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Contents

Page

Page

D Explanation of State Profiles

The relations between the National Assessment of Educational Progress (NAEP) results and individual state assessment results vary from state to state. Individual state profiles in this section display the comparisons for each state. Each state profile has up to 13 elements, depending on the availability of school-level state assessment information in the national longitudinal school-level state assessment score database (NLSLSASD). They include:

- a summary description of the state assessment data;
- an overview of the results displayed in the profile;
- a display of the state's achievement standard thresholds on the NAEP achievement distribution in the state;
- the correlations between NAEP and state assessment school achievement;
- the percentages of students with disabilities or English language learners;
- a comparison of NAEP and state assessment achievement changes;
- state-reported percentages of students meeting standards; and
- comparisons of NAEP and state assessment achievement gaps.

These are described below, in the context of the example profile displayed on the following pages.

Element 1
Brief description of the state assessment data

The description is based primarily on information provided on the state education agency website, as it applies to the data used in this comparison report (school-level scores on reading and mathematics assessments). The information included in the descriptions includes test(s) used, grades tested, subgroup data availability, availability of data across years, and data suppression information, as well as any information which would be required for understanding the results presented in the profile.

Element 2
Brief textual summary of statistically significant differences between NAEP and state assessment scores.

The summary provides a brief overview of the results being displayed in the profile. It includes the number of schools in each grade which are being used for the comparison, a textual explanation of the standards comparison graphs (element 3), a brief explanation of the changes in achievement (element 6), and a summary of significant results for each gap type (Black-White, Hispanic-White, and poverty–elements 8-13).[1] The summary serves to highlight the information presented in the graphs and tables.

1. The poverty gap in achievement refers to the difference in achievement between economically disadvantaged students and other students, where disadvantaged students are defined as those eligible for free/reduced price lunch.

Figure D-1. Elements 1 and 2 of the state profile

D

State X

1

Through the Comprehensive Assessment System, X administers exams in grades 4 and 7 in English language arts and grades 4 and 8 in mathematics. Scores are available for Hispanic and Black students, but there are too few Black students in grade 8 to provide a reliable comparison. State X uses four achievement levels for reporting purposes: *warning*, *needs improvement*, *proficient*, and *advanced*. Assessment scores based on 9 or fewer students are suppressed.

2

Summary of Comparisons

The results of comparisons between NAEP and state assessment results, which for 2003 are based on 189 schools in grade 4 and 145 schools in grade 8, are shown graphically on the following pages. A brief summary of the results follows:[1]

- **Standards.** The state's primary grade 4 mathematics performance standard (*proficient*) is close to the NAEP proficient level. This is also true for grade 8.
- **Trends.** Between 2000 and 2003, NAEP reported a gain in grade 4 in percent proficient, which the state did not. Between 2000 and 2003, the NAEP grade 8 gains in percent proficient are greater than the state assessment gains.
- **Gaps.** Overall, the Black-White gap in grade 4 in percent meeting the state's standard in mathematics in 2003 was greater when measured by NAEP compared to the state assessment. There were insufficient data for comparing the NAEP and state assessment measurement of the Black-White gap in mathematics in grade 8 in 2003. Overall, there were no significant differences between NAEP and the state assessment in measurement of the Hispanic-White gap in mathematics in grades 4 and 8 in 2003. There were insufficient data for comparing the NAEP and state assessment measurement of the poverty gap in mathematics in grades 4 and 8 in 2003.

1. All statements of differences are based on statistical tests at the 5% significance level. However, these results must be considered in the context of the available data. NAEP and state assessments may employ different test items, testing accommodations, and scoring methods; they may involve different students in each school, at different times of the year, with different motivational characteristics. At the present time, in spite of controlling for effects of school sampling, differences in standards, and NAEP exclusion rates, we cannot identify specific reasons for differences between NAEP and state assessment results.

Element 3
Position of standards in the achievement distribution

The position of the state's achievement standard thresholds on the NAEP achievement distribution in the state are based on mapping the percentages achieving state standards reported for schools participating in NAEP with the distribution of NAEP grade 4 or grade 8 performance in those schools.[2] In some cases, the state's standard is for an adjacent grade. In those cases, the assumption is made that the percentage of students meeting the state's standard for one grade would be approximately the same as the percentage meeting a standard the state might set for the next grade. The distributions are displayed for all states with available percentages achieving standards in NAEP schools.

Because Alabama, Tennessee, and Utah data files available for this report do not include percentages of students meeting standards, the state profiles for these states, unlike the other states, are based on the median percentile rank in each school, not the percentages meeting state standards. Therefore, no state standard thresholds are placed on the NAEP scale.

Element 4
Correlations of NAEP and state assessment school achievement

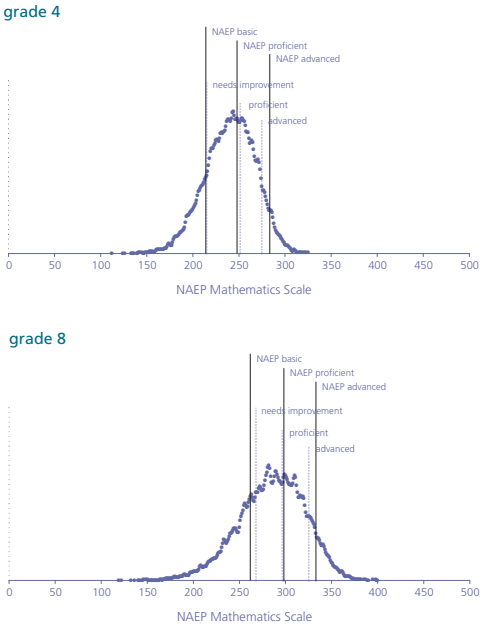
Based on schools participating in NAEP, this table displays correlations of percentages reported as meeting state standards with NAEP percentages of achievement meeting the estimated state standard in the same schools. For this display, NAEP has been rescored to estimate the percentages of students above the state's cutpoints indicated in element 3.

In states with multiple standards, one standard was identified for this report as the primary standard. In nearly every case, this is the standard that is used for reporting adequate yearly progress to the federal government. For Alabama, Tennessee, and Utah, the correlations are for median percentile ranks.

2. The figure plots the relative frequency of the NAEP plausible values in the state. Since the numerical values on the vertical axis (i.e., the relative frequencies, or more accurately, approximate probability densities) are solely a function of the fineness of the categorization of the continuous scale on the horizontal axis, it is neither meaningful nor appropriate to display numerical values for the vertical axis.

Figure D-2. Elements 3 and 4 of the state profile

Figure 1. Distribution of grades 4 and 8 NAEP mathematics achievement scores: 2003



3

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2003 Mathematics Assessment: Full population estimates. The National Longitudinal School-Level State Assessment Score Database (NLSLSASD) 2004.

Table 1. School-level correlations between NAEP and state assessment of percentages of students achieving state's mathematics standards: 2003

	Grade 4		Grade 8	
Standard	Correlation	Standard error	Correlation	Standard error
Needs Improvement	0.78	0.015	0.88	0.015
Proficient	0.82	0.008	0.87	0.012
Advanced	0.74	0.033	0.87	0.023

4

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2003 Mathematics Assessment: Full population estimates. The National Longitudinal School-Level State Assessment Score Database (NLSLSASD) 2004.

Element 5
Percentages of students with disabilities or English language learners

Because measurement of trends in achievement can be affected by changes in the percentages of students with disabilities (SD) or English language learners (ELLs), through their exclusion from testing or access to testing accommodations, information about these percentages are presented for NAEP assessments in 2000 and 2003. The percentages are presented separately for (1) English language learners (but not with a disability), (2) students with disabilities (who are not English language learners), and (3) English language learners who also have a disability. The percentages of students identified with disabilities or as English language learners who participated in NAEP without accommodations are not included in the table.

The percentages of students excluded from NAEP participation are based on the total student population. For example, if 10 percent of students have a disability and 40 percent of those with a disability are excluded, that means that 4 percent of the total student population is excluded. The use of full population estimates in this report is intended to minimize the effects of NAEP exclusions on the results of changes in achievement. Similarly, the percentages of students accommodated by NAEP are based on the total student population. In the example above, if 50 percent of the included SD/ELL students were accommodated, that would mean that accommodations were provided for 50 percent of the included 6 percent, or 3 percent of the total population.

Element 6
Comparison of NAEP and state assessment changes in achievement, based on NAEP schools

Achievement changes are presented as percentages meeting the states' standards in NAEP schools for state assessment results (lighter line) and for NAEP results (darker line). The standards are equated in the first year of analysis, forcing the percentages to match in the first year by definition. Differences between NAEP and state assessment achievement changes are revealed at the second point in time. Asterisks on the charts indicate statistically significant differences ($p<.05$) between NAEP and state assessment gains.

Comparisons of achievement changes are available only for states in which comparable state scores are reported across years. Many states changed tests or changed standards between 2000 and 2003 and, although data were available for the different tests, it is impossible to construct meaningful comparisons of NAEP and state assessment gains.

Element 7
State reported percentages meeting standard

The changes in achievement presented in element 6 are based on the NAEP sample of schools, weighted to represent the state. In most states, these results can be compared to reports issued by state education agencies on their websites.[3] These are shown in

3. The state-reported percentages were retrieved from state education agencies' websites in July 2004.

element 7. Ideally, the percentages in the table of state-reported achievement should match the state assessment percentages based on the NAEP sample of schools. However, in some cases state assessment scores were not available for all NAEP schools. This occurs, for example, when state assessment scores are for an adjacent grade and some NAEP schools do not include the grade tested, or when they have not been reported by the state.

Figure D-3. Elements 5, 6, and 7 of the state profile

STATE X D

5

Table 2. Percentages of English language learners and students with disabilities identified, excluded, and accommodated in the NAEP mathematics assessments, by grade: 2000 and 2003

	Grade 4		Grade 8	
Students	**2000**	**2003**	**2000**	**2003**
Identified	19.4	21.9	19.4	18.4
English language learner	5.1	3.8	3.0	2.0
Student with disability	13.7	17.0	15.6	15.2
Both	0.6	1.0	0.9	1.2
Excluded	2.7	2.9	2.7	3.1
English language learner	2.0	0.8	0.9	0.8
Student with disability	0.7	1.8	1.2	1.8
Both	0.0	0.3	0.6	0.5
Accommodated	10.1	15.0	8.8	10.8
English language learner	1.5	1.1	1.1	0.4
Student with disability	8.2	13.3	7.5	10.0
Both	0.5	0.6	0.2	0.5

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2000 and 2003 Mathematics Assessments.

6

Figure 2. Comparison of NAEP and state assessment achievement changes in percent meeting mathematics standards, by grade: 2000 and 2003

* NAEP and state assessment 2000-2003 changes are significantly different ($p < .05$).

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2003 Mathematics Assessment: Full population estimates. The National Longitudinal School-Level State Assessment Score Database (NLSLSASD) 2004.

7

Table 3. Percentage meeting mathematics standards as reported by state: 2003

Level	2000	2003
Grade 4	40.0	40.0
Grade 8	34.0	37.0

SOURCE: State education agency website.

Element 8
Comparison of NAEP and state assessment of the Black–White grade 4 achievement gap

Three graphs and a table on the third page of the profile pertain to measurement of an achievement gap in grade 4 in 2003. The graphs show comparisons of the gap as measured in NAEP schools (a) by state assessment and (b) by NAEP. In states in which at least 10 percent of public school membership is Black, the first achievement gap presented is the Black-White gap.[4]

The two graphs at the top of the page are population profiles of the achievement of Black and White students as indicated by state assessment results (lighter lines) and NAEP results (darker lines). Both graphs represent percentages meeting the primary state standard in the same sample of schools.[5]

Interpretation of the population profiles is as follows: imagine the students in a subpopulation (e.g., White students) lined up along the horizontal axis, sorted from those in the lowest scoring segments of the subpopulation at the left to the highest scoring segments of the subpopulation at the right. The graph shows the percentage of students in each student's school achieving the standard. For example, at the median (50th percentile) of the White student population, White students are in schools in which about 62 percent of the White students are achieving the standard (the dashed line on the following graph), as measured by both NAEP and the state assessment. By comparison, at the median (50th percentile) of the Black student population in the state, Black students are in schools in which about 33 percent of the Black students are achieving the standard (the solid line on the same graph).

The population gap profile in the lower left portion of the page displays the difference between the Black and White population profiles (i.e., the White profile is subtracted from the Black profile). The lighter line refers to state assessment of the gap; the darker line refers to NAEP assessment of the gap. The space between those two lines represents the difference between NAEP and state assessment of the gap. In this graph, it appears that both assessments, but especially NAEP, find the gap to be somewhat larger in comparing the lower halves of the subpopulations than in comparing the upper halves.

The table at the lower right summarizes the average differences in gaps and indicates whether the NAEP-State gap difference is significantly different from zero.[6] Positive numbers indicate that the state assessment found the gap to be larger, negative numbers the opposite. For example, in comparing the lower quarters of the subpopulations, NAEP found the gap to be 1.4 percent larger (i.e., the gap between

4. At least 10 NAEP schools with sufficient numbers of minority students were required for constructing a comparison.

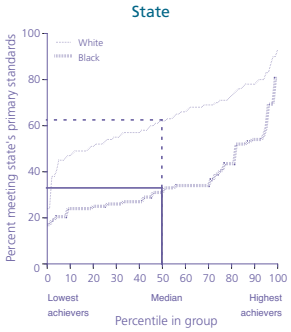
5. For Alabama, Tennessee, and Utah, states for which state reports of percentages meeting standards were unavailable, comparisons are based on median percentile scores.

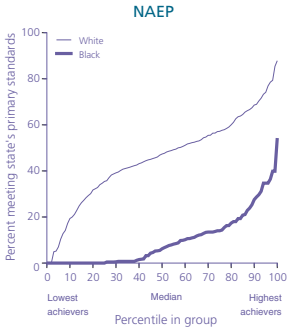
6. The significance was determined by a Student's *t*. However, it is important to examine the values of a Student's *t* before reaching conclusions about gap differences, because in the cases of small samples, large variations in percentages meeting standards can occur by chance.

the percentages of Black and White students meeting the standard was 1.4 percent greater when the NAEP measurements were compared than when the state assessment scores were compared.) However, Student's *t*-test indicates that these differences may well be random. In the top quarter, NAEP found the gap to be 12.4 percent larger with Student's *t* indicating that these differences are *statistically significant* for this gap comparison.

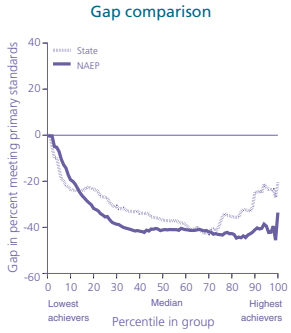
Figure D-4. Element 8 of the state profile

Figure 3. Comparison of NAEP and state assessment Black-White achievement gaps in percent meeting grade 4 mathematics standards: 2003





8



Population	Average NAEP-state gap difference
Overall	-5.5 *
Lower half	-3.3
Upper half	-7.8
Lower quarter	-1.4
Middle half	-4.3
Upper quarter	-12.4 *

* NAEP–State gap difference significantly different from zero ($p < .05$)

SOURCE: U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics, National Assessment of Educational Progress (NAEP), 2003 Mathematics Assessment: Full population estimates. The National Longitudinal School-Level State Assessment Score Database (NLSLSASD) 2004.

Elements 9-13
Other gap profiles

Gap profiles in the same form as element 8 are also included for grade 8 and for the Hispanic-White gap and the poverty gap where more than 10 percent of the students are in the subpopulation and sufficient data are available. All gap profiles are based on percentages of students in schools meeting achievement standards, and for small schools these percentages are subject to large random variations. Therefore, results from schools where very small numbers of minority students are enrolled and participate in the assessment are suppressed and are not represented in the population profiles. The *suppression threshold* for state assessment scores varies from state to state; however, in analyzing NAEP data, we omitted school-level percentages based on one or two students.