

Students of Color Face Persistent Disparities in Access to Advanced STEM Courses

By Stephen Sawchuk on April 24, 2018 1:06 PM

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The proportion of students of color who take high-level math and science courses continues to trail that of their white peers—jeopardizing those students' ability to master the knowledge they need to secure a college-preparatory diploma.

What's more, the segregation of American high schools is a factor in students' access to these types of courses. Schools that serve disproportionate numbers of black and Latino students offer fewer advanced math and science courses, such as calculus and physics, than do schools with more white students.

Those are some of the findings from [a new analysis from the U.S. Department of Education's Office of Civil Rights](#), which reflects data from the 2015-16 school year. Thanks to updates to the required elements, this analysis also presents a more nuanced picture of math and science offerings than previous years' collections. The data reflects information submitted by nearly every public school in America. (Edweek reporter Sarah D. Sparks [tells you everything you need to know about the collection in this post](#).)

White students made up 51 percent of high school enrollment that year, and comprised 51 and 58 percent of enrollment in physics and calculus, respectively. Black students comprised 16 percent of high school enrollment, but just 12 percent of physics enrollment, and 8 percent of calculus enrollment. (See chart, below.)

Latino students made up 24 percent of high school enrollment, but represented 16 percent of students enrolled in calculus and 19 percent of those in advanced mathematics. (That term excludes calculus but includes courses beyond Algebra 2.)

Algebra I: A Gateway Shut for Many Students

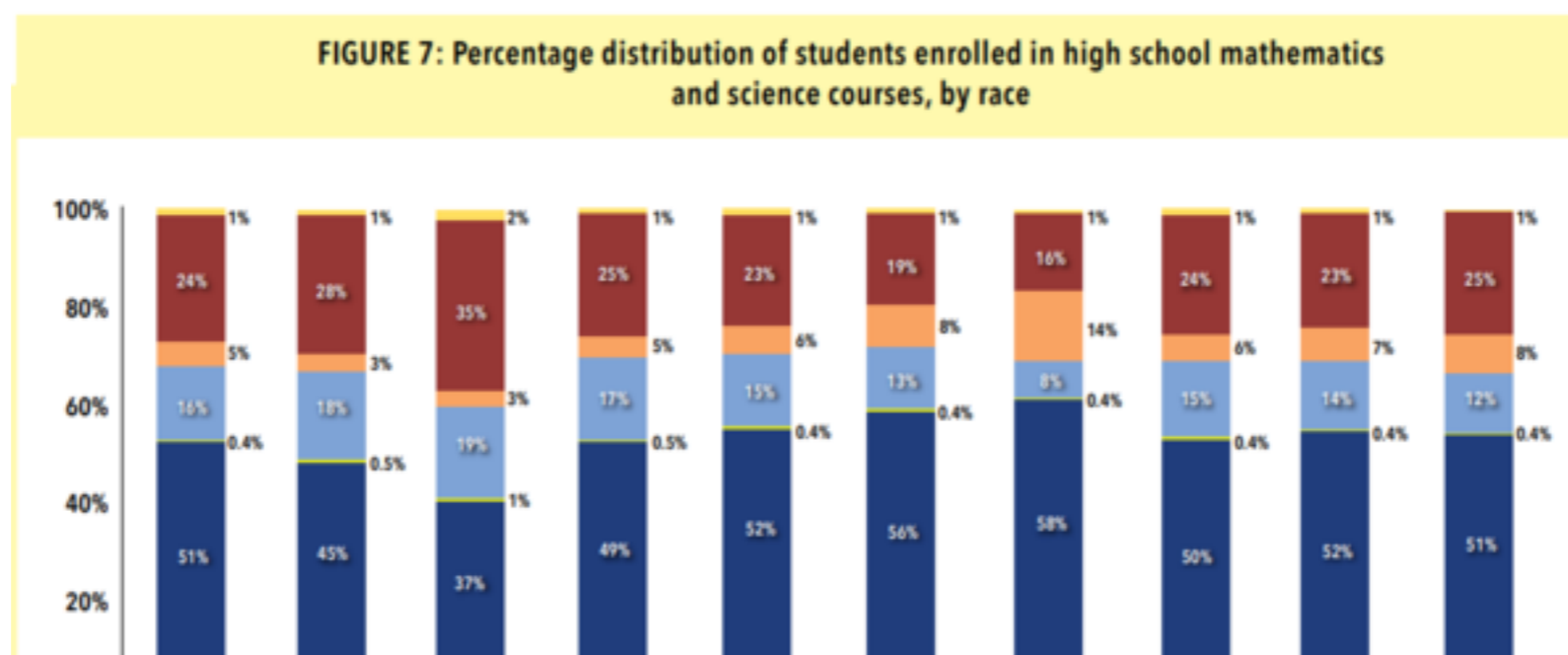
The data highlights gaps between white and Asian students and their black peers that open up even before they reach high school, in Algebra I, considered a fundamental "gateway" math course.

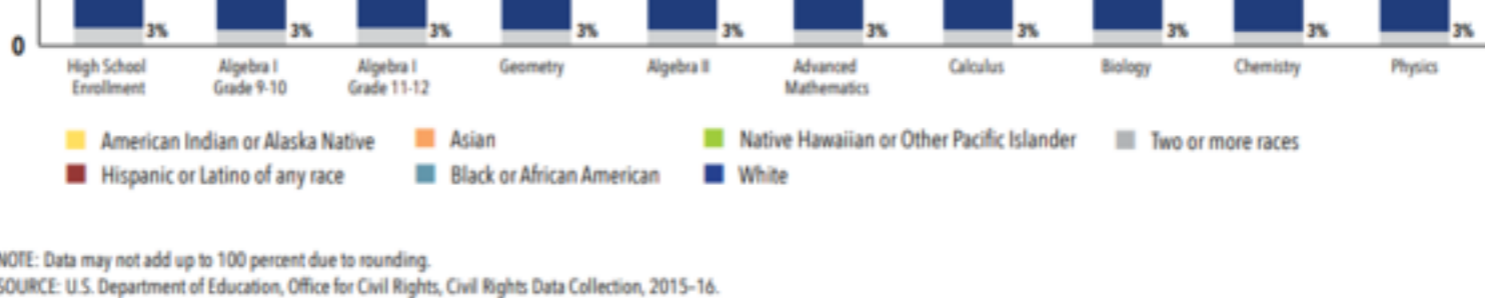
White students and Asian students were disproportionately likely to be enrolled in Algebra I in grade 8—and of those, 85 percent of white students and 74 percent of Asian students passed the course. But black and Native American students were all disproportionately likely to take Algebra I in high school—and they were overrepresented in those classes in junior or senior year, which would make it next to impossible to fit in multiple advanced math courses before graduation.

Native American students are just 1 percent of the overall high school population, yet they made up 2 percent of those enrolled in Algebra I in 11th and 12th grade—a damning statistic.

Research indicates that forcing students to take Algebra I before they're ready can be harmful. But it's not clear whether these patterns reflect well-founded policy or policy beset by racism.

"Is it because they've correctly assessed students' ability and put them in the appropriate course? Or is it because there's some amount of discrimination going on?" said Joshua Goodman, an associate professor of public policy at Harvard University's Kennedy School. "I take this as a sign that there is a major challenge, though it doesn't help pinpoint the root causes of the challenge."



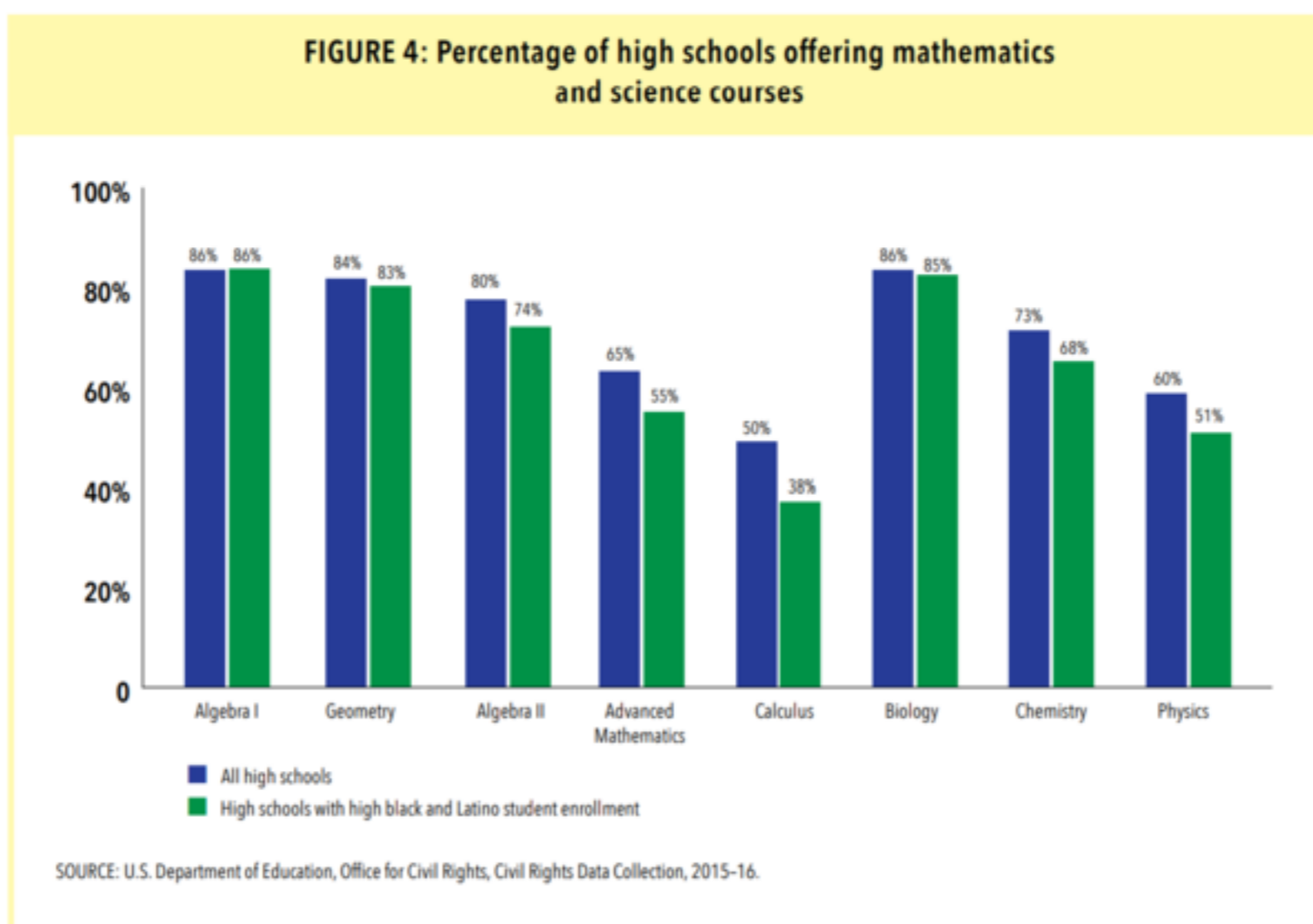


School Composition Matters

For upper-level math coursework, it's likely that school composition has a relationship to what classes are offered: About 5,000 high schools, the data show, had high levels of Latino or black enrollment (defined here as schools with more than 75 percent black and Latino). And they offered advanced math and science at lower rates than other high schools.

The largest disparity was for calculus, which half of all high schools offered, but only 38 percent of these highly segregated high schools did.

Generally, research shows that taking more high school math and science courses improves the odds that students will go on to take them in college—though expanding the number of high school courses offered **isn't a guarantee that students will take them**. That's probably due to the differing expectations and within-school tracking that many students of color face, even when they are academically capable of succeeding in challenging courses.



The new data collection also contains new information on how those classes are being taught—for example, on the number of high school math and science classes taught by teachers with the appropriate certification.

But that data was not included in the Education Department's initial analysis. (Because the data are self-reported by schools and districts, they can reflect data-entry errors and require cleaning, although the Education Department has instituted more of its own audits.)

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