STRATEGIC DATA PROJECT

SDP COLLEGE-GOING DIAGNOSTIC

Tennessee Department of Education

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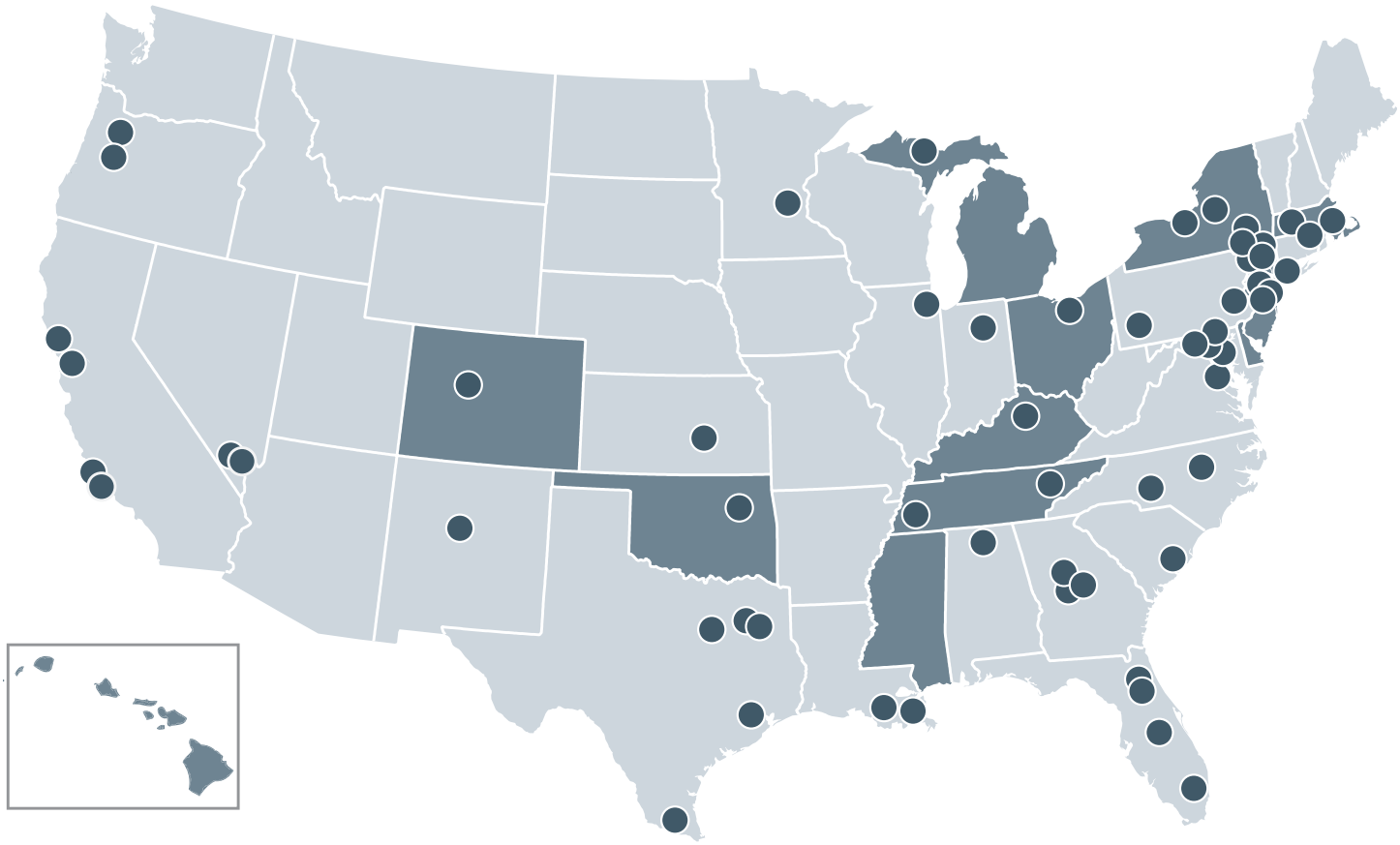

THE STRATEGIC DATA PROJECT (SDP)

Since 2008, SDP has partnered with 75 school districts, charter school networks, state agencies, and nonprofit organizations to bring high-quality research methods and data analysis to bear on strategic management and policy decisions. Our mission is to transform the use of data in education to improve student achievement.

Part of the Center for Education Policy Research at Harvard University, SDP was formed on two fundamental premises:

1. Policy and management decisions can directly influence schools' and teachers' ability to improve student achievement.
2. Valid and reliable data analysis significantly improves the quality of decision making.

SDP's theory of action is that if we are able to bring together the right people, assemble the right data, and perform the right analysis, we can help leaders make better decisions—ultimately improving student achievement significantly.

To make this happen, SDP pursues three strategies:

1. Building a network of top-notch data strategists who serve as fellows for two years with our partners (e.g., school district, charter management organization, nonprofit, or state education agency).
2. Conducting rigorous diagnostic analyses of teacher effectiveness and college-going success using agency data.
3. Disseminating our tools, methods, and lessons learned to the education sector broadly.

The project is supported by the Bill & Melinda Gates Foundation.

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Introduction and Background

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A few generations ago, a high school diploma opened the door to skilled jobs and middle-class earnings. Today, a college diploma is essential to accomplish the same goals. Postsecondary education, whether in the form of a two- or four-year college or a technical program, has become a critical step to achieving stable employment and financial security. These trends, coupled with the fact that an individual with a bachelor's degree will earn approximately $844,000 more, on average, over his or her lifetime than a high school graduate, underscore the importance of preparing students to graduate from high school with the knowledge and skills to successfully complete higher education (U.S. Census Bureau, 2011).

Given these patterns, we at the Strategic Data Project (SDP) designed a set of analyses called the SDP College-Going Diagnostic as a means to:

1. Better inform leaders of school districts and state education agencies about the college-going outcomes of their students; and
2. Identify potential areas for action to increase students' levels of academic achievement, preparedness for college, and postsecondary educational attainment.

The diagnostic is a collection of analyses that can help high schools, districts, and states better understand their current performance, set future goals, and plan responses strategically. Additionally, the diagnostic is meant to demonstrate more broadly how education agencies can capitalize on existing data to inform decision making. Diagnostic analyses are completed by members of SDP's research team at the Center for Education Policy Research at Harvard University with the support of staff at the collaborating education agencies.

In the summer of 2013, SDP launched a College-Going Diagnostic research collaboration with the Tennessee Department of Education (TDOE) as part of a larger partnership between the two organizations.[1] In defining the scope of work for this project, TDOE policymakers were particularly interested in investigating how students' transition from high school to postsecondary education differed across schools, regions, and student subgroups. In recent years, Tennessee had made great strides in raising high school graduation rates, but state policymakers and practitioners had less information about how many of their students—and which students—made a successful transition to postsecondary education. To investigate the high-school-to-postsecondary transition in greater depth, SDP tailored the College-Going Diagnostic to examine the extent to which Tennessee high school students faced specific barriers to postsecondary enrollment, such as inadequate academic preparation for college-level coursework and limited college access.

This research collaboration was timely given recent developments in Tennessee's education policy and research resources. As SDP's collaboration with TDOE was beginning, Tennessee Governor Bill Haslam launched a number of initiatives related to higher education. With the slogan "Mission: Workforce Ready," the Governor's Drive to 55 initiative aims to have 55% of the state's residents "equipped with a college degree or certificate by the year 2025" (Drive to 55 Alliance, 2014). The Tennessee Promise provides two years of free tuition to qualifying graduating seniors seeking degrees from community colleges or colleges of applied technology in Tennessee (Tennessee Promise, n.d.). The SAILS program attempts to reduce the need for mathematics remediation in college by enrolling low-achieving students in a math development class in their senior year of high school (Chattanooga State

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Introduction and Background

Community College, n.d.). Lastly, in 2013, the Tennessee legislature authorized a two-year pilot program that waives examination fees for students enrolled in Advanced Placement courses at select schools, while TDOE added a second program aiming to expand access to Advanced Placement courses in rural districts.

At the same time the state was implementing these new policies, faculty and research staff at the University of Tennessee's Center for Business and Economic Research (CBER) were launching a new longitudinal data warehouse that combines data from a number of state agencies, including the Tennessee Department of Education and the Tennessee Higher Education Commission. SDP was one of the first external organizations to rely on this new data system, and the College-Going Diagnostic was greatly enhanced by the ability to work with CBER's research staff to obtain rich state data on key indicators related to K–12 and postsecondary education.[2]

This report summarizes key findings from the College-Going Diagnostic. It is organized as follows: Section I provides an overview of Tennessee students' progress along a five-year college-going pathway—from entering ninth grade through enrolling in a postsecondary institution upon high school graduation. Section II presents the results from customized analyses related to the several barriers that high school students face as they transition from high school to postsecondary education. Appendix A includes maps that highlight how district-level postsecondary enrollment rates differ across geographic regions in the state.

The analyses were completed by members of the research team at the Center for Education Policy Research at Harvard University with the support of staff and SDP Fellows at the Tennessee Department of Education.

Sources of Postsecondary Enrollment Records for Tennessee Students

The National Student Clearinghouse (NSC), a nonprofit organization that provides enrollment verification for colleges and universities, was the primary data source for postsecondary enrollment records. The NSC maintains student enrollment records for more than 3,600 institutions of higher education throughout the United States, which collectively serve 98% of all postsecondary students nationwide and 85% of postsecondary students in Tennessee.[3] We increased this coverage rate to 89% by obtaining enrollment records for the Tennessee Colleges of Applied Technology, which do not participate in the NSC. However, the remaining non-NSC institutions are still excluded and, in a number of instances, students may file requests for privacy that prohibit the disclosure of their records, as authorized under the Family Educational Rights and Privacy Act (FERPA). As a result, actual enrollment rates in Tennessee may be higher than those reported here.

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Key Findings

Section I. Student Progression From Ninth Grade Into College

- For every 100 first-time ninth graders who enroll in public high schools in Tennessee, 87 graduate high school within four years and 44 enroll in a postsecondary institution seamlessly: 29 in a four-year institution and 15 in a two-year institution.
- Economically disadvantaged students are 12 percentage points less likely to complete high school and only half as likely to enroll in postsecondary education, compared with non-economically disadvantaged students.

Section II. Barriers to Postsecondary Enrollment

- Just over half of all high school graduates in Tennessee enroll in postsecondary institutions seamlessly. For many high schools, postsecondary enrollment rates are substantially lower.
- Factors at the source of low postsecondary enrollment may differ across schools and student groups, suggesting different policy and programmatic responses.
- This report examines five categories of barriers to students' successful transition from high school to postsecondary education: low college readiness, low college readiness among students with strong middle school performance, low college access among college-ready students, disparities in college readiness by economically disadvantaged status, and disparities in college access by economically disadvantaged status.

Low College Readiness

- Thirty-eight percent of high school graduates in Tennessee are college-ready.
- College readiness varies widely across schools: At several high schools, not a single graduate is college-ready; at other schools, nearly all students graduate college-ready.
- Ninety-four high schools are categorized as having low college readiness, with fewer than 25% of their graduates receiving an ACT score of 21 or higher.

Low College Readiness Among Graduates With Strong Middle School Performance

- In Tennessee, 85% of graduates with high eighth-grade test scores are college-ready upon graduating from high school. Across high schools, these rates vary from 44% to 100%.
- Fifty-eight schools are categorized as having low college readiness among students with strong middle school performance.

Low College Access

- Only 80% of college-ready graduates in the state enroll in postsecondary education seamlessly. Across high schools, the enrollment rate of these graduates varies from 46% to 92%.
- Forty-seven high schools are categorized as having low college access, with fewer than 70% of their college-ready graduates enrolling in postsecondary education.

Disparity in College Readiness, by Economically Disadvantaged Status

- In Tennessee, 74% of economically disadvantaged students with strong middle school performance graduate college-ready, compared to 90% of non-economically disadvantaged students with similarly high prior achievement.
- The disparity in college readiness is particularly acute in 24 high schools, where economically disadvantaged students are at least 20 percentage points less likely than their higher-income classmates to graduate college-ready.

Disparity in College Access, by Economically Disadvantaged Status

- Of college-ready economically-disadvantaged students, 70% enroll in postsecondary education, compared with 84% for college-ready non-economically disadvantaged students.
- The disparity in college access is particularly acute in 41 schools, with a college enrollment gap in excess of 20 percentage points between economically disadvantaged college-ready graduates and their higher-income college-ready classmates.

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Analyses: Student Progression from Ninth Grade Into College

Section I: Student Progression from Ninth Grade into College

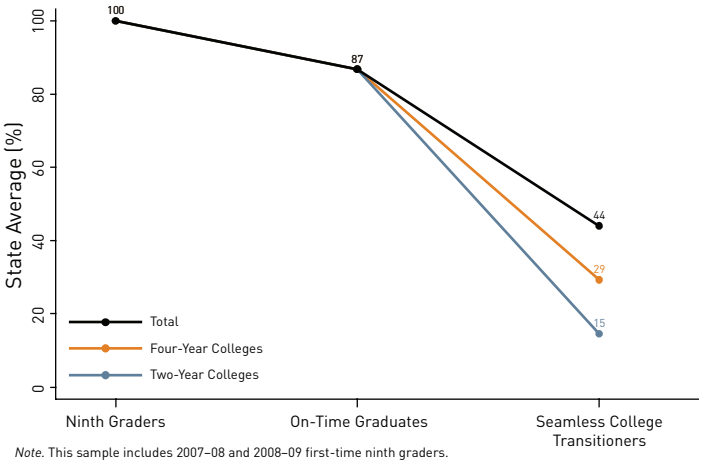
This section provides a broad overview of student performance in Tennessee along the entire college-going pathway, from entering ninth grade through seamless enrollment in a postsecondary institution. To investigate students' progress along this pathway, these analyses track the percentage of first-time ninth graders who complete high school within four years and enroll in a postsecondary institution seamlessly (that is, the fall after high school graduation). In addition to describing state-level trends, this section explores how students' progression along the college-going pathway varies across Tennessee high schools and by students' family income.

Figure 1 shows the average rates at which ninth graders in Tennessee successfully attain two milestones along the college-going pathway: high school graduation and postsecondary enrollment. These results are based on analyses of cohorts of ninth graders who entered high school in the 2007–08 and 2008–09 school years. (Additional analyses not shown here indicate that, at the state level, the average rates of high school graduation and college enrollment vary little across individual cohorts.) Overall, for every 100 first-time ninth graders who enrolled in a public high school in Tennessee in 2007–08 and 2008–09, 87 completed high school within four years and 44 seamlessly transitioned to a postsecondary institution: 29 enrolled in a four-year institution and 15 enrolled in a two-year institution.[4] By comparison, for every 100 ninth graders nationwide, roughly 78 graduate high school within four years and 53 immediately enroll in college.[5]

To provide further context for these findings, Figure 2 shows results from similar analyses for other states that have partnered with SDP. Overall, first-time ninth graders in Tennessee graduate from high school at rates higher than their peers both nationally and in all other SDP partner states. At the same time, however, they are less likely than their peers to enroll in college seamlessly: While Tennessee has the highest high school graduation rate among SDP partner states, its postsecondary enrollment rate trails behind a number of states, suggesting that students in Tennessee may be struggling with significant barriers in their pursuit of postsecondary education.

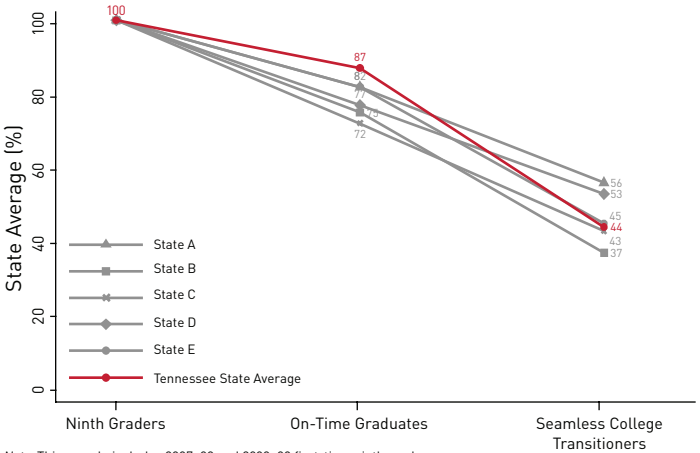
While the state has a high on-time graduation rate and a relatively low postsecondary enrollment rate, these state-level results may mask large differences across individual high schools and geographic regions in the state. Indeed, when exploring differences across high schools, analyses reveal a 76 percentage point gap in on-time graduation rates (24–100%) and a 90 percentage point gap in college enrollment rates (0–90%) between the school with the lowest rate and the school with the highest rate of each outcome (analyses not shown). Further, we

Figure 1. Students' Progression From Ninth Grade to Postsecondary Enrollment, Tennessee State Average



Note. This sample includes 2007–08 and 2008–09 first-time ninth graders.

Figure 2. Students' Progression From Ninth Grade to Postsecondary Enrollment, State Average Comparisons



Note. This sample includes 2007–08 and 2008–09 first-time ninth graders.

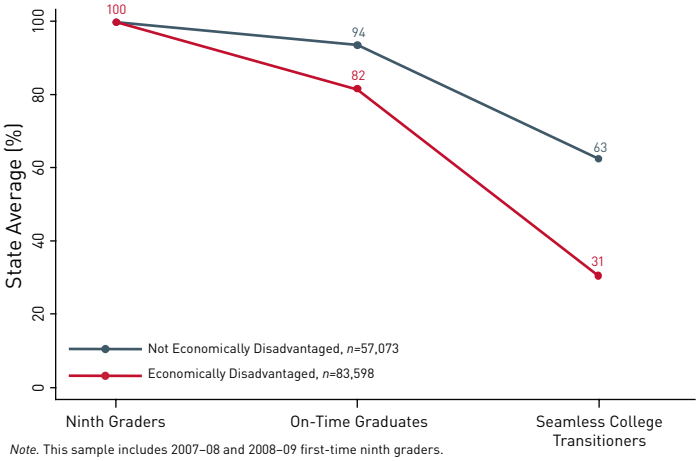
Analyses: Student Progression & Barriers to Postsecondary

find considerable differences in postsecondary enrollment rates by geographic location, suggesting that students' success in navigating the college-going pathway is not uniform across the state (see maps in Appendix A).

Socioeconomic factors, such as family income, can greatly influence students' performance in high school and beyond. In Figure 3, we examine how students' progress along the college-going pathway is affected by their family income. For these analyses, we use a student's eligibility for free and reduced-price lunch (FRPL) as an approximate measure of his or her family income.

These analyses reveal very large differences in high school graduation and college enrollment rates among students with different levels of family income. On average, across the state, economically disadvantaged students—those eligible for FRPL—are considerably less likely to complete high school on time and to enroll in postsecondary education, compared with their peers from higher-income families. Economically disadvantaged students graduate high school at a rate 12 percentage points lower than non-economically disadvantaged students. They face even greater difficulties in transitioning to postsecondary education: They are half as likely as their peers from higher-income families to enroll in college seamlessly.

Figure 3. Students' Progression From Ninth Grade to Postsecondary Enrollment, by Student Economic Status



Note. This sample includes 2007–08 and 2008–09 first-time ninth graders.

Section II: Barriers to Postsecondary Enrollment

Just over half of all high school graduates in Tennessee enroll in postsecondary education seamlessly. In many schools across the state, however, this share is substantially lower, and factors at the source of low postsecondary enrollment may differ across schools or student groups. With input from the TDOE, SDP conducted additional deeper-dive analyses and identified five different categories of barriers that students across the state face in their transition from high school into postsecondary education. These analyses segmented the overall finding of low postsecondary enrollment into concrete challenges with clearer implications for action.

The five categories capture the following challenges to successful transition into postsecondary education: low college readiness, low college readiness among students with strong middle school performance, low college access, disparities in college readiness by economically disadvantaged status, and disparities in college access by economically disadvantaged status between economically disadvantaged students and their peers from more privileged backgrounds. TDOE worked with SDP to define a threshold for the challenge in each category such that it captures only schools in which that challenge is particularly acute, and at the same time, it identifies a manageable number of schools in which to target supports.

In this section, we define the categories of postsecondary enrollment challenges in a separate sidebar and then report on their prevalence across the state. The analyses combine data from students who graduated high school in school years 2010–11 and 2011–12, as results vary little across individual student cohorts.

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Analyses: Barriers to Postsecondary Enrollment

Categorizing Barriers to Postsecondary Enrollment

Low College Readiness

Strong academic preparation—from the elementary grades through high school—is an essential foundation for the successful transition into postsecondary education. Compared with low-achieving peers, students who graduate high school college-ready—that is, academically ready to tackle college-level coursework—not only pursue postsecondary education at greater rates, but, once in college, are also less likely to require remedial coursework.

High schools in which fewer than 25% of graduates receive a composite score of 21 or higher on the ACT are categorized as having low levels of college readiness. For more details on our approach to defining college readiness, please refer to the following "Defining College Readiness" section.

Low College Readiness Among Graduates With Strong Middle School Performance

Academic preparation for postsecondary success begins well before high school, but sustained academic achievement during high school also matters (Adelman, 1999, 2006). Without access to rigorous high school coursework or high expectations, even students who were well prepared prior to high school entry may falter.

High schools in which fewer than 75% of graduates with strong middle school preparation are categorized as having this challenge.

Low College Access

Though academic college readiness is a necessary factor for postsecondary success, students must also navigate numerous complex and sequential steps in completing their college and financial aid applications. Lacking family experience with the process and having little access to college counseling supports, many college-ready graduates risk falling through the cracks on the pathway to college.

High schools in which fewer than 70% of college-ready graduates enroll in postsecondary education the first fall after high school are categorized as having low college access.

Disparity in College Readiness, by Economically Disadvantaged Status

In Tennessee, low-income students with high prior academic achievement are 16 percentage points less likely to graduate high school college-ready, compared with students with high prior achievement but from more privileged backgrounds. At certain high schools, this gap is considerably larger.

High schools with a large disparity in college readiness by students' economically disadvantaged status are those in which

1. the difference in college readiness rates between economically disadvantaged and non-economically disadvantaged students with high eighth-grade test scores is greater than 20 percentage points, *and*
2. in one or both of these groups, fewer than 75% of students receive a composite score of 21 or higher on the ACT.

Disparity in College Access, by Economically Disadvantaged Status

Well-prepared economically disadvantaged students experience greater difficulties in transitioning to postsecondary education than similarly well-prepared non-economically disadvantaged students. In a number of schools across the state, the disparity in college access between the two groups is particularly pronounced.

Schools with a large disparity in college access by students' economically disadvantaged status are those in which

1. the difference in college enrollment rates between college-ready economically disadvantaged students and college-ready non-economically disadvantaged students is greater than 20 percentage points, and
2. in one or both of these groups, fewer than 70% of students enroll in college the first fall after high school graduation.

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Analyses: Barriers to Postsecondary Enrollment

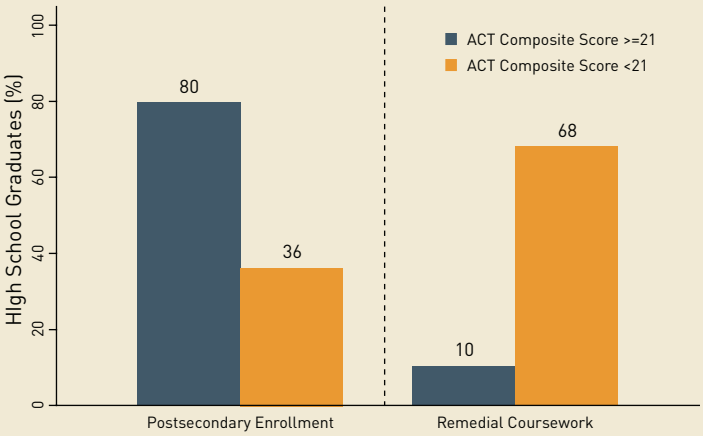
Defining College Readiness

Several postsecondary challenges highlighted in these analyses focus on building and maintaining college readiness—the rigorous academic preparation necessary for the successful pursuit of postsecondary education. At the early stages of the diagnostic, SDP researchers worked extensively with the TDOE to construct a definition of what it means for a high school graduate to be college-ready in Tennessee.

In the analyses in this report, a high school graduate is considered to be college-ready if he or she has taken the ACT and received a composite score of 21 or higher. Along with a cumulative GPA of 3.0, a minimum ACT score of 21 is one of the eligibility criteria of the state's Hope Scholarship—a program that provides tuition assistance to students enrolled in four-year colleges or two -year colleges with on-campus housing. Further, in 2013, across nine states with universal ACT participation, an ACT composite score of 21 corresponded to the 64th percentile of test-takers, on average.

Figure 4 shows that graduates who are college-ready according to this definition have more successful postsecondary outcomes than their classmates who fail to meet the ACT score threshold. Students with ACT scores of 21 or higher are more than twice as likely to enroll in a postsecondary institution (80%) than their peers with lower scores (36%). They are also much less likely to require remedial coursework once in college: One in 10 college-ready graduates enrolled in a public postsecondary institution has taken a remedial course, compared with nearly seven in 10 graduates with lower academic achievement (68%).

Figure 4. Postsecondary Outcomes by ACT Composite Score Categories



Note. To analyze postsecondary enrollment rates, we use 2010–11 and 2011–12 high school graduates. To examine differences in remedial course-taking patterns, we use the 2009–10 graduation cohort, as remediation data for more recent graduation cohorts are incomplete.

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Analyses: Barriers to Postsecondary Enrollment

I. Low College Readiness

Students who graduate high school with strong academic preparation are more likely to enroll in postsecondary education—and much more likely to succeed once they are in college—compared with less-prepared graduates (see Figure 4). Academic preparation begins long before students enter high school: Those who begin the ninth grade with already low academic achievement are much less likely to excel in high school, graduate ready for college, and enroll in postsecondary institutions. Only 17% of students who score in the bottom quartile of eighth-grade TCAP mathematics test scores statewide graduate on time and enroll in college the fall following graduation (analyses not shown). This rate is 74% for students with top-quartile eighth-grade scores—a 57 percentage point difference. Given the critical importance of academic preparation for college, we first examine how rates of college readiness vary among graduates from different high schools in the state.

Figure 5 shows the percentage of students in each high school who are college-ready upon graduating from high school. In the figure, high schools are sorted in ascending order based on their college readiness rates. On average, 38% of high school graduates in Tennessee are college-ready, though college readiness levels vary widely across the state. At a handful of low-performing urban high schools, not a single student is college-ready at the time of high school graduation; at other schools, nearly all graduates are college-ready.

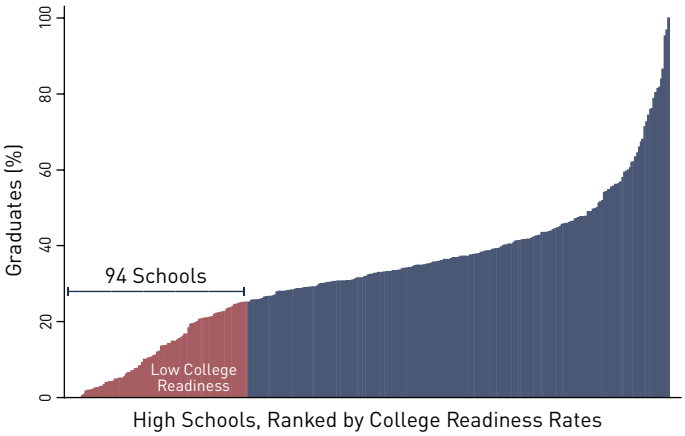
Overall, 94 high schools are categorized as having low college readiness, with fewer than 25% of their graduates receiving an ACT score of 21 or higher. The college readiness rates of these schools are shown in red in the lower left corner of the figure. The majority of schools in this category are urban and serve predominantly economically disadvantaged students with very low prior academic achievement, suggesting the need for a system-wide focus on boosting student achievement and expectations in all grades from kindergarten through high school.

II. Low College Readiness Among Graduates with Strong Middle School Performance

While academic preparation in the earlier grades is critical, even students with high prior achievement may fail to keep up with their high school studies well enough to prepare for college. To shed further light on this, we next examine college readiness rates among graduates who had attained high levels of academic achievement by the end of middle school.

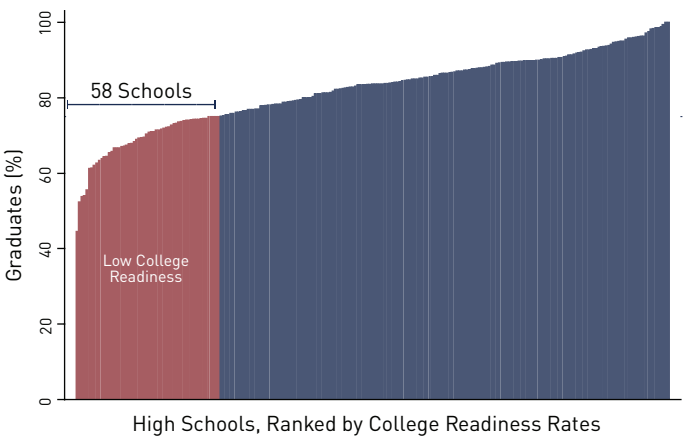
Figure 6 shows the percentage of students with strong middle school performance who are college-ready upon high school graduation. On average, in Tennessee, 85% of graduates with high eighth-grade test scores successfully maintain a high level of achievement throughout high school and graduate college-ready. Across high schools in the state, these rates vary from 44% to 100%. In particular, 58 schools—shown in red in the figure—are categorized as having low college readiness among students with strong middle school performance.

Figure 5. Share of College-Ready Graduates Across All Students, by High School



Note. This sample includes 2010–11 high school graduates with ACT test scores

Figure 6. Share of College-Ready Graduates Among Students With High Prior Achievement, By High School



Note. This sample includes 2010–11 and 2011–12 high school graduates with ACT test scores and eighth-grade TCAP math test scores equal to or higher than 583.

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Analyses: Barriers to Postsecondary Enrollment

Schools in this category may consider a variety of strategies to help promising students maintain academic readiness for college, such as improving access to rigorous high school coursework (AP, IB, or dual enrollment), raising students' awareness of the importance of taking rigorous courses, and fostering a general climate of strong college-going expectations. Students engaged in intensive, challenging coursework during high school tend to perform better on the college entrance exams and to both enroll in and complete college at greater rates than their peers who take less challenging classes (see, for example, Adelman, 1999, 2006; Attewell & Domina, 2008; Long, Conger, & Iatrola, 2009). In light of these findings, the state's recent Advanced Placement pilot programs that expand rural access to AP courses and pay the test-taking fees for AP students are particularly promising.

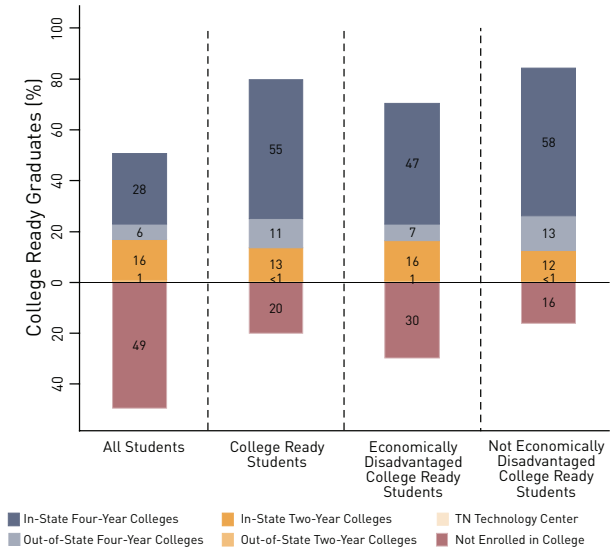
III. Low College Access

The previous two analyses explore differences in college readiness across high schools for the entire population of high school graduates and among graduates who entered high school with high levels of prior achievement. However, maintaining strong academic preparation is only one step in pursuing postsecondary education successfully. Actually gaining access to college requires that students navigate complex steps in completing their college and financial aid applications. In this section, we examine the extent to which different students with different characteristics are able to navigate these steps and successfully enroll in postsecondary institutions.

Figure 7 examines the postsecondary enrollment outcomes of all high schools graduates (left-most bar) and college-ready graduates (second bar from the left), including the percentage in each group who fail to transition to any form of higher education. Just over half of all high school graduates enroll in postsecondary institutions seamlessly. Not surprisingly, among college-ready graduates, this rate is considerably higher: four out of every five college-ready graduates (80%) seamlessly transition to college (total of all outcomes above the midline). However, this also means that one out of every five graduates who are academically well prepared for postsecondary studies (20%) fail to take the final step toward postsecondary enrollment. Furthermore, among college-ready graduates, economically disadvantaged students are less likely to enroll in college: 30% of economically disadvantaged college-ready students do not enroll anywhere, compared to 16% of college-ready students from higher-income families. In the remainder of this section, we explore in more depth college enrollment rates among college-ready students as well as students of different economic status.

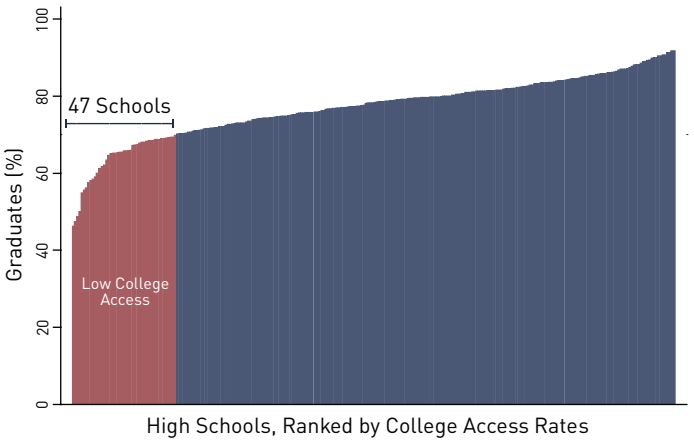
Figure 8 shows the percentage of college-ready graduates, by high school, who seamlessly transition to a postsecondary institution. While 80% of these well-prepared graduates in Tennessee seamlessly enroll in college, enrollment rates of individual high schools vary from 46% to 92%. Overall, 47 high schools are categorized as having low college access—that is, fewer than 70% of

Figure 7. Seamless Postsecondary Enrollment Choices of High School Graduates, by College-Ready and Economic Status



Note. This sample includes 2010–11 and 2011–12 high school graduates with ACT test scores.

Figure 8. Seamless Postsecondary Enrollment Rates, Among College-Ready Graduates, by High School



Note. This sample includes 2010–11 high school graduates with ACT composite scores equal to or higher than 21.

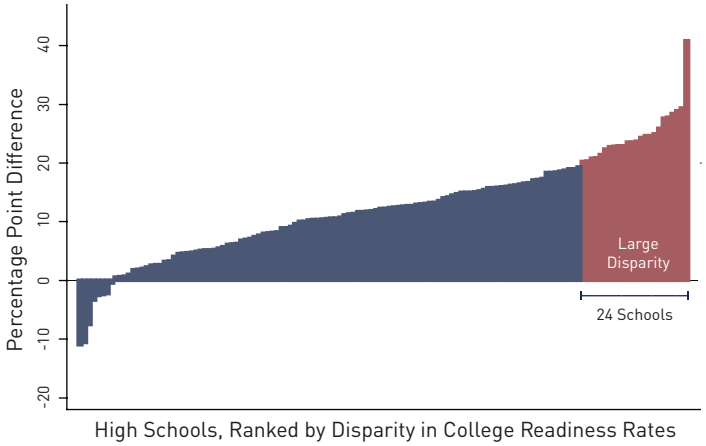
Analyses: Barriers to Postsecondary Enrollment

their college-ready graduates enroll in postsecondary education the first fall after high school. These schools are shown in red in the lower left corner of Figure 8.

Highly qualified students may fail to transition to college for a variety of reasons, such as lack of family experience with postsecondary education, scarcity of peer examples, or geographic isolation. Regardless of which barriers are at the source of low enrollment, high schools may consider a number of strategies to help support these high-achieving students more effectively. Building a system of counseling about critical steps and deadlines, potentially in partnership with local nonprofit or community organizations, may help students navigate the college application process more successfully. Tracking individual students' progress through key milestones may allow guidance counselors to target supports to those most in need. Finally, students, particularly those from low-income families, may also benefit from improved access to information about financial aid options, procedures, and deadlines, as well as hands-on assistance with complex tasks like completing and submitting FAFSA applications (see, for example, Avery, 2013; Bettinger, Long, Oreopoulos, & Sanbonmatsu, 2012; Constantine, Seftor, Sama Martin, Silva, & Myers, 2006; Hoxby & Turner, 2012; and Hurwitz & Howell, in press).

IV. Disparity in College Readiness, by Economically Disadvantaged Status

Figure 9. Disparity in College Readiness Between Economically Disadvantaged and Non-Economically Disadvantaged Students With High Prior Achievement, by High School



Note. This sample includes 2010–11 and 2011–12 high school graduates with ACT test scores and eighth-grade TCAP math test scores equal to or higher than 583.

In Tennessee, students from low-income families experience greater difficulty in bridging the gap from high school graduation to postsecondary enrollment than their classmates from higher-income families (see Figures 3 and 7). Disparities in college readiness are largely driven by the weaker academic preparation of economically disadvantaged students well before high school entry. Statewide, only 15% of economically disadvantaged students enter high school in the top quartile of eighth-grade mathematics achievement, compared to 41% of non-economically disadvantaged students (analysis not shown). However, even among highly promising students who begin high school with strong middle school preparation, disparities in college readiness by economic disadvantage persist.

Figure 9 illustrates, by high school, the difference in college readiness between economically disadvantaged students with high prior achievement and their non-economically disadvantaged classmates. In the figure, high schools are sorted in ascending order based on the size of the college readiness gap between the two student groups. (The figure only shows results for high schools with at least 20 students in each group.) In Tennessee, on average, the difference in college readiness rates between the two groups is 16 percentage points—74% of the economically disadvantaged students with strong middle school preparation graduate college-ready, compared to 90% of non-economically disadvantaged students with similarly strong prior preparation. This disparity is particularly acute in 24 high schools, shown in red in the figure. In these schools, the gap in college readiness rates between low-income students and their more privileged classmates is greater than 20 percentage points.

This disparity is far from unique to Tennessee. Research has shown that low-income students are less likely to take rigorous coursework in high school because of both lack of access and lack of encouragement (Adelman, 1999; Martinez & Klopott, 2003; Wimberly & Noeth, 2005). For example, about half of all students nationally are eligible for free or reduced-price lunch, but they account for just over one quarter of students who take at least one AP exam (College Board, 2014; Keaton, 2012, Table 7). At the same time, studies have also highlighted the promise of various strategies designed to increase disadvantaged students' participation in rigorous college preparatory coursework, such as expanding access to challenging courses, encouraging students to enroll in these, and assisting them in paying associated fees (see, for example, Jackson, 2010; Wakelyn, 2009; Wyatt & Mattern, 2011).

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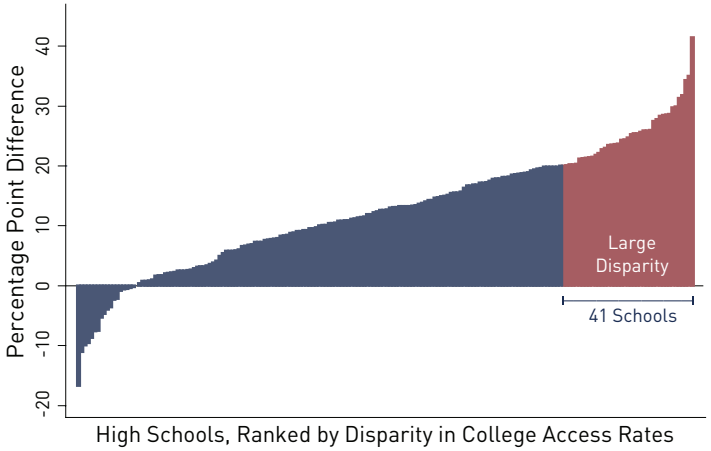
Analyses: Barriers to Postsecondary Enrollment & Conclusion

V. Disparity in College Access, by Economically Disadvantaged Status

Even if they are college-ready at the time of high school graduation, economically disadvantaged students may face greater difficulties in transitioning to higher education than similarly qualified non-economically disadvantaged students. Figure 10 shows the difference, by high school, between the postsecondary enrollment rate of college-ready economically disadvantaged graduates and that of their college-ready non-economically disadvantaged peers. High schools are sorted in ascending order based on the size of the college enrollment gap between the two student groups; only schools with at least 20 college-ready graduates of each economic disadvantage status are included. On average, in the state, 70% of economically disadvantaged students who are academically prepared for college actually matriculate, compared with 84% for their higher-income peers—a 14 percentage point gap in enrollment rates. Forty-one schools are categorized as having a large disparity in college access by student economic disadvantage status, with a college enrollment gap between the two groups in excess of 20 percentage points. These schools are highlighted in red on the right-hand side of Figure 10.

As economically disadvantaged students are often first-generation college-goers and have limited opportunities to seek guidance at home, they may require additional supports in the college application process (Roderick, Coca, & Nagaoka, 2011). It may be possible for education leaders to partner with local nonprofit or community-based organizations to expand supports for low-income graduates, including helping them select colleges that best suit their needs, securing fee waivers to defray the costs of college applications and college-entrance tests, determining their eligibility for various grant and loan programs, and applying for financial aid.

Figure 10. Disparity in College Access between Economically Disadvantaged and Non-Economically Disadvantaged College-Ready Students, by High School



Note. This sample includes 2010–11 and 2011–12 high school graduates with ACT composite scores equal to or higher than 21.

Conclusion

At the outset of this research collaboration, TDOE policymakers sought additional information about Tennessee students' transition from high school to postsecondary education. While this report has enhanced TDOE staff's understanding of this transition, much of the hard work to disseminate the results from these analyses and, more importantly, to strategize about how to facilitate successful high-school-to-postsecondary transitions lies ahead. These important next steps hinge on collaboration with key leaders and analysts from each of Tennessee's eight Center of Regional Excellence (CORE) offices across the state that support local districts and schools through a number of strategies, including data analysis and needs assessments.

In the fall of 2014, representatives from SDP and TDOE presented the findings from this report to an audience of district leaders and CORE representatives as part of the state's annual Educational Leadership Conference. At this conference, SDP also demonstrated the capability of an Excel-based report template that allows users to automatically generate a customized report with school-level results for each district. Over the course of the 2014–15 school year, TDOE staff will work with CORE leadership to use these reports to identify local obstacles to postsecondary enrollment. CORE staff will disseminate results from these analyses to schools and districts within their regions and collaborate with district administrators and building leaders to generate action plans to support students' successful transition from high school to postsecondary settings.

As a final component of the diagnostic research collaboration, SDP will provide TDOE with the datasets, programming code, and additional tools, such as the Excel template, needed to replicate and extend these analyses in future years. TDOE and CORE staff can use these resources to examine their progress against local goals, as well as to gauge their contributions to the statewide objectives outlined in Governor Haslam's postsecondary initiatives.

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Appendix A: Postsecondary Enrollment Rates by Geographic Region

Postsecondary Enrollment Rates by Geographic Location

In this appendix, we display three maps that show geographic variation in postsecondary enrollment rates by school district. Figure 11, Figure 12, and Figure 13 show district-level postsecondary enrollment rates at four-year institutions, at two-year institutions, and overall at all institutions, respectively.

Districts with high four-year postsecondary enrollment rates, shown in the darkest-orange shade in Figure 11, tend to be located in or near large metropolitan areas with high concentrations of four-year institutions. Districts with high postsecondary enrollment rates at two-year institutions, shown in the darkest-blue shade in Figure 12, are located primarily in the eastern part of the state. Finally, districts with high overall postsecondary enrollment rates, shown in the darkest-green shade in Figure 13, regardless of institution type, are somewhat evenly distributed across the state.

Figure 11. Seamless Postsecondary Enrollment Rates at Four-Year Institutions, by District

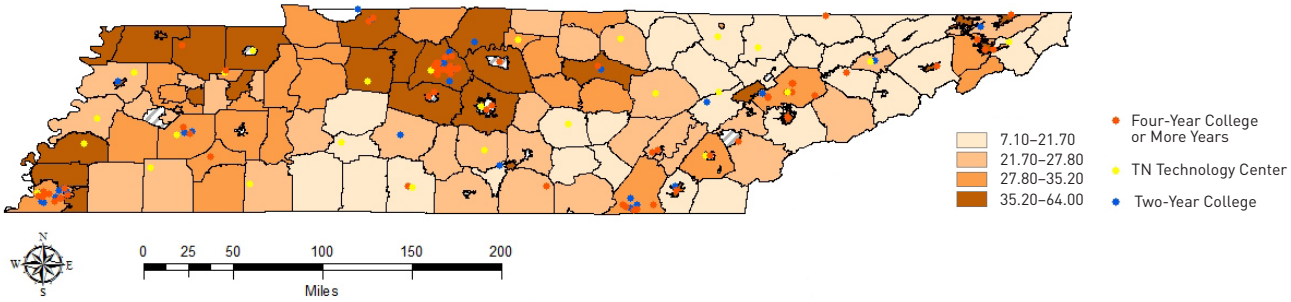


Figure 12. Seamless Postsecondary Enrollment Rates at Two-Year Institutions, by District

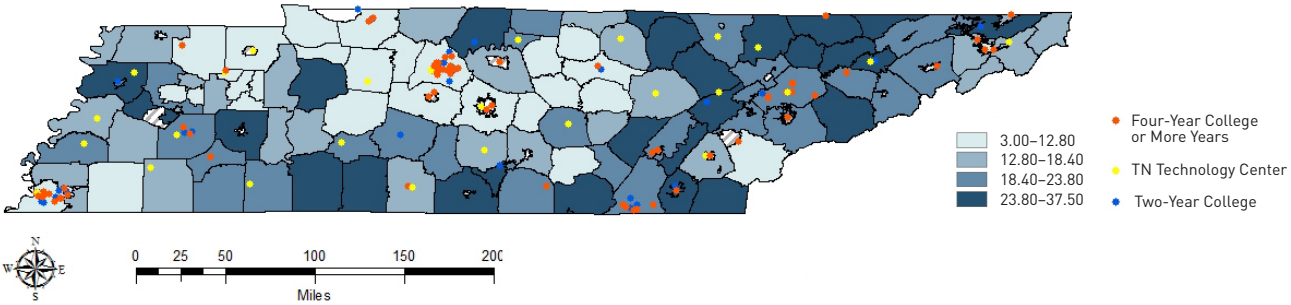
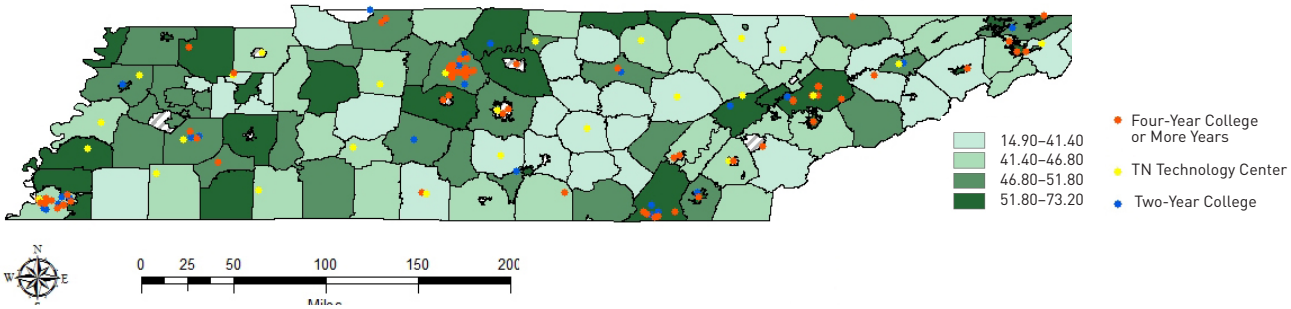


Figure 13. Total Seamless Postsecondary Enrollment Rates, by District



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Appendix B: Data Sources and Definitions

Which students are included in these analyses?

For most analyses, we combine student-level data from two consecutive cohorts of either first-time ninth graders or graduates from public high schools. This ensures that we have sufficient numbers of students at each school and reduces short-term random variation in outcomes. While this is appropriate for understanding recent high school graduation and college-going outcomes of students in the state as a whole, major changes that occurred in any individual school over any given year examined may be muted in the reported outcomes.

In Section I, we use the ninth-grade cohorts of 2007–08 and 2008–09 to analyze variation in high school graduation and postsecondary enrollment. In Section II, we use the high school graduate cohorts from 2010–11 and 2011–12 to examine the prevalence of college-readiness and college-access challenges in the state. We exclude from high school graduation analyses students who transferred out of the Tennessee public school system between ninth and 12th grade, but do include students who were enrolled in ninth grade elsewhere but transferred into the state in a later grade.

Alternative schools and schools that provide special services are excluded from all analyses. Students at charter schools are included in all analyses.

Which tests are used to identify prior student achievement?

For analyses that incorporate information on prior academic achievement (for example, Figures 6 and 9 in Section II), we use students' eighth-grade test scores on the mathematics portion of the Tennessee Comprehensive Assessment Program (TCAP). Using eighth-grade student scores from the ELA portion of the same test yields very similar results.

High School Graduation Rate

To calculate high school graduation rates, we use a cohort-based formula similar to the "compact rate" used by the National Governors Association and required for graduation-rate accountability by the No Child Left Behind Act. The SDP formula divides the number of high school completers (students earning standard diplomas) by the number of first-time ninth graders four years earlier. To identify the number of first-time ninth graders four years earlier, we add together two groups of students: 1) students enrolled in ninth grade in a public high school in the state, and 2) students enrolled in ninth grade elsewhere who transferred into the Tennessee public school system at some point during high school. We exclude from the calculation students who transferred out of the state between ninth and 12th grade.

Postsecondary Enrollment Rate

We report one primary postsecondary enrollment outcome for students who earn high school diplomas: enrollment in postsecondary education the first fall following high school graduation (i.e., seamless enrollment). To calculate seamless enrollment, we determine whether a student is enrolled in any postsecondary institution (four-year institution, two-year institution, or a Tennessee college of applied technology) of as of October 1 of his or her high school graduation year.

Endnotes

[1] http://www.doe.mass.edu/apa/dart/

[2] The national high school graduation rate estimate is for 2009–10 and is reported by the U.S. Department of Education's National Center for Education Statistics (NCES). The national average college enrollment and college persistence rates of ninth graders are calculated by the authors based on college enrollment (for 2009–10) and persistence (for 2010–11) data reported by the NCES. Because NCES's data collection, methodology, and analysis approach differ from ours, we encourage caution when comparing Philadelphia-specific rates to these national estimates. (See U.S. Department of Education, National Center for Education Statistics, 2012a,b,c.

[3] Note that for the purposes of these analyses, high school graduate cohorts include only students who completed high school within five years; high school graduates who took longer than five years to graduate are excluded from the analyses.

[4] In this report, we define "summer melt" the same way as Castleman, Page, & Snowdon, 2013.

[5] http://profiles.doe.mass.edu/state_report/plansofhsgrads.aspx

[6] The SDP Summer Melt Handbook, recently published by Center for Education Policy Research at Harvard University, outlines a number of concrete strategies that district and school administrators can implement to examine and address summer melt problems in their organizations. To learn more about the summer melt phenomenon and to download the Handbook, please visit the SDP Summer Melt Handbook webpage: http://www.gse.harvard.edu/sdp/resources/summer-melt/index.php. (Castleman et al., 2013).

[7] The national coverage rate is reported by the National Student Clearinghouse. The regional rate is calculated by comparing postsecondary institutions in the National Student Clearinghouse with the universe of postsecondary institutions in Massachusetts as reported in the Integrated Postsecondary Education Data System (IPEDS). See NSC, 2013; U.S. DOE, 2013.

[6] The National Governors Association "compact rate" is a four-year, adjusted cohort graduation rate used to determine the percentage of on-time high school graduates from a given four-year student cohort. It is widely considered a valid and reliable formula and has been adopted by more than half of the states to improve the consistency and accuracy of graduation rate reporting. For more information on the compact rate, see National Governors Association, 2005, 2010.

[7] This persistence outcome is not dependent on maintaining enrollment at the same institution from one year to the next. Therefore, we consider a student to have persisted to the second year if we observe that student enrolled at any college over the course of two subsequent years.

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