

## First-Year Undergraduate Remedial Coursetaking: 1999–2000, 2003–04, 2007–08

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*Statistics in Brief publications present descriptive data in tabular formats to provide useful information to a broad audience, including members of the general public. They address topical issues and questions. They do not investigate more complex hypotheses, account for inter-relationships among variables, or support causal inferences. We encourage readers who are interested in more complex questions and in-depth analysis to explore other NCES resources, including publications, online data tools, and public- and restricted-use datasets. See [nces.ed.gov](http://nces.ed.gov) and references noted in the body of this document for more information.*

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A primary goal of the U.S. Department of Education's Elementary and Secondary Education Act (ESEA) Blueprint for Reform is to improve the college readiness of high school graduates (U.S. Department of Education 2010). College readiness is a complex benchmark and has been measured in several ways, including transcript analysis (Adelman 2006) and standardized test scores (ACT 2005). One such measure, and the focus of this Statistics in Brief, is remedial coursework enrollment.<sup>1</sup>

Consistent with earlier NCES publications, this brief defines remedial courses as courses for students lacking skills necessary to perform college-level work at the degree of rigor required by the institution (Parsad and Lewis 2003). At the start of their college careers, students who are not sufficiently prepared to complete entry-level courses are often encouraged or required to take developmental or remedial courses. Results from previous surveys conducted by the National Center for Education Statistics (NCES) that collected data on the percentage of students enrolled in remedial coursework found that 28 percent of first-year students who entered 2- or 4-year degree-granting postsecondary institutions were enrolled in remedial courses in both 1995 and 2000 (Parsad and Lewis 2003).<sup>2</sup>

Given evidence of stable remediation rates during the late-1990s, and the current education reform context that seeks to reduce remediation in college, this Statistics in Brief provides descriptive data on the frequency of self-reported enrollment in remedial courses within and across three time points, 1999–2000, 2003–04, and 2007–08. The purpose of the brief is to update the available evidence regarding self-reported student remediation and provide descriptive information as context for policy discussions.

This Statistics in Brief uses data from the National Postsecondary Student Aid Study (NPSAS) to examine the incidence of remedial coursetaking between the 1999–2000, 2003–04, and 2007–08 academic years. Specifically, this brief examines the percentages of first-year<sup>3</sup> undergraduate students enrolled in institutions of higher education (IHE)<sup>4</sup> who reported taking remedial courses in the 1999–2000, 2003–04, and 2007–08 academic years, by institutional characteristics, such as institutional control (public or private), level (2-year or 4-year) and selectivity.<sup>5</sup> For students who attended public institutions, the brief examines enrollment characteristics, such as undergraduate degree program and field of study; and student characteristics, such as sex, race/ethnicity, age, parents' education, and dependency status.<sup>6</sup> NPSAS is a nationally representative survey

<sup>1</sup> In this Issue Brief, remedial coursework refers to remedial or developmental coursework.

<sup>2</sup> Unlike the 1995 and 2000 data collection, NCES did not ask students about remedial coursework enrollment by subject matter in 2008. Therefore, this brief does not present self-report remedial enrollment by subject matter.

<sup>3</sup> "First-year" indicates the respondent has accumulated credit hours that correspond to first-year status. The term does not correspond to the time enrolled in an institution. The remedial coursetaking for undergraduates in their second year or beyond is not included in these analyses. In the remainder of this brief, "undergraduates" refer to first-year undergraduates only.

<sup>4</sup> Table 1 includes information for all IHEs; tables 2 and 3 include only 2-year and 4-year public IHEs.

<sup>5</sup> Selectivity only applies to public or private nonprofit 4-year institutions. For more details, see Cunningham, A.F., *Changes in Patterns of Prices and Financial Aid*. (NCES 2006-153) U.S. Department of Education. Washington, DC: National Center for Education Statistics.

<sup>6</sup> Dependency status is federally defined for student aid purposes. A dependent student has access to his or her parents' financial resources.

of all postsecondary students enrolled in Title IV institutions.<sup>7</sup>

Readers should consider the following limitations when considering the findings presented in this report. First, in this brief remedial coursetaking is based on self-reported data from students. Self-reported data were used instead of transcript data because transcripts generally do not indicate whether a course was remedial or developmental. Second, the findings presented here may not represent the full extent of the need of remediation for first-year undergraduate students. Prior research documents a gap between those who need remediation, those who enroll in remediation, and those who complete remediation (Bailey, Jeong, and Cho 2010). Again, this brief presents data only for those students who reported that they enrolled in remedial coursework. The data and findings presented here should not be construed as describing the entirety of student need, enrollment, or completion of remedial coursework.

A third limitation relates to the low item response rates for the remedial coursework measures in NPSAS:04 and NPSAS:08. All results presented in this brief are based on remedial coursetaking measures that have pre-imputation item response rates below 85 percent. NCES statistical standards require nonresponse bias analysis for any items that do not meet the 85 percent item response rate standard. Therefore, NCES analyzed the remedial coursetaking measures used here for potential bias and created weighted and imputed values to minimize bias due to nonresponse. That is, NCES extrapolated values for missing responses from valid responses to create fully imputed datasets for NPSAS:04 and NPSAS:08. The imputation is assumed to reduce bias because imputation procedures are designed specifically to identify donors with similar characteristics to those with missing data.

Further, NCES analyzed the fully imputed 2004 and 2008 data to identify and minimize any potential bias introduced through imputation. Readers should consider that while the findings presented here are sound given the statistical methods used to produce both the data and the results, they are neither certain nor conclusive. Details of the bias analyses and imputation procedures can be found in the Methodology and Technical Notes section of this brief.

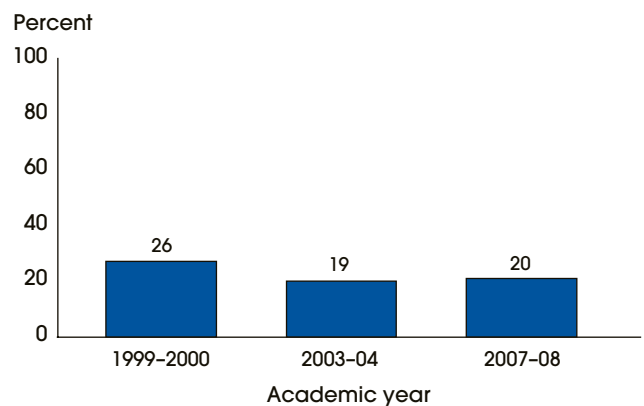
This Statistics in Brief is structured as follows: first, the brief compares first-year undergraduates' remedial coursetaking by institutional control, level, and selectivity for public and private institutions (table 1); second, for public 2- and 4-year institutions only, the brief explores remedial coursetaking differences by enrollment and student characteristics (tables 2 and 3, respectively) across and within the 1999–2000 and 2003–04 academic years; using the same enrollment and student characteristics

<sup>7</sup> "Title IV institutions" refers to institutions eligible to participate in federal financial aid programs under Title IV of the Higher Education Act.

in tables 2 and 3, the brief then compares remedial coursetaking across 2003–04 and 2007–08, and within 2007–08.

As figure 1 illustrates, from 1999–2000 to 2007–08, there was a net drop in the overall percentage of first-year undergraduate students who reported enrollment in remedial courses. Specifically, across all public and private IHEs listed in table 1, the percentage of first-year undergraduate students who reported enrollment in remedial coursework was significantly lower in 2003–04 compared to 1999–2000 (19 vs. 26 percent). From 2003–04 to 2007–08, the percentage of students who reported they enrolled in remedial coursework increased by approximately one percentage point to 20 percent.

**Figure 1. Percentage of first-year undergraduate students enrolled in institutions of higher education who reported taking remedial courses: Academic years 1999–2000, 2003–04, 2007–08**



NOTE: "First-year" indicates the respondent has accumulated credit hours that correspond to first-year status. The term does not correspond to the time enrolled in an institution. The figure excludes students who attended multiple institutions. SOURCE: U.S. Department of Education, National Center for Education Statistics, 1999–2000, 2003–04, and 2007–08 National Postsecondary Student Aid Studies (NPSAS:2000, NPSAS:04, and NPSAS:08).

## Differences by Institutional Control and Level

### Public and private institutions

In 1999–2000, 2003–04, and 2007–08, larger percentages of students who attended 4-year public institutions reported that they enrolled in remedial coursework compared to students who attended 4-year private not-for-profit institutions<sup>8</sup> (1999–2000: 25 vs. 16 percent; 2003–04: 18 vs. 13 percent; 2007–08: 21 vs. 15 percent, respectively).

### Public institutions

Within the 1999–2000, 2003–04, and 2007–08 academic years, larger percentages of students attending 2-year

<sup>8</sup> Direct comparison between public 2-year or 4-year institutions and for-profit institutions is not possible because for-profit institutions are classified as less than 2-year or 2 years or more and may not be equivalent to the public 2-year or 4-year categories.

**Table 1. Percent of first-year undergraduate students enrolled in institutions of higher education who reported taking remedial courses, by institutional control, level, and selectivity: Academic years 1999–2000, 2003–04, and 2007–08**

Institutional control, level, and selectivity	1999–2000	2003–04	2007–08
<b>All institutions</b>	<b>26.3</b>	<b>19.3</b>	<b>20.4</b>
Institutional control and level			
Public institutions			
2-year	30.4	23.4	24.0
4-year	25.0	18.2	21.0
Private institutions			
Not-for-profit 4-year	16.2	13.3	15.1
For-profit less than 2-year	5.1	7.5	5.5
For-profit 2-years or more	16.2	11.4	11.0
Selectivity among 4-year institutions <sup>1</sup>			
Very selective	13.3	11.7	12.8
Moderately selective	22.0	17.0	18.8
Minimally selective	26.7	19.0	20.7
Open admission	37.1	19.2	25.6

<sup>1</sup> Selectivity rating is based on whether the institution was open admission (no minimum requirements), the number of applicants, the number of students admitted, the 25th and 75th percentiles of ACT and/or SAT scores, and whether or not test scores were required. Selectivity only applies to public or private not-for-profit 4-year institutions. For more details, see Cunningham, A.F., *Changes in Patterns of Prices and Financial Aid* (NCES 2006-153). U.S. Department of Education, Washington, DC: National Center for Education Statistics.

NOTE: Excludes students who attended more than one institution of higher education over the course of the academic year. "First-year" indicates the respondent has accumulated credit hours that correspond to first-year status. The term does not correspond to the time enrolled in an institution.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1999–2000, 2003–04, and 2007–08 National Postsecondary Student Aid Studies (NPSAS:2000, NPSAS:04, and NPSAS:08).

public institutions reported enrollment in remedial courses than did those attending 4-year public institutions (1999–2000: 30 vs. 25 percent; 2003–04: 23 vs. 18 percent; 2007–08: 24 vs. 21 percent, respectively). Compared to 1999–2000, student-reported enrollment percentages in remedial coursework were smaller at both 2-year and 4-year public institutions in 2003–04 (2-year: 30 vs. 23 percent; 4-year: 25 vs. 18 percent, respectively). However, by 2007–08, a larger percentage of students in 4-year public institutions reported enrollment in remedial coursework compared to 2003–04 (21 vs. 18 percent, respectively).

### Private institutions

Private IHEs included 4-year not-for-profit institutions, for-profit less than 2-year institutions, and for-profit 2-years or more institutions. In 1999–2000 and 2003–04, the percentage of students who reported enrollment in remedial courses did not measurably differ between those who attended not-for-profit 4-year institutions or those who attended for-profit 2-years or more institutions; however, larger percentages of students who attended these two types of institutions reported enrollment in remedial courses compared to the percentage of students who reported they enrolled in remedial courses at for-profit less than 2-year institutions. For example, in 1999–2000, 16 percent of students at either not-for-profit 4-year institutions or for-profit 2-years or more institutions reported enrollment in remedial courses, which differed from the 5 percent of students who attended for-profit less than 2-year institutions. These relationships changed by the 2007–08 academic year. In 2007–08, the percentage of

students who reported they enrolled in remedial courses differed between those who attended not-for-profit 4-year institutions and those who attended for-profit 2-years or more institutions, as well as those who attended for-profit less than 2-year institutions (15 vs. 5 and 11 percent, respectively).

While differences in remedial coursetaking existed across private institutional control categories from 1999–2000 to 2003–04, and from 2003–04 to 2007–08, no measurable differences existed from 1999–2000 to 2007–08. A larger percentage of students who attended not-for-profit 4-year institutions in 1999–2000 reported they enrolled in remedial coursework compared to those who attended in 2003–04 (16 vs. 13 percent). Also, a larger percentage of students who attended for-profit less-than 2-year institutions in 2003–04 reported enrollment in remedial coursework than those who attended in 2007–08 (8 vs. 5 percent).

### Differences by Selectivity

Selectivity is measured by a rating based on whether the institution had an open admission policy (no minimum requirements), the number of applicants, the number of students admitted, the 25th and 75th percentiles of admitted students' ACT and/or SAT scores, and whether or not test scores were required for admission. Selectivity ratings apply only to public or private not-for-profit 4-year institutions. Within each year, very selective institutions had lower percentages of students who reported they enrolled in remedial coursework compared to all other selectivity categories. For example, in 2007–08, 13

percent of students at very selective institutions reported enrollment in remedial courses compared to 19 percent at moderately selective institutions, 21 percent at minimally selective institutions, and 26 percent at open admission institutions.

Meanwhile, compared to 1999–2000, in 2003–04 lower percentages of students who attended moderately selective, minimally selective, and open admission institutions reported they enrolled in remedial courses (moderately: 22 vs. 17, percent; minimally: 27 vs. 19 percent; open admission: 37 vs. 19 percent). In contrast, from 2003–04 to 2007–08, the only measurable difference by selectivity was found for students who attended open admissions institutions, such that a larger percentage of students who attended open admissions IHEs in 2007–08 reported they enrolled in remedial courses (19 vs. 26 percent). The percentage of students who reported they enrolled in remedial courses at open admission private IHEs in 2007–08 remained below the percentage in 1999–2000.

### Remedial Coursetaking in Public Institutions by Enrollment and Student Characteristics 1999–2000 and 2003–04

Differences by enrollment and student characteristics in the percentages of students who attended public institutions and who reported enrollment in remedial courses were found across the three academic years examined in this report. Overall, the percentage of first-year undergraduate students who attended public institutions<sup>9</sup> and reported they enrolled in remedial courses was lower in 2003–04 than in 1999–2000 (table 2) (22 vs. 29 percent). The following section analyzes 1999–2000 and 2003–04, where the largest drop in remedial course taking occurred. The subsequent section reports on 2003–04 and 2007–08.

#### Differences by degree program and field of study

The percentage of first-year undergraduate students in associate's and bachelor's degree programs who reported enrolling in remedial courses was lower in 2003–04 than in 1999–2000 (24 vs. 32 percent for associate's degrees and 18 vs. 24 percent for bachelor's degrees). Within both years, students who sought an associate's degree had higher percentages of remedial coursetaking than did those who sought a certificate or bachelor's degree (1999–2000: 32 vs. 24 and 24 percent; 2003–04: 24 vs. 21 and 18 percent, respectively).

Consistent with the estimates of total remedial coursetaking, the percentages of students who reported they enrolled in remedial courses within some fields of study<sup>10</sup> dropped from 1999–2000 to 2003–04. These differences occurred in the humanities (31 vs. 21 percent),

engineering/computer science/mathematics (29 vs. 19 percent), business/management (28 vs. 22 percent), and health (34 vs. 25 percent). Within 2003–04, compared to health, lower percentages of students who sought degrees in humanities reported that they enrolled in remedial courses (25 vs. 21 percent); and lower percentages of students who majored in engineering/computer science/mathematics took remedial courses (19 percent) than did those who sought degrees in health (25 percent) or education (24 percent).

#### Differences by student characteristics

Differences in the percentages of first-year undergraduate students in public IHEs who reported that they enrolled in remedial courses—both within and across the 1999–2000 and 2003–04 academic years—are discussed below by the following student characteristics: sex and race/ethnicity, age, parents' education, and dependency status (table 3).

*Sex and race/ethnicity.* Consistent with the overall drop in remedial coursetaking among all students enrolled in public institutions from 1999–2000 to 2003–04, larger percentages of both male and female students reported enrollment in remedial courses in 1999–2000 than in 2003–04 (29 vs. 21 percent for males, and 29 vs. 23 percent for females). There was no measurable difference in 1999–2000 in remedial coursetaking by sex, but in 2003–04, a larger percentage of females than males reported that they enrolled in remedial coursework (23 vs. 21 percent). For both males and females, lower percentages of Black and Hispanic students reported remedial coursetaking in 2003–04 than in 1999–2000 (Male: Black: 25 vs. 38 percent; Hispanic: 24 vs. 35 percent Female: Black: 29 vs. 38 percent; Hispanic: 29 vs. 43 percent, respectively). Similarly, for males, a lower percentage of White undergraduates reported that they enrolled in remedial courses in 2003–04 compared to 1999–2000 (19 vs. 25 percent). Further, in both years, among male undergraduates larger percentages of Black and Hispanic students reported enrollment in remedial courses than did White students (1999–2000: 38 and 35 vs. 25 percent; 2003–04: 25 and 24 vs. 19 percent, respectively). Among females, larger percentages of Black and Hispanic students who reported that they enrolled in remedial courses in 1999–2000 and in 2003–04 compared to Whites (1999–2000: 38 and 43 vs. 24 percent; 2003–04: 29 for each vs. 20 percent, respectively). Additionally, in 2003–04, a smaller percentage of female Asian students reported enrollment in remedial courses compared to Black and Hispanic female undergraduates (19 vs. 29 percent for each, respectively).

*Age.* From 1999–2000 to 2003–04, the percentage of first-year undergraduate students who reported that they enrolled in remedial courses dropped across the three age groups between 19 years and 39 years (19–23 years: 32 vs. 23 percent; 24–29 years: 35 vs. 20 percent; 30–39 years: 29 vs. 18 percent, respectively), while those ages

<sup>9</sup> To illustrate the overall trends discussed in this brief, only public IHEs are included in estimates on remedial coursetaking by enrollment and student characteristics.

<sup>10</sup> Field of study data is only available for students seeking bachelor's degrees.

**Table 2. Percent of first-year undergraduate students attending public institutions who reported taking remedial courses, by degree program and field of study : Academic years 1999–2000, 2003–04, and 2007–08**

Degree program and field of study	1999–2000	2003–04	2007–08
<b>Total</b>	<b>28.8</b>	<b>22.1</b>	<b>23.3</b>
Undergraduate degree program			
Certificate	23.7	20.6	15.2
Associate’s degree	32.1	24.5	26.2
Bachelor’s degree	24.4	18.1	20.1
Field of study <sup>2</sup>			
Humanities	30.6	20.9	23.8
Social/behavioral sciences	26.9	21.8	23.9
Life and physical sciences	24.5	21.0	22.2
Engineering/computer science/mathematics	28.7	19.5	23.3
Business/management	28.2	22.4	26.1
Health	33.8	24.8	25.1
Education	28.0	24.0	25.3

<sup>1</sup> “Field of study” only includes students in a bachelor’s degree program.

NOTE: Excludes students who attended more than one institution of higher education over the course of the academic year. “First-year” indicates the respondent has accumulated credit hours that correspond to first-year status. The term does not correspond to the time enrolled in an institution.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1999–2000, 2003–04, and 2007–08 National Postsecondary Student Aid Study (NPSAS:2000, NPSAS:04, and NPSAS:08).

18 or younger and ages 40 or over had no measurable difference. Within academic years, a lower percentage of undergraduates ages 18 or younger reported enrollment in remedial courses (24 percent) in 1999–2000 compared to those ages 19–23 (32 percent) or 24–29 (35 percent). In 2003–04, compared to those in the 24–29 age group (20 percent) or the 30–39 age group (18 percent), a larger percentage of undergraduates ages 18 or younger or ages 19–23 reported that they enrolled in remedial courses (23 percent each for ages 18 or younger and ages 19–23 ).

*Parents’ education.* The percentage of first-year undergraduate students who reported that they enrolled in remedial courses dropped from 1999–2000 to 2003–04 at each level of parents’ education. For example, in 1999–2000, 27 percent of first-year undergraduate students who had parents with a bachelor’s degree or higher reported enrollment in remedial courses, compared to 19 percent in 2003–04. Although no measurable differences existed in the 1999–2000 academic year, in 2003–04, lower percentages of undergraduate students who had parents with a bachelor’s degree or higher reported that they enrolled in remedial courses (19 percent) than did students who had parents with either only a high school diploma or the equivalent (25 percent) or who had parents with some postsecondary education (22 percent). Further, undergraduates who had parents with some postsecondary education had lower reported enrollment in remedial courses than did those who had parents with a high school diploma or the equivalent.

*Dependency status.* Consistent with the difference measured for all students, lower percentages of both dependent and independent first-year undergraduates reported that they enrolled in remedial courses in 2003–04 than in 1999–2000 (dependent: 25 vs. 29 percent;

independent: 19 vs. 28 percent, respectively). Meanwhile, in 2003–04, compared to dependent students, a lower percentage of independent students reported that they enrolled in remedial coursework (25 vs. 19 percent).

## Remedial Coursetaking in Public Institutions by Enrollment and Student Characteristics 2003–04 and 2007–08

### Differences by degree program and field of study

Overall, the percentage of undergraduate students attending public 2-year or 4-year IHEs who reported that they enrolled in remedial courses increased from 22 percent in 2003–04 to 23 percent in 2007–08 (table 2). From 2003–04 to 2007–08, the percentage of students who reported enrollment in remedial courses differed for each degree program in different ways. Those who sought an associate’s or bachelor’s degree had larger percentages of remedial coursetaking in 2007–08 than those who sought the same degree in 2003–04 (associate’s degree: 26 vs. 25 percent; bachelor’s degree: 20 vs. 18 percent, respectively). Conversely, those who sought a certificate had a lower percentage of remediation in 2007–08 than in 2003–04 (15 vs. 21 percent).

The only measurable differences by field of study from 2003–04 to 2007–08 were larger percentages of remedial coursetaking for undergraduates who studied the humanities (21 vs. 24 percent) or business/management (22 vs. 26 percent).

Within 2007–08, compared to certificate or bachelor’s degree students, a larger percentage of students who sought an associate’s degree reported enrollment in remedial courses (15 and 20 vs. 26 percent, respectively). No measurable difference existed by field of study.

### Differences by student characteristics

Differences in the percentages of first-year undergraduate students in public IHEs who reported that they enrolled in remedial courses—both across the 2003–04 and 2007–08 academic years and within the 2007–08 academic year—are discussed below by the following student characteristics: sex and race/ethnicity, age, parents' education, and dependency status (table 3).

*Overall race/ethnicity.* Overall, compared to both 2003–04 and 2007–08, larger percentages of White, Black, Hispanic, and Asian/Pacific Islander students reported

taking remedial courses during 1999–2000. For example, in 1999–2000, 38 percent of Black students took remedial courses compared to 27 percent in 2003–04 and 30 percent in 2007–08. Within each year lower percentages of White students reported taking remedial courses compared to Black, and Hispanic students and compared to Asian/Pacific Islander students for 1999–2000. For instance, in 1999–2000, Black and Hispanic students (38 percent for each) and Asian/Pacific Islander students (35 percent) had higher percentages of remedial coursetaking compared to White students (24 percent). Meanwhile, in 2003–04 and 2007–08 at 20 and 22 percent, Asian/Pacific Islander

**Table 3. Percent of first-year undergraduate students attending public institutions who reported taking remedial courses, by selected student characteristics: Academic years 1999–2000, 2003–04, and 2007–08**

Student characteristics	1999–2000	2003–04	2007–08
<b>Total</b>	<b>28.8</b>	<b>22.1</b>	<b>23.3</b>
Sex and race/ethnicity <sup>1</sup>			
Overall			
White	24.3	19.7	19.9
Black	37.7	27.4	30.2
Hispanic	37.8	26.8	29.0
Asian/Pacific Islander	34.9	20.1	22.5
Other or Two or more races	34.4	24.0	27.5
Male	28.5	20.7	21.6
White	24.7	19.0	18.7
Black	38.3	24.9	28.7
Hispanic	34.8	24.4	28.3
Asian/Pacific Islander	35.3	21.0	20.8
Other or Two or more races	32.0	22.0	21.8
Female	29.1	23.1	24.7
White	23.7	20.3	21.0
Black	37.7	29.0	31.2
Hispanic	42.5	28.6	29.5
Asian/Pacific Islander	35.6	19.3	24.2
Other or Two or more races	32.9	25.4	32.2
Age			
18 or younger	24.4	23.1	23.7
19–23	31.9	22.6	23.8
24–29	34.7	20.1	22.0
30–39	29.5	17.5	20.3
40 or older	24.9	20.6	18.4
Parents' education			
High school diploma or equivalent	29.6	24.6	24.7
Some postsecondary education	26.8	22.2	23.8
Bachelor's degree or higher	27.5	19.0	20.4
Dependency status <sup>2</sup>			
Dependent students	29.1	24.6	25.6
Independent students	28.5	19.1	20.4

<sup>1</sup> Black includes African American, Hispanic includes Latino, and Asian/Pacific Islander includes Native Hawaiian. Other includes American Indian and Alaska Native and respondents having origins in a race/ethnicity not listed.

<sup>2</sup> Dependency status is federally defined for student aid purposes. A dependent student has access to his or her parents' financial resources.

NOTE: Excludes students who attended more than one institution of higher education over the course of the academic year. "First-year" indicates the respondent has accumulated credit hours that correspond to first-year status. The term does not correspond to the time enrolled in an institution.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1999–2000, 2003–04 and 2007–08 National Postsecondary Student Aid Study (NPSAS:2000, NPSAS:04, and NPSAS:08).

students reported lower remedial coursetaking compared to Black (27 and 30 percent), and Hispanic students (27 and 29 percent).

*Sex and race/ethnicity.* Larger percentages of first-year undergraduate female students reported enrollment in remedial courses in 2007–08 than in 2003–04 (25 vs. 23 percent). Unlike differences by race between 1999–2000 and 2003–04, no measurable differences existed by race between 2003–04 and 2007–08. However, in 2007–08 for both sexes, lower percentages of White students reported that they enrolled in remedial courses compared to Black and Hispanic students (Male: 19 vs. 29 and 28 percent; Female: 21 vs. 31 and 29 percent, respectively). Differences also existed between male Asian students (21 percent) and male Black and Hispanic students (29 and 28 percent, respectively). Meanwhile, smaller percentages of female Asian students reported enrollment in remedial courses compared to female Black students (24 vs. 31 percent).

*Age.* No measurable differences existed from 2003–04 to 2007–08 in any of the age groups, and only two differences existed by age in 2007–08. Compared to first-year undergraduates ages 18 or younger and ages 19–23, lower percentages of students ages 40 or older reported that they enrolled in remedial courses (24 for each vs. 18 percent, respectively).

*Parents' education.* Again, remedial coursetaking did not measurably differ from 2003–04 to 2007–08 based on parents' education, but in 2007–08, a lower percentage of students reported enrollment in remedial courses who had parents with a bachelor's degree or higher (20 percent) compared to students who had parents with a high school diploma or the equivalent (25 percent) or some postsecondary education (24 percent).

*Dependency status.* In 2007–08, a higher percentage of dependent undergraduates (26 percent) reported enrollment in remedial courses, compared to independent students (20 percent).

## Summary

Remedial coursetaking dropped for first-year undergraduate students from 1999–2000 to 2003–04 by almost every institutional, enrollment, and student characteristic presented in table 1 for those attending public and private IHEs and in tables 2 and 3 for those attending public IHEs. However, after the drop from 1999–2000 to 2003–04, higher percentages of students reported that they enrolled in remedial courses in 2007–08 compared to 2003–04 among the following groups: undergraduates in public 4-year schools, open admission schools, associate's degree and bachelor's degree programs; humanities and business management majors; and female undergraduates. Despite the higher percentages compared to 2003–04, the percentage of undergraduates that

reported remedial coursetaking was measurably lower in 2007–08 compared to 1999–2000 for both public 2- and 4-year institutions and by many characteristics of students attending public institutions, including: students in both associate's and bachelor's degree programs; males and females; White, Black, Hispanic and Asian students; those in age categories of 19–23 or above; and dependent and independent students.

Four differences in the percentage of undergraduates who reported enrollment in remedial courses were common to each academic year. First, a larger percentage of students who attended 4-year public institutions reported that they enrolled in remedial coursework compared to those who attended 4-year private not-for-profit institutions. Second, percentages were lower in very selective admission institutions compared to all other levels of selectivity. Third, a larger percentage of first-year undergraduates in associate's degree programs reported enrollment in remedial courses than were first-year undergraduates in certificate or bachelor's degree programs. Fourth, for both male and female undergraduates, White students had lower percentages of remedial coursetaking than Black or Hispanic students.

The overall drop in the percentages of first-year undergraduates taking remedial courses from 1999–2000 to 2007–08 presented in this Statistics in Brief may suggest increased college readiness. However, these analyses do not control for other policies or practices that may also affect the frequency of student self-reported remedial coursework enrollment (e.g., acceptance policies that require that developmental work be done prior to college entrance or changes in the evaluation of undergraduates' need for remedial courses). Nonetheless, the findings based on student reports of remedial coursetaking that are presented here provide evidence that the rate of remedial coursetaking may have dropped since 1999–2000.

## Methodology and Technical Notes

### Survey methodology

The estimates provided in this Statistics in Brief are based on data collected through the 1999–2000, 2003–04, and 2007–08 National Postsecondary Student Aid Studies (NPSAS:2000, NPSAS:04, and NPSAS:08). NPSAS covers broad topics concerning student enrollment in postsecondary education and how students and their families finance their education.

In 2000, students provided data through surveys administered over the telephone, and in 2004 and 2008, through surveys administered over the Internet or by telephone. In addition to student responses, data were collected from the institutions that sampled students attended (IHEs) and from relevant databases, including U.S. Department of Education (ED) records on student

loan and grant programs and student financial aid applications.

The National Center of Education Statistics (NCES) has conducted NPSAS every 3 to 4 years since 1986–87. The NPSAS:2000, NPSAS:04, and NPSAS:08 target populations include students enrolled in postsecondary institutions in the United States and Puerto Rico at any time between July 1st and June 30th of the survey year. The target populations were limited to those enrolled in an academic program, at least one course for credit that could be applied toward an academic degree, or an occupational or vocational program requiring at least 3 months or 300 clock hours of instruction to receive a degree, certificate, or other formal award. The populations excluded students who were also enrolled in high school or a high school completion (e.g., GED preparation) program. The populations were also limited to students enrolled in Title IV institutions.

The institution sampling frames for NPSAS:2000, NPSAS:04, and NPSAS:08 were constructed from contemporary Institutional Characteristics, Fall Enrollment, and Completions files of the Integrated Postsecondary Education Data System (IPEDS). The sampling design consisted of first selecting eligible institutions, then selecting students from these institutions. Institutions were selected with probabilities proportional to a composite measure of size based on expected enrollment during the survey year. In NPSAS: 08, eligible sampled students were defined as study respondents if at least 11 key data elements were available from any data source. Similar definitions of study respondents were developed for each of the earlier NPSAS administrations. For detailed descriptions of these definitions, see the full-scale methodology reports for NPSAS:2000 (Riccobono et al. 2001), NPSAS:04 (Cominole et al. 2004), and NPSAS:08 (Cominole et al. 2010).

There are several types of participation/coverage rates in NPSAS. For the student record abstraction phase of the study (referred to as computer-assisted data entry or CADE), institution completion rates vary across different types of institutions and depend on the method of data submission. Institutions could choose from among three modes for student record abstraction: (1) self-CADE, by which institutional staff entered data directly into the web-based CADE system; (2) data-CADE, by which institutional staff provided student record information in data file uploads according to specifications; and (3) field-CADE, by which trained field data collectors used laptops to abstract student record data into the CADE system. Nearly two-thirds of institutions (63 percent) chose to submit student data by self-CADE. About 36 percent of institutions submitted student records by data-CADE. Approximately 1 percent of institutions submitted their data by field-CADE. Estimates were weighted to adjust for the unequal probability of selection into the sample and for nonresponse.

Two broad categories of error occur in estimates generated from surveys: sampling and nonsampling errors. Sampling errors occur when observations are based on samples rather than on entire populations. The standard error of a sample statistic is a measure of the variation due to sampling and indicates the precision of the statistic. The complex sampling design used in NPSAS must be taken into account when calculating variance estimates such as standard errors. NCES' online PowerStats, which generated the estimates in this report, uses the balanced repeated replication (BRR) and Jackknife II (JK2) methods to adjust variance estimation for the complex sample design. For additional information visit PowerStats at <http://nces.ed.gov/datalab>.

Nonsampling errors can be attributed to several sources: incomplete information about all respondents (e.g., some students or institutions refused to participate, or students participated but answered only certain items); differences among respondents in question interpretation; inability or unwillingness to give correct information; mistakes in recording or coding data; and other errors of collecting, processing, sampling, and imputing missing data.

Methodological differences among surveys trying to measure the same phenomena may have an impact on the estimates of those phenomena. It is important to be aware of these methodological differences. In this analysis specifically, the 1999–2000 survey was telephone administered, whereas the 2003–04 and 2007–08 surveys were administered by Web with a telephone follow-up. Also, in 1999–2000, students were asked to report their remedial coursetaking since they “have been in college,” whereas in 2003–04 and 2007–08 they were asked to report since they “completed high school.” Finally, different procedures were used in the 1999–2000 survey to address item or unit nonresponse than were used in the later surveys.

### **Response rates and potential biases**

NCES Statistical Standard 4-4-1 states that “[a]ny survey stage of data collection with a unit or item response rate less than 85 percent must be evaluated for the potential magnitude of nonresponse bias before the data or any analysis using the data may be released” (U.S. Department of Education 2002). This means that nonresponse bias analysis could be required at any of three levels: (1) institutions, (2) study respondents, or (3) items.

For more information on response rates and nonresponse bias analysis for selected variables please see the relevant methodology reports for NPSAS:2000 (Riccobono et al. 2001), NPSAS:04 (Cominole et al. 2004), and NPSAS:08 (Cominole et al. 2010). For NPSAS:2000, National Postsecondary Student Aid Study 1999–2000 (NPSAS:2000), CATI Nonresponse Bias Analysis Report provides additional information. Note that for NPSAS:2000, nonresponse bias analysis for computer-assisted telephone



interview (CATI) nonresponse was conducted at the student level and not at the item level.

#### *NPSAS:04 nonresponse bias analyses*

For NPSAS:04, the study respondent response rate was 91 percent and thus nonresponse bias analysis was not required at the study respondent level. The institution response rate, however, was 80 percent and therefore nonresponse bias analyses were conducted for all institutions and for the six types of institutions with a weighted response rate below 85 percent. Further, the student interview response rate was 71 percent; therefore, nonresponse bias analysis was required for those variables based in whole or in part on student interviews. Institution weighting adjustments were made to reduce bias due to institutional nonresponse. The institution weighting adjustments eliminated some, but not all, significant bias. However, for all institutions, public less-than-2-year institutions, and public 2-year institutions, no significant bias remained after weighting for the variables analyzed. For the other types of institutions, the percent of variable categories with significant bias decreased after weight adjustments. Significant bias was reduced for the variables known for most respondents and nonrespondents.

The primary NPSAS:04 measure of remedial coursetaking used in this brief (REMETOOK) had a response rate of 35 percent and thus required nonresponse bias analysis. For this variable and all other NPSAS:04 variables with a weighted response rate of less than 85 percent, nonresponse bias analysis was conducted to determine whether respondents and nonrespondents differed on the following characteristics: institution region, and total enrollment; whether the student had Free Application for Federal Student Aid (FAFSA) data, was a Pell Grant recipient, or borrowed a Stafford Loan; and the amount, if any, of a student's Pell Grant or Stafford Loan. Differences between respondents and nonrespondents on these variables were tested for statistical significance at the 5 percent level. All other NPSAS:04 variables used in this Brief had a pre-imputation response rate of 85 percent or higher.

Nonresponse bias analyses of the REMETOOK variable indicated that respondents differed from nonrespondents on 40 percent of the characteristics analyzed, indicating that there may be bias in these estimates. Any bias due to nonresponse, however, is based upon responses prior to stochastic imputation. Missing responses were imputed using a hot-deck procedure, and the potential for bias in these estimates may have been reduced due to imputation. Because imputation procedures are designed specifically to identify donors with similar characteristics to those with missing data, the imputation is assumed to reduce bias. While item-level bias before imputation is measurable, such bias after imputation is not, so whether the imputation affected the bias cannot be directly evaluated. Therefore, the item estimates before and after imputation were

compared to determine whether the imputation changed the biased estimate, thus suggesting a reduction in bias.

For categorical variables, such as REMETOOK, the estimated difference was computed for each of the categories as the percentage of students in that category before imputation minus the percentage of students in that category after imputation. These estimated differences were tested for statistical significance at the 95 percent confidence level. A significant difference in the item means after imputation implies a reduction in bias due to imputation. A nonsignificant difference suggests that imputation may not have reduced bias, that the sample size was too small to detect a significant difference, or that there was little bias to be reduced. Statistical tests of the differences between the means before and after imputation for REMETOOK were significant, indicating that the nonresponse bias may have been reduced through imputation. Readers should interpret estimates that may be biased with caution.

#### *NPSAS:08 nonresponse bias analyses*

For NPSAS:08, the institution and study respondent response rates were 90 and 96 percent, respectively, and thus nonresponse bias analysis was not required at those levels. The student interview response rate, however, was 71 percent, and therefore nonresponse bias analysis was required for those variables based in whole or in part on student interviews. The following NPSAS:08 variable used in this report required nonresponse bias analysis: N8REMSY (28 percent) which was the gate variable for REMETOOK, which was fully imputed. Using methods similar to those used in NPSAS:04, nonresponse bias analyses were conducted for the N8REMSY variable to determine whether respondents and nonrespondents differed on the following characteristics: institution sector, region, and total enrollment; student type, gender, and age group; whether the student had Free Application for Federal Student Aid (FAFSA) data, was a federal aid recipient, was a Pell Grant recipient, or borrowed a Stafford Loan; and the amount, if any, of a student's Pell Grant or Stafford Loan. Differences between respondents and nonrespondents on these variables were tested for statistical significance at the 95 percent confidence level. All other NPSAS:08 variables used in this Brief had a pre-imputation response rate of 85 percent or higher.

Nonresponse bias analyses of these variables indicated that respondents differed from nonrespondents on 52 percent (REMETOOK) of the characteristics analyzed, indicating that there may be bias in these estimates. The NPSAS:08 item estimates for REMETOOK before and after imputation were compared to determine whether the imputation changed the biased estimate, thus suggesting a reduction in bias.

Statistical tests of the differences between the means before and after imputation REMETOOK were significant,

indicating that the nonresponse bias may have been reduced through imputation. Readers should interpret estimates that may be biased with caution.

For more detailed information on nonresponse bias analysis and an overview of the survey methodology, see the 2007–08 National Postsecondary Student Aid Study (NPSAS:08) Full-scale Methodology Report (<http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2011188>).

### Statistical procedures

The estimates presented in this brief were produced through the NCES PowerStats tool available on the DataLab website. The variables named in the text were used to create the tables. In addition, the variable AIDSECT was used as a filter in PowerStats to exclude students who attended more than one institution over the course of a single academic year from the analyses.

Comparisons made in the text were tested for statistical significance at the  $p < .05$  level to ensure that the differences were larger than might be expected due to sampling variation. When comparing estimates between categorical groups (e.g., sex, race/ethnicity),  $t$  statistics were calculated. The following formula was used to compute the  $t$  statistic:

$$t = \frac{E_1 - E_2}{\sqrt{se_1^2 + se_2^2}}$$

where  $E_1$  and  $E_2$  are the estimates being compared and  $se_1$  and  $se_2$  are the corresponding standard errors of these estimates. No adjustments were made for multiple comparisons. It is important to note that many of the variables examined in this brief may be related to one another and to other variables not included in the analyses. The complex interactions and relationships among the variables were not fully explored in this report and warrant more extensive analysis. Furthermore, the variables examined in this report are just a few of those that could be examined in these data. Readers are cautioned not to draw causal inferences based on the results presented.

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## Appendix A. Standard Error Tables

**Table A-1. Standard errors for percent of first-year undergraduate students enrolled in institutions of higher education who reported taking remedial courses, by institutional control, level, and selectivity: Academic years 1999–2000, 2003–04, and 2007–08**

Institutional control, level, and selectivity	1999–2000	2003–04	2007–08
<b>All institutions</b>	<b>0.83</b>	<b>0.31</b>	<b>0.36</b>
Institutional control and level			
Public institutions			
2-year	1.24	0.48	0.46
4-year	1.33	0.62	0.71
Private institutions			
Not-for-profit 4-year	1.20	0.68	1.04
For-profit less than 2-year	1.42	0.27	0.46
For-profit 2-years or more	2.83	1.14	1.14
Selectivity among 4-year institutions			
Very selective	1.62	0.96	1.17
Moderately selective	1.33	0.55	0.74
Minimally selective	2.93	1.70	1.80
Open admission	5.80	1.69	1.54

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1999–2000, 2003–04, and 2007–08 National Postsecondary Student Aid Studies (NPSAS:2000, NPSAS:04, and NPSAS:08).

**Table A-2. Standard errors for percent of first-year undergraduate students attending public institutions who reported taking remedial courses, by degree program and field of study : Academic years 1999–2000, 2003–04, and 2007–08**

Degree program and field of study	1999–2000	2003–04	2007–08
<b>Total</b>	<b>0.96</b>	<b>0.40</b>	<b>0.40</b>
Undergraduate degree program			
Certificate	3.16	1.57	1.30
Associate's degree	1.37	0.51	0.49
Bachelor's degree	1.30	0.62	0.66
Field of study			
Humanities	2.55	1.19	0.85
Social/behavioral sciences	2.99	2.08	2.15
Life and physical sciences	5.08	1.87	1.86
Engineering/computer science/mathematics	2.86	1.23	1.51
Business/management	2.01	1.38	1.11
Health	3.22	0.95	1.08
Education	3.19	1.39	1.55

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1999–2000, 2003–04, and 2007–08 National Postsecondary Student Aid Study (NPSAS:2000, NPSAS:04, and NPSAS:08).

**Table A-3. Standard errors for percent of first-year undergraduate students attending public institutions who reported taking remedial courses, by selected student characteristics: Academic years 1999–2000, 2003–04, and 2007–08**

Student characteristics	1999–2000	2003–04	2007–08
<b>Total</b>	<b>0.96</b>	<b>0.40</b>	<b>0.40</b>
Sex and race/ethnicity			
Overall			
White	1.13	0.43	0.42
Black	2.42	1.02	1.13
Hispanic	2.92	0.99	1.03
Asian/Pacific Islander	4.14	2.13	2.21
Other or Two or more races	7.25	2.18	2.00
Male	1.20	0.56	0.60
White	1.17	0.63	0.68
Black	4.91	1.55	1.34
Hispanic	3.76	1.54	1.66
Asian/Pacific Islander	7.08	2.58	2.86
Other or Two or more races	8.29	3.01	2.54
Female	1.42	0.53	0.49
White	1.73	0.57	0.56
Black	3.24	1.30	1.57
Hispanic	3.90	1.39	1.40
Asian/Pacific Islander	8.93	2.79	2.63
Other or Two or more races	5.77	2.89	2.90
Age			
18 or younger	1.44	0.69	0.54
19–23	1.29	0.61	0.59
24–29	3.64	1.09	1.56
30–39	4.16	1.33	1.96
40 or older	5.60	1.61	2.16
Parents' education			
High school diploma or equivalent	1.65	0.74	0.71
Some postsecondary education	1.91	0.86	0.86
Bachelor's degree or higher	1.41	0.59	0.64
Dependency status			
Dependent students	1.36	0.51	0.50
Independent students	1.51	0.56	0.58

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1999–2000, 2003–04 and 2007–08 National Postsecondary Student Aid Study (NPSAS:2000, NPSAS:04, and NPSAS:08).

For more information on the National Postsecondary Student Aid Study, visit <http://nces.ed.gov/surveys/npsas/>. To order additional copies of this Statistics in Brief or other NCES publications, call 1-877-4ED-PUBS or visit <http://www.edpubs.org>. NCES publications are also available on the Internet at <http://nces.ed.gov>.