

## **Pandemic Effects on Student Attendance and Achievement during the 2020-21 School Year: Trends from Six Tennessee Districts**

*J. Edward Guthrie and S. Colby Woods*

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The 2020-21 school year was one of the most challenging years in a generation as districts and schools worked through myriad issues arising from the COVID-19 global pandemic. National studies have documented disruptions to student learning and engagement, and we have continued to see the concerning ways the pandemic has exacerbated long-standing racial and socioeconomic inequities within our school system. In a report on the impacts of the pandemic on the American education system, the Office for Civil Rights underscored the ways the pandemic has deepened inequities related to educational access and academic growth, particularly for students of color, students with disabilities, and English Learners.<sup>1</sup>

To help inform and support district decision-making and future planning throughout the 2020-21 school year, the Tennessee Education Research Alliance (TERA) worked with six school districts in Tennessee by monitoring, analyzing, and reporting on key trends in their data. TERA's first report from this work examined student engagement trends and enrollment and staffing needs from the 2020-21 fall semester.<sup>2</sup> We also reported on the results of student surveys administered during the fall and spring semesters of the 2020-21 school year<sup>3</sup> and the results of the spring 2021 Tennessee Educator Survey.<sup>4</sup> The results from these reports mirror those from national studies, shining a light on the many challenges Tennessee students and teachers face as schools and districts look to recover from a chaotic year.

As part of a continued effort to understand the ways the pandemic may have impacted student outcomes, this final report from our work with these partner districts presents trends in student attendance and achievement during the 2020-21 school year. Specifically, we describe key patterns in attendance data from six districts and state assessment data from five districts. Where possible, we compare patterns from the 2020-21 school year to previous years to contextualize results.

### **Key Findings:**

- 1** *Student chronic absenteeism was higher in the 2020-21 school year than in previous years, and nearly one in four students was classified as chronically absent by the end of the year.*
- 2** *Student chronic absenteeism increased as the 2020-21 school year progressed, especially among English Learners, students of color, and students who are economically disadvantaged.*
- 3** *In the 2020-21 school year, TNReady scores for grades 5-8 were significantly lower than previous years in both math and English, but with dramatically greater drops in math.*
- 4** *Drops in TNReady scores were largely consistent across student race, socioeconomic status, and prior achievement.*

Importantly, these results provide a unique view into what happened across six districts during a global pandemic, yet we also want to recognize the historic recovery efforts that have been underway in the time since we conducted these analyses. As a result of federal funding dedicated to pandemic recovery in schools, Tennessee received over \$4.5 billion for K-12 education to be spent between spring 2020 and fall 2024. Through three rounds of funding referred to as ESSER (Elementary and Secondary School Emergency Relief), over \$3.58 billion will flow directly to local school districts to decide how to spend. The state has also implemented several key initiatives designed to provide resources and provide direct support for districts as they continue to recover from the pandemic.

# SECTION 1: STUDENT ATTENDANCE

Throughout the pandemic, schools and districts have faced persistent challenges around student attendance. Previous studies have linked student absences with lower achievement, higher dropout rates, and worse socioemotional outcomes.<sup>5</sup> When looking at student attendance during the 2020-21 school year, we explored which students have missed the most instructional time during the pandemic and how trends might have changed over the course of the school year. As schools and districts develop long-term strategies for improving attendance, it will continue to be important to understand the various ways of measuring attendance, how attendance rates may ebb and flow at various stages of the pandemic, and which students are missing the most school.



## Data and Methods: How We Measured and Analyzed Student Attendance in Six Districts

For six districts, we examined overall descriptive patterns and student attendance differences across student characteristics (such as student race/ethnicity, economic disadvantage, English Learner status, and disability status) and school characteristics (school tier) using data from Tennessee’s Education Information System (EIS).

We examined historical trends by comparing school year 2020-21 absence data to previous years for K-12 students. For 2019-2020, we limited our full-year analysis to enrollment and attendance data as of March 15, 2020, when most Tennessee schools closed in response to the pandemic. For the 2020-21 school year, most of our attendance analyses relied on the absence rate, which is a proportional measure between the number of absences and the number of instructional days. As a result, we took into consideration the shorter school year of 2019-2020.

Collectively, the six districts serve over 155,000 students across approximately 250 schools. Table 1 describes the students and schools in these districts. Our previous report on fall semester trends focused on students enrolled by October 1, 2020, whereas this report includes students enrolled throughout the 2020-21 school year. While overall enrollment was down across

the districts (as reported in our mid-year report) over the course of the school year, these six districts saw an enrollment increase of around 4.5%, which is similar to trends seen in prior years.<sup>6</sup>

The findings in this section represent the patterns in these six districts, and therefore, are not representative of the state overall. Certain areas of this report focus on specific student subgroups and those samples will be described as necessary.

**TABLE 1. STUDENT AND SCHOOL CHARACTERISTICS ACROSS SIX DISTRICTS**

STUDENT CHARACTERISTICS	
Asian, Pacific Islander, and Indigenous students	5%
Black students	33%
Hispanic students	22%
White students	40%
Female students	49%
Economically disadvantaged students	36%
English learners	12%
Students with disabilities	13%

SCHOOL CHARACTERISTICS	
Elementary schools	50%
Middle schools	20%
High schools	20%
K-8/K-12/other schools	10%

*Note – numbers have been rounded to maintain confidentiality.*

# 1

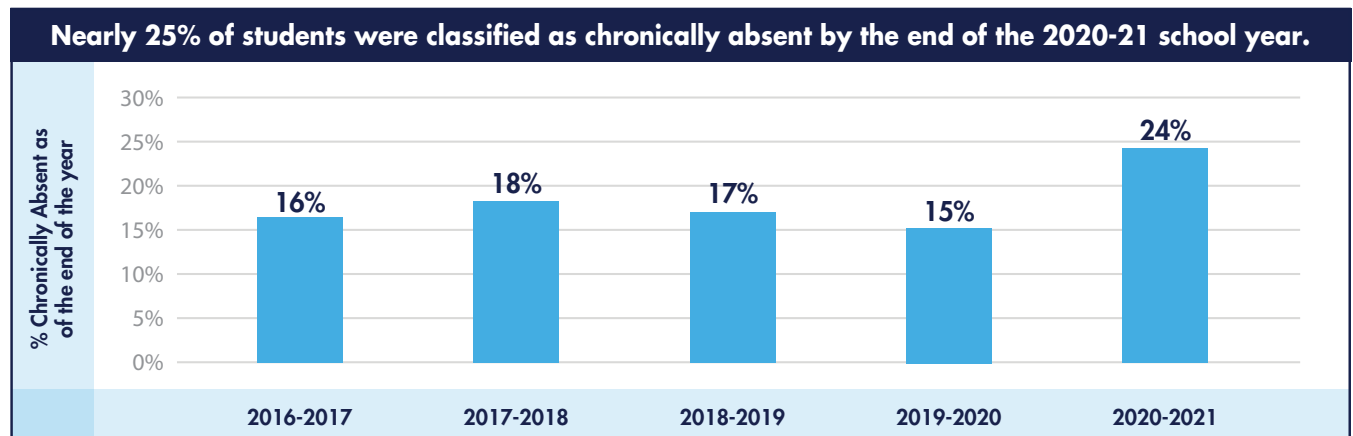
## KEY FINDING 1

**Student chronic absenteeism was higher in the 2020-21 school year than in previous years, and nearly one in four students was classified as chronically absent by the end of the year.**

Student attendance has been linked to other academic outcomes on student assessments and social-emotional learning outcomes.<sup>7</sup> Tracking changes over time allows schools to anticipate potential challenges they might face in the future, especially considering the disruption caused by the COVID-19 pandemic. More than any school year in the past, the 2020-21 school year was fraught with student absenteeism, and more students missed a concerning number of instructional days throughout the year.

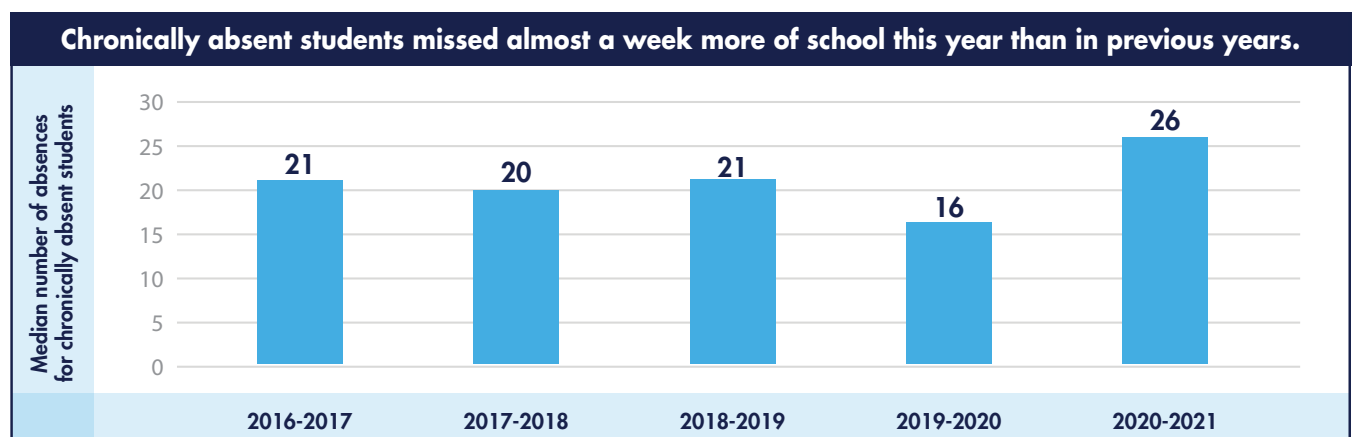
Tennessee defines students as chronically absent if they missed at least 10 percent of their instructional days. By the end of the 2020-21 school year, nearly 25% of students in the six districts were chronically absent, up from about 20% of students at the end of Fall 2020 and about 15%, on average, in previous years before the pandemic. Across each of the districts, chronic absenteeism rates varied from 3% to 31%, in part due to the different ways that districts took attendance during the 2020-21 school year, particularly for virtual students.

**FIGURE 1**



Importantly, not only were more students chronically absent, but they were missing much more school than in previous years. Figure 2 shows the median number of absences for students who were chronically absent over the past five years. In the 2020-21 school year, the standard chronically absent student missed 26 days, almost a full week more than the standard chronically absent student in a normal school year.

**FIGURE 2**



# 2

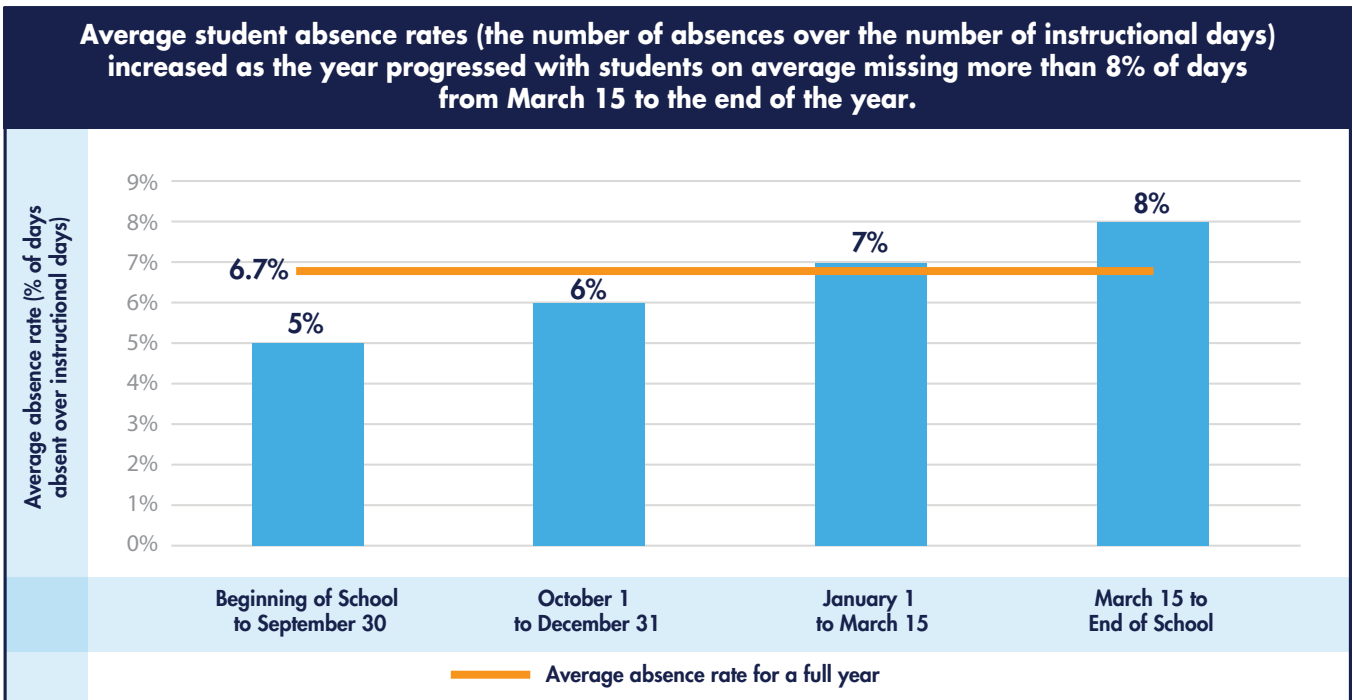
## KEY FINDING 2

**Student chronic absenteeism increased as the 2020-21 school year progressed, especially among English Learners, students of color, and students who are economically disadvantaged.**

Differences in student absenteeism over time and across student subgroups can appear even within the same school year. During the 2020-21 school year, changes in instructional modality (like switching from hybrid to fully in-person schooling) and changes in the community spread of COVID-19, likely affected students differently. Noting the increases or decreases during a particular time of the year or to a particular group of students can indicate a reaction to events or policies that ultimately influence a student's ability to go to school.

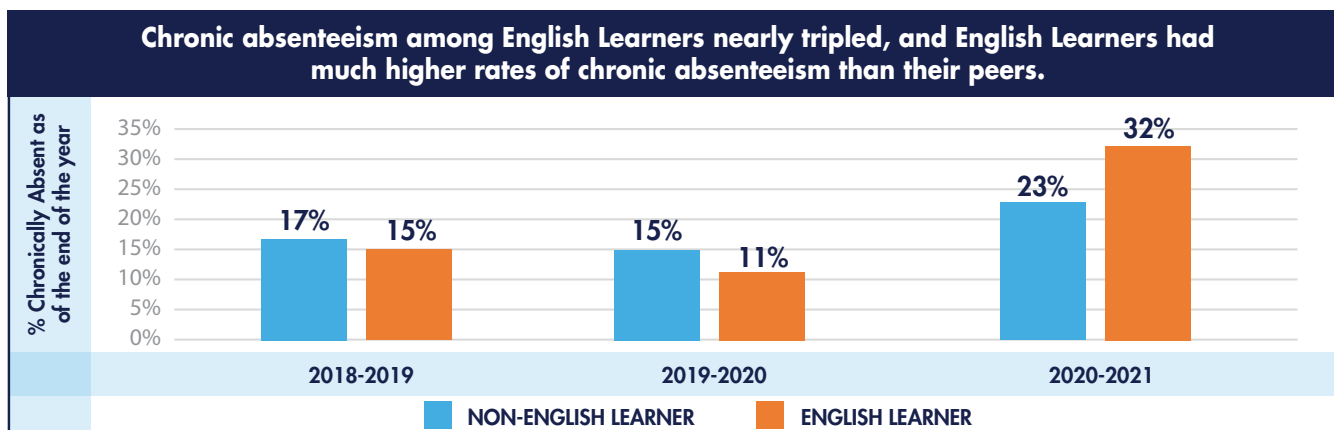
Looking at student attendance over the course of the 2020-21 school year, Figure 3 shows the average absence rate (the number of absences over the number of instructional days) during four similar quarters of the school year. Across our partner districts, the average absence rate for the school year was about 7%, and the rate increased as the school year progressed. Chronic absenteeism rates increased the most for high school students (28% chronically absent by the end of the fall semester compared to 33% at the end of the school year), then middle school students (23% compared to 26%), and then elementary students (15% compared to 18%).

**FIGURE 3**



Further, the concerning trends of chronic absenteeism across student subgroups seen in the fall semester of the 2020-21 school year (as discussed in TERA’s mid-year report) continued through the end of the school year. As shown in Figure 4, English Learners typically had lower rates of chronic absenteeism than their peers in previous years, but in the 2020-21 school year, nearly one-third of English Learners were chronically absent. Chronic absenteeism rates for English Learners increased in five of the six districts, and English Learners had higher chronic absence rates than their peers in four of the six districts.







**FIGURE 4**



Throughout the 2020-21 school year, rates of chronic absenteeism varied across both race/ethnicity and economic status. Similar to fall trends, chronic absenteeism rates were higher among Black and Hispanic students than White students and higher rates of chronic absenteeism among economically disadvantaged students than non-economically disadvantaged students. As illustrated by Table 2, these differences in chronic absenteeism rates by racial/ethnic background and economic disadvantage appeared even before the pandemic, but were larger in the 2020-21 school year than in past years.

**TABLE 2**

**Chronic absenteeism rates increased much more for Black and Hispanic students than White students.**

	2018-19 ABSENCE RATE	%CHANGE	2019-20 ABSENCE RATE	%CHANGE	2020-21 ABSENCE RATE
 <b>BLACK STUDENTS</b> Economically Disadvantaged	29%	-11%	25%	+71%	44%
 <b>BLACK STUDENTS</b> Not Economically Disadvantaged	12%	-6%	11%	+67%	18%
 <b>HISPANIC STUDENTS</b> Economically Disadvantaged	19%	-15%	16%	+115%	35%
 <b>HISPANIC STUDENTS</b> Not Economically Disadvantaged	13%	-17%	11%	+128%	25%
 <b>WHITE STUDENTS</b> Economically Disadvantaged	26%	-6%	24%	+33%	32%
 <b>WHITE STUDENTS</b> Not Economically Disadvantaged	10%	-3%	10%	+8%	10%

# SECTION 2: STUDENT ASSESSMENTS

The COVID-19 pandemic has upended the schooling experience for nearly every student in Tennessee and across the country. While the pandemic continues into 2022, the 2020-21 school year was particularly difficult, as in addition to COVID's direct effects on students, educators, and their families, many schools also wrestled with transitions to virtual and hybrid schooling for the first time. Understanding how the pandemic affected student achievement, especially during the 2020-21 school year, may better equip schools and districts for the coming years as they continue to recover from these disruptions.

In this section, we examine student achievement in English and mathematics during the 2020-21 school year to estimate whether, and to what extent, the COVID-19 pandemic disrupted student learning. Specifically, we explore how student achievement in the 2020-21 school year compared to what we would have expected to observe if there had been no pandemic, and how pandemic effects varied across different student characteristics, including academic subject area, grade level, student race, economic disadvantage, special education status, and prior achievement level.

## Data and Methods: How We Measured and Analyzed Student Assessments in Five Districts

The outcome measures for these analyses were TNReady and End-of-Course (EOC) scale scores from the five participating districts. For TNReady, we had student test scores from both math and English in grades 3-8. For EOC, we used English I, English II, Algebra I, and Algebra II, as these tests are the ones most universally taken by high schoolers.<sup>8</sup> We matched test scores to student demographic characteristics including economic disadvantage,<sup>9</sup> student race-ethnicity, and an indicator for students qualifying for special education services.<sup>10</sup>

Tennessee students first took the TNReady test battery in the 2016-17 school year, and again in 2017-18 and 2018-19 before the state canceled testing for the 2019-20 school year in light of the unfolding pandemic. These three pre-pandemic years of data provided the baseline against which we contrasted performance in 2020-21 to estimate the effect the pandemic had on student achievement.



# 3

## KEY FINDING 3

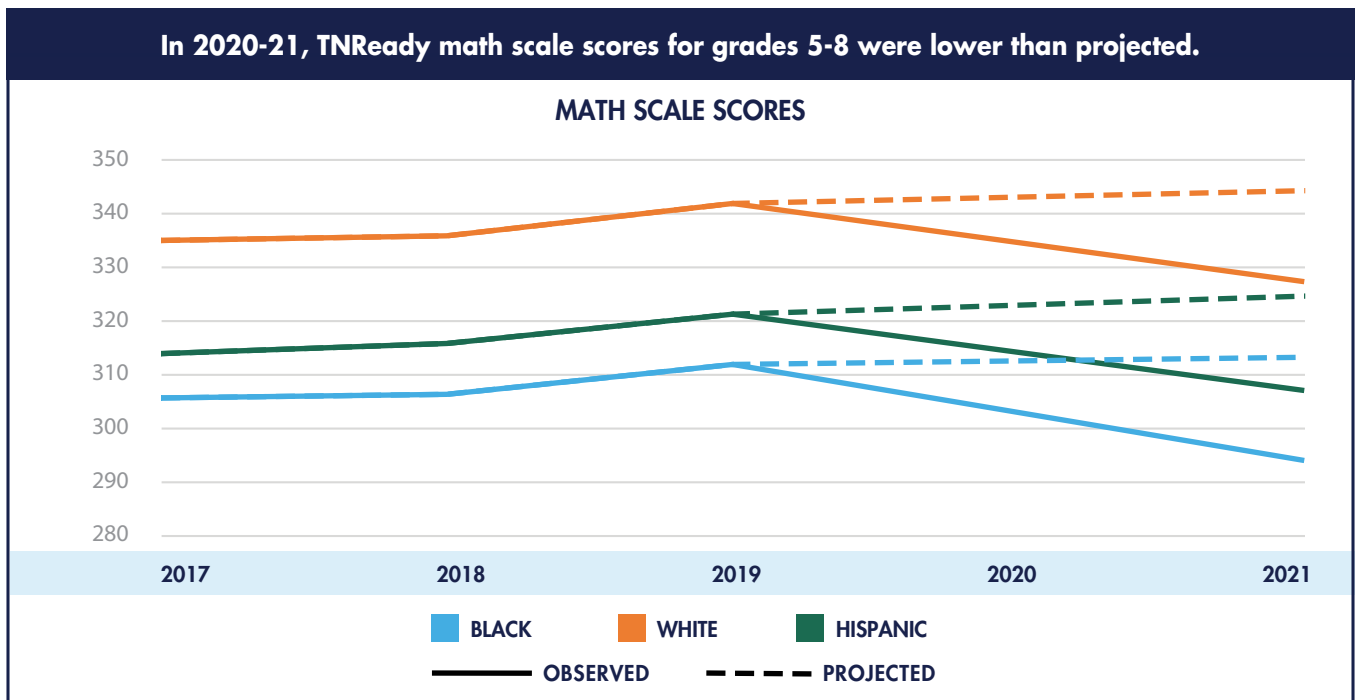
**In the 2020-21 school year, TNReady scores for grades 5-8 were significantly lower than previous years in both math and English, but with dramatically greater drops in math.**

Understanding how the disruption of schooling during the 2020-21 school year may have impacted student learning will better enable schools and districts to make important decisions for how to target supports as they continue to recover from the pandemic.

To estimate the impact of the pandemic on student achievement, we used pre-pandemic data to generate an informed projection of how students in our partner districts would have been expected to perform in the absence of any disruptions, and we compared these projections to the test scores we observed in the 2020-21 school year. This framework allowed us to estimate the size of pandemic effects while controlling for other factors, and also to assess whether the differences in achievement represented statistically significant differences from achievement in the 2016-17, 2017-18, and 2018-19 school years. Each model includes a test fixed effect (grade-by-subject for 3-8 TNReady, course-specific for high school EOC exams). The overall model controls for student race-ethnicity, economic disadvantage, special education status, and prior achievement;<sup>12</sup> subgroup analyses control for prior achievement only.

Figure 5 offers a visual representation of the impacts the models attempt to estimate. The solid line for each racial group represents the observed trajectory of aggregate TNReady math scores from 2016-17 through 2020-21. The dotted lines represent a projected trajectory of these scores in the absence of pandemic disruption from 2018-19 to 2020-21 based on the prior trend and any changes in the composition of student demographics or prior performance.

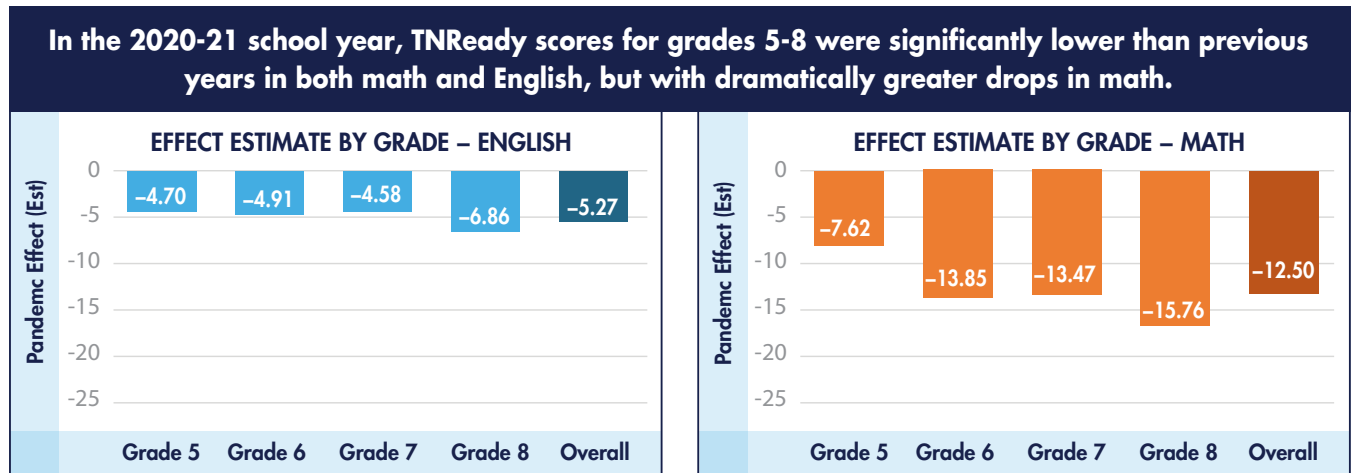
**FIGURE 5**



In this charting of results, TNReady math scores in 2021 across these five districts were a) below those observed in any of the prior years, b) below the scores otherwise projected by the model, and c) similarly below prediction for each of the three major racial/ethnic categories represented in the sample.

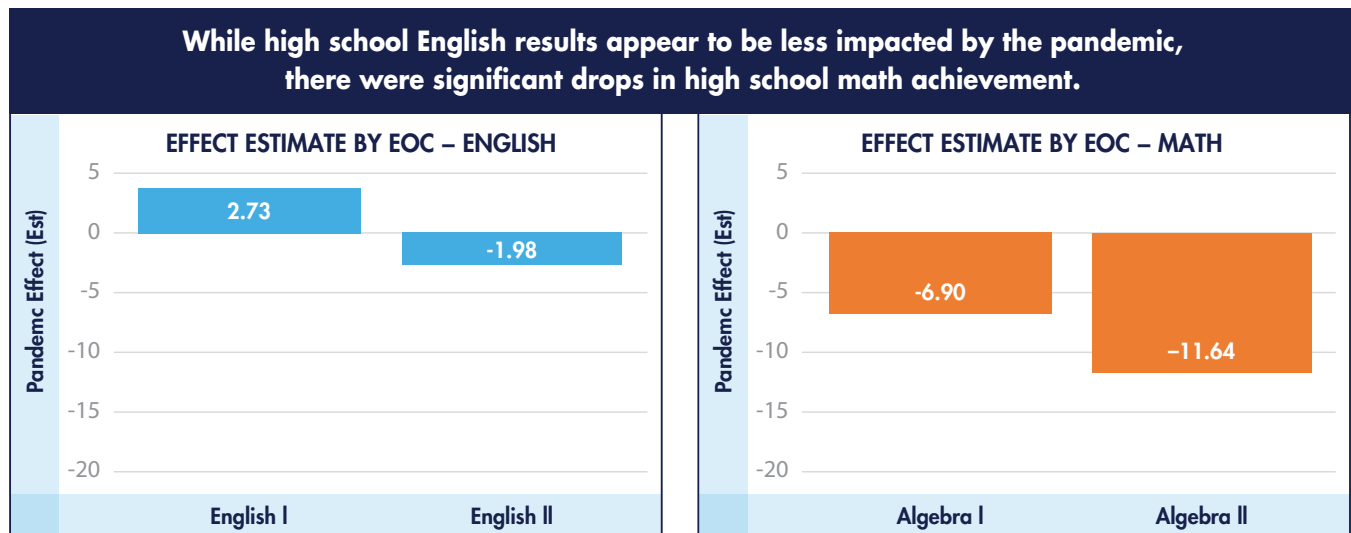
Going deeper, Figure 6 presents student achievement results by grade level as well as overall for TNReady scores in grades 5-8. Focusing first on the overall figures, we observe estimated drops of -5.27 scale score points for English scores and -12.50 points for math. This represents a drop of roughly 16% of a standard deviation in English (14% to 20% by grade) and a whopping 30% of a standard deviation drop in mathematics (17% to 40% by grade).<sup>13</sup> All effects for both subjects across each grade and overall are statistically significant.

**FIGURE 6**



For high school end-of-course exams, the results follow a similar (but less severe) pattern to that of TNReady scores in lower grades. As shown in Figure 7, the pandemic did not appear to have a negative impact on English I scores, though the estimated effect of -1.98 scale score points in English II is statistically significant and represents roughly 15% of a standard deviation. In Algebra, effect estimates are statistically significant in both Algebra I and Algebra II, with impacts of -6.90 scale score points in Algebra I and -11.64 scale score points in Algebra II representing about 25% and 40% of a standard deviation, respectively.

**FIGURE 7**





# 4

## KEY FINDING 4

**Drops in TNReady scores were largely consistent across student race, socioeconomic status, and prior achievement.**

Next, we examined how student subgroups may have differentially experienced the pandemic itself, the resulting disruptions to schooling, or both, to better understand whether schools and districts might need to craft recovery strategies to offset any such differences. Beginning with students' race-ethnicity for TNReady shown in Figure 8, we estimate substantial and statistically-significant negative effects across the five districts among Black, Hispanic, and white students separately, with smaller effects among non-white students in English and smaller effects for Hispanic students in math.

**FIGURE 8**

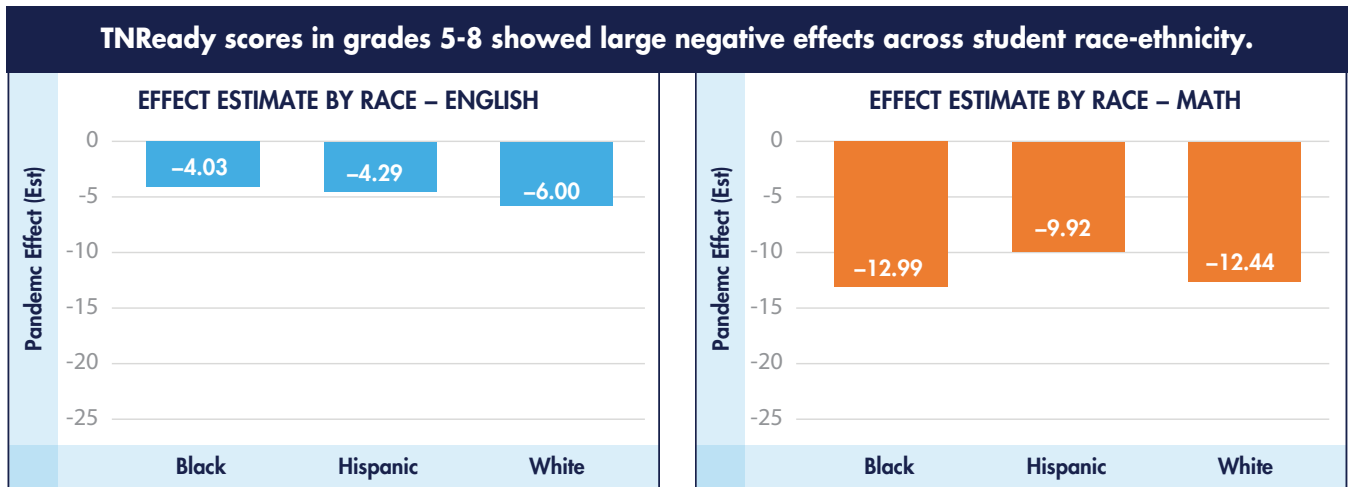


Figure 9 illustrates the effects among high school EOC test takers, with English I and II combined as “English” and Algebra I and Algebra II combined as “math.” Negative effects on student learning were almost twice as large among White students as compared to their non-white peers, close to 20% of a standard deviation in English (-2.4 scale score points) and 50% of a standard deviation in math (-13.2 scale score points). Across our EOC subgroup analysis, there were larger negative effects among white students than their non-white peers, and larger negative effects among non-economically disadvantaged students than their economically disadvantaged peers.

**FIGURE 9**

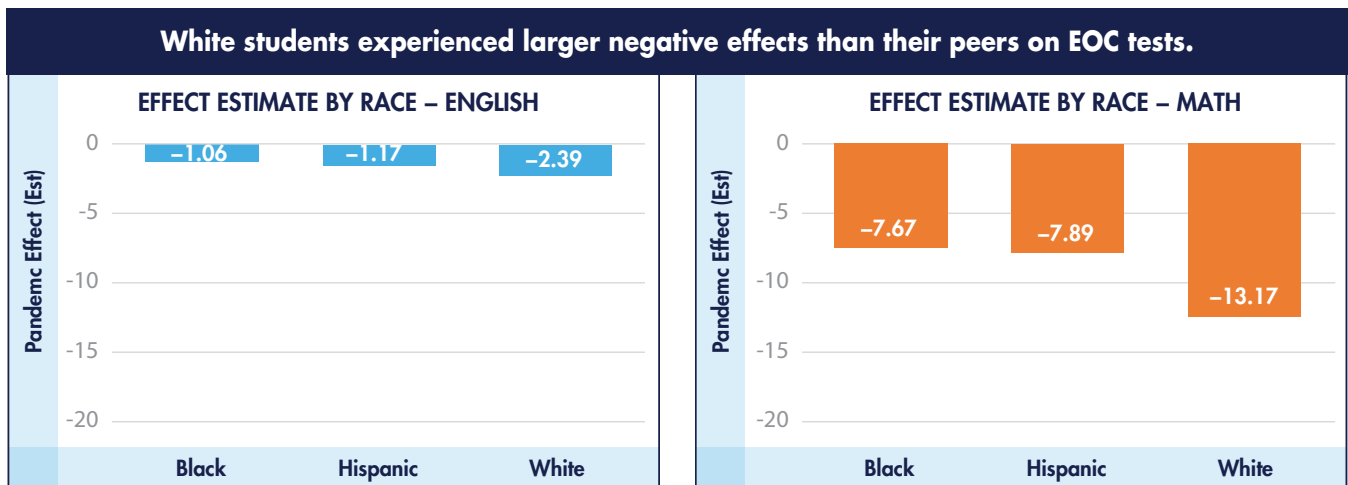


Figure 10 shows TNReady results for different learner subgroups. There were comparable negative effects between economically disadvantaged and non-disadvantaged students in math, while in English the estimated effect is larger among non-ED students. Learning effects for students with disabilities appear to be less pronounced than their peers' in both English and math.

**FIGURE 10**

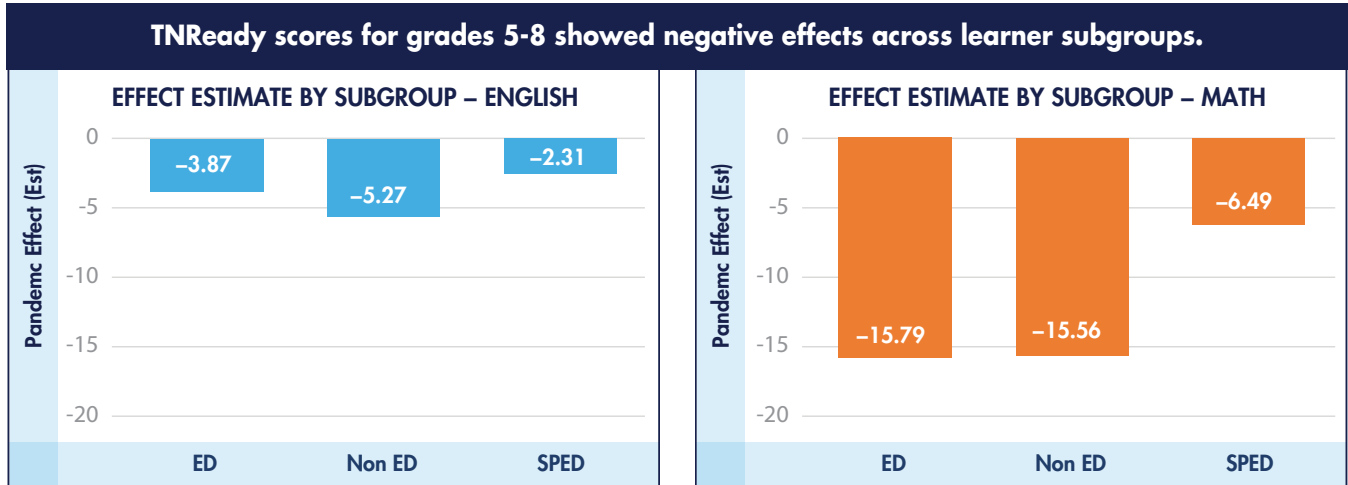
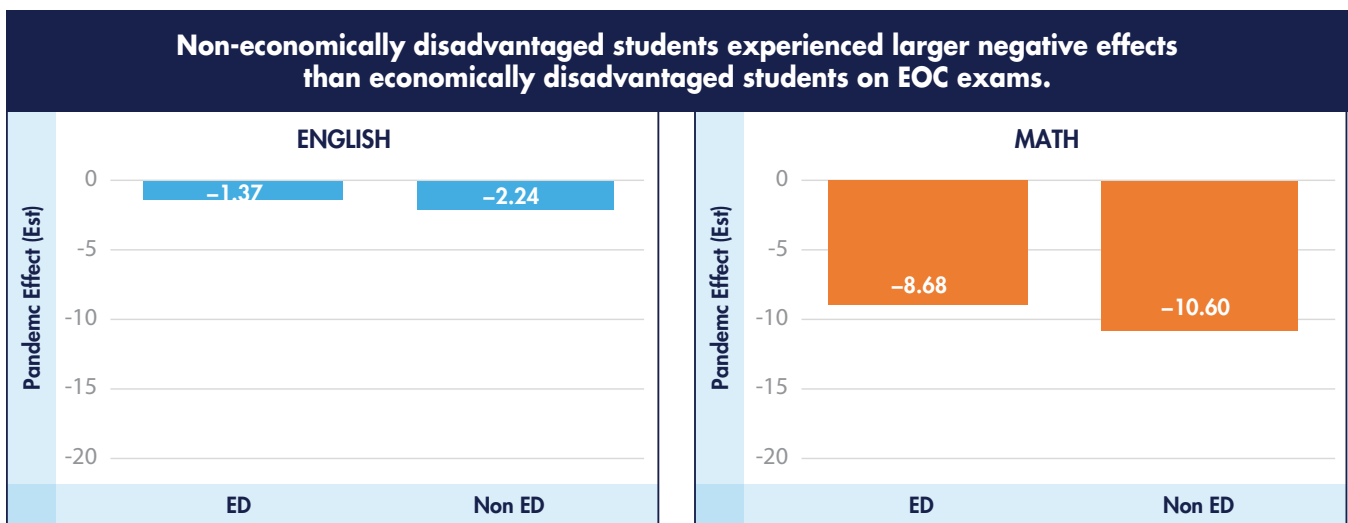


Figure 11 shows the EOC results by economic status, where there were larger negative effects among those not classified as economically disadvantaged, similar to the pattern observed in English for younger learners.

**FIGURE 11**



Finally, we examined pandemic effects by prior student performance to understand how students at various achievement levels were affected by the pandemic. For this analysis, we divided student performance from 2019 into performance quintiles. Prior student performance increases from left to right across each graph in Figure 12, with “Quint 1” representing the 1st quintile of performance, or students whose 2019 TNReady performance placed them at or below the 20th percentile and “Quint 5” representing the 5th quintile, or those who performed above the 80th percentile in 2019.

Most critically, we looked for evidence that the pandemic had larger effects on lower-achieving students, which would have signaled growing inequality in student achievement. This does not appear to have been the case. Instead, in English there was a pattern of increasingly negative effects from lower-performance to higher-performance. In math, estimated effects were largest in the middle three quintiles, with smaller effects estimated at either tail of the distribution.



**FIGURE 12**

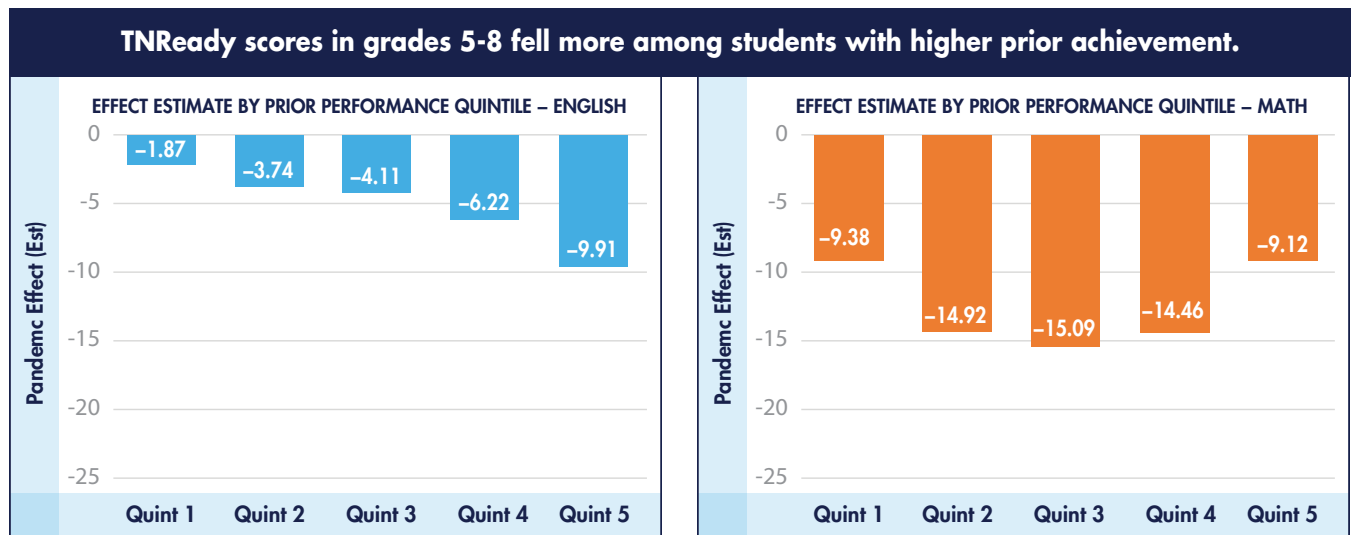
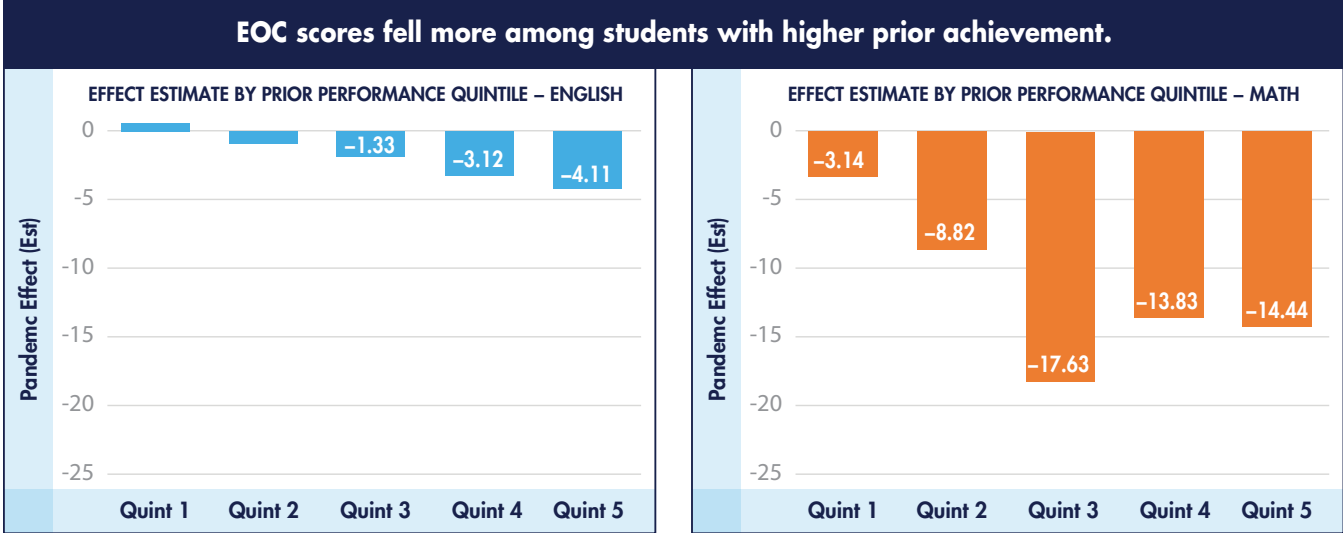


Figure 13 presents the same prior performance analysis for EOC test takers, in this case dividing all students by their scores from the same-subject TNReady tests they took as 8th graders. Among English test-takers, the pattern of effects in EOC exams is similar to what we see from TNReady results in Figure 12. That is, the estimates do not suggest that the pandemic was particularly detrimental to the most at-risk students; rather, effects appear to be inversely correlated with prior performance, with the largest negative effects occurring among the highest performers. The progression of effects between each successive quintile was not as consistent in math, though the pandemic appears to have had greater impact on students who were at or above the median of the performance distribution (3rd, 4th, and 5th quintiles) than those whose prior performance was at or below the 40th percentile (1st and 2nd quintiles).

**FIGURE 13**



# CONCLUSION AND IMPLICATIONS



The COVID-19 pandemic continues to challenge how students access and engage in schooling. With our partner districts, we examined student absenteeism trends and the impact of the pandemic on student achievement during the 2020-21 school year.

Overall, we find clear and consistent evidence that an increase in chronic absenteeism in the 2020-21 school year across six districts exacerbated long-standing inequities between various student groups and that student performance in five districts fell far short of what we would have expected to observe in the absence of the pandemic.

Though the learning impacts were large and significant in English, the most severe negative effects on student learning across all grades, demographics, and levels of prior performance appear to have occurred in math.

Generally speaking, the negative effects of the pandemic on math scores estimated in these analyses are much larger than the gains from even the most successful educational interventions and may take historic levels of support to recover.

Additionally, we find little evidence in our five-district sample that the pattern of effects increased pre-existing inequities in educational performance. That is, the pandemic does not appear to have had a greater negative effect on student achievement for lower-performing students or historically disadvantaged student groups within the project sample.

Importantly, these analyses were only completed in collaboration with TERA's partner districts and the findings cannot be generalized to the entire state.

**Based on the analyses above, our partner districts many want to consider the following strategies as they work to recover from the pandemic:**



- **Implement recovery strategies with more universal (rather than only targeted) learning supports.** Districts and schools looking to bring student achievement back to pre-pandemic levels should implement interventions that offer intensive supports to all students rather than only targeted subgroups. Achievement deficits are large and may require unprecedented supports from all levels and actors in order to recover.



- **Continue monitoring absenteeism trends across multiple student characteristics.** Because of the importance student attendance to many other student outcomes, it is vital for schools and districts to continue to monitor absenteeism trends across multiple student characteristics to ensure that all students remain engaged during the pandemic.

## State Supports for District Recovery

With the infusion of ESSER funds, the Tennessee Department of Education launched several key initiatives in summer 2021 to support districts in their pandemic recovery efforts.



- **Best for All Recognition Program** – The Tennessee Department of Education recognizes districts and charter schools that strategically planned for and invested ESSER 3.0 funds in ways that are likely to accelerate student achievement. To qualify for the Best for All recognition program, a district or charter school must spend 50% of its ESSER 3.0 award amount on proven, research-based strategies to raise student academic achievement and participate in the TN ALL Corps tutoring grant program to provide students with high dosage, low ratio tutoring opportunities.



- **TN ALL Corps** – Launched in 2021, TN All Corps provides districts with an opportunity to apply for grants to either implement new, robust tutoring programs, or strengthen the programs they were already running. Through TN All Corps grants, districts have the flexibility to design their own tutoring supports based on their local need, so long as they meet the grant criteria of providing a strong, high-dosage/low-ratio program that will drive outcomes for students.



- **Reading 360** – To help support literacy development across the state, the Tennessee Department of Education launched **Reading 360**, which includes optional reading resources, grants, and supports for phonic-based instruction at no extra cost to districts and families

In addition to the initiatives outlined above, the Tennessee Department of Education also created a spending template to assist districts in the development of their ESSER spending plans. In the coming years, the state department will continue to innovate and provide critical resources for districts as they work to best support their students through historic pandemic recovery efforts.



# APPENDIX

Table 1A further contextualizes TNReady and EOC scores by showing how the mean and standard deviations of these tests changed across time in the three years of pre-pandemic data available. Both the mean and standard deviation of each test are relatively stable across years, with some exceptions in math: the TNReady math average jumped by five and a half points (from 324.7 to 330.2) between 2017-18 and 2018-19, though the standard deviation was relatively more stable (42.9 vs 41.6). In Algebra II, the average dipped by almost five points from 2016-17 to 2017-18 (300.8 to 296.1) and then increased again by almost eight points (to 304.0) in 2018-19, and the standard deviation swelled by more than five points to 31.9 in 2017-18 compared to what it was in both 2016-17 (26.5) and again in 2018-19 (25.8).

Using these three years of data to establish a baseline, we generally observe that scores for a given subject in a given year may deviate from their central tendency by a point or two in English (5% of a standard deviation) and three to four points in math (10% of a standard deviation).

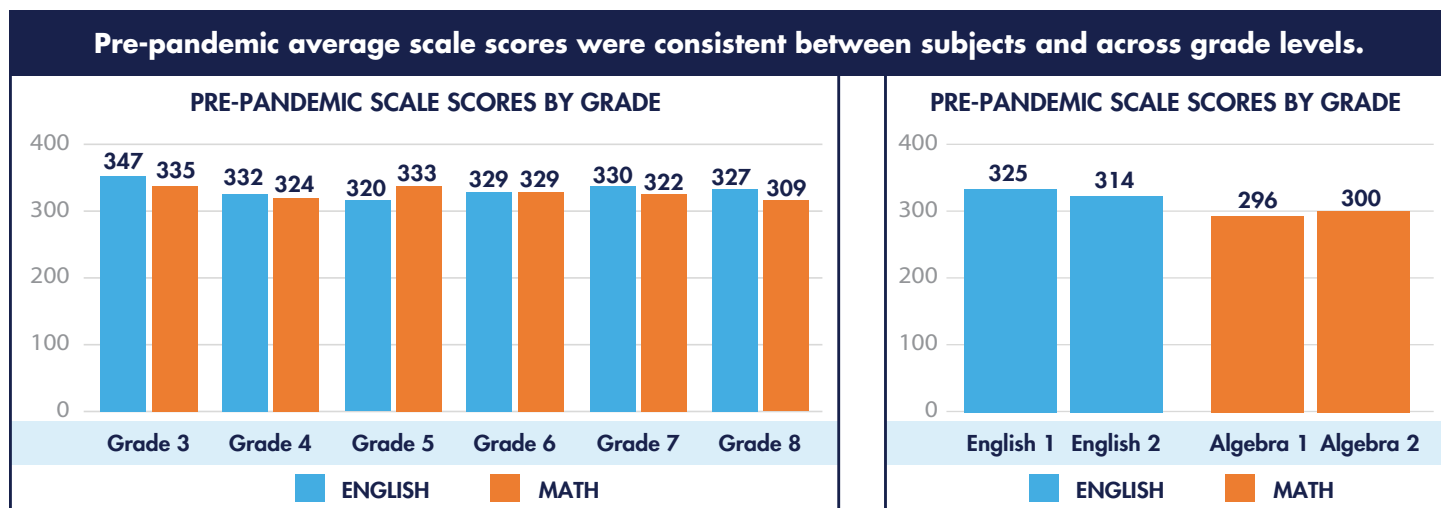
**TABLE 1A: Means and Standard Deviations for TNReady and EOC exams in baseline years.**

TNReady	2017		2018		2019	
	MEAN	S.D.	MEAN	S.D.	MEAN	S.D.
ELA	329.8	34.9	330.5	33.2	330.3	34.1
MATH	324.3	41.0	324.7	41.6	330.2	42.9

EOC	2017		2018		2019	
	MEAN	S.D.	MEAN	S.D.	MEAN	S.D.
English I	324.8	15.0	324.1	13.9	327.2	14.1
English II	314.8	14.1	312.8	12.0	315.6	11.7
Algebra I	296.5	29.3	293.1	31.4	298.8	29.1
Algebra II	300.8	26.5	296.1	31.9	304.0	25.8

Figure 1A displays average scale scores across grades 3 through 8 for TNReady scores in English (blue) and math (red). Notably, TNReady exams are scaled such that average scores are relatively consistent between the two subjects as well as across grade levels. This allows us to use and interpret scale score points as a consistent unit of measure for analysis across grades for both subject areas.<sup>11</sup>

**FIGURE 1A**



# END NOTES

- 1 U.S. Department of Education: Office for Civil Rights. (2021). *Education in a pandemic: The disparate impact of COVID-19 on America's Students*. <https://www2.ed.gov/about/offices/list/ocr/docs/20210608-impacts-of-covid19.pdf>
- 2 Patrick, S. K., Woods, S. C., Bala, N., & Santelli, F. A. (2021). *Schooling during COVID-19: Fall semester trends from six Tennessee school districts*. Tennessee Education Research Alliance. [https://peabody.vanderbilt.edu/TERA/files/covid19\\_fall\\_semester\\_trends\\_FINAL.pdf](https://peabody.vanderbilt.edu/TERA/files/covid19_fall_semester_trends_FINAL.pdf)
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- 4 Jung, J. & Patrick, S. K. (2021). *Educator insights from a year of pandemic schooling: Trends from the 2021 Tennessee Educator Survey*. Tennessee Education Research Alliance. [https://peabody.vanderbilt.edu/TERA/2021\\_Tennessee\\_Educator\\_Survey.php](https://peabody.vanderbilt.edu/TERA/2021_Tennessee_Educator_Survey.php)
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- Gottfried, M. A. (2019). Chronic absenteeism in the classroom context: Effects on achievement. *Urban Education*, 54(1), 3-34.
- 6 Between our mid-year report and this full-year report, we noticed an issue with the attendance data for the 2018-2019 school year. While this does not substantively change our previous results, trends reported for 2018-2019 look slightly different in this report than our mid-year report.
- 7 Santibañez, L. & Guarino, C. M. (2021). The effects of absenteeism on academic and social-emotional outcomes: Lessons for COVID-19. *Educational Researcher*, 50(6), 392-400. <https://doi.org/10.3102/0013189X21994488>
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- 8 The tests most universally taken by high schoolers not only optimizes our sample size, it also minimizes selection bias in the sample of test takers.
- 9 "Economic Disadvantage" as designated and reported by the state.
- 10 "Gifted" is excluded as a special education status for the purposes of this brief.
- 11 Table 1A in the appendix displays the means and standard deviations of TNReady and EOC scores in the three years of pre-pandemic data available.
- 12 This lagged achievement control pulls from two years prior because the canceled testing in 2019-20 means that no scores from 2020-21 have a one-year lag option. Because our outcome year necessarily has a two-year lagged control, we use the same for the other years of testing. That is, the model then estimates how 8th grade students performed in 2021 relative to how 8th grade students performed in 2017, 2018, and 2019, controlling for how those 8th graders in each year had performed two years earlier as 6th graders. Because of the two-year lag, and because 3rd grade is the earliest grade in which students are tested, 5th grade is the earliest grade for which we have results. Our TNReady results are therefore from 5th, 6th, 7th, and 8th grades. To adjust for systematic differences in scale scores across grade levels, we employ a grade-level fixed effect.
- 13 For more information, see Table 1 in the technical appendix
- 14 The contrast between this and findings from other research (e.g. Kuhfeld, Soland, & Lewis, 2022) may owe to the relative prevalence of schools with extreme concentrations of poverty in our limited five-district sample. Testing this hypothesis may require either further analysis with a broader sample of Tennessee districts or more localized examination of data used for national studies. If the widening of achievement gaps at the national or state level is driven by values (or ranges of values) of concentrated poverty seldom observed within a given district, our recommendation to implement universal student supports should stand as valid for the majority of district and school leaders.

