



October 2018

K-12 EDUCATION

Public High Schools with More Students in Poverty and Smaller Schools Provide Fewer Academic Offerings to Prepare for College

GAO Highlights

Highlights of [GAO-19-8](#), a report to the Ranking Member, Committee on Education and the Workforce, House of Representatives

Why GAO Did This Study

Poverty can have a profound effect on academic outcomes and college readiness and students from low-income families are less likely to go to college. The low rates of degree attainment for low-income students raises questions about whether the students who wish to pursue higher education have access to courses that support their readiness for college. GAO was asked to review college preparatory course offerings in U.S. high schools.

This report (1) examines the extent to which high schools of different poverty levels offer courses to prepare students academically for college, and (2) describes the challenges students in high-poverty schools face being prepared to attend college. GAO analyzed 2015-16 Education data on course offerings by school poverty level, type, and size, and developed a generalized linear regression model to explore whether certain school-level characteristics may be associated with course offerings; reviewed a generalizable sample of public 4-year college websites for course requirements for admission; and interviewed officials from Education and the Department of Justice. GAO also conducted site visits to 12 high-poverty high schools in 3 states selected to provide variation in course offerings, among other things. In this review, GAO focused on public 4-year colleges because they offer a bachelor's degree and are generally a more affordable 4-year option.

View [GAO-19-8](#). For more information, contact Jacqueline M. Nowicki at (617) 788-0580 or nowickij@gao.gov.

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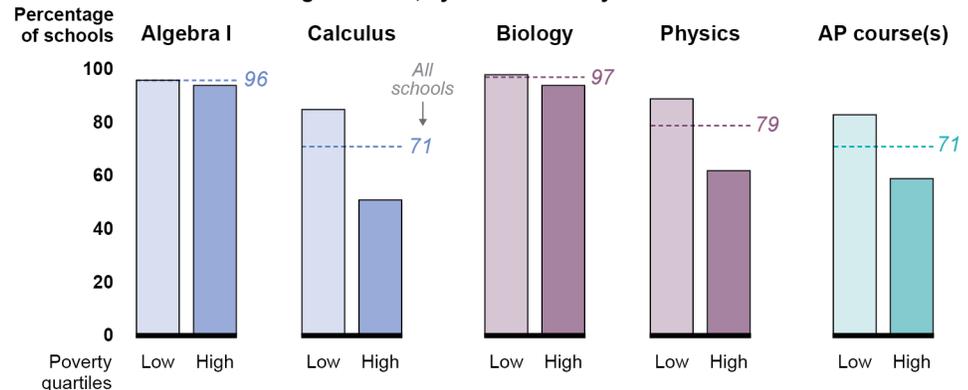
K-12 EDUCATION

Public High Schools with More Students in Poverty and Smaller Schools Provide Fewer Academic Offerings to Prepare for College

What GAO Found

Students in relatively poor and small schools had less access to high school courses that help prepare them for college, according to GAO's analysis of Department of Education (Education) data for school year 2015-16 (the most recent available). While most public high schools, regardless of poverty level, offered courses like algebra and biology, disparities in access were associated with school poverty level for more advanced courses like calculus, physics, and those that may allow students to earn college credit, like Advanced Placement (AP) courses (see figure). High-poverty schools were less likely to offer the math and science courses that most public 4-year colleges expect students to take in high school, according to GAO's analysis of college websites. GAO's regression analysis also showed that smaller schools and certain types of schools, like charter schools, are less likely to offer the college preparatory math or science courses that many colleges look for during the admissions process.

Courses Offered in Public High Schools, by School Poverty Level



Source: GAO analysis of data from the U.S. Department of Education for school year 2015-16. | GAO-19-8

Note: The low poverty quartile represents those schools with 0-24.9 percent of students eligible for free or reduced-price lunch (FRPL), and the high poverty quartile represents those schools with 75-100 percent eligible for FRPL.

Officials GAO interviewed in selected high-poverty high schools said their students can face a number of complex challenges in preparing for college. For instance, officials said that many students are academically behind when they enter high school and are unable to progress to more advanced courses. Further, high-poverty schools may not offer rigorous courses, such as AP courses, due to lack of resources or teaching staff. Students in high-poverty schools also face other stressors that can make going to college challenging. Officials at 9 of the 12 schools GAO visited cited the effects of poverty on their students, such as homelessness, hunger, and trauma, that make preparing for college difficult. School officials also said the steps involved in applying to and enrolling in college can be difficult to navigate for many students in high-poverty schools. Officials in selected schools reported efforts to address these challenges, such as offering free college courses and obtaining outside supports to assist with college advising.

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Abbreviations

AP	Advanced Placement
CCD	Common Core of Data
CRDC	Civil Rights Data Collection
Education	U.S. Department of Education
FSA	U.S. Department of Education, Office of Federal Student Aid
GEAR UP	Gaining Early Awareness and Readiness for Undergraduate Programs
GPA	Grade Point Average
IB	International Baccalaureate
Justice	U.S. Department of Justice
OCR	U.S. Department of Education, Office for Civil Rights
OESE	U.S. Department of Education, Office of Elementary and Secondary Education
OPE	U.S. Department of Education, Office of Postsecondary Education

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October 11, 2018

The Honorable Robert C. “Bobby” Scott
Ranking Member
Committee on Education and the Workforce
House of Representatives

Dear Mr. Scott:

Students from low-income families earn bachelor’s degrees at rates that are significantly lower than their more affluent peers.¹ This is concerning because higher levels of education are associated with higher lifetime earnings, and a bachelor’s degree, in particular, can be a powerful tool for lifting individuals out of poverty. One study found that among individuals who started out in the lowest 20 percent income group, those earning a college degree were over four times more likely to move to the highest income group than those who did not finish college.² Similarly, another study found that adults with a bachelor’s degree or higher are more likely to report that they are at least doing okay financially than those with a high school degree or less.³ Not all students are interested in pursuing a 4-year college degree. However, the low rates of degree attainment for low-income students raises questions about whether the students who wish to pursue higher education have access to courses that support their admission to college.

You asked us to review the spectrum of college preparatory course offerings available in high-poverty schools and challenges students in these schools face preparing for college. Specifically, we (1) examined the extent to which high schools of different poverty levels offer courses to prepare students academically for college, and (2) described challenges that students in high-poverty schools face in being prepared to attend college.

¹ Lauff, E., and Ingels, S.J. (2013). Education Longitudinal Study of 2002 (ELS:2002): A First Look at 2002 High School Sophomores 10 Years Later (NCES 2014-363). U.S. Department of Education. Washington, DC: National Center for Education Statistics.

² The Pew Charitable Trusts, *Pursuing the American Dream: Economic Mobility Across Generations* (July 2012).

³ Board of Governors of the Federal Reserve System, *Report on the Economic Well-Being of U.S. Households in 2017* (May 2018).

To determine the extent to which schools offer courses to prepare students academically for college, we analyzed U.S. Department of Education (Education) data on course offerings, among other things, on the nation's public schools.⁴ Specifically, we analyzed data from Education's school year 2015-16, the most recent available, Civil Rights Data Collection (CRDC), which collects data on course offerings in schools, among other things, such as characteristics of students attending schools (e.g., race, sex, disability), school type (e.g., traditional, charter), and school size. To explore whether course offerings varied by level of school poverty, we matched schools in the CRDC to the same schools in another Education data collection, the Common Core of Data (CCD), which contains information on the percentage of students in a school eligible for free or reduced-price lunch, for school year 2015-16, and sorted them into poverty quartiles.⁵ To understand the interplay of poverty and race, we further analyzed the student demographics of schools in these poverty quartiles. In addition, this descriptive analysis also examined the variation in course offerings by school size, type, and locale. Both the CRDC and CCD are school-level data collections of K-12 public schools. We determined these data were sufficiently reliable for the purposes of this report by reviewing documentation, conducting electronic testing, and interviewing Education officials.

Colleges often look for students to have taken certain courses or a sequence of courses in preparation for college. To test whether offering certain courses or sequences of courses were associated with school characteristics, like its poverty level, we conducted an additional analysis using Education's data. Specifically, we used a generalized linear regression with a logistic regression model to test whether a school offering: at least three math courses (algebra I, geometry, and algebra II); at least three science courses (biology, chemistry, and physics); and any Advanced Placement (AP) courses was associated with particular school

⁴ The course offering variables we used in our analysis are only for those courses typically associated with and reported by high schools. As a result, in this report we define "high schools" as schools with grades: 9, 10, 11, and 12. We also exclude juvenile justice facilities and schools with fewer than 10 students enrolled.

⁵ Throughout this report, we use student eligibility for free or reduced-price lunch as a proxy for poverty. For purposes of this report, we sorted schools into four quartiles based on the percent of students in a school that were eligible for free or reduced-price lunch as follows: schools with 0 to 24.9 percent of students in poverty (low-poverty schools), schools with 25 to 49.9 percent of students in poverty, schools with 50 to 74.9 percent of students in poverty, and schools with 75 to 100 percent of students in poverty (high-poverty schools).

characteristics, like poverty, while controlling for other school characteristics, like school size and demographic makeup. Similarly, we conducted a separate regression for individual course offerings (algebra I, calculus, biology, etc.). By controlling for other related school characteristics that might also be associated with offering a given course or sequence of courses, the model tests whether an association with a particular school characteristic of interest, such as poverty, remains when controlling for other related school characteristics.⁶ To better understand the courses that colleges expect students to take in high school, we reviewed the academic admission criteria posted on the websites of a nationally-representative random sample of public 4-year colleges in the United States. We focused on public 4-year colleges because these institutions offer a bachelor's degree and are generally a more affordable 4-year option because they often offer lower tuition to in-state residents.

To gather information on the challenges students in high-poverty schools face in being prepared for college, we conducted site visits to 12 high schools: 4 schools in each of 3 states (California, Georgia, and Wisconsin). We selected high-poverty schools that provided us with a range in the numbers of different types of math, science, and AP courses offered.⁷ We also selected high schools that provided variation in size, school type, and location. At each of the 12 high schools, we interviewed the principal and other key leadership staff, and high school counselors. We interviewed by phone state educational agency officials in each of the three states, as well as school district officials for most of the high schools we visited. For each state, we also interviewed college admission officials representing at least one public, 4-year college, and representatives of college advising organizations. In selecting the states in our review, we

⁶ All regressions uses statistical tests at the alpha = 0.05 level of significance to determine whether a factor was associated with a specific course offering. See appendix I for more details.

⁷ We were unable to select schools based on English or social studies courses because the CRDC does not collect these data.

considered variation in state policies on college readiness and geographic diversity.⁸

We conducted this performance audit from May 2017 to October 2018 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives. See appendix I for more information on our objectives, scope, and methodology.

Background

Poverty in U.S. High Schools

Poverty can adversely affect academic and other outcomes in profound ways. Specifically, living in poverty is linked with negative conditions for children at home, in schools, and in neighborhoods and communities, and can include substandard housing, homelessness, inadequate nutrition and food insecurity, inadequate home-based child care, increased health care costs, and unsafe neighborhoods.⁹ Poverty has a particularly adverse effect on the academic outcomes of children that starts in early childhood and continues through the academic pipeline. Chronic stress associated with living in poverty has been shown to adversely affect children's concentration and memory which may impact their ability to learn. Census data from 2014 show a relationship between the rate at which students dropped out (left school without obtaining a high school credential) and family income. The dropout rate of students from high-

⁸ These policies include requirements and considerations for some school districts to offer college preparatory courses, statewide or system-wide college admission requirements, and alignment between high school graduation requirements and college admission requirements. Emmy Glancy, Mary Fulton, Lexi Anderson, Jennifer Dounay Zinth, Maria Millard and Brady Delander, *Blueprint for College Readiness* (Denver, CO: Education Commission of the States, October 2014). For the purposes of this review, we did not conduct an independent review of relevant state laws, regulations, or policies.

⁹ GAO, *Child Well-Being: Key Considerations for Policymakers Including the Need for a Federal Cross-Agency Priority Goal*, [GAO-18-41SP](#) (Washington, D.C.: November 2017).

income families was 2.8 percent, while the dropout rate for individuals from low-income families was 11.6 percent.¹⁰

Our prior work describes how the nation's schools have become increasingly comprised of students in poverty.¹¹ In school year 2015-16, of the 12.5 million students in public high schools (schools with grades 9-12), over 5 million (40 percent) attended schools where at least half of the students were experiencing poverty, as indicated by eligibility for free or reduced-priced lunch.¹² Nearly 1.8 million (over 14 percent) attended schools where at least three-quarters of the students were experiencing poverty (see table 1).

¹⁰ U.S. Department of Commerce, Census Bureau, Current Population Survey (CPS), October 2014.

¹¹ [GAO- K-12 Education: Better Use of Information Could Help Agencies Identify Disparities and Address Racial Discrimination, GAO-16-345](#) (Washington, D.C.: April 21, 2016).

¹² Education's National Center for Education Statistics uses eligibility for free or reduced-price lunch as a measure of poverty. The Department of Agriculture's National School Lunch Program provides low-cost or free lunches to children in schools. Children are eligible for free lunches if their household income is below 130 percent of federal poverty guidelines or if they meet certain automatic eligibility criteria, such as eligibility for the Supplemental Nutrition Assistance Program or Temporary Assistance for Needy Families. Students are eligible for reduced-price lunches if their household income is between 130 percent and 185 percent of federal poverty guidelines. For example, the maximum household income for a family of four to qualify for free lunch benefits was \$31,525 in school year 2015-2016. See, for example, Department of Education, *Free and Reduced-Price Lunch Eligibility Data in EDFacts: A White Paper on Current Status and Potential Changes* (2012).

Table 1: Distribution of Public High Schools and Students across Different Levels of School Poverty, School Year 2015-16

School Poverty Level (% eligible for free or reduced-price lunch)	Students		Schools	
	Number	Percent	Number	Percent
0 to 24.9% (low-poverty schools)	2,903,159	23.3%	2,580	18.3%
25 to 49.9%	4,242,328	34.0%	4,840	34.3%
50 to 74.9%	3,225,181	25.9%	3,854	27.3%
75 to 100% (high-poverty schools)	1,788,131	14.3%	2,441	17.3%
Data unavailable	312,377	2.5%	396	2.8%
Total	12,471,176	100%	14,111	100%

Source: GAO analysis of data from the U.S. Department of Education's Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

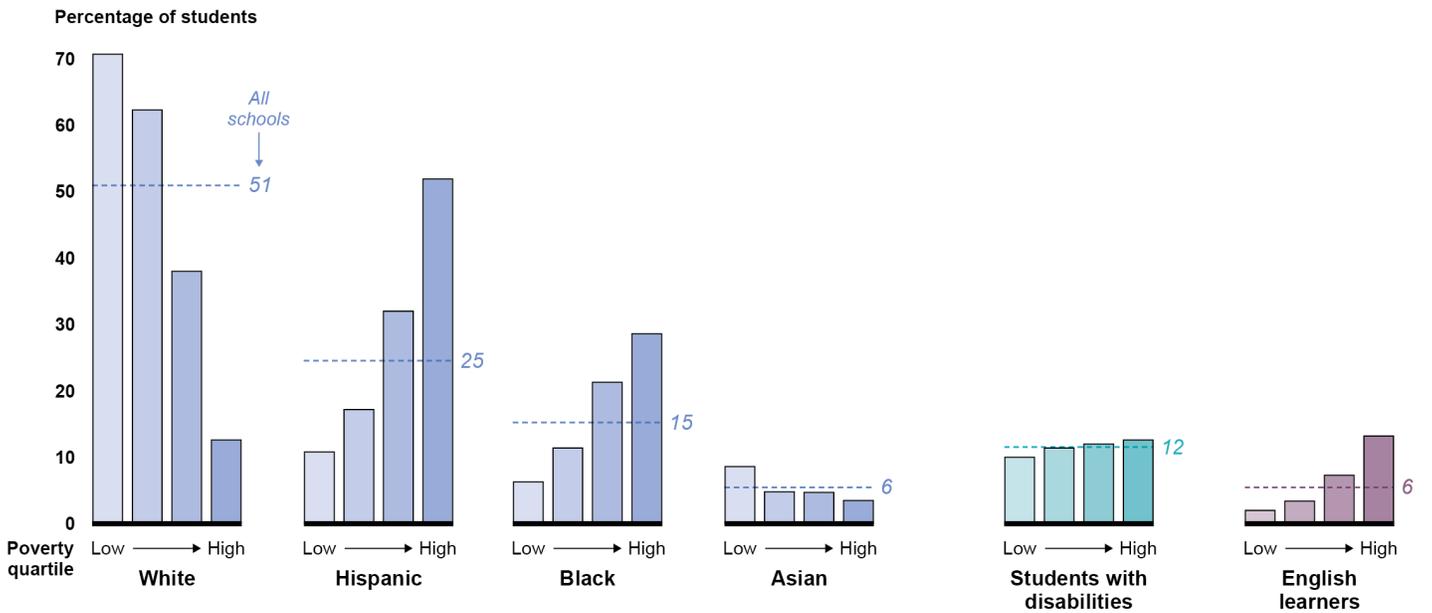
Note: For our analyses we grouped high schools into four categories based on the percent of students enrolled who were eligible for the free or reduced-price lunch program. The category "Data unavailable" refers to schools that did not report the percentage of students eligible for free or reduced-price lunch for school year 2015-16.

Our prior work has also discussed the association between poverty and race or ethnicity.¹³ High schools with a relatively large proportion of students in poverty also tend to have a higher proportion of minority students, students with disabilities, and English learners. The link between racial and ethnic minorities and poverty is long-standing, and studies have noted concerns about this segment of the population that falls at the intersection of poverty and minority status in schools and how this affects their access to quality education.¹⁴

¹³ [GAO-16-345](#).

¹⁴ For example, U.S. Department of Education, Office for Civil Rights, 2013-2014 Civil Rights Data Collection: A First Look: Key Data Highlights on Equity and Opportunity Gaps in Our Nation's Public Schools (Issued June 7, 2016; Revised October 28, 2016).

Figure 1: Student Demographics in Public High Schools across Poverty Levels, for School Year 2015-16



Source: GAO analysis of data from the U.S. Department of Education’s Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

Note: High schools are divided into four quartiles based on the percent of students in a school that were eligible for free or reduced-price lunch as follows: schools with 0 to 24.9 percent of students in poverty (low-poverty), schools with 25 to 49.9 percent of students in poverty, schools with 50 to 74.9 percent of students in poverty, and schools with 75 to 100 percent of students in poverty (high-poverty).

Characteristics of U.S. High Schools and the College Preparation Process

Of the roughly 12.5 million students who were enrolled in public high schools during the 2015-16 school year, about 87 percent attended traditional public schools, according to Education data; the remaining students were enrolled at charters, magnets, and other types of public schools (see table 2).

Table 2: Definitions and Distribution of High-Poverty Public High Schools and Students, by School Type, School Year 2015-16

School type	Definition	Percent of high school students enrolled	Percent of high schools that are high-poverty ^a
Traditional school	Not defined in the Civil Rights Data Collection (CRDC).	86.6%	13.8%
Magnet school	A public school is considered a magnet school if it operates a magnet program for all or some of its students. A magnet program offers a special curriculum capable of attracting substantial numbers of students of different racial/ethnic backgrounds, which may also reduce, prevent, or eliminate minority group isolation. The program may be designed to provide an academic or social focus on a particular theme (e.g., science/math, performing arts, gifted/talented, or foreign language).	9.5%	28.9%
Charter school	A nonsectarian public school under contract—or charter—between a public agency and groups of parents, teachers, community leaders or others.	2.5%	31.2%
Alternative school	A public elementary or secondary school that addresses the needs of students that typically cannot be met in a regular school program.	1.1%	35.6%
Special education school	A public elementary or secondary school that focuses primarily on serving the needs of students with disabilities under the Individuals with Disabilities Education Act (IDEA) or section 504 of the Rehabilitation Act.	0.2%	36.3%

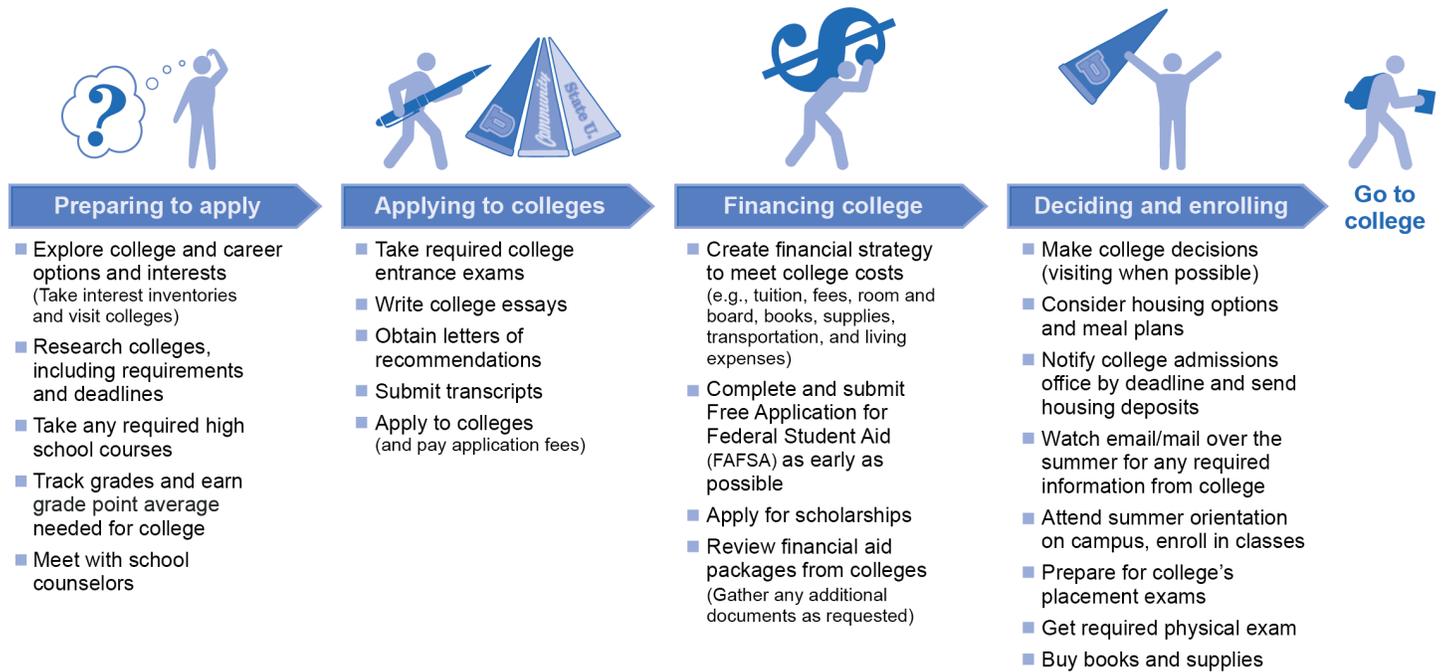
Source: GAO analysis of data from the U.S. Department of Education’s Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

Note: Definitions come from Education’s CRDC, except where noted. Schools could select multiple school types in the CRDC, such as a school that is both a charter and an alternative school. For purposes of analyzing differences by school type, we developed mutually exclusive categories using the following hierarchy: (1) schools that selected “Alternative” are coded as such; (2) schools that selected “Special Education” are coded as such, except those that also selected “Alternative;” (3) schools that selected “Charter” are coded as such, except those that also selected “Alternative” or “Special Education;” (4) schools that selected “Magnet” are coded as such, except those that also selected one of the other school types; and (5) Traditional public schools include all schools that did not select any of the school types in the CRDC.

^aWe define high-poverty high schools as schools in which 75 percent or more of students are eligible for free or reduced-priced lunch.

While not all students will decide to pursue college, those who do generally must prepare for and navigate the college admissions process while in high school. This process can involve multiple administrative and financial steps, according to information from Education and college advising organizations. (See figure 2 for more information on the college application and admissions process.)

Figure 2: Overview of Key Steps and Costs Associated with Applying for and Enrolling in a 4-Year College



Source: GAO analysis of college preparation guidance and resources for students and parents. | GAO-19-8

U.S. Department of Education College Readiness Initiatives

The Department of Education plays a role in helping students be prepared for college through initiatives in several of its offices. For example, Education’s Office of Postsecondary Education (OPE) administers several discretionary grant programs designed to increase college readiness among students from disadvantaged backgrounds, such as the Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP). GEAR UP aims to increase the number of low-income students who are prepared to enter and succeed in postsecondary education. In 2016, OPE awarded approximately \$323 million in grants through GEAR UP. In addition, Education’s Office of Elementary and Secondary Education (OESE) provides grants and technical assistance to states and districts to encourage advanced course opportunities and college and career readiness initiatives. OESE also oversees states’ and districts’ use of Title I, Part A funds under the Elementary and Secondary Education Act, as amended. These funds provide financial assistance to school districts and schools with high numbers or high percentages of children from low-income families to help ensure that all children meet challenging state academic standards, and can be used to provide additional courses and college readiness programs in schools. Finally, Education’s Office of Federal Student Aid

(FSA) is responsible for managing the student financial assistance programs authorized under Title IV of the Higher Education Act of 1965. These programs provide grants, loans, and work-study funds to students attending college or career school. FSA also publishes guidance and other resources related to federal student aid and college costs. These resources are designed for students and parents who are navigating the college application and financial aid processes. (For more information on Education’s grant programs relevant to college readiness, see appendix II.)

Federal Efforts to Promote Equitable Access to Educational Resources

Education and the Department of Justice (Justice) promote equitable access to education resources as part of their missions in two key ways: (1) conducting investigations of discrimination complaints; (2) issuing guidance on ways to address potential disparities; and (3) providing technical assistance.¹⁵ Education and Justice are responsible for enforcing a number of civil rights laws that prohibit discrimination in public schools on the basis of race, sex, disability, color, and national origin.¹⁶ (For examples of cases resolved by Education and Justice related to access to college preparation resources, see appendix IV.)

To enforce relevant civil rights laws, Education carries out complaint-driven and agency-initiated investigations, which are called compliance reviews and which target problems that Education has determined are particularly acute. For example, in a recent review, Education’s OCR reviewed whether Black students in a Virginia school district had the same access to educational opportunities as other students. OCR found a significant disparity between the numbers of Black and White high school students who take AP, advanced courses, and dual credit programs. These discrimination cases can be resolved through several means, including voluntary resolution, dismissal, or closure due to insufficient evidence. Education may also terminate federal funds if Education

¹⁵ Both agencies have regulations that require they periodically review whether recipients of federal funding are complying with certain laws the agencies enforce. See, e.g. 34 C.F.R. § 100.7 and 28 C.F.R. § 42.107.

¹⁶ See, e.g., 42 U.S.C. § 2000d, et seq.; see also 34 C.F.R. Part 100. Poverty is not a protected class under federal civil rights laws.

determines that a recipient is in violation of civil rights laws and the agency is unable to reach agreement with the parties involved.¹⁷

Justice has the authority to file suit in federal court to enforce the civil rights of students in public education. Specifically, Justice investigates discrimination in school resources based on complaints filed under federal civil rights laws and monitors and enforces open federal school desegregation orders where Justice is a party to the litigation.¹⁸ For example, in 2015 Justice entered into a court-approved agreement with a Louisiana city school board after finding that more college preparatory courses were offered in schools that predominantly serve White students than in schools that predominately serve Black students. This agreement required, among other things, that the district ensure that all students were given the opportunity to take all courses offered in the district.

In addition to enforcement actions, Education and Justice help promote equitable access to education resources by issuing guidance and providing technical assistance. For example, in 2014, OCR issued guidance addressing equitable access to educational resources, in part, to address chronic and widespread racial disparities in access to rigorous courses, academic programs, and extracurricular activities which can hinder the education of students of color. In this guidance, OCR describes proactive ways to address potential disparities in academic and extracurricular programs that are differentiated based on academic rigor (e.g., gifted and talented or college preparatory programs) or content (e.g., business, music, art, or career and technical education programs).¹⁹ This guidance includes the following steps that states and school districts can take to help ensure equal access to educational resources:

¹⁷ Agency officials told us that this rarely happens. Before the termination of federal funds can occur, a recipient, among other things, has the right to request a hearing. 42 U.S.C. § 2000d-2. [GAO- K-12 Education: Better Use of Information Could Help Agencies Identify Disparities and Address Racial Discrimination](#), [GAO-16-345](#) (Washington, D.C.: April 21, 2016).

¹⁸ In court cases where school districts were found to have engaged in segregation or discrimination, courts may issue “desegregation orders” requiring the districts to take specific steps to desegregate their schools or otherwise comply with the law.

¹⁹ In 2014, as part of this guidance, OCR also issued a fact sheet, *Ensuring Students Have Equal Access to Educational Resources without Regard to Race, Color, or National Origin*.

- designating an employee to review policies governing how resources are distributed to and within schools;
- evaluating resource access across and within schools;
- notifying parents, students, and community members of avenues to raise concerns about resource access; and
- taking proactive steps to identify disparities in access to resources.

Education also offers technical assistance, through various means, such as conducting webinars, sponsoring and presenting at conferences, and disseminating resource guides to schools and school districts.

High-Poverty Schools Offer Fewer of the Courses That Prepare Students for Public 4-Year College

At a Glance: Student Access to College Preparation Courses and Admissions Expectations

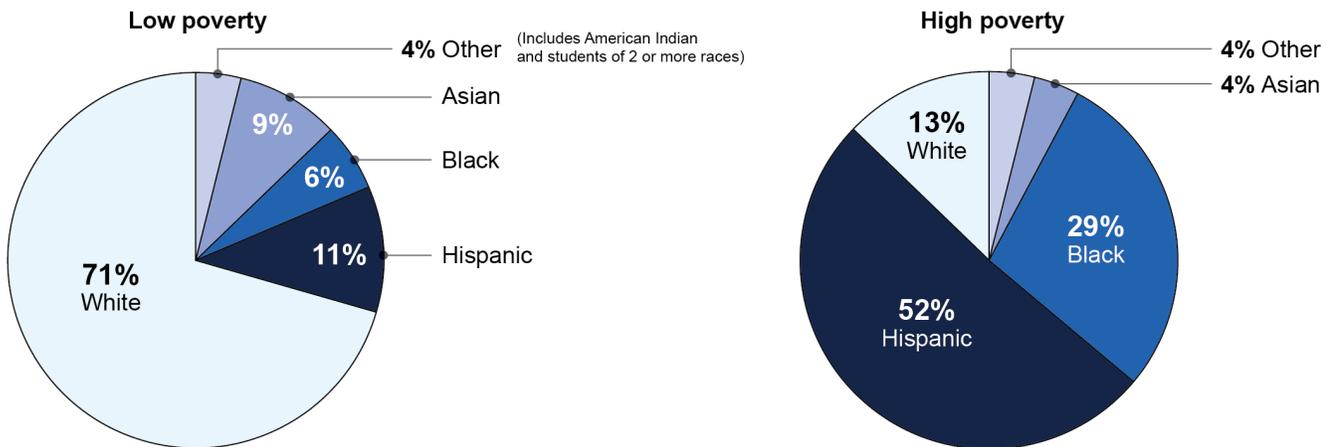
- Poverty and Student Demographics
 - Schools with the highest concentration of poor students were predominantly comprised of Black and Hispanic students.
 - Access to more advanced math and science courses (e.g., calculus and physics) decreased as the level of school poverty increased.
- School size
 - Larger high schools offered more advanced math and science courses than smaller schools, regardless of poverty level.
- School type
 - Charter schools offered fewer advanced math and science courses than traditional and magnet schools, regardless of poverty level.
- College Admissions Expectations
 - Public 4-year colleges generally expect applicants to have completed three or four math and three or four science credits in high school, but we found that the percentage of schools offering these recommended courses decreased as poverty level increased.

Source: GAO analysis of data from the U.S. Department of Education's Common Core of Data and the Civil Rights Data Collection for school year 2015-16, and of websites from a nationally representative sample of colleges, September–November 2017. | GAO-19-8

High-Poverty High Schools Largely Comprised of Black and Hispanic Students

Our analysis of Education data for school year 2015-16 showed that high-poverty high schools were predominately comprised of Black and Hispanic students, while low-poverty schools had a higher proportion of White students. Specifically, roughly 80 percent of students attending high-poverty schools were either Black or Hispanic, but were less than 20 percent of students enrolled in low-poverty schools (see fig. 3).

Figure 3: Student Demographics of Low- and High-Poverty High Schools, School Year 2015-16



Source: GAO analysis of data from the U.S. Department of Education's Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

Note: Percentages do not add to 100 percent, due to rounding.

Access to Advanced High School Courses Varies Based on School Poverty Level, Size, and Type

Poverty Level

Our analysis of Education data for school year 2015-16 showed that students' access to more advanced high school courses decreased as the level of school poverty increased.²⁰ High-poverty schools represented 17 percent of all high schools in 2015-16.

²⁰ For our analyses we grouped high schools into four categories based on the percent of students enrolled who were eligible for free or reduced-price lunch (FRPL). The categories are as follows: schools with 0 to 24.9 percent of students in poverty (low-poverty), schools with 25 to 49.9 percent of students in poverty, schools with 50 to 74.9 percent of students in poverty, and schools with 75 to 100 percent of students in poverty (high-poverty).

College Admissions Perspective

Admissions officials from all four public, 4-year universities we interviewed reported that they look for students to take advanced coursework in high school in order to be more competitive applicants.

Some college admissions officials and college advising organizations reported that students face academic difficulties when they get to college if they did not take advanced courses that help prepare for the rigor of college.

A college admissions official we interviewed reported that over 90 percent of the university's incoming freshmen took courses in high school that could earn college credit, such as Advanced Placement (AP), International Baccalaureate (IB), or dual enrollment courses.

Source: GAO interviews. | GAO-19-8

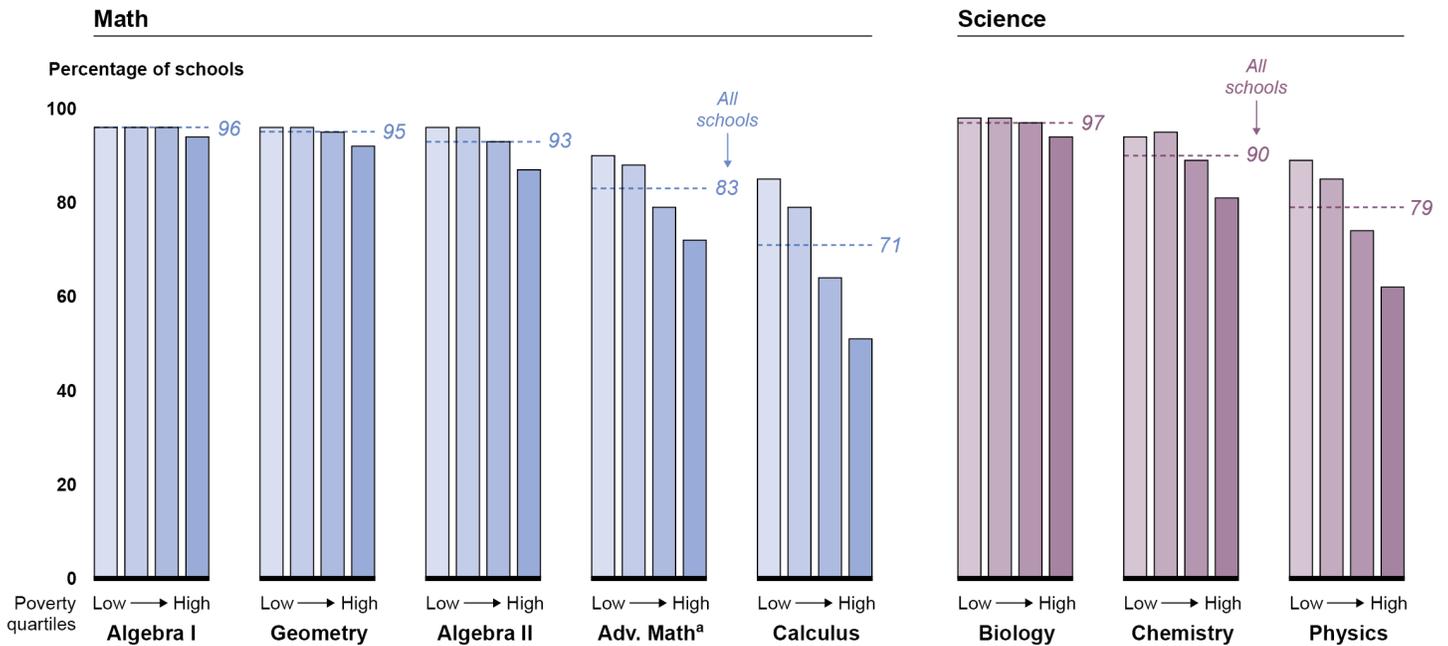
Across all poverty levels, almost all schools offered the basic math courses (algebra I and geometry); however, disparities in offering advanced math courses grew as school poverty level increased (see fig. 4). For calculus in particular, the percentage of schools offering the course decreased as school poverty level increased, with the gap between low- and high-poverty schools widening to nearly 35 percentage points (85 percent of low-poverty schools versus about 50 percent of high-poverty schools).²¹ Generally, a similar pattern emerged for science courses. Again, the majority of all schools, at least 90 percent across all poverty levels, offered biology; but for chemistry and physics, disparities grew as poverty increased.²² For example, almost 90 percent of low-poverty schools offered physics, with the percentage decreasing steadily to 62 percent for high-poverty schools.²³

²¹ Our regression model found lower odds of offering calculus were associated with higher levels of school poverty when controlling for other factors, including school size and demographic make-up. However, our model did not find an association between the odds of offering more basic math classes, like algebra I and geometry, and school poverty level.

²² Our regression model found lower odds of offering physics were associated with higher levels of school poverty when controlling for other factors, including school size and demographic make-up. Generally, however, our model did not find an association between the odds of offering biology and chemistry, and school poverty level.

²³ We also analyzed course offerings in those schools where 90 to 100 percent of the students were eligible for free or reduced-price lunch and found that they were generally similar to offerings in high-poverty schools (75 to 100 percent of students eligible for free or reduced-price lunch). See appendix V for full data tables.

Figure 4: Math and Science Courses Offered in Public High Schools, by School Poverty Level, School Year 2015-16



Source: GAO analysis of data from the U.S. Department of Education’s Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

Note: High schools are divided into four quartiles based on the percent of students in a school that were eligible for free or reduced-price lunch as follows: schools with 0 to 24.9 percent of students in poverty (low-poverty), schools with 25 to 49.9 percent of students in poverty, schools with 50 to 74.9 percent of students in poverty, and schools with 75 to 100 percent of students in poverty (high-poverty).

^a Advanced mathematics is defined by the CRDC as courses that cover the following topics: trigonometry, trigonometry/algebra, trigonometry/analytic geometry, trigonometry/math analysis, analytic geometry, math analysis, math analysis/analytic geometry, probability and statistics, and precalculus.

For courses that allow students to earn college credit and that can help make students more competitive applicants (see text box), our analysis showed a similar trend, with disparities that deepened as school poverty increased. For Advanced Placement (AP) courses overall, our analysis showed that the gap in courses offered was widest between the lowest and highest poverty schools—with over 80 percent of low-poverty schools offering at least one AP course compared to about 60 percent of high-poverty schools.²⁴ We found a similar pattern for AP math and science

²⁴ Advanced Placement (AP) courses are college-level courses through which students may earn college credit and advanced college placement by successfully completing AP courses and standardized AP exams. The AP program is sponsored by the College Board.

High School Courses That Can Earn College Credit

Advanced Placement courses:

Upon successful completion of the course and a standardized AP exam, a student may be qualified to receive college credit and/or placement into advanced college courses.

International Baccalaureate courses:

The International Baccalaureate (IB) courses are designed as an academically challenging and balanced program of education, with final examinations, that prepares students, usually aged 16 to 19, for success in college.

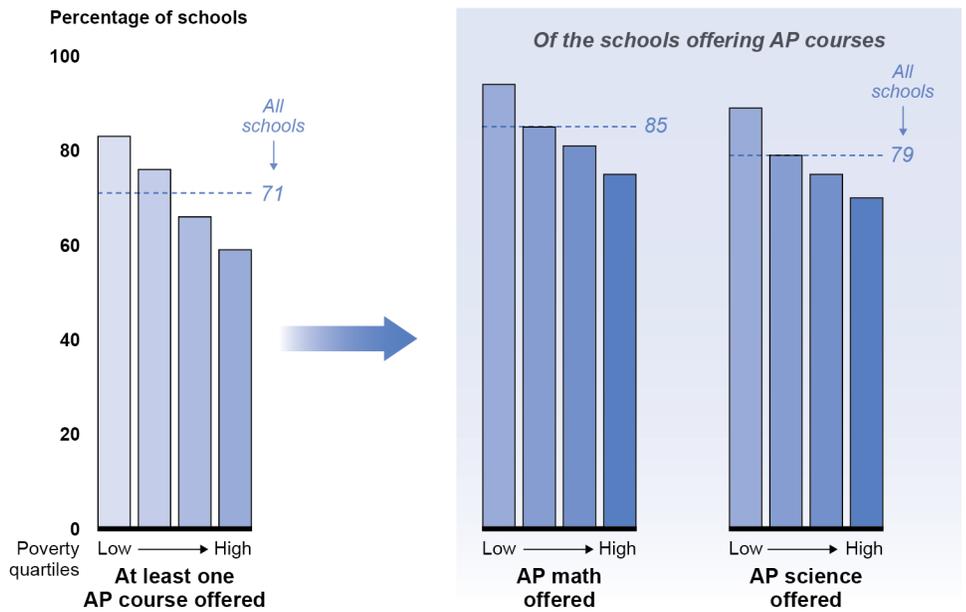
Dual Enrollment/Credit programs:

Dual enrollment/dual credit programs provide opportunities for high school students to take college-level courses offered by colleges, and earn concurrent credit toward a high school diploma and a college degree while still in high school.

Source: Civil Rights Data Collection. | GAO-19-8

courses.²⁵ Among schools that offered any AP courses, nearly all low-poverty schools offered AP math compared to 75 percent of high-poverty schools, a nearly 20 percentage point gap (see fig. 5).

Figure 5: Advanced Placement (AP) Courses Offered in Public High Schools, by School Poverty Level, School Year 2015-16



Source: GAO analysis of data from the U.S. Department of Education's Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

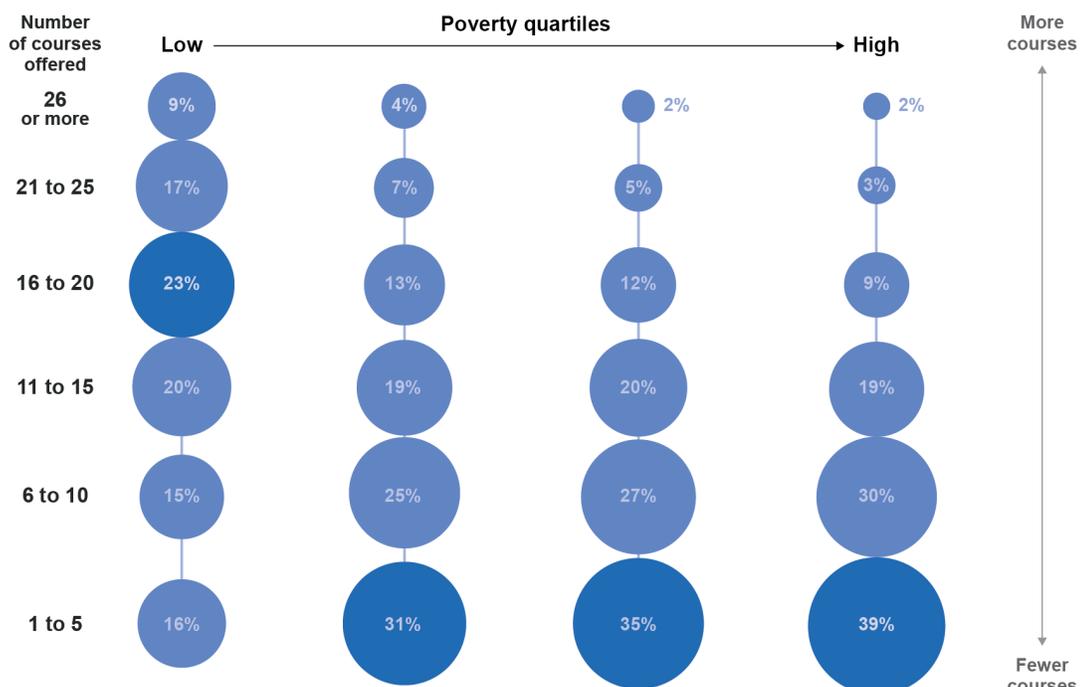
Note: High schools are divided into four quartiles based on the percent of students in a school that were eligible for free or reduced-price lunch as follows: schools with 0 to 24.9 percent of students in poverty (low-poverty), schools with 25 to 49.9 percent of students in poverty, schools with 50 to 74.9 percent of students in poverty, and schools with 75 to 100 percent of students in poverty (high-poverty). Advanced Placement (AP) courses are college-level courses through which students may earn college credit and advanced college placement by successfully completing AP courses and standardized AP exams. The AP program is sponsored by the College Board.

Our analysis also showed that disparities in the variety of AP courses offered grew with school poverty level. For example, among schools that offer AP, roughly 70 percent of low-poverty schools offered more than 10 different AP courses, compared to about 30 percent of high-poverty schools. Similarly, 9 percent of low-poverty schools offered more than 26

²⁵ Our regression model found lower odds of offering any AP courses were associated with higher levels of school poverty when controlling for other factors, including school size and demographic make-up. A similar association was found for AP math and AP science courses.

different AP courses, compared to 2 percent of high-poverty schools (see fig. 6).

Figure 6: Number of Different Advanced Placement (AP) Courses Offered in Public High Schools, by School Poverty Level, School Year 2015-16



Source: GAO analysis of data from the U.S. Department of Education's Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

Note: High schools are divided into four quartiles based on the percent of students in a school that were eligible for free or reduced-price lunch as follows: schools with 0 to 24.9 percent of students in poverty (low-poverty), schools with 25 to 49.9 percent of students in poverty, schools with 50 to 74.9 percent of students in poverty, and schools with 75 to 100 percent of students in poverty (high-poverty). Advanced Placement (AP) courses are college-level courses through which students may earn college credit and advanced college placement by successfully completing AP courses and standardized AP exams. The AP program is sponsored by the College Board.

For dual credit courses, which allow high school students to earn credits toward college, we also found a smaller percentage of high-poverty schools (54 percent) had students enrolled in such programs compared to low-poverty schools (73 percent). The percentage of schools with students enrolled in an IB program did not meaningfully vary by poverty level, and only about 5 percent of high schools offered such a program. (See appendix V for detailed results on dual credit enrollment and IB programs.)

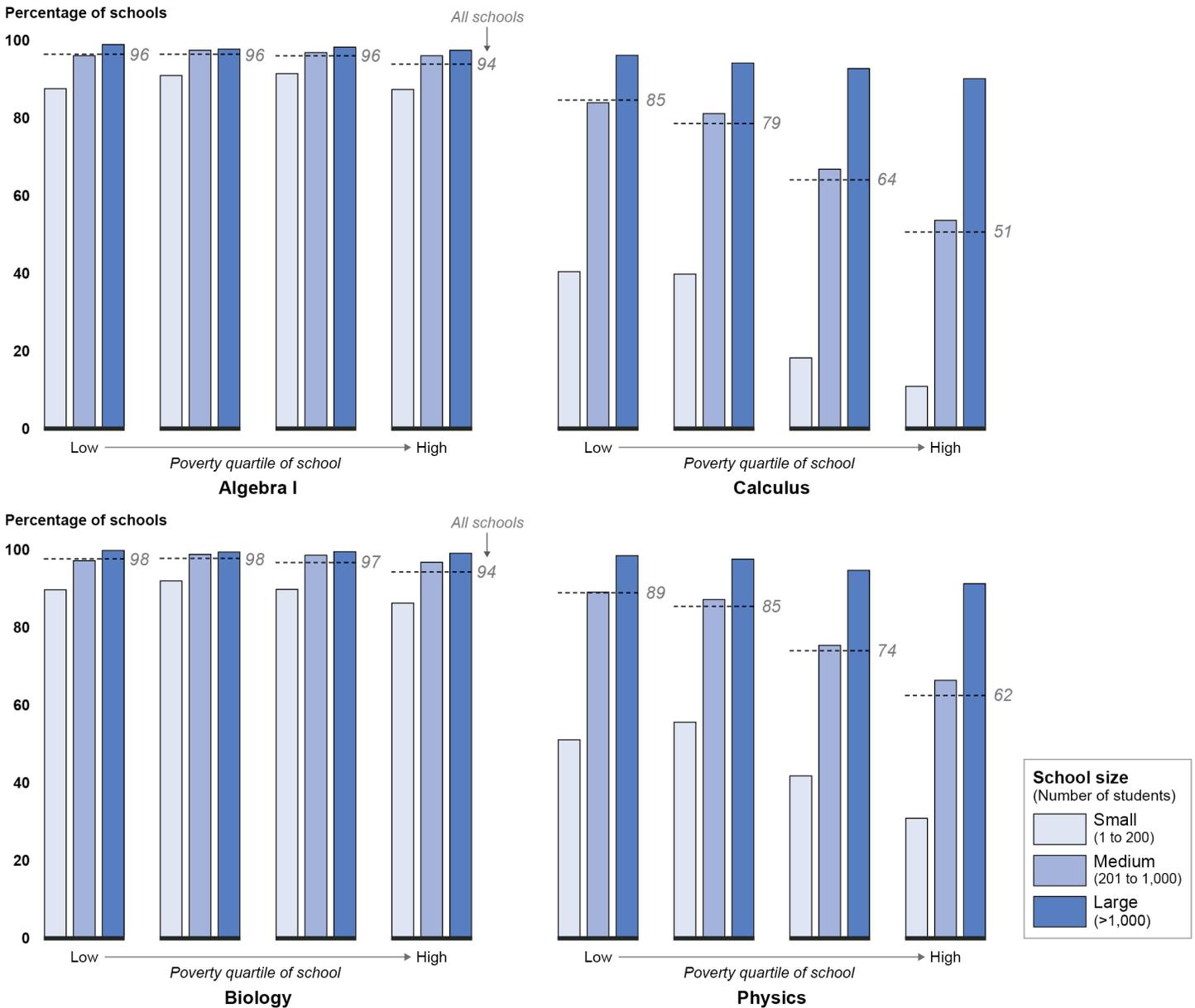
Poverty Level and School Size

Across all poverty levels, larger public high schools offered more advanced math and science courses than smaller schools, according to our analysis of Education's school year 2015-16 data.²⁶ As illustrated in figure 7, this pattern held true for all math and science courses.²⁷ In particular, among high-poverty schools, 90 percent of large schools offered calculus, compared to 54 percent and 11 percent of medium and small schools, respectively. Similarly, among high-poverty schools, over 90 percent of large schools offered physics compared to about two-thirds of medium and about a third of small schools.

²⁶ We divided schools into one of three groups, based on student enrollment. Each group is defined as follows: Small = 1 to 200 students; Medium = 201 to 1000 students; Large = 1001 or more students.

²⁷ Our regression model found an association between offering more advanced math and science courses and larger school size, even when controlling for school poverty level and other factors, such as school type and demographic makeup. Specifically, the odds of offering these courses increased for larger schools versus smaller schools, when controlling for other factors in the model.

Figure 7: Selected Math and Science Courses Offered in Public High Schools, by School Size and Poverty Level, School Year 2015-16

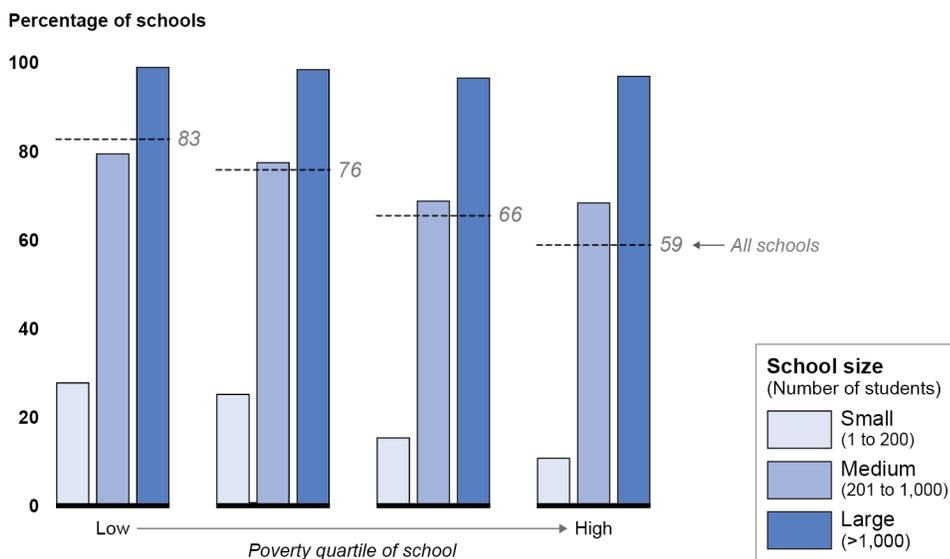


Source: GAO analysis of data from the U.S. Department of Education's Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

Note: High schools are divided into four quartiles based on the percent of students in a school that were eligible for free or reduced-price lunch as follows: schools with 0 to 24.9 percent of students in poverty (low-poverty), schools with 25 to 49.9 percent of students in poverty, schools with 50 to 74.9 percent of students in poverty, and schools with 75 to 100 percent of students in poverty (high-poverty).

A similar pattern was evident for AP courses (see fig. 8). Among high-poverty schools, 97 percent of large schools offered AP courses compared to 68 percent of medium and 11 percent of small schools.

Figure 8: Advanced Placement (AP) Courses Offered in Public High Schools, by School Size and Poverty Level, School Year 2015-16



Source: GAO analysis of data from the U.S. Department of Education's Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

Note: High schools are divided into four quartiles based on the percent of students in a school that were eligible for free or reduced-price lunch as follows: schools with 0 to 24.9 percent of students in poverty (low-poverty), schools with 25 to 49.9 percent of students in poverty, schools with 50 to 74.9 percent of students in poverty, and schools with 75 to 100 percent of students in poverty (high-poverty). Advanced Placement (AP) courses are college-level courses through which students may earn college credit and advanced college placement by successfully completing AP courses and standardized AP exams. The AP program is sponsored by the College Board.

Poverty Level and School Type

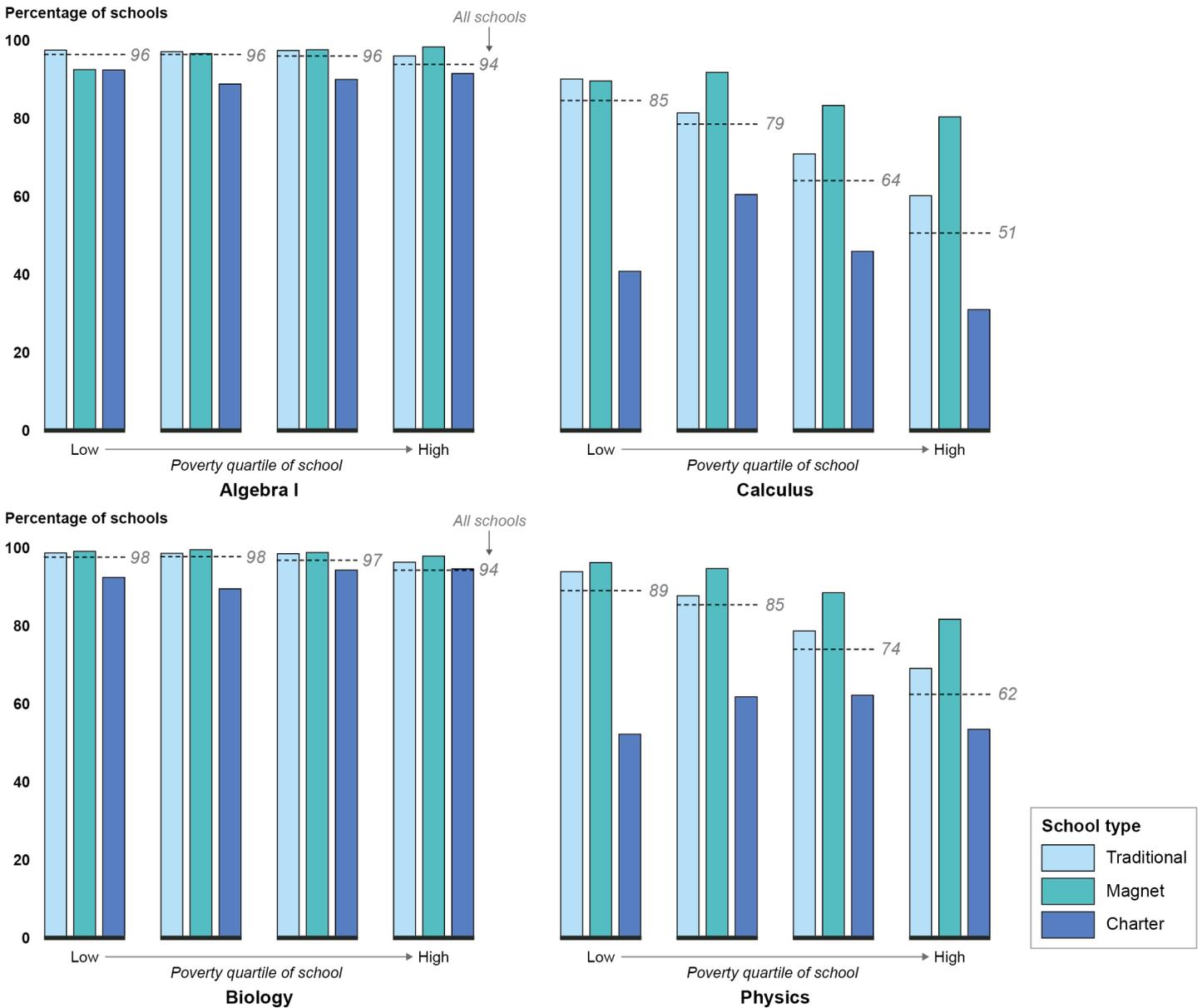
Across all poverty levels, access to advanced courses differed by school type. We found that, in general, fewer charter schools, across all poverty levels, offered math, science, and AP courses, compared to traditional and magnet schools,²⁸ according to our analysis of Education's school

²⁸ The one exception to this pattern was for high-poverty schools offering algebra II, where a slightly higher percentage of charter schools offered the course than did traditional schools.

year 2015-16 data (see fig. 9).²⁹ Further, a higher percentage of magnet schools offered advanced courses (such as physics and AP courses), compared to traditional schools. We also analyzed alternative schools and special education schools. When analyzing Education's data by school type, these schools had the lowest percentage of schools offering college preparatory courses. We focused our analyses in the body of the report on traditional, magnet, and charter schools, the school types with larger enrollments. Alternative and special education schools enroll fewer than 1.5 percent of high school students. See appendix V for full data tables, which include breakouts for alternative and special education schools.

²⁹ Our regression model found that the association between offering more advanced courses and school type generally held, even when controlling for school size, school poverty level, and other school factors, such as population density and demographic makeup. Specifically, charters were generally less likely to offer most offerings when compared to traditional or to magnet schools for most offerings, but not for algebra II or biology.

Figure 9: Selected Math and Science Courses Offered in Public High Schools, by School Type and Poverty Level, School Year 2015-16

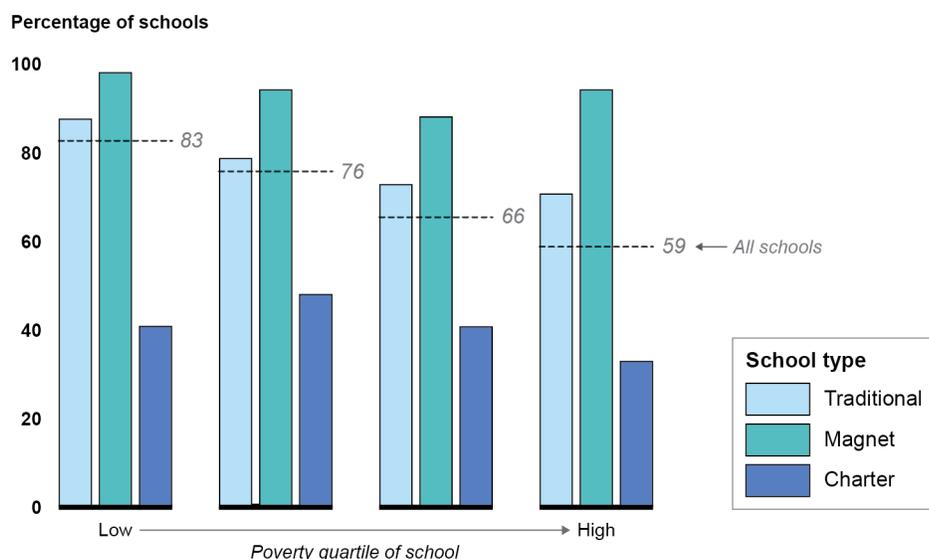


Source: GAO analysis of data from the U.S. Department of Education's Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

Note: High schools are divided into four quartiles based on the percent of students in a school that were eligible for free or reduced-price lunch as follows: schools with 0 to 24.9 percent of students in poverty (low-poverty), schools with 25 to 49.9 percent of students in poverty, schools with 50 to 74.9 percent of students in poverty, and schools with 75 to 100 percent of students in poverty (high-poverty).

For AP courses, across all poverty levels, a lower percentage of charter schools offered these courses compared to traditional and magnet schools (see fig. 10). In particular, among high-poverty schools, 33 percent of charter schools offered any AP courses compared to 71 percent of traditional and 94 percent of magnet schools.

Figure 10: Advanced Placement (AP) Courses Offered in Public High Schools, by School Type and Poverty Level, School Year 2015-16



Source: GAO analysis of data from the U.S. Department of Education's Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

Note: High schools are divided into four quartiles based on the percent of students in a school that were eligible for free or reduced-price lunch as follows: schools with 0 to 24.9 percent of students in poverty (low-poverty), schools with 25 to 49.9 percent of students in poverty, schools with 50 to 74.9 percent of students in poverty, and schools with 75 to 100 percent of students in poverty (high-poverty). Advanced Placement (AP) courses are college-level courses through which students may earn college credit and advanced AP college placement by successfully completing AP courses and standardized AP exams. The AP program is sponsored by the College Board.

We also analyzed high school course offerings based on whether schools were located in an urban, suburban, or rural location, but our regression model did not find a consistent association between school locale and course offerings. For example, a lower percentage of high-poverty schools in rural areas offered advanced math and science courses compared to high-poverty urban or suburban schools. However, a higher percentage of low-poverty rural schools offered advanced math and science courses than did low-poverty urban schools. For full results by school locale, see appendix V.

High-Poverty Schools Were Less Likely to Offer Math and Science Courses Needed for College Admission

Colleges often look for students to have completed multiple credits of a subject in high school, such as math or science; however, our analysis suggests that some high-poverty schools may not offer the math and science courses needed to meet basic admission expectations for public 4-year colleges. Based on our analysis of a generalizable sample of U.S. public 4-year college websites,³⁰ an estimated 95 percent of colleges expected applicants to have completed three or four credits of math (see text box).³¹ Further, a majority of public 4-year colleges specifically recommended that applicants take algebra I, geometry, and algebra II.³² With respect to science an estimated 76 percent of colleges expected students to have completed three or four credits of science, with many specifically recommending biology, chemistry, or physics.³³ (See fig. 11).

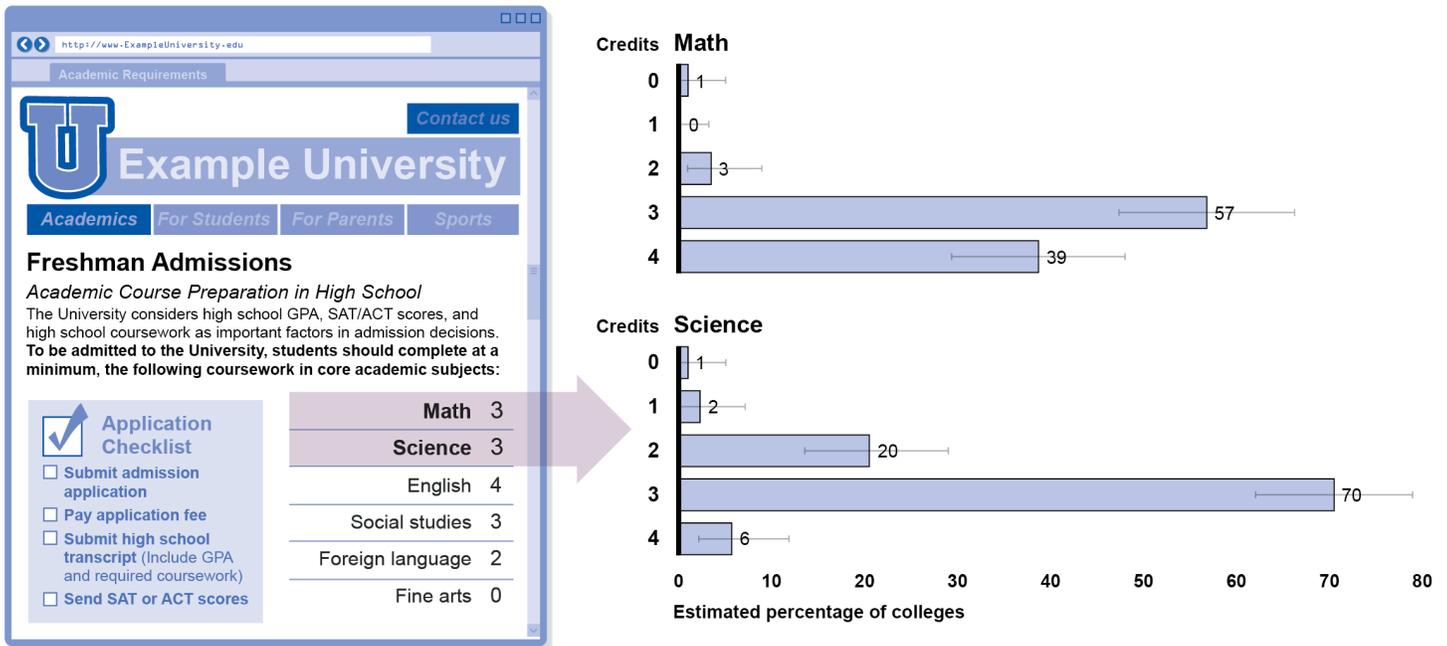
³⁰ Using Education’s 2015-2016 Integrated Postsecondary Education Data System, we drew a stratified random sample of 100 public 4-year colleges to determine the extent to which colleges included high school coursework guidelines on their websites. Based on our review of this generalizable random sample of 100 public 4-year colleges, an estimated 88 percent provided high school coursework guidelines on their websites. Unless otherwise indicated, estimates have margins of error of less than +/- 10 percentage points.

³¹ The National Center for Education Statistics defines a “credit” as the unit of value, awarded for the successful completion of certain courses, intended to indicate the quantity of course instruction in relation to the total requirements for a diploma, certificate, or degree. Credits are frequently expressed in terms such as “Carnegie units,” “semester credit hours,” and “quarter credit hours.” A “Carnegie unit” is defined as the number of credits a secondary student receives for a course taken every day, one period per day, for a full year. It is a factor used to standardize all credits indicated on secondary school transcripts across studies.

³² College websites present information about admission requirements and recommendations in various ways. We collected information on college websites regarding required, recommended, or suggested coursework for applicants. For example, some colleges listed explicit minimum academic courses required for admission, while others listed academic courses that most successful applicants should have taken. We treated these two instances as the same for our purposes, as a student would reasonably infer they should take the courses presented on the college’s website if interested in applying.

³³ Our review also collected information about college admission criteria for English, social studies, foreign language, and fine arts coursework. However, Education’s CRDC does not include information on the number of English, social studies, foreign language, or fine arts courses offered; therefore we were unable to make comparisons for high school coursework other than math and science courses. The full results of our college website review can be found in appendix VII.

Figure 11: Admission Criteria for Public 4-year Colleges



Source: GAO analysis of websites from a nationally representative sample of colleges, September-November 2017. | GAO-19-8

Colleges Look For Students to Take Specific Courses

The estimated percent of public 4-year colleges looking for certain math and science courses:

Math Courses

- Algebra I: 72 percent
- Geometry: 64 percent
- Algebra II: 63 percent

Science Courses

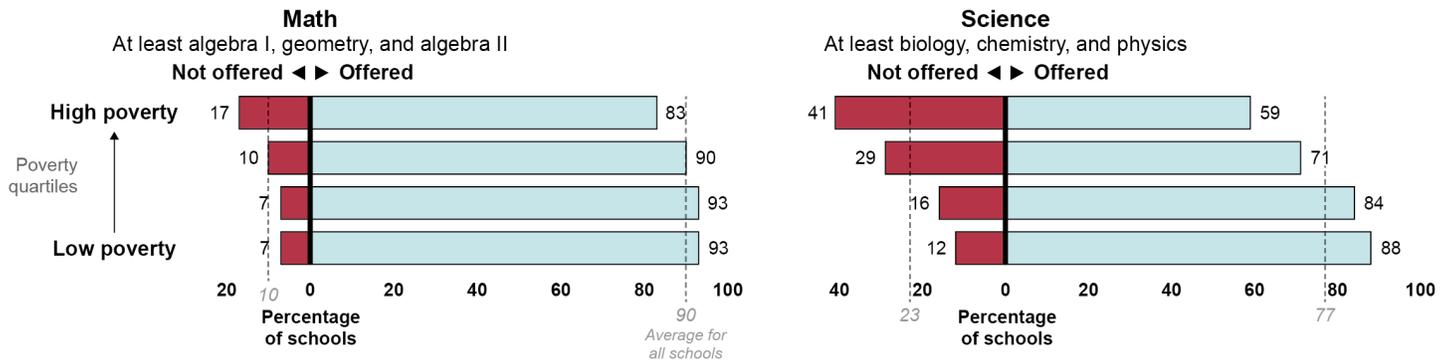
- Biology: 39 percent
- Chemistry: 41 percent
- Physics: 37 percent

Source: GAO analysis of websites from a nationally-representative sample of public 4-year colleges. | GAO-19-8

Our analysis of Education data for school year 2015-16, however, found that the percentage of schools offering these recommended math and science courses decreased as poverty level increased. With respect to math courses, 7 percent of low-poverty schools did not offer the recommended math courses (at least algebra I, geometry, and algebra II), compared to 17 percent of high-poverty schools that did not offer these courses. Further, while 12 percent of low-poverty schools did not offer the recommended science courses (at least biology, chemistry, and physics), 41 percent of high-poverty schools did not.³⁴ (See fig. 12).

³⁴ Schools that do not offer the recommended math and science courses may offer math and science courses not captured in the CRDC that colleges may also consider. Colleges consider a range of factors when making admission decisions.

Figure 12: Recommended Math and Science Courses Offered in Public High Schools, by Poverty Level, School Year 2015-16



Source: GAO analysis of data from the U.S. Department of Education’s Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

Note: High schools are divided into four quartiles based on the percent of students in a school that were eligible for free or reduced-price lunch as follows: schools with 0 to 24.9 percent of students in poverty (low-poverty), schools with 25 to 49.9 percent of students in poverty, schools with 50 to 74.9 percent of students in poverty, and schools with 75 to 100 percent of students in poverty (high-poverty).

Most public 4-year colleges expect students to take three or four credits of math and science in high school and encourage students to take advanced courses, like AP courses. We used a regression analysis to examine whether and what characteristics of schools were associated with offering these courses, while controlling for other factors.³⁵ Our regression found that lower odds of offering the sequence of science courses were associated with higher poverty schools. It also found that lower odds of offering the sequences of math and science courses were associated with schools that have a higher proportion of certain minority students – for example, Hispanic students (see table 3 for variations in these findings). With respect to offering any AP courses, higher poverty schools were less likely to offer them. Further, our regression found strong associations with offering the math and science sequence and any AP courses and school size, in that smaller school were less likely to offer them. Our regression analysis did not find an association between school poverty and the odds of offering the sequence of three math courses (see table 3).

³⁵ We took the same approach when examining individual course offerings, such as calculus, any AP course(s), or physics. See appendix I for the description and full results of the regression analysis.

Table 3: Regression Results Examining Selected Sequences of Math, Science, and Any Advanced Placement (AP) Courses

Regression Model	Odds of offering at least algebra I, geometry, and algebra II	Odds of offering at least biology, chemistry, and physics	Odds of offering any AP courses
School Poverty	Generally, no statistically significant association.	Higher poverty schools were associated with lower odds of offering these courses compared to lower poverty schools.	Higher poverty schools were generally associated with lower odds of offering any AP courses, compared to lower poverty schools.
Race	Higher levels of Hispanic or Asian students were associated with lower odds of offering these courses.	Higher levels of Black, Hispanic, or American Indian/Alaskan Native students were associated with lower odds of offering these courses.	Generally, no statistically significant association.
School Size	Smaller schools were associated with lower odds of offering these courses, compared to larger schools.	Smaller schools are associated with lower odds of offering these courses, compared to larger schools.	Smaller schools were associated with lower odds of offering AP courses, compared to larger schools.
School Type	Alternative schools were associated with lower odds of offering these courses compared to traditional schools; however, the results were not statistically significant for other school types.	Charter schools and alternative schools were associated with lower odds of offering these courses compared to traditional schools.	Charter schools were associated with lower odds of offering any AP courses and magnet schools were associated with higher odds of offering any AP courses, compared to traditional schools.

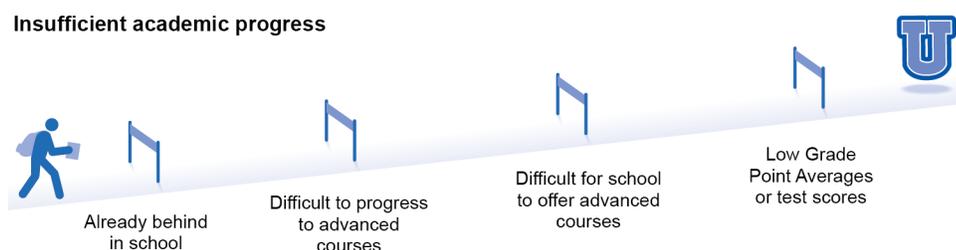
Source: GAO analysis of data from the U.S. Department of Education's Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

Officials from All 12 High-Poverty Schools Stated That Their Students Face Multiple, Complex Challenges to Prepare for College, and Some Had Efforts in Place to Help

Students in High-Poverty Schools Confront Complex Challenges to Prepare for College

Across the three selected states, officials representing the 12 high-poverty schools we visited consistently reported that students confront multiple challenges to being prepared to attend college. They cited a range of academic roadblocks to college, including that students are behind academically before they get to high school; that the schools they attend lack rigorous courses, such as AP courses; and that students struggle to attain grade point averages (GPA) high enough for admission to some 4-year colleges. Officials explained that family challenges and obligations can compound the academic challenges and make navigating the college admissions and enrollment process difficult for their students.

Figure 13: Insufficient Academic Progress Can Be a Challenge to College Preparation for Students in High-Poverty Schools



Source: Interviews with officials representing selected state educational agencies, school districts, high schools, colleges, and college advising organizations. | GAO-19-8

Insufficient Academic Progress

Students have not made sufficient academic progress to be admitted to college, according to officials we interviewed at 12 high-poverty schools (see fig. 13). Officials representing most of these schools (10 of 12) reported that their students were often academically behind. For example, at one urban and predominantly Black Wisconsin high school, officials said that 80 percent of 9th graders were performing below grade-level targets for reading and math, and at a Georgia high school where nearly all of the students were eligible for free or reduced-price lunch, officials said that over 30 percent of freshman students in school year 2016-17 had to repeat the 9th grade.

Insufficient academic progress can be compounded by challenges high-poverty schools face in offering advanced coursework. For example, officials at five schools said they did not offer calculus; officials at three of these schools noted this was because most students typically did not take algebra I in middle school and, therefore, did not have the time to progress to calculus. Officials at a high school with over 900 students reported they did not offer calculus or AP math courses due to low student demand and that they must weigh the cost of providing a course with the number of students who would benefit. Two high-poverty high schools we visited that did not offer calculus courses were exploring offering the courses to students through videoconference. However, an official from one school district we interviewed said the district uses videoconference as a last resort because they have found students learn better with a teacher physically present allowing for more exchange of dialogue. In addition, the challenge of finding and retaining high-quality teachers can exacerbate the difficulties high-poverty schools face in offering advanced courses, according to state educational agency officials in two of the states we visited. Offering advanced courses is important to providing challenging opportunities for students and avoiding remedial coursework once in college, according to college and high school officials we interviewed. Officials we interviewed stressed that taking advanced courses provides students with challenging academic opportunities that help to prepare students for the rigor of college courses, whether they pass their AP exams or not. A representative of a college advising organization said that while it is possible to get into college without higher-level math courses, these courses often determine if a student needs remedial math in college. Officials from two college advising organizations said that when students are required to take remedial courses in college, it can have a detrimental effect. They said remedial courses generally cost money but do not provide credits towards

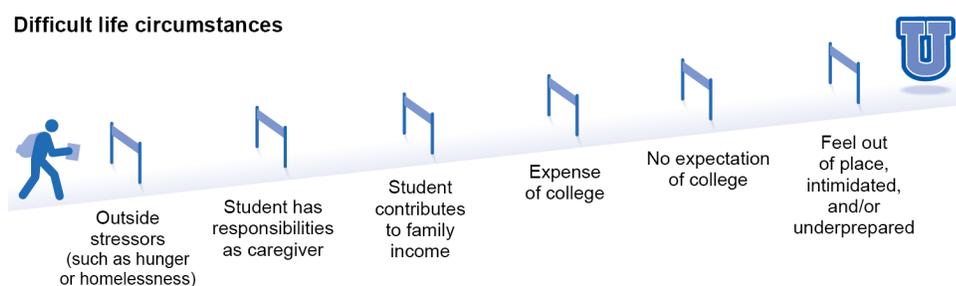
graduation and can delay graduation, and sometimes can contribute to students leaving college without a degree.

School officials for almost all the schools we visited (11 of 12) also said that students often had low GPAs and SAT or ACT scores, which made them less competitive applicants for admission or scholarships to 4-year colleges. For example, the average GPA for 11th grade students at three Wisconsin high schools we visited was below 2.0; officials at one school told us that last year's valedictorian had a 3.0 GPA. Further, officials at multiple schools said students feared they would not do well on the ACTs or SATs; and one counselor said this means that many students did not even try. Low GPAs and college entrance exam scores may be a particularly acute roadblock to 4-year college in areas where the state university system has grown increasingly competitive due to high demand, according to a counselor at one predominantly Hispanic California high school who said the state system is looking for students with 4.0 GPAs.

Difficult Life Circumstances

In addition to insufficient academic progress, a confluence of family, financial, and social-emotional challenges often confronts students in high-poverty schools, making it difficult for them to prepare for college, according to our interviews with school officials (see fig. 14).³⁶

Figure 14: Difficult Life Circumstances Can Impede College Preparation for Students in High-Poverty Schools



Source: Interviews with officials representing selected state educational agencies, school districts, high schools, colleges, and college advising organizations. | GAO-19-8

School and state education officials said that a range of stressors can compound the difficulties poor students face with learning and academic

³⁶ For more discussion of the data and literature on the adverse effects of poverty, see the Background section of this report and [GAO-18-41SP](#).

achievement. Officials at most of the schools (9 of 12) we visited and one state educational agency cited adverse conditions associated with poverty—such as hunger, homelessness, living in foster care, witnessing or experiencing violence or abuse—that made it hard for students to focus on school work. In one high school, officials reported that a school staff member handed out care packages to students every Friday to ensure students had something to eat on the weekend. Officials also reported that students demonstrated behavioral and emotional issues in their schools. Officials at one Wisconsin school said they have noticed a large increase in anxiety among students. This anxiety can be paralyzing for some students and, for others, can result in explosive and violent behavior that affects other students' ability to learn, according to the school officials.

Officials in 11 of the high-poverty schools we visited said that going to college often conflicts with a student's need to help support their families or that the cost of college can be prohibitive. Some students provide an important source of income for their family or are the caregiver for family members, according to officials in nine schools. Family obligations can also affect students' decisions about whether to take college preparation courses, according to one school administrator. For example, the principal of a California charter school said a high-performing student dropped an AP course because the demands from family were so great. In addition, officials in six schools said that the cost of college can deter low-income students. One of these officials reported that even with financial aid and scholarships, their students may not be able to cover even small gaps in funding. According to one high school counselor, the cost of going to college plus the practicalities of getting to and from school and figuring out how to pay for meals during breaks if dorms or the cafeteria are closed, are concerns for low-income students.

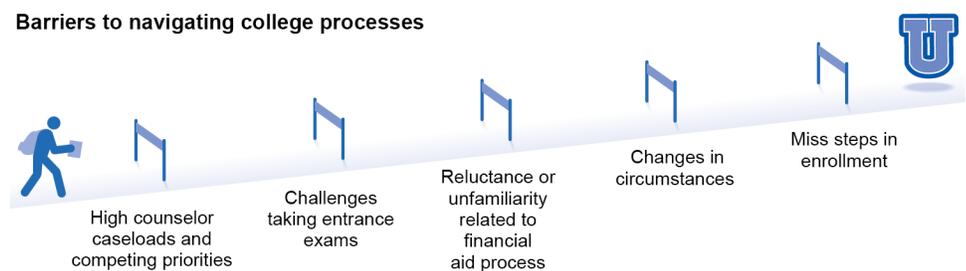
Parents struggling with poverty may not expect their children to go to college, according to college advising officials and officials at most schools (10 of 12) we visited. For example, officials at one Georgia high school said that many students are aiming to be the first in the family to graduate high school (first generation high school graduates), and do not prioritize college. Similarly, at another school, officials said parents and students do not have the expectation of going to college because the parents had not been to college themselves. Students from high-poverty schools may continue to harbor low expectations upon admission to college because they feel they do not belong, according to a principal and a college advising official. In addition, first generation students usually do not have the family support and knowledge to feel confident in their

Barriers to Navigating College Processes

abilities to navigate college life, as a college admissions official noted. School officials at one high school we visited said their students, who attend high school in a highly segregated area, have felt overwhelmed and intimidated trying to transition to a college with a predominately white student population.

A variety of factors—from the availability of high school counselors to taking college entrance exams—can make the college admissions and enrollment processes difficult for students in high-poverty schools, according to school, college, and college advising organizations in the communities we visited (see fig. 15).

Figure 15: Navigating College Admissions and Enrollment Can Be a Barrier to College for Students in High-Poverty Schools



Source: Interviews with officials representing selected state educational agencies, school districts, high schools, colleges, and college advising organizations. | GAO-19-8

College admission officials in two of the states we visited noted the importance of the high school counselor in navigating the college admissions process, such as taking students to college fairs and building relationships with colleges. However, counselors often face high caseloads and competing priorities, such as getting kids to graduate and handling emotional and social issues, according to multiple school officials and local college advising organizations. In one rural school we visited, one counselor handled the needs of about 400 students and was also the bus driver and occasional substitute nurse. Taking the SAT and ACT exams can also pose challenges for students. For example, according to administrators at one school, the cost of the exams may be a deterrent. At another high school, counselors noted that students may lack transportation to the test site and, at another school, officials said weekend jobs kept students from taking the tests.

Applying for financial aid can also be challenging for students from high-poverty schools, according to school and college advising organization officials. At six of the schools we visited, officials said that sometimes

parents are reluctant to report their income, because they are undocumented or because the process is unfamiliar. In addition, some school officials told us that even families with legal immigration status can be reluctant to submit personal information to government websites because they distrust how the information will be used. College advising officials we interviewed in two states said that complicated family financial situations, such as when a student cannot obtain income information from a parent, can also make the financial aid process difficult. In addition, officials from two college advising organizations said that financial aid award packages can be difficult to understand. For instance, they said that these packages may not clearly explain what amount the student is responsible for paying. Further, the aid letters may not indicate the additional cost associated with room and board, books, and transportation, according to one of these officials.

Finally, even after a student has been admitted to college, they still may experience obstacles before classes begin, according to our interviews. Four officials reported that lack of college advisement over the summer after high school graduation has led to “summer melt,” when students do not attend college as planned. Officials from a college advising organization said that sometimes students missed a step in the enrollment process, such as paying deposits or tuition balances before the semester begins.

Some High-Poverty Schools Are Trying to Ease Roadblocks to College

Officials representing selected state educational agencies, school districts, and high-poverty schools we visited reported that they try to mitigate the barriers students in high-poverty schools face in being prepared to attend a 4-year college, despite resource challenges.

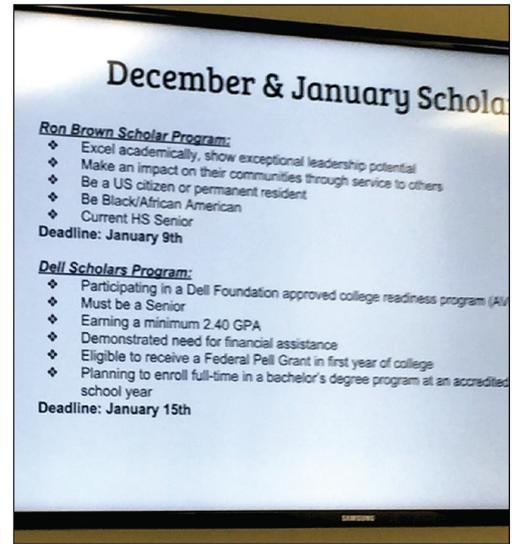
Free access to college courses. Providing students with free access to college courses was one way some states and schools have been able to help students prepare for college. For example, Georgia’s dual enrollment program allows high school students to earn college credit for free while working on their high school diploma. The program covers tuition, mandatory fees, and books. Administrators at a Georgia high school reported that the program has allowed some students to earn an associate’s degree upon graduation from high school, helping to ease the cost burden of college. A charter school we visited in California partners with local colleges and covers tuition, text books, and transportation for college courses. The school principal said that the school does not offer calculus, but students can take it at a local community college and receive college credit.

Outside supports for college advising. In Georgia, officials from a college advising organization reported helping with the college admission process in selected schools, including registering students to take the ACT or SAT, organizing college visits, helping students research colleges, and helping students and parents apply for financial aid. They also said they used text messages as a way to reach out to students and remind them to complete certain steps in the enrollment process. In addition, officials from half of the schools we visited (6 of 12) reported their schools had, or previously had, federal grants that supported college readiness activities for disadvantaged students.³⁷ For example, one Wisconsin high school where most students are eligible for free or reduced-priced lunch (90 percent) and are Black (82 percent) or Hispanic (14 percent) had a GEAR UP grant that supported students in the classes of 2017 and 2018 since middle school, according to the school administrators.

Strategies to exhibit a college-going culture. To help encourage students to consider college as a possibility, officials at some high-poverty schools we visited reported using strategies to exhibit a “college-going culture” within the school. For example, based on our site visit interviews and observations, schools displayed college banners; opened college and career counseling centers; provided incentives, such as prizes, to complete financial aid applications; and posted testing and scholarship information in prominent locations (see figs. 16 and 17). At one urban high school we visited in Georgia, teachers displayed their alma maters on their classroom doors and the school held “College Fridays” so students could learn about different colleges, according to school administrators.

³⁷ These federal grants are designed to prepare low-income or disadvantaged students to enroll in, and complete, postsecondary education. For more information about Education grants related to college preparation, see Appendix II.

Figure 16: Examples of How Some High-Poverty Schools Exhibit a College-Going Culture



Source: GAO photos. | GAO-19-8

All-hands-on deck approach. One California school reported using an “all-hands-on-deck” approach to getting students through the college admission process. Teachers, counselors, and administrators work together to track and follow up with students to ensure they take the needed coursework and do not miss a step in the admissions process. Officials reported that school staff built personal connections with the

students and with the community outside of the school to encourage buy-in surrounding the college application process. At a high school in Georgia where 100 percent of students were eligible for free or reduced-priced lunch, school officials said they also used an all-hands-on-deck approach to help students persevere through personal challenges they face, such as balancing work and school or dealing with trauma. The school provides a team of administrators and counselors for each grade level to better identify when a student may be struggling and help support students' college preparation goals, according to school administrators.

Figure 17: Examples of College and Career Centers at Some High-Poverty Schools



Source: GAO photos. | GAO-19-8

Alignment of graduation requirements and college admission requirements. Wisconsin officials reported that the state made changes to better align high school requirements with college and career readiness expectations, and universities' expectations by increasing its math and science graduation requirements from two units to three units of each, starting with the 2017 graduating class. According to a 2014 analysis by the Education Commission of the States, 18 states have complete or partial alignment between state high school graduation requirements and statewide higher education minimum admission requirements.³⁸ In addition, the University of California and the California State University systems have established a uniform minimum set of courses, known as A-G requirements, required for admission as a freshman. These courses, offered in California high schools and online schools, are designed to ensure students have attained a body of general knowledge for more advanced study, according to information from the University of California. Even though it is not a state requirement, one Georgia school district reported that it requires two units of foreign language because it is a requirement of the University System of Georgia.

Free college admission tests. In two of the states we visited, officials reported that students may take select college entrance exams or preparatory exams during a school day free of charge. Georgia pays for all 10th graders in public schools to take the Preliminary SAT (PSAT).³⁹ Wisconsin officials reported that the state requires and provides the funding for all 11th graders in the state to take the ACT. A school district in California we visited noted that it covers the cost of the PSAT for 9th, 10th, and 11th graders in the district, as well as the SAT for 11th graders. In addition, officials at several schools said they offer students free online test preparation tools.

College initiatives to improve access and retention. Officials at colleges in all three states we visited reported having initiatives that helped increase admissions or ease the transition to college for low-income or first-generation students. For example, officials at the University of Georgia said the college guarantees admission to the

³⁸ Emmy Glancy, Mary Fulton, Lexi Anderson, Jennifer Dounay Zinth, Maria Millard and Brady Delander, *Blueprint for College Readiness* (Denver, CO: Education Commission of the States, October 2014). For the purposes of this review, we did not conduct an independent review of relevant state laws, regulations, or policies.

³⁹ The Preliminary SAT is formally known as the Preliminary SAT/National Merit Scholarship Qualifying Test (PSAT/NMSQT).

valedictorian of every accredited high school in the state. Admissions officials said this helped students with fewer educational opportunities to be competitive for admissions. California State University (CSU)–Los Angeles, as well as other CSU campuses, has a program to help improve access and retention of low-income and educationally disadvantaged students. Under the program, the university accepts a limited number of students who do not meet regular admission criteria and provides academic, and in some cases financial, assistance to these students. The university also offers a 6-week “summer bridge” program for first generation students since they are most in danger of dropping out between high school graduation and the first day of college classes in the fall. At the University of Wisconsin-Milwaukee, an admissions official said the university develops transfer plans for students who start at a 2-year community college, to ease the transition to a 4-year college.

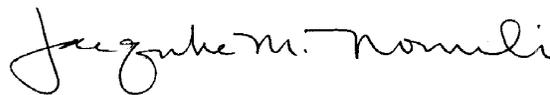
Agency Comments

We provided a draft of this report to the Departments of Education and Justice for review and comment. These agencies provided technical comments, which we incorporated as appropriate.

As agreed with your offices, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies to the appropriate congressional committee, the Secretary of Education, the Attorney General, and other interested parties. In addition, the report will be available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at (617) 788-0580 or nowickij@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made key contributions to this report are listed in appendix VIII.

Sincerely yours,



Jacqueline M. Nowicki, Director
Education, Workforce, and Income Security Issues

Appendix I: Objectives, Scope, and Methodology

Overview

The objectives of this report were to (1) examine the extent to which high schools of different poverty levels offer courses to prepare students academically for college and (2) describe challenges that students in high-poverty schools face in being prepared to attend college.

For our first objective, we analyzed federal data on college preparatory course offerings by school poverty level quartiles; and within these quartiles, we analyzed the demographic composition of students in those schools. We also analyzed course offerings of schools in each poverty quartile by school type, size, and locale. Further, we reviewed college admissions expectations for a generalizable random sample of public 4-year colleges and compared course offerings from schools in each poverty quartile to these expectations. Lastly, we conducted a regression analysis to explore whether and to what extent certain school-level characteristics were associated with higher rates of college preparatory course offerings.

For our second objective, we visited selected high-poverty high schools in three states to provide illustrative examples of challenges students face in being prepared for college. In those states, we also interviewed officials from state educational agencies, school districts, college advising organizations, and public 4-year colleges. We focused on public 4-year colleges because these institutions offer a bachelor's degree and are generally a more affordable 4-year option, compared to private colleges. The following sections contain detailed information about the scope and methodology for this report.

Analysis of College Preparatory Courses National Data

To determine the extent to which schools offer courses to prepare students academically for college, we conducted statistical analyses using the U.S. Department of Education's (Education) Civil Rights Data Collection (CRDC) and the Common Core of Data (CCD). Specifically, the CRDC is a biennial survey that is mandatory for every public school and district in the United States.¹ Conducted by Education's Office for Civil Rights (OCR), the survey collects data on the nation's public schools (pre-K through 12th grade), including course offerings, student

¹ The Assistant Secretary for Civil Rights in the Department of Education is authorized "to collect or coordinate the collection of data necessary to ensure compliance with civil rights laws within the jurisdiction of the Office for Civil Rights [OCR]." 20 U.S.C. § 3413(c)(1). OCR has been collecting this data since 1968. See <https://ocrdata.ed.gov/>.

characteristics and enrollment, and disciplinary actions. The CRDC collected data from nearly every public school in the nation (approximately 17,000 school districts, 96,000 schools, and 51 million students in school year 2015-16).² The course offering variables we used in our analysis are for those courses typically associated with and reported by high schools. As a result, our analysis only includes high schools that have all grades 9, 10, 11, and 12 (a total of 14,111 high schools). We thus excluded schools that had any grades K-8. Further, we excluded juvenile justice facilities—because the provision of educational offerings may function differently in those schools—and schools with fewer than 10 students. Our analysis was conducted using the public-use data file of the CRDC for school year 2015-16, the most recent data available at the time of our analysis. We matched schools in the CRDC for school year 2015-16 to schools in the CCD for school year 2015-16 to enable us to perform certain analyses based on variables that are unique to the different datasets, and excluded schools for which there was not a match. CRDC data are self-reported by districts and schools, and consequently there is potential for misreporting of information.³ Although our analyses of these data showed disparities, taken alone, these disparities do not establish whether unlawful discrimination has occurred.

The 2015-16 CRDC survey collected data on several math and science courses that are considered by Education to be college-preparatory courses. The college-preparatory math courses included in the CRDC are: algebra I; geometry; algebra II; advanced mathematics;⁴ and calculus. The college preparatory science courses included in the CRDC are: biology; chemistry; and physics. The CRDC also collected data on a number of variables related to Advanced Placement (AP) course offerings

² This was the most recent CRDC data available at the time of our analysis. The response rate for this mandatory data collection was 99.8 percent for school year 2015-16.

³ Education has put in place quality control mechanisms to attempt to reduce misreporting of information in the CRDC; however, the potential for misreporting remains. After reviewing their CRDC data, school districts can submit revised data to Education, and Education may release updated versions of the public-use dataset periodically. For example, for the school year 2013-14 data, Education released multiple versions of the public-use CRDC dataset that incorporated revised data from several school districts. For this report, we analyzed the 2015-16 dataset Education released on April 24, 2018, the most recent at the time of our review.

⁴ The CRDC defines advanced mathematics as courses that cover the following topics: trigonometry, trigonometry/algebra, trigonometry/analytic geometry, trigonometry/math analysis, analytic geometry, math analysis, math analysis/analytic geometry, probability and statistics, and precalculus.

as well as other course offerings that potentially offer students college credit.⁵ See table 4 for full definitions of key variables.

Table 4: Variables Used in Analysis of Civil Rights Data Collection (CRDC)

GAO Category	Definition in the CRDC	Information Recorded by the CRDC Survey
Math Courses Offered		
Algebra I	Algebra I is a (college-preparatory) course that includes the study of properties and operations of the real number system; evaluating rational algebraic expressions; solving and graphing first degree equations and inequalities; translating word problems into equations; operations with and factoring of polynomials; and solving simple quadratic equations. Algebra I is a foundation course leading to higher-level mathematics courses, including Geometry and Algebra II.	Number of classes for students in grade 9-12 enrolled in this school, for the mathematics courses in each subject area listed. Include classes with ungraded high school age students in the count. Schools are instructed to report classes that cover the content of the course outline in the definition, regardless of the course name.
Geometry	Geometry is a (college-preparatory) course that typically includes topics such as properties of plane and solid figures; deductive methods of reasoning and use of logic; geometry as an axiomatic system including the study of postulates, theorems, and formal proofs; concepts of congruence, similarity, parallelism, perpendicularity, and proportion; and rules of angle measurement in triangles. Geometry is considered a prerequisite for Algebra II.	Same as above.
Algebra II	Algebra II (college-preparatory) course topics typically include field properties and theorems; set theory; operations with rational and irrational expressions; factoring of rational expressions; in-depth study of linear equations and inequalities; quadratic equations; solving systems of linear and quadratic equations; graphing of constant, linear, and quadratic equations; properties of higher degree equations; and operations with rational and irrational exponents.	Same as above.
Advanced Mathematics	Advanced mathematics (college-preparatory) courses cover the following topics: trigonometry, trigonometry/algebra, trigonometry/analytic geometry, trigonometry/math analysis, analytic geometry, math analysis, math analysis/analytic geometry, probability and statistics, and precalculus.	Same as above.

⁵ Advanced Placement courses are rigorous college-level courses through which students may earn college credit and advanced college placement by successfully completing AP courses and standardized AP exams. The AP program is sponsored by the College Board.

Appendix I: Objectives, Scope, and Methodology

GAO Category	Definition in the CRDC	Information Recorded by the CRDC Survey
Calculus	Calculus (college-preparatory) course topics include the study of derivatives, differentiation, integration, the definite and indefinite integral, and applications of calculus. Typically, students have previously attained knowledge of precalculus topics (some combination of trigonometry, elementary functions, analytic geometry, and math analysis).	Same as above.
Science Courses Offered		
Biology	Biology (college-preparatory) courses are designed to provide information regarding the fundamental concepts of life and life processes. These courses include (but are not restricted to) such topics as cell structure and function, general plant and animal physiology, genetics, and taxonomy.	Number of classes for students in grade 9-12 enrolled in this school, for the science courses in each subject area listed. Include classes with ungraded high school age students in the count. Schools are instructed to report classes that cover the content of the course outline in the definition, regardless of the course name.
Chemistry	Chemistry (college-preparatory) courses involve studying the composition, properties, and reactions of substances. These courses typically explore such concepts as the behaviors of solids, liquids, and gases; acid/base and oxidation/reduction reactions; and atomic structure. Chemical formulas and equations and nuclear reactions are also studied.	Same as above.
Physics	Physics (college-preparatory) courses involve the study of the forces and laws of nature affecting matter, such as equilibrium, motion, momentum, and the relationships between matter and energy. The study of physics includes examination of sound, light, and magnetic and electric phenomena.	Same as above.
Advanced Placement Courses Offered		
AP Offered	Advanced Placement (AP) course is an advanced, college-level course designed for students who achieve a specified level of academic performance. Upon successful completion of the course and a standardized AP exam, a student may be qualified to receive college credit and/or placement into advanced college courses.	Does this school have any students enrolled in one or more Advanced Placement (AP) courses?
AP Math Offered	AP mathematics courses include calculus (AB and BC) and statistics.	Does this school have any students enrolled in one or more Advanced Placement (AP) mathematics courses?
AP Science Offered	AP science courses include biology, chemistry, physics, and environmental science.	Does this school have any students enrolled in one or more Advanced Placement (AP) science courses?
AP Other Offered	"Other subjects" include all AP courses other than those in mathematics and science. For example, AP computer science and AP foreign language are included in "other subjects."	Does this school have any students enrolled in one or more Advanced Placement (AP) courses in other subjects?

Appendix I: Objectives, Scope, and Methodology

GAO Category	Definition in the CRDC	Information Recorded by the CRDC Survey
Number of AP Courses Offered	Number of different AP courses offered by the school.	How many different AP courses does the school provide?
Other College Preparatory Offerings		
Dual Credit Offered	Dual enrollment/dual credit programs provide opportunities for high school students to take college-level courses offered by colleges, and earn concurrent credit toward a high school diploma and a college degree while still in high school. These programs are for high school-enrolled students who are academically prepared to enroll in college and are interested in taking on additional coursework. For example, students who want to study subjects not offered at their high school may seek supplemental education at colleges nearby. Dual enrollment/dual credit programs do not include the Advanced Placement (AP) program or the International Baccalaureate Diploma Programme.	Does this school have any students enrolled in a dual enrollment/dual credit program?
International Baccalaureate Diploma Programme	The International Baccalaureate (IB) Diploma Programme, sponsored by the International Baccalaureate Organization, is designed as an academically challenging and balanced program of education with final examinations that prepares students, usually aged 16 to 19, for success at university and life beyond. The Programme is typically taught over two years. IB Diploma Programme students study six courses at higher level or standard level. Students must choose one subject from each of groups 1 to 5, thus ensuring breadth of experience in languages, social studies, the experimental sciences and mathematics. The sixth subject may be an arts subject chosen from group 6, or the student may choose another subject from groups 1 to 5. Additionally, IB Diploma Programme students must meet three core requirements: the extended essay, the theory of knowledge course, and a creativity/action/service experience.	Does this school have any students enrolled in the International Baccalaureate Diploma Programme?

Source: Civil Rights Data Collection and GAO analysis. | GAO-19-8

Analysis by Poverty and Student Demographics

To analyze course offerings by the poverty level of the school, we pulled in data on free or reduced-price lunch (FRPL) eligibility from the 2015-2016 CCD, and matched it to our universe of 14,111 high schools in the 2015-16 CRDC, given that the CRDC does not collect FRPL eligibility data. The CCD is administered by Education’s National Center for Education Statistics (NCES), and annually collects nonfiscal data about all public schools in the nation. A student is generally eligible for free or reduced-price lunch based on federal income eligibility guidelines that are

tied to the federal poverty level and size of the family.⁶ State educational agencies supply these data for their schools and school districts.

We then sorted high schools into poverty quartiles based on the percentage of students eligible for free or reduced-price lunch as follows: schools with 0 to 24.9 percent of students that are FRPL eligible, which we call low-poverty schools; schools with 25 to 49.9 percent of students that are FRPL eligible; schools with 50 to 74.9 percent of students that are FRPL eligible; and schools with 75 to 100 percent of students that are FRPL eligible, which we call high-poverty schools (see table 5). The poverty thresholds and measure of poverty discussed here and throughout this report were commonly used in the literature and also aligned with how Education analyzed its data. Further, to understand which students attend schools in the different poverty quartiles, we analyzed student demographic composition for each group of schools.

Table 5: Number and Percent of Public High School Students and Schools by School Poverty Level, School Year 2015-16

School Poverty Level (% eligible for free or reduced-price lunch)	Students		Schools	
	Number	Percent of all students	Number	Percent of all schools
0 to 24.9%	2,903,159	23.3%	2,580	18.3%
25 to 49.9%	4,242,328	34.0%	4,840	34.3%
50 to 74.9%	3,225,181	25.9%	3,854	27.3%
75 to 100%	1,788,131	14.3%	2,441	17.3%
Data unavailable	312,377	2.5%	396	2.8%
Total	12,471,176	100%	14,111	100%

Source: GAO analysis of data from the U.S. Department of Education's Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

Note: School poverty level is measured by the percentage of students eligible for free or reduced-price lunch. The category "Data unavailable" refers to schools that did not report the percentage of students eligible for free or reduced-price lunch for school year 2015-16.

⁶ Education's National Center for Education Statistics uses eligibility for free or reduced-price lunch as a measure of poverty. The Department of Agriculture's National School Lunch Program provides low-cost or free lunches to children in schools. Students are eligible for free lunches if their household income is at or below 130 percent of federal poverty guidelines or if they meet certain automatic eligibility criteria, such as eligibility for the Supplemental Nutrition Assistance Program. Students are eligible for reduced-price lunch if their household income is between 130 percent and 185 percent of federal poverty guidelines.

Beginning in the 2014-15 school year, the National School Lunch Program included a new provision for providing free meals to all students in the school, without needing to collect individual applications from students to determine eligibility.⁷ This provision—known as the Community Eligibility Provision (CEP)—was implemented to expand access to free meals to all students and decrease household and administrative burdens for participating schools. We assessed whether the CEP variable had the potential to make sorting schools into quartiles based on the percentage of students eligible for free or reduce-price lunch unreliable. Our analysis showed that the number of schools in each poverty quartile remained roughly the same as in prior years and thus, we concluded the reported FRPL data was reliable for our purposes.

Analysis by School Size

To analyze course offerings by the size of public school a student attended, we sorted the 14,111 high schools in our universe into three groups, based on the number of students enrolled in the school, according to the 2015-16 CRDC data (see table 6). We excluded schools with fewer than 10 students because (1) schools of this size likely do not have the resources or infrastructure to offer advanced courses and (2) to prevent minor fluctuations in the data from having large effects on our results.

We grouped schools into one of three size categories based on the number of students enrolled. The Department of Education and the CRDC do not have classifications of schools by size, so we determined reasonable size categories based on our analysis of the data. To arrive at these categories, we looked at average number of advanced course offerings by school size strata in groupings of 100 students. This analysis led to three categories based on the distribution of the data: 1 to 200

⁷ In 2010, the Healthy, Hunger-Free Kids Act amended the National School Lunch Program to provide an alternative provision – known as the Community Eligibility Provision (CEP) – for eligible schools. Pub. L. No. 111-296, Title I, Subtitle A, § 104, 124 Stat. 3193-3201. Generally, schools are eligible for the CEP if at least 40 percent of students enrolled meet the free and reduced lunch eligibility criteria based on direct certification of participation in other specific means-tested programs, such as the Supplemental Nutrition Assistance Program and Temporary Assistance for Needy Families program. The Community Eligibility Provision was piloted in selected states starting in school year 2011-2012, and became available to eligible schools nationwide starting in school year 2014-15. We do not have evidence that these changes substantively affected our analysis for school year 2015-16. See, for example, Department of Education, *Free and Reduced-Price Lunch Eligibility Data in EDFacts: A White Paper on Current Status and Potential Changes* (2012).

students (small schools); 201 to 1000 students (medium schools); and 1,001 or more students (large schools).

Table 6: Number and Percent of Public High School Students and Schools by School Size, School Year 2015-16

Students Enrolled	Students		Schools	
	Number	Percent of all students	Number	Percent of all schools
1-200 (Small) ^a	301,932	2.4%	2,855	20.2%
201-1,000 (Medium)	3,278,095	26.3%	6,165	43.7%
1,001 or more (Large)	8,891,149	71.3%	5,091	36.1%
Total	12,471,176	100%	14,111	100%

Source: GAO analysis of data from the U.S. Department of Education’s Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

^aSchools with fewer than 10 students enrolled were not included in our analysis.

Analysis by School Type

To analyze course offerings by the type of public school a student attended, we sorted the 14,111 schools in our universe into mutually exclusive categories using the self-reported school type variable in the CRDC. The CRDC allowed schools to self-identify as special education, magnet, charter, and alternative schools (see table 7).

Table 7: Definition of Public School Types, School Year 2015-16

School Type	Definition in the Civil Rights Data Collection
Alternative school	A public elementary or secondary school that addresses the needs of students that typically cannot be met in a regular school program. The school provides nontraditional education services as an adjunct to a regular school, and falls outside the categories of regular education, special education, or vocational education.
Charter school	A nonsectarian public school under contract—or charter—between a public agency and groups of parents, teachers, community leaders or others who want to create alternatives and choice within the public school system. A charter school creates choice for parents and students within the public school system, while providing a system of accountability for student achievement. In exchange for increased accountability, a charter school is given expanded flexibility with respect to select statutory and regulatory requirements.
Magnet school	A magnet program is a program within a public school that offers a special curriculum capable of attracting substantial numbers of students of different racial/ethnic backgrounds, which may also reduce, prevent, or eliminate minority group isolation. The program may be designed to provide an academic or social focus on a particular theme (e.g., science/math, performing arts, gifted/talented, or foreign language). A public school is considered a magnet school if it operates a magnet program for all students or some students within the school.
Special education school	A public elementary or secondary school that focuses primarily on serving the needs of students with disabilities under the Individuals with Disabilities Education Act (IDEA) or Section 504 of the Rehabilitation Act.
Traditional school	Not defined in the Civil Rights Data Collection.

Source: Department of Education, Civil Rights Data Collection, and GAO analysis. | GAO-19-8

The categories of public schools in the CRDC were not mutually exclusive; that is, schools could select multiple school types to describe their schools, such as a charter school that was also an alternative school.⁸ To create mutually exclusive categories for analytical purposes, we applied the following criteria:

- Alternative school: all schools that selected “alternative” as the school type in the CRDC, even if they selected other types as well.
- Special education school: schools that selected “special education” as the school type in the CRDC, except those schools that also selected the alternative school type.
- Charter school: schools that selected “charter” as the school type, except those schools that also selected the alternative school type or the special education school type.
- Magnet school: schools that selected “magnet” as the school type, except those schools that also selected the alternative school type, the special education school type, or the charter school type.
- Traditional school: schools that did not select any other school type in the CRDC.

Table 8 provides the breakdown of students and schools captured in the 2015-16 CRDC after applying these criteria.

Table 8: Number and Percent of Public High School Students and Schools by School Type, School Year 2015-16

School Type	Students		Schools	
	Number	Percent of all students	Number	Percent of all schools
Traditional	10,805,890	86.6%	11,428	81%
Magnet	315,943	2.5%	826	5.9%
Charter	1,179,292	9.5%	830	5.9%
Alternative	140,277	1.1%	936	6.6%
Special Education	29,774	0.2%	91	0.6%
Total	12,471,176	100%	14,111	100%

Source: GAO analysis of data from the U.S. Department of Education’s Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

⁸ In addition to the “school type” variable, the CRDC also includes a separate variable indicating whether or not a school is a “juvenile justice facility”. The CRDC defines a justice facility as a public or private facility that confines pre-adjudicated/pre-convicted individuals, post-adjudicated/post-convicted individuals, or both. Because the course offering and educational programs in these facilities may be fundamentally different than in other schools, our analysis does not include juvenile justice facilities.

Analysis by School Locale

To analyze courses offerings by the locale of public school a student attended, we pulled in the school locale variable from the 2015-16 CCD and matched it to schools in the CRDC, which did not collect data on school locale. The locale variable in the CCD is primarily based on a school’s location relative to populous areas. The locale variable is divided into four main types: City, Suburb, Town, and Rural. For the purposes of our analyses, we combined the Town and Rural variables into one Town/Rural variable because they are defined similarly (see table 9).

Table 9: Definition of Public School Locales, School Year 2015-16

GAO Category	Locale Variable from CCD	Category Definition
Urban	<ul style="list-style-type: none"> City, Large City, Midsize City, Small 	Territory inside an urbanized area and inside a principal city
Suburban	<ul style="list-style-type: none"> Suburb, Large Suburb, Midsize Suburb, Small 	Territory outside a principal city and inside an urbanized area
Rural	<ul style="list-style-type: none"> Town, Fringe Town, Distant Town, Remote 	Territory inside an urban cluster
	<ul style="list-style-type: none"> Rural, Fringe Rural, Distant Rural, Remote 	Census-defined rural territory

Source: GAO analysis of U.S. Department of Education’s Common Core of Data from school year 2015-16. | GAO-19-8

Table 10 provides the breakdown of students and schools captured in the 2015-16 CRDC after applying the GAO Categories above.

Table 10: Number and Percent of Public High School Students and Schools by Locale, School Year 2015-16

School Locale	Students		Schools	
	Number	Percent of all students	Number	Percent of all schools
Urban	3,481,017	27.9%	3,270	23.2%
Suburban	5,297,951	42.5%	4,165	29.5%
Rural	3,692,051	29.6%	6,670	47.3%
Data Unavailable	157	0.0%	6	0.0%
Total	12,471,176	100%	14,111	100%

Source: GAO analysis of data from the U.S. Department of Education’s Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

Note: The category “Data unavailable” refers to schools that had “missing” data for the locale variable for school year 2015-16.

CRDC and CCD Data Reliability

We determined that the data we used from the CRDC and CCD were sufficiently reliable for the purposes of this report by reviewing technical documentation, conducting electronic testing, and interviewing officials from Education’s OCR and NCES. Past releases of the CRDC have subsequently been updated by Education to correct errors and omissions in the data. For our analysis of the 2015-16 CRDC, we used the data file that was publically available as of April 24, 2018.

Regression Analysis

We conducted a generalized linear regression with a logistic regression model using the 2015-16 CRDC and CCD data to explore whether and to what extent certain school-level characteristics were associated with higher rates of college preparatory course offerings, while controlling for other factors. Such a model allowed us to test the association between the offering of college preparatory courses and school characteristics, including poverty, while holding other school characteristics constant (school type, school size, school locale, student demographics). Table 11 lists the variables we included in our regression model. We conducted a separate regression for each of the course offerings or sequence of offerings listed as an outcome variable.

Table 11: Variables Included in Our Regression Model

Independent variables	Outcome (or dependent) variables
Poverty Category: 0 -24.9%, 25 -49.9%, 50 -74.9%, 75 -100% of students eligible for free or reduced-price lunch program	<ul style="list-style-type: none"> • School offers (Yes/No): • At least three math courses - including Algebra I, Geometry, and Algebra II • At least three science courses - biology, chemistry, and physics • Any AP course(s) • Algebra I • Geometry • Algebra II • Advanced Mathematics • Calculus • Biology • Chemistry • Physics
Percent of the student population that are: White, Hispanic, Black, Asian, American Indian/Alaska Native, English learners, students with disabilities	
School Type: Alternative (Yes/No), Special Education (Yes/No), Charter (Yes/No), Magnet (Yes/No), Traditional (Yes/No)	
Population Density: Rural, Suburban, Urban	
School Size: 10-200 students, 201-1,000 students, more than 1,000 students	

Source: GAO analysis of variables from the U.S. Department of Education’s Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

Our regression model used the same universe of 14,111 schools as our descriptive analysis of the CRDC data. Since the regression model is based on observations across all independent variables, and some variables had a small number of missing data points, our final model had 13,278 observations.

All regression models are subject to limitations and for this model the limitations included:

- Data we analyzed were by school rather than student. Consequently, we were not able to describe the association between our independent variables and a student's access to college preparatory courses, while controlling for characteristics of an individual student, such as sex, race or ethnicity, disability status, or grade level. Instead, the school-level nature of the CRDC data limited our description of the associations between school characteristics and course offerings to whether there was an increase, decrease, or no effect on course offerings for schools with a given characteristic, controlling for other characteristics of the entire school's population, such as school type.
- Some variables that may be related to student access to advanced courses are not available in the data. For example, in this context, it could be that parent education level or household type (single- versus multiple-headed household) could be related to course access.
- Results of our analyses are associational and do not imply a causal relationship.

Typically, a logistic regression model, which is a generalized linear regression model, is appropriate when the model assumption of normality is not appropriate, as is the case with a binary (yes/no) outcome. A logistic regression model provides an estimated odds ratio, where a value greater than one indicates a higher or positive association, in this case, between whether a course is offered and the independent variable of interest, such as being a charter school or having a higher percentage of Black students. An estimated odds ratio less than one indicates lower odds of offering a given college preparatory course when a factor is present.

Given the limitations of our model as described above, we present the results of our regression model in tables 12, 13, and 14 by describing the direction of the associations, rather than the estimated odds of outcome variables. For categorical variables in these tables, we provided the comparison school characteristic in brackets. For example, the results in these tables should be interpreted as charter schools were significantly

less likely than traditional schools to offer AP courses, because the association is negative. For continuous variables (i.e., those starting with “Percent”), the results in these tables should be interpreted as the likelihood of offering courses decreased, if the association was negative, as the percentage of students in the school with a given characteristic increased. For example, as the percentage of Black students increased, we found that the likelihood of offering the sequence of at least three science courses decreased.

Table 12: Associations of Regression Model Variables with High School Math Offerings, School Year 2015-16

Association related to likelihood of school offering math courses						
School Characteristic [comparison variable]	Algebra I	Geometry	Algebra II	Adv. Math	Calculus	Offers at least three math courses ^a
Poverty Category						
[75 to 100%, High-poverty]						
0 to 24.9%	Insignificant	Insignificant	Insignificant	Insignificant	Positive	Insignificant
25 to 49.9%	Insignificant	Insignificant	Insignificant	Insignificant	Positive	Insignificant
50 to 74.9%	Insignificant	Insignificant	Insignificant	Negative	Positive	Positive
Student Demographics						
Percent Black students	Positive	Positive	Negative	Negative	Negative	Insignificant
Percent Hispanic students	Negative	Negative	Negative	Negative	Negative	Negative
Percent Asian students	Negative	Insignificant	Negative	Positive	Negative	Negative
Percent American Indian/Alaska Native students	Insignificant	Insignificant	Insignificant	Negative	Negative	Insignificant
Percent students with disabilities (IDEA)	Negative	Negative	Negative	Negative	Negative	Negative
English Learners (EL)	Insignificant	Insignificant	Insignificant	Negative	Insignificant	Insignificant
School Type						
[Traditional schools]						
Charter	Negative	Negative	Insignificant	Negative	Negative	Insignificant
Magnet	Insignificant	Insignificant	Positive	Insignificant	Positive	Insignificant
Alternative	Negative	Negative	Negative	Negative	Negative	Negative
Special Education	Insignificant	Negative	Positive	Negative	Negative	Insignificant
Locale/Population Density						
[Urban]						
Rural	Insignificant	Insignificant	Positive	Insignificant	Positive	Positive
Suburban	Insignificant	Insignificant	Positive	Insignificant	Positive	Positive

Appendix I: Objectives, Scope, and Methodology

Association related to likelihood of school offering math courses						
School Characteristic [comparison variable]	Algebra I	Geometry	Algebra II	Adv. Math	Calculus	Offers at least three math courses^a
School Size [Small: 1- 200 students]						
Medium: 201-1,000 students	Positive	Positive	Positive	Positive	Positive	Positive
Large: more than 1,000 students	Positive	Positive	Positive	Positive	Positive	Positive

Source: GAO analysis of variables from the U.S. Department of Education's Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

Note: Cells marked "Positive" indicate instances where we found school characteristics were associated with a significantly higher likelihood of schools offering the given courses. Cells marked "Negative" indicate a significantly lower likelihood of schools offering the given courses. Cells marked "Insignificant" indicate no association between the given school characteristic and the likelihood of a school offering the given courses. Significance is indicated by a p value of less than 0.05.

^aAt least three math courses - including algebra I, geometry, and algebra II

Table 13: Associations of Regression Model Variables with High School Science Offerings, School Year 2015-16

Association related to likelihood of school offering science courses				
School Characteristic [comparison variable]	Biology	Chemistry	Physics	Offers at least three science courses^a
Poverty Category [75 to 100%, High-poverty]				
0 to 24.9%	Insignificant	Insignificant	Positive	Positive
25 to 49.9%	Insignificant	Positive	Positive	Positive
50 to 74.9%	Insignificant	Insignificant	Insignificant	Positive
Student Demographics				
Percent Black students	Insignificant	Insignificant	Negative	Negative
Percent Hispanic students	Negative	Negative	Negative	Negative
Percent Asian students	Insignificant	Insignificant	Insignificant	Insignificant
Percent American Indian/Alaska Native students	Insignificant	Negative	Negative	Negative
Percent students with disabilities (IDEA)	Negative	Negative	Negative	Negative
English Learners (EL)	Insignificant	Insignificant	Insignificant	Insignificant
School Type [Traditional schools]				
Charter	Insignificant	Negative	Negative	Negative
Magnet	Insignificant	Insignificant	Insignificant	Insignificant
Alternative	Negative	Negative	Negative	Negative

Appendix I: Objectives, Scope, and Methodology

Association related to likelihood of school offering science courses				
School Characteristic [comparison variable]	Biology	Chemistry	Physics	Offers at least three science courses^a
Special Education	Insignificant	Negative	Insignificant	Insignificant
Locale/Population Density [Urban]				
Rural	Positive	Positive	Negative	Negative
Suburban	Insignificant	Insignificant	Insignificant	Insignificant
School Size [Small: 1- 200 students]				
Medium: 201-1,000 students	Positive	Positive	Positive	Positive
Large: more than 1,000 students	Positive	Positive	Positive	Positive

Source: GAO analysis of variables from the U.S. Department of Education’s Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

Note: Cells marked “Positive” indicate instances where we found school characteristics were associated with a significantly higher likelihood of schools offering the given courses. Cells marked “Negative” indicate a significantly lower likelihood of schools offering the given courses. Cells marked “Insignificant” indicate no association between the given school characteristic and the likelihood of a school offering the given courses. Significance is indicated by a p value of less than 0.05.

^aAt least three science courses - biology, chemistry, and physics

Table 14: Associations of Regression Model Variables with High School Advanced Placement Offerings, School Year 2015-16

Association related to likelihood of school offering Advanced Placement (AP) courses			
School Characteristic [comparison variable]	Offers AP course(s)	Offers AP Math	Offers AP Science
Poverty Category [75 to 100%, High-poverty]			
0 to 24.9%	Positive	Positive	Positive
25 to 49.9%	Positive	Positive	Positive
50 to 74.9%	Insignificant	Positive	Positive
Student Demographics			
Percent Black students	Insignificant	Insignificant	Insignificant
Percent Hispanic students	Insignificant	Positive	Positive
Percent Asian students	Positive	Positive	Positive
Percent American Indian/Alaska Native students	Insignificant	Negative	Negative
Percent students with disabilities (IDEA)	Negative	Negative	Negative
English Learners (EL)	Insignificant	Insignificant	Insignificant
School Type [Traditional schools]			
Charter	Negative	Negative	Negative

Association related to likelihood of school offering Advanced Placement (AP) courses			
School Characteristic [comparison variable]	Offers AP course(s)	Offers AP Math	Offers AP Science
Magnet	Positive	Insignificant	Insignificant
Alternative	Negative	Negative	Negative
Special Education	Negative	Negative	Insignificant
Locale/Population Density [Urban]			
Rural	Insignificant	Insignificant	Negative
Suburban	Positive	Positive	Positive
School Size [Small: 1- 200 students]			
Medium: 201-1,000 students	Positive	Positive	Positive
Large: more than 1,000 students	Positive	Positive	Positive

Source: GAO analysis of variables from the U.S. Department of Education’s Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

Note: Cells marked “Positive” indicate instances where we found school characteristics were associated with a significantly higher likelihood of schools offering the given courses. Cells marked “Negative” indicate a significantly lower likelihood of schools offering the given courses. Cells marked “Insignificant” indicate no association between the given school characteristic and the likelihood of a school offering the given courses. Significance is indicated by a p value of less than 0.05.

Review of College Admission Criteria

To determine which academic courses colleges expect applicants to take while in high school, we reviewed websites from a generalizable stratified random sample of 100 public 4-year colleges in the United States. The sample was selected from Education’s 2015-16 Integrated Postsecondary Education Data System (IPEDS), which contains data for colleges that participate in federal student aid programs authorized under Title IV of the Higher Education Act of 1965, as amended.⁹ Our sampling frame consisted of all public 4-year degree granting colleges that participated in Title IV federal student aid programs, predominately award baccalaureate degrees, have full-time first-time undergraduate students, and that are located in a U.S. state or the District of Columbia, yielding a universe of 555 colleges.¹⁰ We stratified the sample by groupings colleges based on

⁹ The Integrated Postsecondary Education Data System consists of survey data collected annually by the U.S. Department of Education’s National Center for Education Statistics. IPEDS gathers information from every college, university, and technical and vocational institution that participates in the federal student financial aid programs. Data for academic year 2015-16 was the most recently available at the time of our review.

¹⁰ Our sampling frame excluded colleges that do not award degrees, do not have an undergraduate program, and that are 2-year or less than 2-year colleges.

admission rates into four strata.¹¹ We computed the sample size of 100 schools to achieve a precision of at least plus or minus 10 percentage points for an estimate of a population proportion at the 95 percent confidence level. We then proportionally allocated the sample size across the defined strata. This sample allowed us to make national estimates about the admission criteria for expected high school coursework at public 4-year colleges.

To review comparable information across the sampled schools, we developed a standardized web-based data collection instrument that we used to examine the admission criteria for first-time freshman applicants posted on each college's website. Specifically, we attempted to identify the minimum required or recommended units of math, science, social studies, English, Foreign Language, and Fine Arts courses applicants are expected to take in high school to be considered for admission to the college. For math and science courses, we also attempted to identify any specified courses the colleges provide to meet the required or recommended units for those subject.¹² We also collected information on whether or not each college required students to submit SAT or ACT exam scores to be considered for admission. We reviewed websites from September 2017 through November 2017. One analyst recorded information in the data collection instrument. The information was then checked and verified by another analyst. We collected complete information for all 100 colleges in our sample. We then analyzed the information across colleges. We did not, as part of our review of college websites, assess whether the information provided on the website accurately reflected the current admission policies of the college. Instead, this review was intended to better understand the courses that colleges expect students to take in high school.

¹¹ The four strata were colleges with acceptance rates less than 50 percent; colleges with acceptance rates of 50-74.9 percent, colleges with acceptance rates of 75 percent or greater; and schools with a missing acceptance rate.

¹² Specifically, we recorded whether or not each college required or recommended that students take the college preparatory math and science courses that are included in Education's CRDC data. These courses are algebra I, geometry, algebra II, advanced mathematics, and calculus for math and biology, chemistry, and physics for science.

High School Site Visits

To obtain information on the challenges students attending high-poverty high schools face in being prepared to attend public 4-year colleges, we selected three states—California, Georgia, and Wisconsin—and conducted site visits to four high schools in each of the states (for a total of 12 high schools). To select states for our site visits, we used the 2013-14 CRDC data—the most recent available at the time of our selection—to sort states based on the percentage of their schools offering courses commonly associated with college readiness.¹³ We selected states that fell below the national average in percentage of schools offering Algebra II.¹⁴ We also considered states that were at or above the national average in percent of high-poverty schools offering two or fewer math and science courses. We also selected states providing us with a mix of state policies on college readiness and geographic diversity.¹⁵

Within each of the three states we used 2013-14 CRDC data to select high schools to visit that had greater than 75 percent of students eligible for free or reduced-price lunch (FRPL) and that offered a range of math and science courses. We also considered the number of AP courses offered by the school. As secondary criteria, we selected schools to achieve variation in school size, school type, and locale, to gather perspectives from officials in a diverse array of high-poverty schools. At each of the 12 schools, we interviewed the principal and other key leadership staff, and high school counselors.

To supplement our site visits, we interviewed by phone state educational agency officials in each of the three states, as well as school district officials for most of the schools we visited. We interviewed officials from

¹³ We selected high schools to visit during the Fall 2017. At that time, the 2013-14 CRDC data was the most recent available to use in making site visit selections. The 2015-16 CRDC data was publically released by Education in April 2018, after our site visits had concluded.

¹⁴ An analysis conducted by Achieve found that the content found in Algebra II was generally required in states with college- and career-ready high school diplomas. See Achieve, *Closing the Expectations Gap 2014 Annual Report* and *Achieve State High School Graduation Requirements 2015*.

¹⁵ In considering state-level college readiness policies, we relied on the Education Commission of the States' analysis of state college readiness policies: Emmy Glancy, Mary Fulton, Lexi Anderson, Jennifer Dounay Zinth, Maria Millard and Brady Delander, *Blueprint for College Readiness* (Denver, CO: Education Commission of the States, October 2014). For the purposes of this review, we did not conduct an independent review of relevant state laws, regulations, or policies.

at least one local college advising organization in each of these states. In addition, we interviewed officials from at least one public 4-year university in each of the three states, for a total of four public 4-year universities. We selected universities that admit a high percent of in-state students, to attempt to talk to officials who were familiar with the high schools that we selected. These interviews provided us with information about what college admission officers view as challenges in admitting students from high poverty schools and the challenges students face in being successful in completing college.

Because we selected the schools judgmentally, based on our criteria, the findings about the challenges these schools reported or the strategies they used to help students address those challenges cannot be generalized to all schools nationwide.

Additional Interviews

In addition to interviews in our site visit states, we interviewed officials from the Education Commission of the States, National Association for College Admission Counseling, and the College Board. We also held interviews and reviewed documentation from the U.S. Departments of Education and Justice to gather information on their programs supporting access to college preparation opportunities. We also reviewed relevant literature, as appropriate.

We conducted this performance audit from May 2017 to October 2018 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Appendix II: U.S. Department of Education Discretionary Grant Programs to Increase College Readiness in K-12 Students

Table 15: U.S. Department of Education Discretionary Grant Programs to Increase College Readiness in K-12 Students

Grant Name (Related Program Office)	Description of Selected Program Characteristics	Target Population	Program Goal	Program Funding and Number of Grantees in Fiscal Year 2016
Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP) (Office of Postsecondary Education)	<ul style="list-style-type: none"> Provides services at high-poverty middle and high schools. Funds can also be used to provide college scholarships to low-income students. 	High-poverty middle and high school students	To increase the number of low-income students prepared to enter and succeed in postsecondary education	Funding: \$322,754,000 Awards: 134 Participating Students: 524,938
Talent Search program (TRIO) (Office of Postsecondary Education)	<ul style="list-style-type: none"> Provides academic, career, and financial counseling to program participants and encourages them to graduate from high school and continue on to and complete their postsecondary education. Publicizes the availability of financial aid, assists participants with the postsecondary application process, and encourages persons who have not completed education programs at the secondary or postsecondary level to enter or reenter and complete postsecondary education. 	Students age 11-27 who are: students from low-income families or from families in which neither parent holds a bachelor's degree, and/or are limited English proficient, traditionally underrepresented in postsecondary education, students with disabilities, who are homeless, in foster care or are aging out of foster care system or otherwise disconnected.	To increase the number of youth from disadvantaged backgrounds who complete high school and enroll in and complete their postsecondary education.	Funding \$150,635,825 Awards: 481 Participants (in 2016): 318,723

**Appendix II: U.S. Department of Education
Discretionary Grant Programs to Increase
College Readiness in K-12 Students**

Grant Name (Related Program Office)	Description of Selected Program Characteristics	Target Population	Program Goal	Program Funding and Number of Grantees in Fiscal Year 2016
Upward Bound (TRIO) (Office of Postsecondary Education)	<ul style="list-style-type: none"> Provides academic instruction in mathematics, laboratory sciences, composition, literature, and foreign languages, tutoring, counseling, mentoring, cultural enrichment, work-study programs, and education or counseling services designed to improve the financial and economic literacy of students Provides advice and assistance in secondary and postsecondary course selection, as well as assistance in preparing for college entrance examinations and completing college admission applications. 	High school students from low-income families or from families in which neither parent holds a bachelor's degree and students who are limited English proficient, traditionally underrepresented in postsecondary education, students with disabilities, students who are homeless, in foster care or are aging out of foster care system or otherwise disconnected.	To increase the rate at which participants complete secondary education and enroll in and graduate from institutions of postsecondary education.	For 2016: Funding \$270,228,385 Awards: 810 Participants 61,747

**Appendix II: U.S. Department of Education
Discretionary Grant Programs to Increase
College Readiness in K-12 Students**

Grant Name (Related Program Office)	Description of Selected Program Characteristics	Target Population	Program Goal	Program Funding and Number of Grantees in Fiscal Year 2016
Upward Bound Math and Science (TRIO) (Office of Postsecondary Education)	<ul style="list-style-type: none"> Provides services, such as, summer programs with intensive math and science training; year-round counseling and advisement; exposure to university faculty members who do research in mathematics and the sciences; computer training; participant-conducted scientific research under the guidance of faculty members or graduate students, who are serving as mentors; and education or counseling services designed to improve the financial and economic literacy of students Provides advice and assistance in secondary and postsecondary course selection, as well as assistance in preparing for college entrance examinations and completing college admission applications. 	High school students from low-income families or from families in which neither parent holds a bachelor's degree and students who are limited English proficient, traditionally underrepresented in postsecondary education, students with disabilities, students who are homeless, in foster care or are aging out of foster care system or otherwise disconnected.	To help students recognize and develop their potential to excel in math and science and to encourage them to pursue postsecondary degrees in math and science, and ultimately careers in the math and science profession.	For 2016: Funding: \$44,289,274 Awards: 162 Participants: 10,176
Statewide Longitudinal Data Systems (SLDS) Grant Program (National Center for Education Statistics)	<ul style="list-style-type: none"> Supports state collection and use of longitudinal data to support student outcomes, including college and career readiness. 	Projects must address two of six priority areas: 1) Financial Equity and Return on Investment, 2) Educator Talent Management, 3) Early Learning, 4) College and Career, 5) Evaluation and Research, and 6) Instructional Support.	To aid State Educational Agencies design, develop, and implement Statewide longitudinal data systems to efficiently and accurately manage, analyze, disaggregate, and use individual student data.	Funding (2015): \$27,000,000 Total awards (after 6 rounds of funding): 51

Source: GAO review of selected laws and U.S. Department of Education documents and information. | GAO-19-8

Appendix III: Federal Agencies Responsible for Enforcing Civil Rights Laws in Public Schools

Table 16: Federal Agencies Responsible for Enforcing Civil Rights Laws in Public Schools

Selected Civil Rights Laws	Enforced by Department of Justice (Justice), Department of Education (Education), or Both ^a
Title IV of the Civil Rights Act of 1964 authorizes the Attorney General to file civil actions to address certain complaints of discrimination by public schools and public institutions of high learning based on race, color, national origin, sex, and religion in public schools and institutions of higher learning. It authorizes Education to provide technical assistance to states or school districts in preparing, adopting, and implementing desegregation plans, to arrange for training for school personnel on dealing with educational problems caused by desegregation, and to provide grants to school boards for staff training or hiring specialists to address desegregation. ^b	Justice
Title VI of the Civil Rights Act of 1964 prohibits discrimination based on race, color, or national origin in programs or activities that receive federal financial assistance. ^c	Education and Justice
Title IX of the Education Amendments of 1972 prohibits discrimination based on sex in education programs or activities that receive federal financial assistance. ^d	Education and Justice
Section 504 of the Rehabilitation Act of 1973 prohibits discrimination on the basis of disability in programs or activities that receive federal financial assistance. ^e	Education and Justice
Equal Educational Opportunities Act of 1974, among other things, prohibits state and local educational agencies from denying equal educational opportunity to individuals, including deliberate segregation of students, on the basis of race, color, sex, or national origin. ^f	Justice
Title II of the Americans with Disabilities Act of 1990 prohibits discrimination on the basis of disability by public entities, whether or not they receive federal financial assistance. ^g	Education and Justice

Source: Department of Education (Education) and Department of Justice (Justice). | GAO-19-8

^aJurisdiction under the same law does not necessarily indicate that the agencies have identical responsibilities under those laws.

^bTitle IV of the Civil Rights Act of 1964, 42 U.S.C. §§ 2000c - 2000c-9.

^cTitle VI of the Civil Rights Act of 1964, 42 U.S.C. §§ 2000d – 2000d-7.

^dTitle IX of the Education Amendments of 1972, 20 U.S.C § 1681.

^eSection 504 of the Rehabilitation Act of 1973, 29 U.S.C. § 794.

^fEqual Educational Opportunities Act of 1974, 20 U.S.C. § 1701 – 1721.

^gTitle II of the Americans with Disabilities Act, 42 U.S.C. §§ 12131 – 12134.

Appendix IV: Selected Federal Civil Rights Enforcement Cases Related to Access to College Preparation Courses and Programs

Department of Education

According to administrative data from the U.S. Department of Education (Education), the Office for Civil Rights (OCR) received over 480 civil rights cases related to college and career readiness and resource comparability from FY 2011 through 2017. Some of these cases were initiated by external complaints and other reviews were initiated by Education. In the selected cases described below Education found underrepresentation of minority students or English learners in advanced, honors, or Advanced Placement (AP) middle and high school courses or in other types of college preparatory programs. This selection of cases is not generalizable, and was selected for illustrative purposes only.

Education Case 1: Equitable Access to Advanced Courses for Black Students in an Ohio School District.¹ In a 2016 investigation, OCR identified a number of potential Title VI compliance concerns regarding equitable access to certain resources for Black students at some schools.² Specifically, OCR found that students at three schools, including two predominantly Black high schools, did not have the opportunity to take advanced courses taught live at their schools and, therefore, could not engage in-person with the course instructors. According to OCR's investigation, students participated remotely, watching the class through a video system. When the classes first started during the 2011-12 school year, the district staffed the distance classroom with paraprofessionals to assist the students. For that year, the district reported using technology to offer greater curriculum choices to its students through distance learning, especially when a sufficient number of students did not sign up for an advanced course at a specific school. After OCR notified the district of its concerns regarding this practice, the district placed teachers in these classrooms effective the 2014-15 school year. The district reported to Education that it was also pursuing efforts that would allow students to earn college credit, increase the number of courses, and improve the courses to provide high-level course choices for students. Before OCR concluded its investigation, district school officials voluntarily entered into a resolution agreement with Education, which committed the district to take certain actions, such as implementing programs designed to ensure that equally effective and qualified teachers are equitably distributed throughout the district and ensure Advanced Placement and other higher-level college preparatory courses are taught

¹ <https://www2.ed.gov/about/offices/list/ocr/docs/investigations/more/15105002-a.pdf>

² For ease of reference, we refer to Title VI of the Civil Rights Act of 1964 as Title VI.

in the district's predominantly Black high schools, and provide students the opportunity to engage in-person with course instructors.

Education Case 2: Equitable Access to College Preparatory Programs for Black, Hispanic, and English Learner (EL) Students in a New York School District.³ In 2013, OCR investigated whether a New York school district discriminated against Black, Hispanic, and EL students by establishing and implementing policies and procedures that resulted in their exclusion from college and career ready programs and courses, such as honors courses and AP courses. OCR reviewed information that the district provided regarding its high school honors courses and analyzed data from the district that revealed that Black, Hispanic, and EL students were underrepresented to a statistically significant degree in high school honors courses and AP courses. OCR also reviewed information concerning the district's gifted and talented program at the elementary and middle school levels and its advanced courses at the middle school level. Data provided by the district indicated that Black, Hispanic and EL students were underrepresented to a statistically significant degree in middle school advanced courses, as well as in some of the district's enrichment programs. OCR noted that enrollment in these programs and courses could potentially have an effect on later enrollment in high school honors and AP courses. Before the conclusion of OCR's investigation, the district voluntarily entered into a resolution agreement with Education. The agreement committed the district to take specific actions including hiring a consultant with expertise in addressing the underrepresentation of Black, Hispanic, and EL students in advanced and enrichment courses. According to the agreement, the consultant was to study the underrepresentation and make specific recommendations, as appropriate, for improving the district's efforts to provide all students with equal access to and an equal opportunity to participate in its advanced courses and programs.

Education Case 3: Representation of Black Students in Advanced Courses and Enrichment Programs in a New Jersey School District.⁴ In 2014, OCR determined that Black students in a New Jersey school district were underrepresented in high school AP courses. Specifically, OCR found that Black students comprised 51.5 percent of high school students in the district, but only 18.7 percent of students in AP courses in

³ <https://www2.ed.gov/about/offices/list/ocr/docs/investigations/more/02115001-a.pdf>

⁴ <https://www2.ed.gov/documents/press-releases/south-orange-maplewood-letter.pdf>

school year 2012-13. In addition, OCR determined that in middle schools, Black students were underrepresented in the district's advanced math courses, as well as in the math enrichment programs at certain schools in the district. Before the conclusion of OCR's investigation, the district voluntarily entered into a resolution agreement with Education. The agreement committed the district to take specific actions including hiring a consultant with expertise in addressing the underrepresentation of Black students in college and career preparatory courses. According to the agreement, the consultant was to study the underrepresentation and make recommendations, as appropriate, for improving the district's efforts to provide all students with equal access to and an equal opportunity to participate in its advanced courses and programs.

Education Case 4: College Preparation Opportunities for Black Students in a Virginia School District.⁵ In 2014, OCR investigated whether a Virginia school district discriminated against Black students by failing to provide them with the same resources and educational opportunities that it provided to White students to prepare them for postsecondary education or careers. As part of this review, OCR reviewed information regarding the district's high school higher-level learning opportunities, including advanced courses, AP courses, and dual credit programs (where students enroll in courses at a local community college). In addition, OCR collected and reviewed information about other possible barriers to college and career readiness, including student discipline. OCR found a significant disparity between the numbers of Black and White high school students who take AP, advanced courses, and dual credit programs. Preliminary information provided by the district indicated disproportion in the representation of Black students in advanced math classes, gifted programs, and accelerated reading programs in elementary schools. When speaking with students about what they considered in determining whether to enroll in these courses, many students informed OCR that they took AP or advanced courses if they took advanced courses in middle school and elementary school. OCR also reviewed student discipline, particularly exclusionary disciplinary that removes students from the school setting, because, according to OCR, such removals can serve as a potential barrier to college and career readiness. Before OCR concluded its investigation, the district voluntarily entered into a resolution agreement with Education to resolve the case. The agreement committed the district to retain the

⁵ <https://www2.ed.gov/about/offices/list/ocr/docs/investigations/more/11105004-a.pdf>

services of a consultant with expertise in addressing the underrepresentation of Black students in gifted programs, elementary and middle school advanced courses, and high school AP and dual credit courses. The consultant's role was to examine the root causes for underrepresentation and to make recommendations about what measures, if any, the district should take as part of its on-going efforts to provide all students with equal access to advanced courses and programs. According to the agreement, the consultant was to study the underrepresentation and make recommendations, as appropriate, for improving the district's efforts to provide all students with equal access to and an equal opportunity to participate in its advanced courses and programs.

Department of Justice

Justice also investigates allegations of discrimination related to school resources in response to complaints filed under federal civil rights statutes and monitors and enforces open federal school desegregation orders where Justice is a party to the litigation.⁶ Justice sometimes partners with OCR on these cases. In September 2017, Justice officials stated that there were 172 open cases to which the agency was a party. The selected cases described below summarize Justice's findings and the agreed upon remedies. This selection of cases is not generalizable, and was selected for illustrative purposes only.

Justice Case 1: Equal Educational Opportunities in an Alabama School District.⁷ As part of an ongoing civil rights lawsuit against an Alabama school district, in 2015, the U.S. District Court for the Northern District of Alabama approved a consent order filed by Justice and the district to reconfigure school attendance zones, improve access to quality course offerings, and address racial discrimination in student discipline, among other areas. The proposed consent order required the district to provide equal educational opportunities to Black students by revising attendance zones and growing and strengthening magnet programs to improve diversity at many of its schools. It also required the district to expand access for Black students by taking a number of steps, including expanding access for Black students to college counseling and advance

⁶ In court cases where school districts were found to have engaged in segregation or discrimination, courts may issue "desegregation orders" requiring the districts to take specific steps to desegregate their schools or otherwise comply with the law.

⁷ <https://www.justice.gov/opa/pr/justice-department-and-huntsville-city-schools-announce-proposed-consent-decree-provide-equal>

course offerings such as AP and International Baccalaureate (IB). It also required the district to expand access for Black students to pre-kindergarten, gifted programs, and academic afterschool programs. The district agreed to implement measures to promote faculty and administrator diversity and to ensure that all students are aware of and can equally participate in extracurricular activities.

Justice Case 2: Equitable Access to Course Offerings in a Louisiana School District.⁸ As part of an ongoing civil rights lawsuit against a Louisiana School Board, in 2015, the U.S. District Court for the Western District of Louisiana approved a consent decree between Justice and the school board. This consent decree addressed district's fulfillment of its desegregation obligations, terminating long-standing judicial supervision of the district in this matter. Prior to this consent decree, in 2010, the court directed the district to offer the same courses at every high school. However, 5 years later, the court found that a high school in the district, which predominantly served White students, offered 32 more courses, including college preparatory courses, than another high school, which predominantly served Black students. Similarly, across all schools in the district (elementary, middle, and high), the schools that were racially identifiable as White had far more gifted and talented course offerings than other schools. In the consent decree, the district agreed, among other things, to strive to have all courses listed in its course catalog taught at each high school. Further, if a course is ultimately not taught at a given school, students at that school would be given the opportunity to take the course at another school in the district. The district also agreed to provide free transportation, at the student's request, and to adjust the student's schedule and the scheduling and location of the course, as necessary, to facilitate the student's attendance at the course.

Justice Case 3: Access to College and Career Readiness Programs and Courses for American Indian Students in a New Mexico School District.⁹ In 2017, Justice and OCR resolved a compliance review of a New Mexico school district. The purpose of the review was to determine whether the district discriminated against American Indians by excluding them from college and career readiness programs and courses, such as

⁸ <https://www.justice.gov/crt/case-document/andrews-and-us-vs-monroe-city-school-board-second-amended-consent-decree>

⁹ <https://www.justice.gov/crt/case-document/gallup-mckinley-county-school-district-resolution-agreement>

gifted and talented, AP, and honors courses. Justice and OCR also evaluated whether the district discriminated against American Indian parents by not providing them with information surrounding the aforementioned programs and courses in a language they understand. District staff surveyed during this review recommended ways to address American Indian student underrepresentation in college and career readiness programs and courses. On February 14, 2017, the district entered into a resolution agreement with OCR and Justice, committing to take specific actions to ensure that it is providing an equal opportunity and equal access for all students to its advanced and higher level learning opportunities. The district agreed to several actions including reaching out to an equity assistance center or consultant for technical assistance in addressing the underrepresentation of American Indian students in the college and career readiness programs and courses and improving outreach to the American Indian community.

Appendix V: Additional Data Tables

This appendix contains several tables that show the underlying data used throughout this report, as well as additional analyses we conducted using the Department of Education's Civil Rights Data Collection (CRDC) and Common Core of Data (CCD) for school year 2015-16. The following tables and information are included in this appendix:

- **Table 17:** High schools offering math and science courses, by school poverty level.
- **Table 18:** High schools offering math and science sequences, by school poverty level.
- **Table 19:** High schools offering Advanced Placement courses, International Baccalaureate program, and Dual Enrollment options, by school poverty level.
- **Table 20:** High schools offering different numbers of Advanced Placement courses, by school poverty level.
- **Table 21:** High schools offering math courses, by school size and poverty level.
- **Table 22:** High schools offering science courses, by school size and poverty level.
- **Table 23:** High schools offering math and science sequences, by school size and poverty level.
- **Table 24:** High schools offering Advanced Placement courses, International Baccalaureate program, and Dual Enrollment options, by school size and poverty level.
- **Table 25:** High schools offering math courses, by school type and poverty level.
- **Table 26:** High schools offering science courses, by school type and poverty level.
- **Table 27:** High schools offering math and science sequences, by school type and poverty level.
- **Table 28:** High schools offering Advanced Placement courses, International Baccalaureate program, and Dual Enrollment options, by school type and poverty level.
- **Table 29:** High schools offering math courses, by school locale and poverty level.
- **Table 30:** High schools offering science courses, by school locale and poverty level.

- **Table 31:** High schools offering math and science sequences, by school locale and poverty level.
- **Table 32:** High schools offering Advanced Placement courses, International Baccalaureate program, and Dual Enrollment options, by school locale and poverty level.

Table 17: Number and Percent of High Schools Offering Math and Science Courses, by School Poverty Level, School Year 2015-16

	All Schools	Percent of students eligible for free or reduced-price lunch					
		0 to 24.9%	25 to 49.9%	50 to 74.9%	75 to 100%	90 to 100%	
Total	Number	14,111	2,580	4,840	3,854	2,441	1,085
	Percent	100%	100%	100%	100%	100%	100%
Math Course							
Algebra I	Number	13,512	2,486	4,665	3,701	2,289	1,038
	Percent	95.8%	96.4%	96.4%	96.0%	93.8%	95.7%
Geometry	Number	13,402	2,479	4,657	3,657	2,243	1,011
	Percent	95.0%	96.1%	96.2%	94.9%	91.9%	93.2%
Algebra II	Number	13,181	2,481	4,641	3,586	2,126	951
	Percent	93.4%	96.2%	95.9%	93.1%	87.1%	87.7%
Advanced Mathematics	Number	11,692	2,322	4,275	3,027	1,751	806
	Percent	82.9%	90.0%	88.3%	78.5%	71.7%	74.3%
Calculus	Number	9,977	2,182	3,805	2,471	1,236	510
	Percent	70.7%	84.6%	78.6%	64.1%	50.6%	47.0%
Science Course							
Biology	Number	13,663	2,518	4,734	3,732	2,302	1,034
	Percent	96.8%	97.6%	97.8%	96.8%	94.3%	95.3%
Chemistry	Number	12,748	2,413	4,591	3,412	1,983	894
	Percent	90.3%	93.5%	94.9%	88.5%	81.2%	82.4%
Physics	Number	11,109	2,297	4,135	2,853	1,525	656
	Percent	78.7%	89.0%	85.4%	74.0%	62.5%	60.5%

Source: GAO analysis of data from the U.S. Department of Education's Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

Table 18: Number and Percent of High Schools Offering Math and Science Course Sequences, by School Poverty Level, School Year 2015-16

	All Schools	Percent of students eligible for free or reduced-price lunch					
		0 to 24.9%	25 to 49.9%	50 to 74.9%	75 to 100%	90 to 100%	
Total	Number	14,111	2,580	4,840	3,854	2,441	1,085
	Percent	100%	100%	100%	100%	100%	100%
Math Sequence							
At least Algebra I, Geometry, and Algebra II	Number	12,742	2,409	4,501	3,482	2,020	915
	Percent	90.3%	93.4%	93.0%	90.4%	82.8%	84.3%
Science Sequence							
At least Biology, Chemistry, and Physics	Number	10,813	2,268	4,066	2,754	1,434	612
	Percent	76.6%	87.9%	84.0%	71.5%	58.7%	56.0%

Source: GAO analysis of data from the U.S. Department of Education's Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

Table 19: Number and Percent of High Schools Offering Advanced Placement Courses, International Baccalaureate Program, and Dual Enrollment Options, by School Poverty Level, School Year 2015-16

	All Schools	Percent of students eligible for free or reduced-price lunch					
		0 to 24.9%	25 to 49.9%	50 to 74.9%	75 to 100%	90 to 100%	
Total	Number	14,111	2,580	4,840	3,854	2,441	1,085
	Percent	100%	100%	100%	100%	100%	100%
Advanced Placement (AP)							
AP Offered							
Yes	Number	10,048	2,134	3,670	2,526	1,436	632
	Percent	71.2%	82.7%	75.8%	65.5%	58.8%	58.2%
No	Number	4,063	446	1,170	1,328	1,005	453
	Percent	28.8%	17.3%	24.2%	34.5%	41.2%	41.8%
AP Math Offered							
Yes	Number	8,522	2,009	3,136	2,047	1,080	429
	Percent	84.8%	94.1%	85.4%	81.0%	75.2%	67.9%
No	Number	1,529	125	536	480	356	203
	Percent	15.2%	5.9%	14.6%	19%	24.8%	32.1%
AP Science Offered							
Yes	Number	7,933	1,892	2,900	1,891	999	401
	Percent	78.9%	88.7%	79%	74.8%	69.6%	63.4%

Appendix V: Additional Data Tables

		Percent of students eligible for free or reduced-price lunch					
		All Schools	0 to 24.9%	25 to 49.9%	50 to 74.9%	75 to 100%	90 to 100%
Total	Number	14,111	2,580	4,840	3,854	2,441	1,085
No	Number	2,118	242	772	636	437	231
	Percent	21.1%	11.3%	21.0%	25.2%	30.4%	36.6%
AP Other Offered							
Yes	Number	9,471	2,060	3,427	2,350	1,363	588
	Percent	94.2%	96.5%	93.3%	93.0%	94.9%	93%
No	Number	580	74	245	177	73	44
	Percent	5.8%	3.5%	6.7%	7%	5.1%	7.0%
International Baccalaureate (IB)							
Yes	Number	770	154	264	218	118	1,024
	Percent	5.5%	6.0%	5.5%	5.7%	4.8%	5.6%
No	Number	13,341	2,426	4,576	3,636	2,323	61
	Percent	94.5%	94.0%	94.5%	94.3%	95.2%	94.4%
Dual Enrollment							
Yes	Number	9,788	1,886	3,773	2,630	1,328	639
	Percent	69.4%	73.1%	78.0%	68.2%	54.4%	58.9%
No	Number	4,323	694	1,067	1,224	1,113	446
	Percent	30.6%	26.9%	22%	31.8%	45.6%	41.1%

Source: GAO analysis of data from the U.S. Department of Education's Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

Table 20: Number and Percent of High Schools Offering Different AP Courses, by School Poverty Level, School Year 2015-16

		Percent of students eligible for free or reduced-price lunch					
		All Schools	0 to 24.9%	25 to 49.9%	50 to 74.9%	75 to 100%	90 to 100%
Number of AP Courses Offered							
1-5	Number	2,982	341	1,146	886	554	311
	Percent	29.7%	16.0%	31.2%	35.1%	38.6%	49.2%
6-10	Number	2,411	311	928	682	427	179
	Percent	24	14.6%	25.3%	27.0%	29.7%	28.3%
11-15	Number	1,945	426	686	493	266	91
	Percent	19.4	20.0%	18.7%	19.5%	18.5%	14.4%
16-20	Number	1,462	487	493	293	125	35
	Percent	14.5	22.8%	13.4%	11.6%	8.7%	5.5%
21-25	Number	815	369	267	117	41	8

		Percent of students eligible for free or reduced-price lunch					
All Schools		0 to 24.9%	25 to 49.9%	50 to 74.9%	75 to 100%	90 to 100%	
26-30	Percent	8.1	17.3%	7.3%	4.6%	2.9%	1.3%
	Number	299	151	103	30	12	3
31-35	Percent	3	7.1%	2.8%	1.2%	0.8%	0.5%
	Number	66	26	22	11	5	3
36+	Percent	0.7	1.2%	0.6%	0.4%	0.3%	0.5%
	Number	68	23	25	14	6	2
	Percent	0.7	1.1%	0.7%	0.6%	0.4%	0.3%

Source: GAO analysis of data from the U.S. Department of Education's Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

Table 21: Number and Percent of High Schools Offering Math Courses, by School Size and Poverty Level, School Year 2015-16

	School Size					
	Small: 1 to 200		Medium: 201 to 1000		Large: 1001+	
	Number	Percent	Number	Percent	Number	Percent
Total Schools	2,855	100%	6,165	100%	5,091	100%
Math Course						
Algebra I						
0 to 24.9%	288	87.5%	901	96.0%	1,297	98.9%
25 to 49.9%	760	90.9%	2,224	97.4%	1,681	97.7%
50 to 74.9%	821	91.4%	1,615	96.8%	1,265	98.2%
75 to 100%	630	87.3%	1,030	96.0%	629	97.4%
All Schools	2,558	89.6%	5,961	96.7%	4,993	98.1%
Geometry						
0 to 24.9%	289	87.8%	900	95.8%	1,290	98.3%
25 to 49.9%	762	91.1%	2,204	96.5%	1,691	98.3%
50 to 74.9%	789	87.9%	1,605	96.2%	1,263	98.1%
75 to 100%	595	82.4%	1,019	95.0%	629	97.4%
All Schools	2,487	87.1%	5,920	96.0%	4,995	98.1%
Algebra II						
0 to 24.9%	283	86.0%	898	95.6%	1,300	99.1%
25 to 49.9%	745	89.1%	2,211	96.8%	1,685	97.9%
50 to 74.9%	738	82.2%	1,587	95.1%	1,261	97.9%
75 to 100%	553	76.6%	957	89.2%	616	95.4%
All Schools	2,370	83.0%	5,829	94.5%	4,982	97.9%

Appendix V: Additional Data Tables

	School Size					
	Small: 1 to 200		Medium: 201 to 1000		Large: 1001+	
	Number	Percent	Number	Percent	Number	Percent
	2,855	100%	6,165	100%	5,091	100%
Advanced Mathematics						
0 to 24.9%	200	60.8%	840	89.5%	1,282	97.7%
25 to 49.9%	571	68.3%	2,050	89.8%	1,654	96.1%
50 to 74.9%	397	44.2%	1,418	85.0%	1,212	94.1%
75 to 100%	250	34.6%	882	82.2%	619	95.8%
All Schools	1,446	50.6%	5,363	87.0%	4,883	95.9%
Calculus						
0 to 24.9%	133	40.4%	788	83.9%	1,261	96.1%
25 to 49.9%	333	39.8%	1,852	81.1%	1,620	94.1%
50 to 74.9%	163	18.2%	1,114	66.8%	1,194	92.7%
75 to 100%	79	10.9%	575	53.6%	582	90.1%
All Schools	720	25.2%	4,487	72.8%	4,770	93.7%

Source: GAO analysis of data from the U.S. Department of Education's Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

Note: The sum of each variable in this table may not equal the value in the "All Schools" row because approximately three percent of high schools (or 396 schools) in our analysis did not report the percentage of students eligible for free or reduced-price lunch for school year 2015-16.

Table 22: Number and Percent of High Schools Offering Science Courses, by School Size and Poverty Level, School Year 2015-16

	School Size					
	Small: 1 to 200		Medium: 201 to 1000		Large: 1001+	
	Number	Percent	Number	Percent	Number	Percent
Total Schools	2,855	100%	6,165	100%	5,091	100%
Science Course						
Biology						
0 to 24.9%	295	89.7%	913	97.2%	1,310	99.8%
25 to 49.9%	769	92.0%	2,255	98.8%	1,710	99.4%
50 to 74.9%	806	89.8%	1,644	98.6%	1,282	99.5%
75 to 100%	623	86.3%	1,039	96.8%	640	99.1%
All Schools	2,551	89.4%	6,048	98.1%	5,064	99.5%
Chemistry						
0 to 24.9%	209	63.5%	896	95.4%	1,308	99.7%
25 to 49.9%	656	78.5%	2,227	97.5%	1,708	99.2%
50 to 74.9%	563	62.7%	1,568	94.0%	1,281	99.5%
75 to 100%	370	51.2%	974	90.8%	639	98.9%

Appendix V: Additional Data Tables

	School Size					
	Small: 1 to 200		Medium: 201 to 1000		Large: 1001+	
	Number	Percent	Number	Percent	Number	Percent
Total Schools	2,855	100%	6,165	100%	5,091	100%
All Schools	1,833	64.2%	5,856	95.0%	5,059	99.4%
Physics						
0 to 24.9%	168	51.1%	837	89.1%	1,292	98.5%
25 to 49.9%	465	55.6%	1,990	87.2%	1,680	97.6%
50 to 74.9%	375	41.8%	1,258	75.4%	1,220	94.7%
75 to 100%	223	30.9%	712	66.4%	590	91.3%
All Schools	1,253	43.9%	4,955	80.4%	4,901	96.3%

Source: GAO analysis of data from the U.S. Department of Education's Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

Note: The sum of each variable in this table may not equal the value in the "All Schools" row because approximately three percent of high schools (or 396 schools) in our analysis did not report the percentage of students eligible for free or reduced-price lunch for school year 2015-16.

Table 23: Number and Percent of High Schools Offering Math and Science Sequences, by School Size and Poverty Level, School Year 2015-16

	School Size					
	Small: 1 to 200		Medium: 201 to 1000		Large: 1001+	
	Number	Percent	Number	Percent	Number	Percent
Total Schools	2,855	100%	6,165	100%	5,091	100%
Math Sequence						
At least Algebra I, Geometry, and Algebra II						
0 to 24.9%	272	82.7%	886	94.4%	1,284	97.9%
25 to 49.9%	734	87.8%	2,182	95.6%	1,670	97.0%
50 to 74.9%	765	85.2%	1,587	95.1%	1,254	97.4%
75 to 100%	569	78.8%	997	92.9%	622	96.3%
All Schools	2,391	83.7%	5,840	94.7%	4,951	97.3%

Appendix V: Additional Data Tables

	School Size					
	Small: 1 to 200		Medium: 201 to 1000		Large: 1001+	
	Number	Percent	Number	Percent	Number	Percent
	2,855	100%	6,165	100%	5,091	100%
Science Sequence						
At least Biology, Chemistry, and Physics						
0 to 24.9%	146	44.4%	831	88.5%	1,291	98.4%
25 to 49.9%	421	50.4%	1,970	86.3%	1,675	97.3%
50 to 74.9%	307	34.2%	1,228	73.6%	1,219	94.6%
75 to 100%	158	21.9%	686	63.9%	590	91.3%
All Schools	1,050	36.8%	4,870	79.0%	4,893	96.1%

Source: GAO analysis of data from the U.S. Department of Education's Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

Note: The sum of each variable in this table may not equal the value in the "All Schools" row because approximately three percent of high schools (or 396 schools) in our analysis did not report the percentage of students eligible for free or reduced-price lunch for school year 2015-16.

Table 24: Number and Percent of High Schools Offering Advanced Placement Courses, International Baccalaureate Program, and Dual Enrollment Options, by School Size and Poverty Level, School Year 2015-16

	School Size					
	Small: 1 to 200		Medium: 201 to 1000		Large: 1001+	
	Number	Percent	Number	Percent	Number	Percent
Total Schools	2,855	100%	6,165	100%	5,091	100%
Advanced Placement (AP)						
AP Offered						
0 to 24.9%	91	27.7%	746	79.4	1,297	98.9
25 to 49.9%	210	25.1%	1,767	77.4	1,693	98.4
50 to 74.9%	137	15.3%	1,146	68.7	1,243	96.5
75 to 100%	77	10.7%	733	68.3	626	96.9
All Schools	522	18.3%	4,554	73.9	4,972	97.7
AP Math						
0 to 24.9%	58	63.7%	672	90.1	1,279	98.6
25 to 49.9%	117	55.2%	1,386	78.4	1,633	96.5
50 to 74.9%	57	41.3%	822	71.7	1,168	94
75 to 100%	21	27.3%	481	65.6	578	92.3
All Schools	257	49%	3,497	76.8	4,768	95.9
AP Science						
0 to 24.9%	38	41.8%	587	78.7	1,267	97.7
25 to 49.9%	82	38.7%	1,245	70.5	1,573	92.9
50 to 74.9%	51	37%	742	64.7	1,098	88.3
75 to 100%	24	31.2%	422	57.6	553	88.3
All Schools	200	38.1%	3,131	68.8	4,602	92.6
AP Other						
0 to 24.9%	76	83.5%	694	93.0%	1,290	99.5%
25 to 49.9%	152	71.7%	1,607	90.9%	1,668	98.5%
50 to 74.9%	102	73.9%	1,028	89.7%	1,220	98.1%
75 to 100%	66	85.7%	676	92.2%	621	99.2%
All Schools	399	76.0%	4,162	91.4%	4,910	98.8%
International Baccalaureate (IB)						
0 to 24.9%	2	0.6%	26	2.8%	126	9.6%
25 to 49.9%	1	0.1%	46	2%	217	12.6%
50 to 74.9%	1	0.1%	38	2.3%	179	13.9%
75 to 100%	1	0.1%	40	3.7%	77	11.9%
All Schools	6	0.2%	157	2.5%	607	11.9%

Appendix V: Additional Data Tables

	School Size					
	Small: 1 to 200		Medium: 201 to 1000		Large: 1001+	
	Number	Percent	Number	Percent	Number	Percent
Total Schools	2,855	100%	6,165	100%	5,091	100%
Dual Enrollment						
0 to 24.9%	160	48.6%	685	72.9%	1,041	79.3%
25 to 49.9%	540	64.6%	1,830	80.2%	1,403	81.5%
50 to 74.9%	382	42.5%	1,269	76.1%	979	76%
75 to 100%	204	28.3%	681	63.5%	443	68.6%
All Schools	1,296	45.4%	4,557	73.9%	3,935	77.3%

Source: GAO analysis of data from the U.S. Department of Education’s Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

Note: The sum of each variable in this table may not equal the value in the “All Schools” row because approximately three percent of high schools (or 396 schools) in our analysis did not report the percentage of students eligible for free or reduced-price lunch for school year 2015-16.

Table 25: Number and Percent of High Schools Offering Math Courses, by School Type and Poverty Level, School Year 2015-16

	School Type									
	Traditional		Charter		Magnet		Alternative		Special Educ.	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total Schools	11,428	100%	826	100%	830	100%	936	100%	91	100%
Math Course										
Algebra I										
0 to 24.9%	2,178	97.5%	145	92.4%	98	92.5%	59	81.9%	6	60.0%
25 to 49.9%	4,177	97.1%	135	88.8%	199	96.6%	132	83.0%	22	95.7%
50 to 74.9%	2,945	97.4%	188	90.0%	246	97.6%	304	88.1%	18	78.3%
75 to 100%	1,514	96.0%	236	91.5%	236	98.3%	283	85.0%	20	60.6%
All Schools	11,088	97.0%	752	91.0%	804	96.9%	800	85.5%	68	74.7%
Geometry										
0 to 24.9%	2,169	97.1%	141	89.8%	102	96.2%	60	83.3%	7	70.0%
25 to 49.9%	4,171	97.0%	129	84.9%	204	99.0%	134	84.3%	19	82.6%
50 to 74.9%	2,927	96.8%	182	87.1%	246	97.6%	286	82.9%	16	69.6%
75 to 100%	1,480	93.9%	240	93.0%	233	97.1%	270	81.1%	20	60.6%
All Schools	11,019	96.4%	738	89.3%	810	97.6%	771	82.4%	64	70.3%
Algebra II										
0 to 24.9%	2,172	97.2%	142	90.4%	102	96.2%	56	77.8%	9	90.0%
25 to 49.9%	4,164	96.8%	132	86.8%	205	99.5%	121	76.1%	19	82.6%
50 to 74.9%	2,891	95.6%	187	89.5%	245	97.2%	246	71.3%	17	73.9%
75 to 100%	1,411	89.5%	239	92.6%	235	97.9%	221	66.4%	20	60.6%

Appendix V: Additional Data Tables

	School Type									
	Traditional		Charter		Magnet		Alternative		Special Educ.	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total Schools	11,428	100%	826	100%	830	100%	936	100%	91	100%
All Schools	10,910	95.5%	744	90.1%	798	96.1%	662	70.7%	67	73.6%
Advanced Mathematics										
0 to 24.9%	2,112	94.5%	95	60.5%	100	94.3%	11	15.3%	4	40.0%
25 to 49.9%	3,905	90.8%	104	68.4%	201	97.6%	52	32.7%	13	56.5%
50 to 74.9%	2,604	86.1%	114	54.5%	229	90.9%	72	20.9%	8	34.8%
75 to 100%	1,306	82.8%	135	52.3%	226	94.2%	77	23.1%	7	21.2%
All Schools	10,181	89.1%	479	58.0%	778	93.7%	220	23.5%	34	37.4%
Calculus										
0 to 24.9%	2,014	90.1%	64	40.8%	95	89.6%	7	9.7%	2	20.0%
25 to 49.9%	3,500	81.4%	92	60.5%	189	91.8%	13	8.2%	11	47.8%
50 to 74.9%	2,145	70.9%	96	45.9%	210	83.3%	15	4.3%	5	21.7%
75 to 100%	950	60.2%	80	31.0%	193	80.4%	9	2.7%	4	12.1%
All Schools	8,849	77.4%	355	43.0%	706	85.1%	45	4.8%	22	24.2%

Source: GAO analysis of data from the U.S. Department of Education's Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

Note: The sum of each variable in this table may not equal the value in the "All Schools" row because approximately three percent of high schools (or 396 schools) in our analysis did not report the percentage of students eligible for free or reduced-price lunch for school year 2015-16.

Table 26: Number and Percent of High Schools Offering Science Courses, by School Type and Poverty Level, School Year 2015-16

	School Type									
	Traditional		Charter		Magnet		Alternative		Special Educ.	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total Schools	11,428	100%	826	100%	830	100%	936	100%	91	100%
Science Course										
Biology										
0 to 24.9%	2,205	98.7%	145	92.4%	105	99.1%	55	76.4%	8	80.0%
25 to 49.9%	4,241	98.6%	136	89.5%	205	99.5%	131	82.4%	21	91.3%
50 to 74.9%	2,979	98.5%	197	94.3%	249	98.8%	290	84.1%	17	73.9%
75 to 100%	1,518	96.3%	244	94.6%	235	97.9%	282	84.7%	23	69.7%
All Schools	11,222	98.2%	769	93.1%	819	98.7%	782	83.5%	71	78.0%
Chemistry										
0 to 24.9%	2,176	97.4%	107	68.2%	103	97.2%	25	34.7%	2	20.0%
25 to 49.9%	4,155	96.6%	123	80.9%	204	99.0%	91	57.2%	18	78.3%

Appendix V: Additional Data Tables

	School Type									
	Traditional		Charter		Magnet		Alternative		Special Educ.	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total Schools	11,428	100%	826	100%	830	100%	936	100%	91	100%
50 to 74.9%	2,814	93.0%	163	78.0%	245	97.2%	179	51.9%	11	47.8%
75 to 100%	1,397	88.6%	191	74.0%	234	97.5%	152	45.6%	9	27.3%
All Schools	10,814	94.6%	621	75.2%	809	97.5%	463	49.5%	41	45.1%
Physics										
0 to 24.9%	2,099	93.9%	82	52.2%	102	96.2%	11	15.3%	3	30.0%
25 to 49.9%	3,772	87.7%	94	61.8%	195	94.7%	59	37.1%	15	65.2%
50 to 74.9%	2,381	78.7%	130	62.2%	223	88.5%	109	31.6%	10	43.5%
75 to 100%	1,089	69.1%	138	53.5%	196	81.7%	96	28.8%	6	18.2%
All Schools	9,600	84.0%	470	56.9%	722	87.0%	283	30.2%	34	37.4%

Source: GAO analysis of data from the U.S. Department of Education's Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

Note: The sum of each variable in this table may not equal the value in the "All Schools" row because approximately three percent of high schools (or 396 schools) in our analysis did not report the percentage of students eligible for free or reduced-price lunch for school year 2015-16.

Table 27: Number and Percent of High Schools Offering Math and Science Course Sequences, by School Type and Poverty Level, School Year 2015-16

		School Type				
		Traditional	Charter	Magnet	Alternative	Special Educ.
		Number	Number	Number	Number	Number
Total Schools	Number	11,428	826	830	936	91
	Percent	100%	100%	100%	100%	100%
Math Sequence						
At least Algebra I, Geometry, and Algebra II						
0 to 24.9%	Number	2,129	129	96	50	5
	Percent	95.3%	82.17%	90.6%	69.4%	50.0%
25 to 49.9%	Number	4,060	118	198	107	18
	Percent	94.4%	77.63%	96.1%	67.3%	78.3%
50 to 74.9%	Number	2,828	171	241	226	16
	Percent	93.5%	81.82%	95.6%	65.5%	69.6%
75 to 100%	Number	1,356	221	226	205	12
	Percent	86.0%	85.66%	94.2%	61.6%	36.4%
All Schools	Number	10,630	682	772	605	53
	Percent	93.0%	82.57%	93.0%	64.6%	58.2%

Appendix V: Additional Data Tables

		School Type				
		Traditional	Charter	Magnet	Alternative	Special Educ.
Total Schools	Number	11,428	826	830	936	91
	Percent	100%	100%	100%	100%	100%
Science Sequence						
At least Biology, Chemistry, and Physics						
0 to 24.9%	Number	2,083	74	101	8	2
	Percent	93.2%	47.1%	95.3%	11.1%	20.0%
25 to 49.9%	Number	3,720	88	194	49	15
	Percent	86.5%	57.9%	94.2%	30.8%	65.2%
50 to 74.9%	Number	2,317	120	221	87	9
	Percent	76.6%	57.4%	87.7%	25.2%	39.1%
75 to 100%	Number	1,045	124	194	67	4
	Percent	66.3%	48.1%	80.8%	20.1%	12.1%
All Schools	Number	9,422	429	714	218	30
	Percent	82.4%	51.9%	86.0%	23.3%	33.0%

Source: GAO analysis of data from the U.S. Department of Education's Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

Note: The sum of each variable in this table may not equal the value in the "All Schools" row because approximately three percent of high schools (or 396 schools) in our analysis did not report the percentage of students eligible for free or reduced-price lunch for school year 2015-16.

Table 28: Number and Percent of High Schools Offering Advanced Placement Courses, International Baccalaureate Program, and Dual Enrollment Options, by School Type and Poverty Level, School Year 2015-16

		School Type									
		Traditional		Charter		Magnet		Alternative		Special Educ.	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total Schools		11,428	100%	826	100%	830	100%	936	100%	91	100%
Advanced Placement (AP)											
AP Offered											
0 to 24.9%		1,958	87.6%	64	40.8%	104	98.1%	6	8.3%	2	20.0%
25 to 49.9%		3,383	78.7%	73	48.0%	194	94.2%	11	6.9%	9	39.1%
50 to 74.9%		2,201	72.8%	85	40.7%	222	88.1%	11	3.2%	7	30.4%
75 to 100%		1,115	70.7%	85	32.9%	226	94.2%	7	2.1%	3	9.1%
All Schools		8,897	77.9%	328	39.7%	766	92.3%	36	3.8%	21	23.1%
AP Math Offered											
0 to 24.9%		1,859	94.9%	42	65.6%	103	99.0%	3	50.0%	2	100%

Appendix V: Additional Data Tables

	School Type									
	Traditional		Charter		Magnet		Alternative		Special Educ.	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Total Schools	11,428	100%	826	100%	830	100%	936	100%	91	100%
25 to 49.9%	2,883	85.2%	54	74.0%	183	94.3%	8	66.7%	8	88.9%
50 to 74.9%	1,784	81.1%	60	70.6%	193	86.9%	7	58.3%	3	42.9%
75 to 100%	831	74.5%	56	65.9%	187	82.7%	4	57.1%	2	66.7%
All Schools	7,581	85.2%	220	67.1%	683	89.2%	23	60.5%	15	71.4%
AP Science Offered										
0 to 24.9%	1,751	89.4%	39	60.9%	98	94.2%	2	33.3%	2	100%
25 to 49.9%	2,665	78.8%	47	64.4%	175	90.2%	5	41.7%	8	88.9%
50 to 74.9%	1,649	74.9%	59	69.4%	174	78.4%	4	33.3%	5	71.4%
75 to 100%	771	69.1%	48	56.5%	177	78.3%	1	14.3%	2	66.7%
All Schools	7,058	79.3%	204	62.2%	642	83.8%	12	31.6%	17	81.0%
AP Other Offered										
0 to 24.9%	1,892	96.6%	59	92.2%	101	97.1%	6	100%	2	100%
25 to 49.9%	3,151	93.1%	71	97.3%	188	96.9%	9	75.0%	8	88.9%
50 to 74.9%	2,039	92.6%	77	90.6%	217	97.7%	10	83.3%	7	100%
75 to 100%	1,049	94.1%	83	97.6%	224	99.1%	4	57.1%	3	100%
All Schools	8,363	94.0%	309	94.2%	749	97.8%	30	78.9%	20	95.2%
International Baccalaureate (IB)										
0 to 24.9%	134	6.0%	1	0.6%	19	17.9%	0	0%	0	0%
25 to 49.9%	197	4.6%	6	3.9%	60	29.1%	1	0.6%	0	0%
50 to 74.9%	148	4.9%	10	4.8%	60	23.8%	0	0%	0	0%
75 to 100%	79	5.0%	6	2.3%	32	13.3%	1	0.3%	0	0%
All Schools	569	5.0%	24	2.9%	175	21.1%	2	0.2%	0	0%
Dual Enrollment										
0 to 24.9%	1,738	77.8%	56	35.7%	80	75.5%	11	15.3%	1	10.0%
25 to 49.9%	3,478	80.9%	73	48%	166	80.6%	42	26.4%	14	60.9%
50 to 74.9%	2,282	75.4%	90	43.1%	180	71.4%	70	20.3%	8	34.8%
75 to 100%	999	63.3%	90	34.9%	173	72.1%	60	18.0%	6	18.2%
All Schools	8,640	75.6%	331	40.1%	601	72.4%	185	19.8%	31	34.1%

Source: GAO analysis of data from the U.S. Department of Education's Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

Note: The sum of each variable in this table may not equal the value in the "All Schools" row because approximately three percent of high schools (or 396 schools) in our analysis did not report the percentage of students eligible for free or reduced-price lunch for school year 2015-16.

Table 29: Number and Percent of High Schools Offering Math Courses, by School Locale and Poverty Level, School Year 2015-16

	School Locale					
	Urban		Suburban		Town/Rural	
	Number	Percent	Number	Percent	Number	Percent
Total Schools	3,270	100%	4,165	100%	6,670	100%
Math Course						
Algebra I						
0 to 24.9%	364	93.1%	1,208	97.3%	909	96.5%
25 to 49.9%	691	97.2%	1,200	96.1%	2,774	96.3%
50 to 74.9%	925	95.3%	914	95.9%	1,862	96.5%
75 to 100%	1,039	94.6%	466	91.6%	784	94.0%
All Schools	3,114	95.2%	3,983	95.6%	6,410	96.1%
Geometry						
0 to 24.9%	357	91.3%	1,205	97.1%	912	96.8%
25 to 49.9%	688	96.8%	1,203	96.3%	2,766	96.0%
50 to 74.9%	918	94.5%	892	93.6%	1,847	95.7%
75 to 100%	1,031	93.9%	459	90.2%	753	90.3%
All Schools	3,088	94.4%	3,956	95.0%	6,353	95.2%
Algebra II						
0 to 24.9%	361	92.3%	1,209	97.4%	907	96.3%
25 to 49.9%	675	94.9%	1,192	95.4%	2,774	96.3%
50 to 74.9%	886	91.2%	881	92.4%	1,819	94.2%
75 to 100%	921	83.9%	459	90.2%	746	89.4%
All Schools	2,915	89.1%	3,937	94.5%	6,325	94.8%
Advanced Mathematics						
0 to 24.9%	307	78.5%	1,156	93.2%	859	91.2%
25 to 49.9%	642	90.3%	1,105	88.5%	2,528	87.8%
50 to 74.9%	750	77.2%	730	76.6%	1,547	80.2%
75 to 100%	818	74.5%	382	75.0%	551	66.1%
All Schools	2,587	79.1%	3,556	85.4%	5,549	83.2%

Appendix V: Additional Data Tables

	School Locale					
	Urban		Suburban		Town/Rural	
	Number	Percent	Number	Percent	Number	Percent
Total Schools	3,270	100%	4,165	100%	6,670	100%
Calculus						
0 to 24.9%	283	72.4%	1,119	90.2%	780	82.8%
25 to 49.9%	580	81.6%	1,044	83.6%	2,181	75.7%
50 to 74.9%	634	65.3%	664	69.7%	1,173	60.8%
75 to 100%	547	49.8%	329	64.6%	360	43.2%
All Schools	2,100	64.2%	3,327	79.9%	4,550	68.2%

Source: GAO analysis of data from the U.S. Department of Education's Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

Note: The sum of each variable in this table may not equal the value in the "All Schools" row because approximately three percent of high schools (or 396 schools) in our analysis did not report the percentage of students eligible for free or reduced-price lunch for school year 2015-16.

Table 30: Number and Percent of High Schools Offering Science Courses, by School Locale and Poverty Level, School Year 2015-16

	School Locale					
	Urban		Suburban		Town/Rural	
	Number	Percent	Number	Percent	Number	Percent
Total Schools	3,270	100%	4,165	100%	6,670	100%
Science Course						
Biology						
0 to 24.9%	363	92.8%	1,221	98.4%	930	98.7%
25 to 49.9%	685	96.3%	1,218	97.5%	2,831	98.3%
50 to 74.9%	940	96.8%	920	96.5%	1,872	97.0%
75 to 100%	1,043	95.0%	478	93.9%	781	93.6%
All Schools	3,126	95.6%	4,040	97.0%	6,493	97.3%
Chemistry						
0 to 24.9%	322	82.4%	1,196	96.4%	893	94.8%
25 to 49.9%	662	93.1%	1,185	94.9%	2,744	95.3%
50 to 74.9%	859	88.5%	840	88.1%	1,713	88.8%
75 to 100%	929	84.6%	415	81.5%	639	76.6%
All Schools	2,857	87.4%	3,829	91.9%	6,060	90.9%

Appendix V: Additional Data Tables

	School Locale					
	Urban		Suburban		Town/Rural	
	Number	Percent	Number	Percent	Number	Percent
Total Schools	3,270	100%	4,165	100%	6,670	100%
Physics						
0 to 24.9%	298	76.2%	1,165	93.9%	833	88.4%
25 to 49.9%	622	87.5%	1,117	89.4%	2,396	83.2%
50 to 74.9%	753	77.5%	743	78.0%	1,357	70.3%
75 to 100%	756	68.9%	345	67.8%	424	50.8%
All Schools	2,479	75.8%	3,558	85.4%	5,071	76.0%

Source: GAO analysis of data from the U.S. Department of Education's Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

Note: The sum of each variable in this table may not equal the value in the "All Schools" row because approximately three percent of high schools (or 396 schools) in our analysis did not report the percentage of students eligible for free or reduced-price lunch for school year 2015-16.

Table 31: Number and Percent of High Schools Offering Math and Science Sequences, by School Locale and Poverty Level, School Year 2015-16

	School Locale					
	Urban		Suburban		Town/Rural	
	Number	Percent	Number	Percent	Number	Percent
Total Schools	3,270	100%	4,165	100%	6,670	100%
Math Sequence						
At least Algebra I, Geometry, and Algebra II						
0 to 24.9%	342	87.5%	1,179	95.0%	884	93.8%
25 to 49.9%	658	92.5%	1,154	92.4%	2,689	93.4%
50 to 74.9%	863	88.8%	847	88.9%	1,772	91.8%
75 to 100%	891	81.1%	421	82.7%	708	84.9%
All Schools	2,825	86.4%	3,786	90.9%	6,127	91.9%
Science Sequence						
At least Biology, Chemistry, and Physics						
0 to 24.9%	290	74.2%	1,159	93.4%	819	86.9%
25 to 49.9%	616	86.6%	1,105	88.5%	2,345	81.4%
50 to 74.9%	732	75.4%	730	76.6%	1,292	66.9%
75 to 100%	717	65.3%	333	65.4%	384	46.0%
All Schools	2,400	73.4%	3,512	84.3%	4,901	73.5%

Source: GAO analysis of data from the U.S. Department of Education's Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

Note: The sum of each variable in this table may not equal the value in the "All Schools" row because approximately three percent of high schools (or 396 schools) in our analysis did not report the percentage of students eligible for free or reduced-price lunch for school year 2015-16.

Table 32: Number and Percent of High Schools Offering Advanced Placement Courses, International Baccalaureate Program, and Dual Enrollment Options, by School Locale and Poverty Level, School Year 2015-16

	School Locale					
	Urban		Suburban		Town/Rural	
	Number	Percent	Number	Percent	Number	Percent
Total Schools	3,270	100%	4,165	100%	6,670	100%
Advanced Placement (AP)						
AP Offered						
0 to 24.9%	287	73.4%	1,154	93.0%	693	73.6%
25 to 49.9%	584	82.1%	1,089	87.2%	1,997	69.3%
50 to 74.9%	674	69.4%	704	73.9%	1,148	59.5%
75 to 100%	702	63.9%	338	66.4%	396	47.5%
All Schools	2,303	70.4%	3,460	83.1%	4,285	64.2%
AP Math						
0 to 24.9%	272	94.8%	1,124	97.4%	613	88.5%
25 to 49.9%	550	94.2%	1,011	92.8%	1,575	78.8%
50 to 74.9%	592	87.8%	616	87.5%	839	73.0%
75 to 100%	526	74.9%	301	89.1%	253	63.9%
All Schools	1,983	86.1%	3,213	92.9%	3,326	77.6%
AP Science						
0 to 24.9%	261	90.9%	1,090	94.5%	541	78.1%
25 to 49.9%	532	91.1%	967	88.8%	1,401	70.1%
50 to 74.9%	547	81.2%	590	83.8%	754	65.6%
75 to 100%	499	71.1%	274	81.1%	226	57.1%
All Schools	1,884	81.8%	3,083	89.1%	2,966	69.2%
AP Other						
0 to 24.9%	279	97.2%	1,138	98.6%	643	92.8%
25 to 49.9%	573	98.1%	1,064	97.7%	1,790	89.5%
50 to 74.9%	651	96.6%	681	96.7%	1,018	88.6%
75 to 100%	688	98.0%	332	98.2%	343	86.6%
All Schools	2,244	97.4%	3,385	97.8%	3,842	89.6%
International Baccalaureate (IB)						
0 to 24.9%	34	8.7%	97	7.8%	23	2.4%
25 to 49.9%	104	14.6%	102	8.2%	58	2.0%
50 to 74.9%	102	10.5%	86	9.0%	30	1.6%
75 to 100%	73	6.6%	30	5.9%	15	1.8%
All Schools	321	9.8%	319	7.7%	130	1.9%

Appendix V: Additional Data Tables

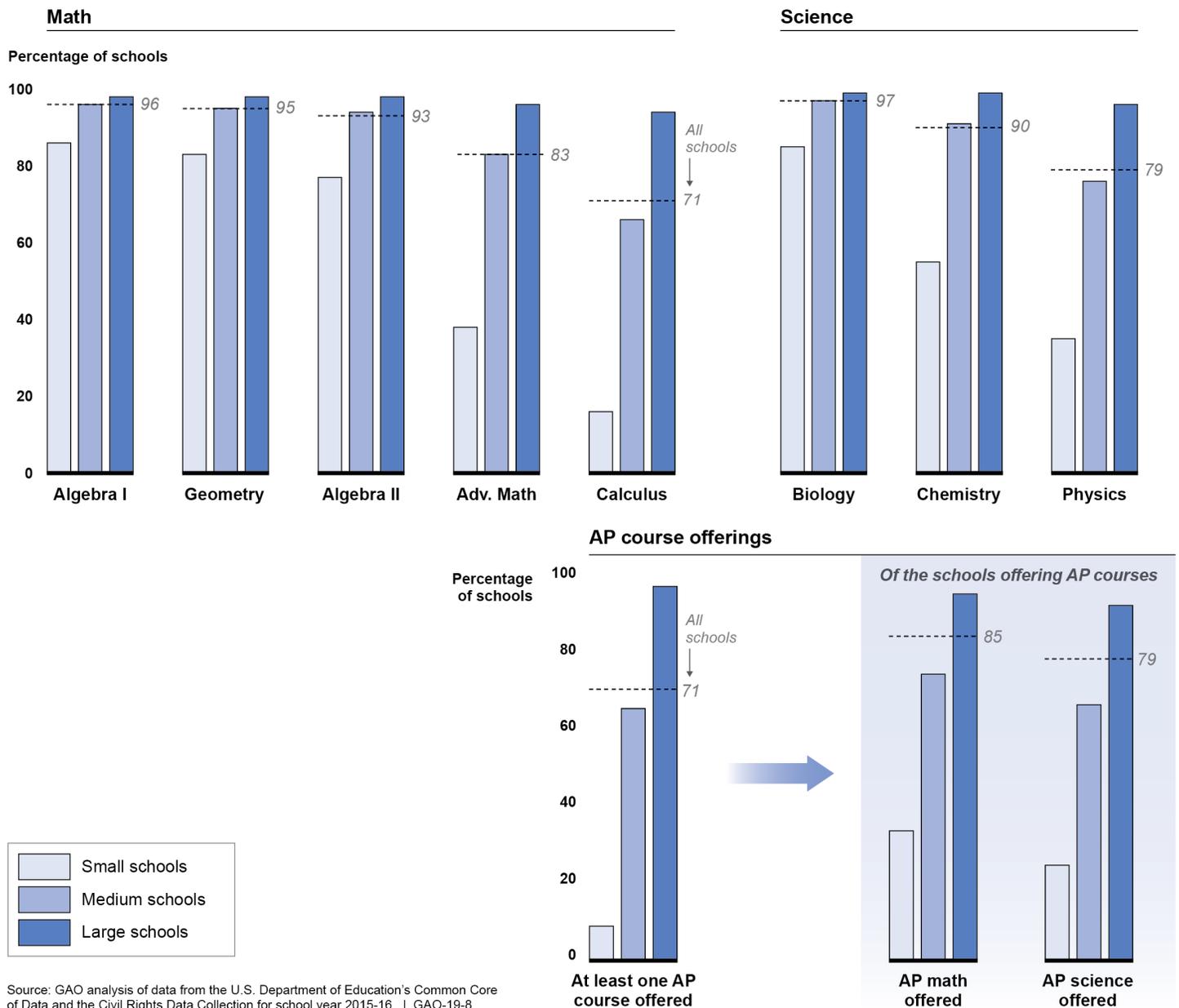
	School Locale					
	Urban		Suburban		Town/Rural	
	Number	Percent	Number	Percent	Number	Percent
Total Schools	3,270	100%	4,165	100%	6,670	100%
Dual Enrollment						
0 to 24.9%	236	60.4%	884	71.2%	766	81.3%
25 to 49.9%	502	70.6%	931	74.5%	2,340	81.3%
50 to 74.9%	568	58.5%	594	62.3%	1,468	76.1%
75 to 100%	535	48.7%	268	52.7%	525	62.9%
All Schools	1,870	57.2%	2,772	66.6%	5,146	77.2%

Source: GAO analysis of data from the U.S. Department of Education's Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

Note: The sum of each variable in this table may not equal the value in the "All Schools" row because approximately three percent of high schools (or 396 schools) in our analysis did not report the percentage of students eligible for free or reduced-price lunch for school year 2015-16.

Appendix VI: Additional Figures

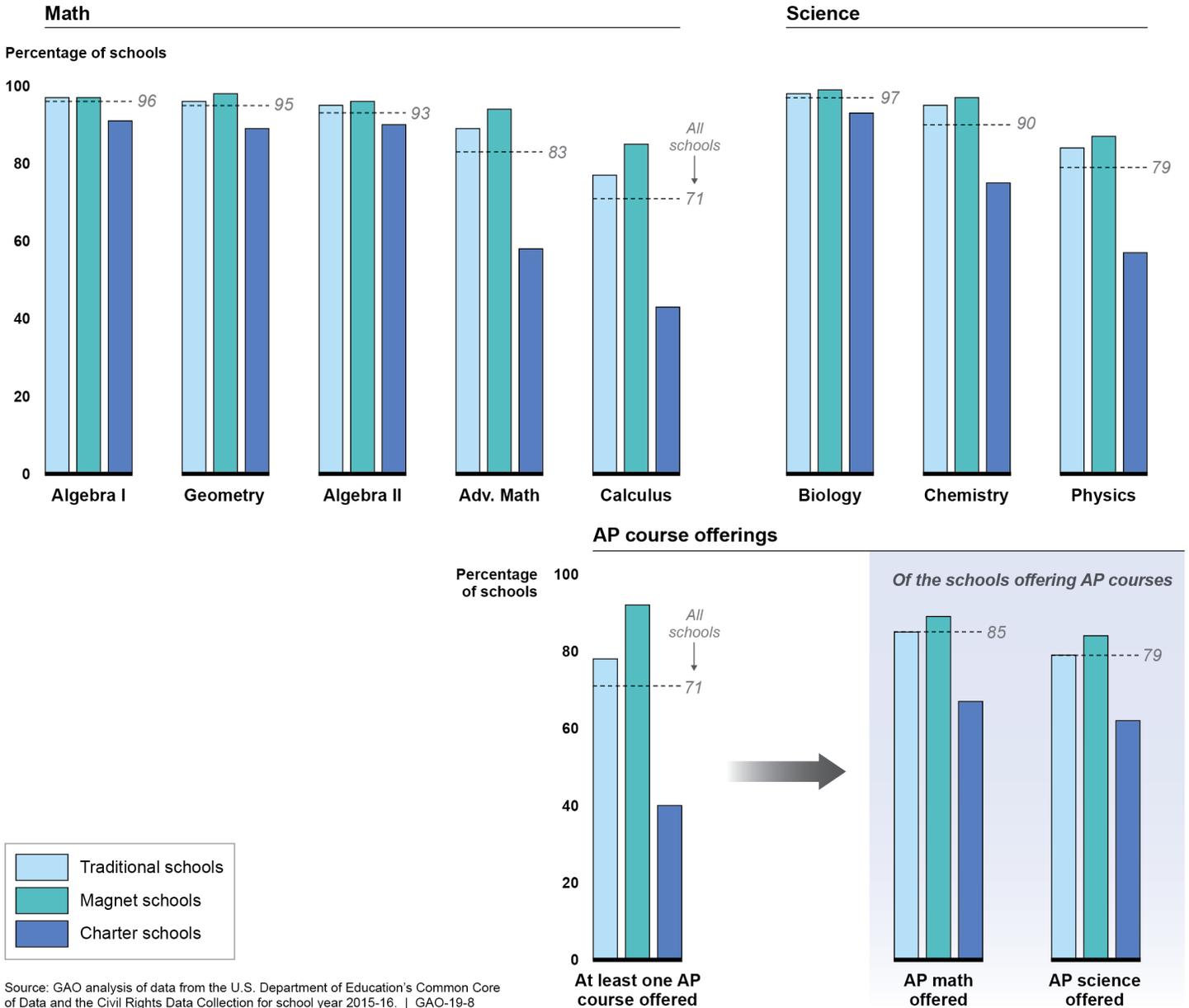
Figure 18: Course Offerings in Small, Medium, and Large High Schools, School Year 2015-16



Source: GAO analysis of data from the U.S. Department of Education's Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

Note: The CRDC defines advanced mathematics as courses that cover the following topics: trigonometry, trigonometry/algebra, trigonometry/analytic geometry, trigonometry/math analysis, analytic geometry, math analysis, math analysis/analytic geometry, probability and statistics, and precalculus. Advanced Placement (AP) courses are college-level courses through which students may earn college credit and advanced college placement by successfully completing AP courses and standardized AP exams. The AP program is sponsored by the College Board.

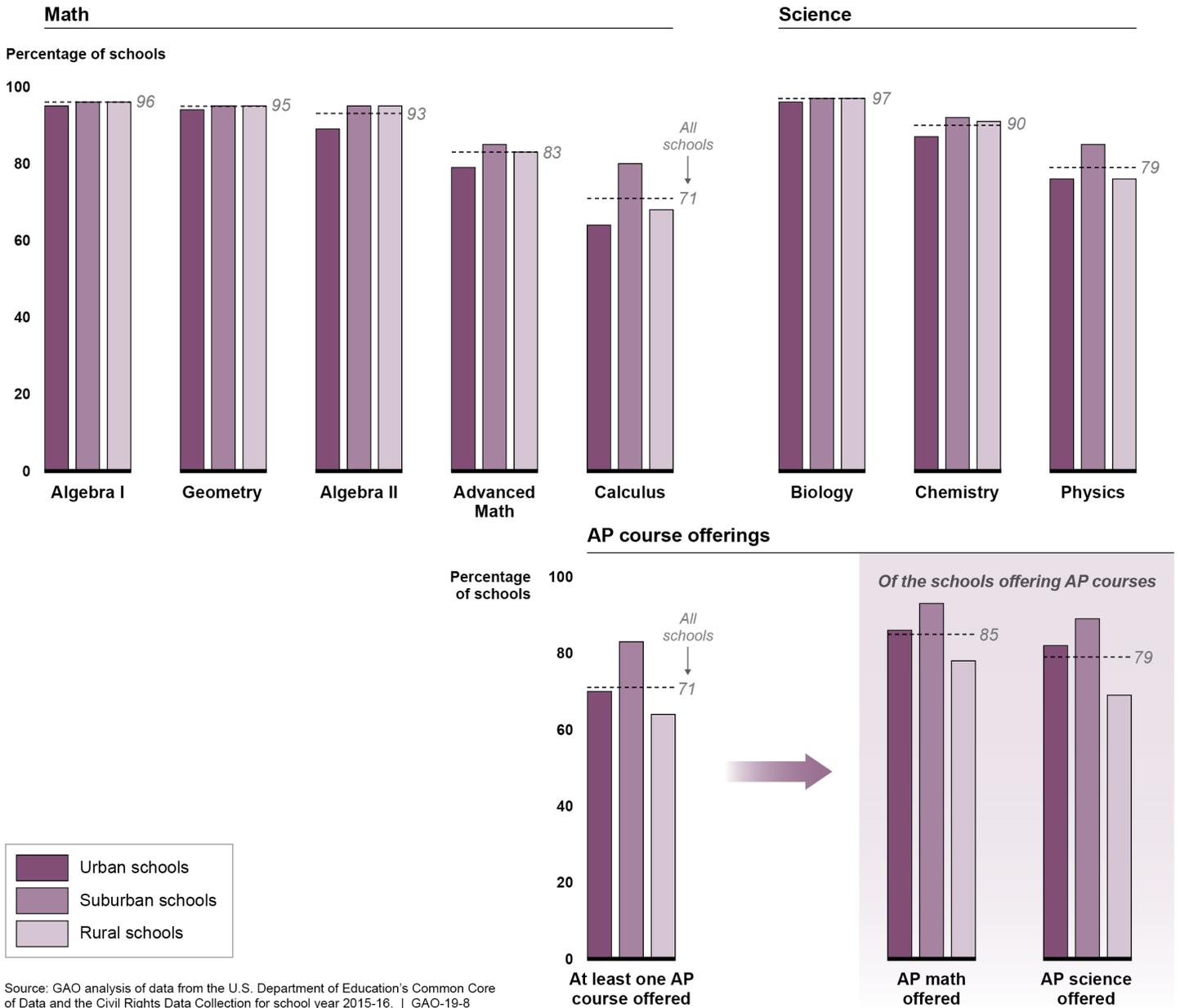
Figure 19: Course Offerings in Traditional, Charter, and Magnet High Schools, School Year 2015-16



Source: GAO analysis of data from the U.S. Department of Education's Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

Note: The CRDC defines advanced mathematics as courses that cover the following topics: trigonometry, trigonometry/algebra, trigonometry/analytic geometry, trigonometry/math analysis, analytic geometry, math analysis, math analysis/analytic geometry, probability and statistics, and precalculus. Advanced Placement (AP) courses are college-level courses through which students may earn college credit and advanced college placement by successfully completing AP courses and standardized AP exams. The AP program is sponsored by the College Board.

Figure 20: Course Offerings in Urban, Suburban, and Rural High Schools, School Year 2015-16



Source: GAO analysis of data from the U.S. Department of Education's Common Core of Data and the Civil Rights Data Collection for school year 2015-16. | GAO-19-8

Note: The CRDC defines advanced mathematics as courses that cover the following topics: trigonometry, trigonometry/algebra, trigonometry/analytic geometry, trigonometry/math analysis, analytic geometry, math analysis, math analysis/analytic geometry, probability and statistics, and precalculus. Advanced Placement (AP) courses are college-level courses through which students may earn college credit and advanced college placement by successfully completing AP courses and standardized AP exams. The AP program is sponsored by the College Board.

Appendix VII: College Admission Website Review

As described in Appendix I, we reviewed websites from a nationally-representative sample of 100 public 4-year colleges in the United States to determine which academic courses colleges expect applicants to take while in high school. Our sampling frame consisted of all public 4-year degree granting colleges that participated in Title IV federal student aid programs, predominately award baccalaureate degrees, have full-time first-time undergraduate students, and that are located in a U.S. state or the District of Columbia, yielding a universe of 555 colleges. Based on our review, an estimated 88 percent of public 4-year colleges posted recommended or required high school coursework as admission criteria for applicants. Of the colleges that had coursework criteria posted on their websites, the results are shown in table 33 below.

Table 33: Estimated Number of Credits that Public 4-year Colleges Expect Students to Take in High School for Core Subjects

Number of Credits	Estimated Percent	Lower Bound	Upper Bound	Margin of Error (%)
Math				
0	1.09	0.05	5.20	4.10
1	0.00	0.00	3.35	3.35
2	3.42	0.85	8.90	5.49
3	56.84	47.30	66.37	9.54
4	38.66	29.29	48.02	9.37
Science				
0	1.09	0.05	5.20	4.10
1	2.28	0.37	7.18	4.90
2	20.47	13.49	29.04	8.57
3	70.47	62.00	78.95	8.48
4	5.69	2.11	12.02	6.32
Social Studies				
0	3.37	0.85	8.73	5.37
1	3.42	0.85	8.90	5.49
2	22.75	15.35	31.65	8.90
3	59.07	49.72	68.42	9.35
4	10.25	5.17	17.72	7.47
English				
0	1.09	0.05	5.20	4.10
1	0.00	0.00	3.35	3.35
2	0.00	0.00	3.35	3.35
3	1.14	0.05	5.49	4.35

**Appendix VII: College Admission Website
Review**

Number of Credits	Estimated Percent	Lower Bound	Upper Bound	Margin of Error (%)
4	97.77	92.89	99.65	4.88
<i>Foreign Language</i>				
0	29.52	20.85	38.19	8.67
1	1.14	0.05	5.47	4.33
2	58.04	48.99	67.09	9.05
3	7.98	3.68	14.70	6.71
4	1.13	0.05	5.44	4.31
<i>Fine Arts</i>				
0	69.42	60.83	78.01	8.59
1	27.26	19.13	36.68	9.42
2	0.00	0.00	3.35	3.35
3	0.00	0.00	3.35	3.35
4	0.00	0.00	3.35	3.35

Source: GAO analysis of websites from a nationally representative sample of colleges, September-November 2017. | GAO-19-8

Appendix VIII: GAO Contacts and Staff Acknowledgments

GAO Contact

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Staff Acknowledgments

In addition to the contact named above, Sherri Doughty (Assistant Director), Cady Panetta (Analyst-in-Charge), James Ashley, James Bennett, David Dornisch, Holly Dye, Alison Grantham, Connor Kincaid, Grant Mallie, Benjamin Sinoff, Walter Vance, and Sonya Vartivarian made key contributions to this report. Also contributing were Deborah Bland, Aaron Karty, Sheila R. McCoy, and Margie Shields.

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