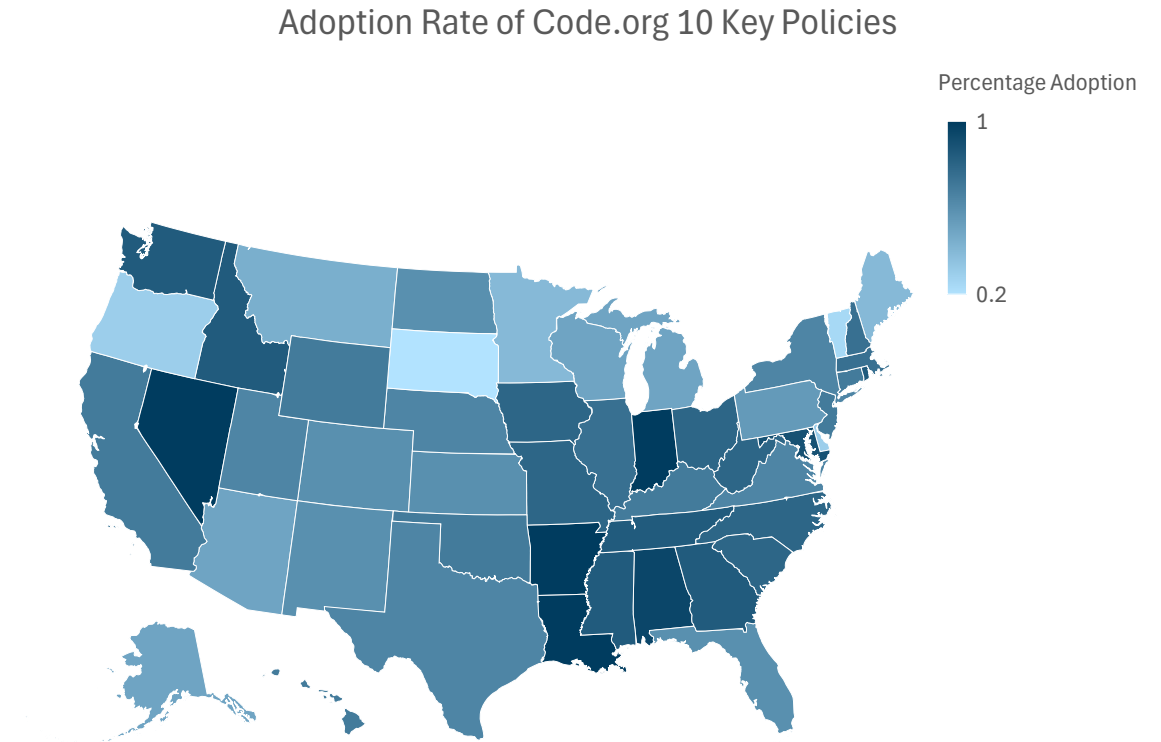
- The top 10 states include the 7 of the 10 most sparsely populated states in the U.S. (AK, WY, MT, ND, SD, NM, NE).
- They also include 5 of the 10 largest states in terms of total area (AK, MT, NM, AZ, WY).
- This creates distinct opportunities and challenges.



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Finding 5: Greater policy adoption is correlated with greater access. But states with more NA/AN students tend to adopt fewer policies.

- The top 10 states exemplify this finding.
 - They have fewer policies adopted and less overall access to foundational CS for all students.
- At the same time, five of the top 10 are above the national average for *NA/AN student access* to foundational CS in high school.
 - This suggests that targeted efforts to reach NA/AN students are succeeding.



Finding 6: Oklahoma and New Mexico are notable cases.

- Oklahoma is #2 and New Mexico is #5 for concentration of NA/AN students.
- Both states are **10 percentage points above the national average** for NA/AN student access to foundational CS in high school.
- In both states, CS participation parity has been achieved for NA/AN students.
- Oklahoma has 6 key policies adopted; New Mexico has 7 key policies adopted.
 - Both states were early adopters of K-12 CS standards.
 - Both states offer CS teacher certification options.

What are some additional *limitations* and *considerations* related to the 2024 Code.org data analysis?

What does the 2024 Code.org analysis tell us?

- This analysis provides a national, high-level overview of access to and enrollment in foundational computer science courses, AP course enrollment, and related state policy.
- The results provide a baseline understanding of access to and enrollment in high school CS courses for Indigenous students in specific states and nationally overall and compared to their non-Native peers.



Indigenous Student Counts

An analysis conducted in 2023 by AIR's Indigenous Student Identification (ISI) project indicated:

- Federal race/ethnicity data (including NCES) are almost certainly inaccurate and
- The undercounting of public K-12 NA/AN students may be as high as 70% nationwide.

Accordingly, the current report is limited by the inaccuracies of extant federal race/ethnicity data used for analysis.

Learn more about the ISI report and map [here](#).

Indigenous Students Count

A Landscape Analysis of American Indian and Alaska Native Student Data in U.S. K–12 Public Schools



IESLN



Bureau of Indian Education (BIE) schools

- According to the Code.org 2024 report, BIE schools and students are counted in the Code.org *national* numbers; yet student participation numbers are not included in *state* participation numbers.
- Additionally, BIE schools are federally operated as part of the federal trust responsibility to Tribes—thus they are not beholden to state education policies, including computer science. Consequently, there is an opportunity for the BIE to update its [BIE Agency \(state\) Plan](#) to include computer science standards and policies to provide increased CS access to NA/AN students that attend these schools.



Tribally-controlled (TC) schools

- In our reading of the Code.org data, TC schools and students are not included in national or state participation numbers, thus are not included in the data nor this analysis.
- Similar to BIE schools, TC schools are only beholden to federal policy—yet TC schools have greater autonomy to create their own policies.
- Consequently, there is an opportunity for TC schools to be included in future Code.org reports to establish baseline TC school and NA/AN student access to CS education and policies.



Population Mismatches

- Comparisons of CS participation and K-12 population share (for assessing parity and underrepresentation) are made by comparing Code.org and U.S. Department of Education NCES data.
- Also, the top 10 states are identified only using NCES data.
- The most recent NCES K-12 enrollment data is from fall 2022.



Sample Size

- When Code.org requests CS information, when sample sizes are low (below 5), states can't share or need to mask those data. When reporting numbers by race/ethnicity or gender, the reporting statistics get even harder to report out for some categories.*
- States have even less available information to report about CS for kindergarten through Grade 8.*
- Before 2021, Code.org does not have publicly available data.*

* Based on feedback given by Code.org staff.



Years of Data Available

- The comparisons across states and between states and national data reflect the *most recent available data*.
- This means that some comparisons are across different years.



Missing State Data

Enrollment in foundational CS courses is not reported for several key states in the Code.org dataset with large populations of NA/AN high school students:

- These eight states have never reported ***any*** enrollment data to Code.org: AK, CA, ME, MI, NV, NH, OH, SD.
- Many states, including AK, SD, MD, and MT, have never reported enrollment data ***disaggregated by race/ethnicity***.



Considerations and Possible Future Next Steps

- Code.Org defines what foundational CS means. In a future definition, we recommend including aspects like computational thinking and problem-solving aspects.
- In previous iterations of the Code.org datasets, Code.org provided more detailed student demographic information that combined federal NCES data with input from State Education Agencies. Given the uncertainty of the future of NCES data collection, we recommend exploring alternative options to supplement these existing data.



What is the bigger picture?

- The Code.org analysis can't tell us the “whys” to some of these questions (i.e., why Indigenous students attended high schools that offered CS at lower rates, or why some states with higher populations of Indigenous students had above average enrollment in CS).
- The Code.org analysis is part of a set of tasks within a study. Some other parts of the larger study can begin to address some of the whys.



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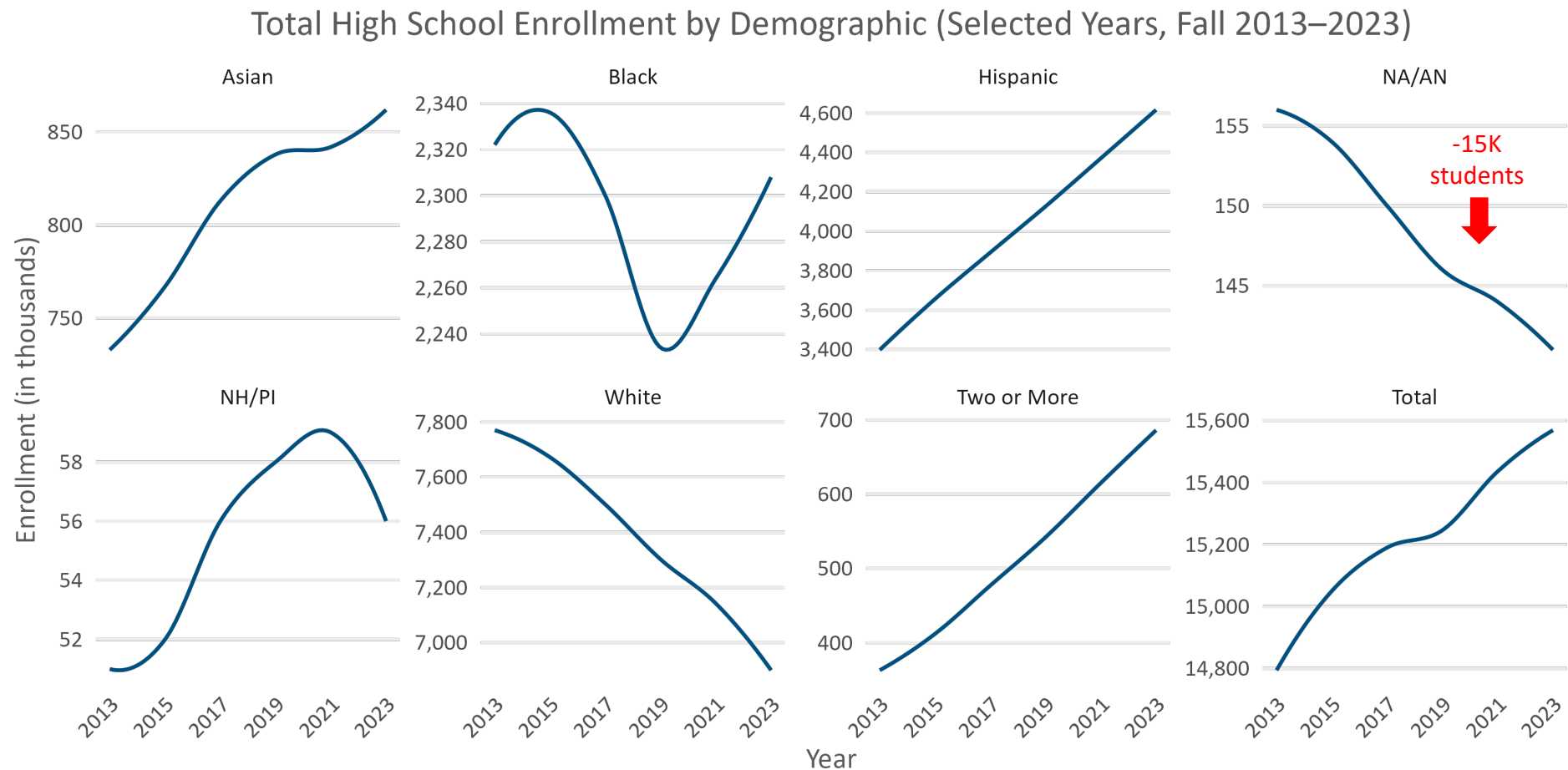
Appendix

Different data sources use slightly different category names for race/ethnicity.

Code.org	NCES	AIR
Asian	Asian	Asian
Black/African American	Black or African American	Black
Hispanic/Latino/Latina/Latinx	Hispanic/Latino	Hispanic
Native American/Alaskan	American Indian/Alaska Native	American Indian /Alaska Native (AI/AN)
Native Hawaiian/Pacific Islander	Native Hawaiian or Other Pacific Islander	Native Hawaiian/Pacific Islander (NH/PI)
White	White	White
Two or More	Two or More	Two or More

Source: [Code.org, 2024 State of CS Annual Access Report](#); [NCES Definitions for New Race and Ethnicity Categories](#)

The total number of high school students who identify as Native American/Native Alaskan has been trending down since 2013.



Source: [U.S. Department of Education, NCES, Table 203.65 \(2024\)](#)