

BRINGING IT ALL TOGETHER: Leaks in the Postsecondary Pipeline

DATA BRIEF

The first three of our four briefs in this series focused on individual aspects of the postsecondary pipeline, including enrollment, first-year persistence, and six-year attainment. In this supplement, we examine these three distinct milestones in combination to understand how group differences at each point may contribute to widening or narrowing educational disparities over time.

Figure 1 displays how attrition at key stages of the postsecondary pipeline impacts the overall outcomes of the 2009-2011 North Carolina public high school graduates.¹

- 67 percent of the 2009-2011 NC public high school graduates enrolled in a postsecondary program by May 15, 2012.
- While 76 percent of postsecondary enrollers persisted to their second year, this represents just over half—51 percent—of all NC public high school graduates.
- Among postsecondary enrollers, six-year completion rates were 51 percent. Overall, this yields 34 percent of all 2009-2011 NC public high school graduates who earned a degree or credential within six years of postsecondary enrollment.

Table 1 shows the shares of students who reach each milestone and the related loss points on the postsecondary pipeline by demographic characteristics, economic disadvantage, and high school academic performance. In each subsequent section, we include a visual and narrative overview of the results found in Table 1, findings from the postsecondary education research literature to contextualize these leaks in the pipeline, and highlight potential intervention strategies to improve postsecondary outcomes for all North Carolina students.



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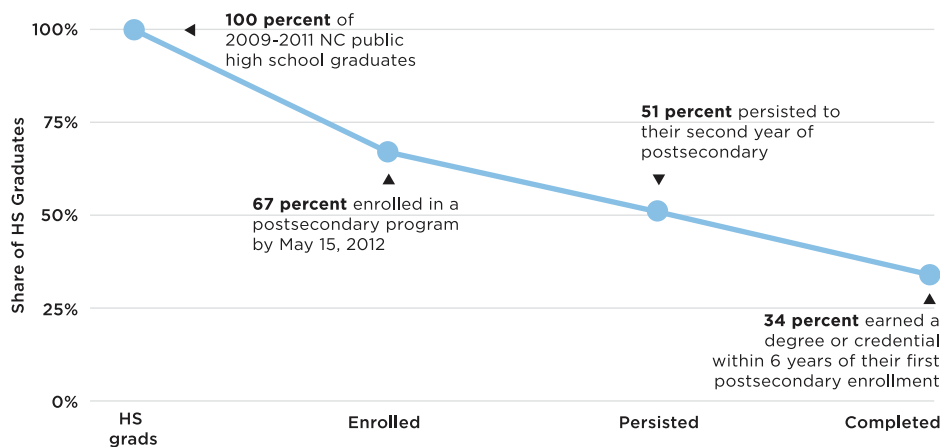


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FIG. 1: POSTSECONDARY OUTCOMES
(2009-2011 NC High School Graduates)



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TABLE 1: POSTSECONDARY PIPELINE MILESTONES AND LOSS POINTS BY DEMOGRAPHIC, ECONOMIC, AND ACADEMIC CHARACTERISTICS (2009-2011 NC High School Graduates)

Note: Percentages may not add up due to rounding

	Total HS Graduates (#)	Postsecondary Outcomes (% of HS graduates making it to each milestone)			Loss from the Postsecondary Pipeline (% of HS graduates lost at each milestone)		
		Enrolled	Persisted to Year 2	Completed in 6 Years	Access: Not Enrolled	Persistence: Enrolled but did not persist	Completion: Persisted but did not complete
All Students	268,327	67%	51%	34%	33%	16%	17%
Prosperity Zone							
North Central	61,001	70%	56%	39%	30%	14%	17%
Northeast	15,079	67%	49%	30%	33%	18%	19%
Northwest	17,771	64%	48%	34%	36%	16%	14%
Piedmont-Triad	46,857	69%	52%	35%	31%	16%	18%
Sandhills	25,923	62%	43%	26%	38%	19%	17%
Southeast	25,430	65%	48%	31%	35%	17%	17%
Southwest	59,554	69%	53%	37%	31%	15%	17%
Western	16,645	64%	48%	34%	36%	16%	14%
Sex							
Female	137,465	73%	57%	40%	27%	16%	17%
Male	130,862	62%	45%	29%	38%	17%	16%
Race/Ethnicity							
American Indian	3,560	57%	36%	20%	43%	21%	16%
Asian	6,565	74%	64%	48%	26%	10%	16%
Black	75,849	65%	43%	22%	35%	21%	21%
Hispanic	17,826	45%	33%	20%	55%	12%	13%
White	158,166	71%	57%	42%	29%	14%	15%
Economic Disadvantage							
Economically Disadvantaged	90,605	55%	35%	18%	45%	20%	17%
Not Economically Disadvantaged	177,722	74%	59%	43%	26%	14%	17%
High School GPA (unweighted)							
Not Reported	12,126	68%	51%	32%	32%	17%	20%
<1.5	10,776	31%	11%	2%	69%	20%	9%
1.5-2.0	32,068	43%	19%	5%	57%	24%	15%
2.0-2.5	51,029	56%	34%	13%	44%	23%	21%
2.5-3.0	59,502	69%	51%	29%	31%	18%	22%
3.0-3.5	59,905	80%	69%	52%	20%	11%	17%
3.5-4.0	42,921	87%	82%	74%	13%	5%	8%



Prosperity Zone

Figure 2 illustrates differences in the postsecondary pipeline by prosperity zone. While this chart is tightly clustered at the enrollment milestone, disparities between students from the state's eight prosperity zones widen at the persistence milestone and do not significantly narrow between persistence and completion, though the relative position of some prosperity zones shifts substantially.²

At every milestone, rates were highest among students from the North Central (Triangle) prosperity zone and lowest among students from the Sandhills prosperity zone. Specifically, among all 2009-2011 North Carolina public high school graduates:

- 70 percent from the North Central prosperity zone enrolled in postsecondary compared to 62 percent from the Sandhills prosperity zone, an 8 percentage point gap.
- 56 percent from North Central persisted in postsecondary to their second year compared to 43 percent of students from the Sandhills, a 13 percentage point gap.
- 39 percent from North Central earned a degree or credential within six years of their first enrollment versus a completion rate of 26 percent among high school graduates from the Sandhills, a gap of 13 percentage points.

Beyond increasing enrollment among students from the Sandhills prosperity zone, the widening of the gap at the persistence milestone indicates a significant leak in the postsecondary pipeline and an important intervention point for these students. Being from one of the most economically disadvantaged regions of North Carolina,³ students from the Sandhills prosperity zone may experience greater barriers to postsecondary success due to lack of college preparatory resources and affordability issues. Interventions that offer postsecondary educational support⁴ and financial aid may help these students persist to degree completion.

The other prosperity zones varied in rank across these milestones. **Figure 3** illustrates how these rankings change at each milestone, from highest to lowest rates.⁵

The Piedmont-Triad and Southwest (Charlotte) prosperity zones were consistently ranked second and third highest for each milestone. The enrollment rate for Piedmont-Triad graduates was only 0.1 percentage

FIG. 2: POSTSECONDARY PIPELINE BY PROSPERITY ZONE
(2009-2011 NC High School Graduates)

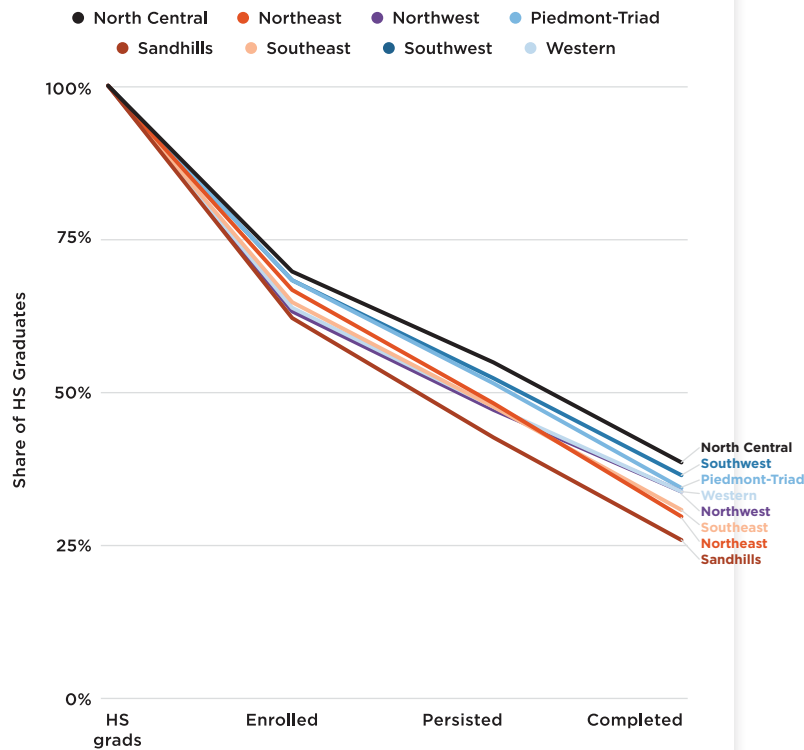
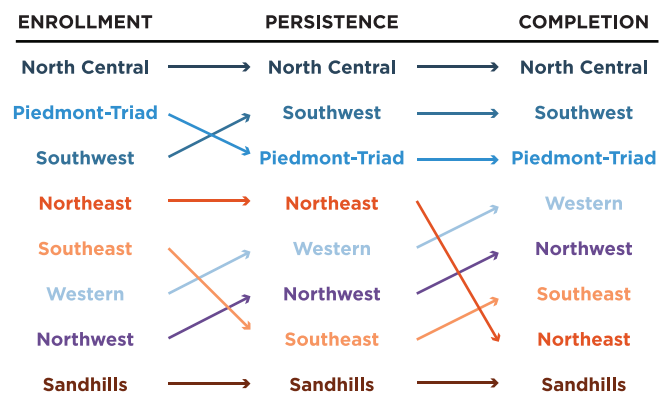


FIG. 3: CHANGES IN THE RANK OF PROSPERITY ZONE GRADUATES THROUGH THE POSTSECONDARY PIPELINE



points higher than that of Southwest graduates (68.7 percent versus 68.6 percent), but this gap widened with subsequent milestones in favor of the Southwest. The share persisting among Southwest graduates was one percentage point higher than students from the Piedmont-Triad (53 percent versus 52 percent), and the overall completion rate for Southwest was two percentage points higher (37 percent versus 35 percent).

While the Northeast prosperity zone was fourth highest for both enrollment (67 percent) and persistence (49 percent), this prosperity zone dropped to seventh for completion (30 percent). The 19 percentage point decrease from persistence to completion means that 19 of every 100 high school graduates from the Northeast enrolled in a postsecondary program and persisted to their second year but did not complete a degree within six years. This was the largest change between milestones across all prosperity zones and indicates the need to provide support for degree completion among these students.

Although fifth in enrollment (65 percent), the Southeast prosperity zone dropped to seventh in persistence (48 percent) and rebounded to sixth in completion (31 percent). The lower share persisting in this prosperity zone may suggest differences in academic readiness for postsecondary education, lack of sufficient finances, or a mismatch between student capabilities and college of enrollment.

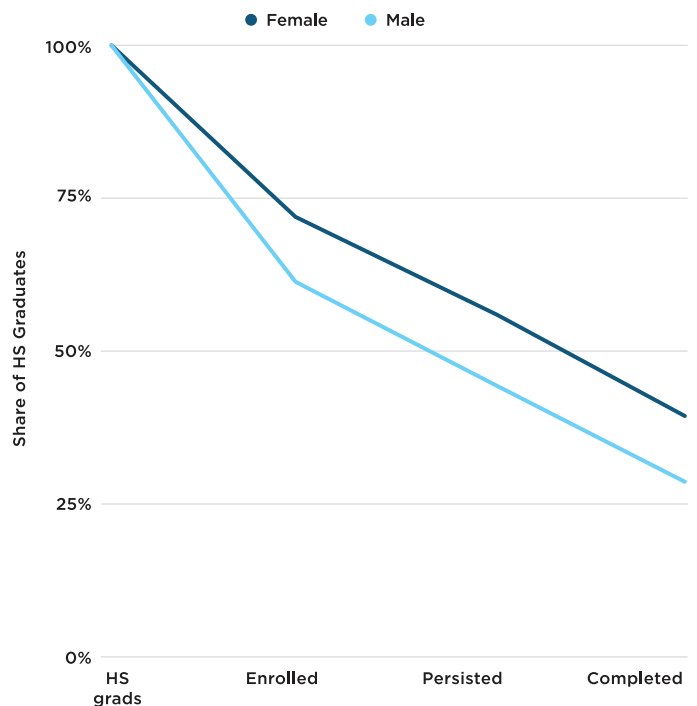
Finally, both the Western and Northwest prosperity zones differed from each other by less than a percentage point for all milestones, beginning at sixth and seventh in enrollment (64 percent), respectively. At each subsequent milestone, they incrementally increased in rank, moving to fifth and sixth in overall persistence (48 percent) and ending at fourth and fifth in completion (34 percent). These results suggest that students who do attend college from these prosperity zones do relatively well, but greater enrollment support may be necessary to increase postsecondary attainment outcomes among students from these areas.

Sex

Across all pipeline milestones, rates were higher among female high school graduates compared to male graduates (Figure 4). Although female students had higher rates of transition at every point, the gaps between the share of all graduates succeeding to each milestone were consistent over time. Specifically, the gaps between female and male high school graduates at each milestone on the postsecondary pipeline were:

- 11 percentage points for enrollment;
- 12 percentage points for persistence; and
- 11 percentage points for completion within six years.

FIG. 4: **POSTSECONDARY OUTCOMES BY SEX**
(2009-2011 NC High School Graduates)



Race/Ethnicity

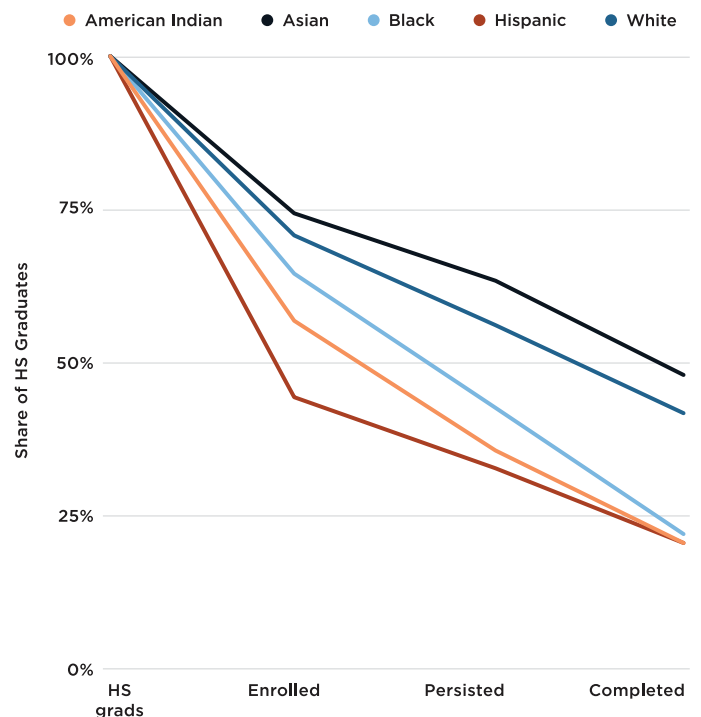
Figure 5 shows variation in the postsecondary pipeline by racial/ethnic identification of high school graduates.⁶

- Asian students had the highest rates for every milestone: 74 percent of Asian graduates enrolled in a postsecondary program, 64 percent persisted to their second year, and nearly half—48 percent—earned a degree within six years.
- In contrast, Hispanic students had the lowest rates for almost every milestone. The gap between Hispanic students and Asian students remained relatively constant across milestones, differing by 29 percentage points for enrollment, 31 percentage points for persistence, and 28 percentage points for completion rates.

These large but consistent gaps suggest that interventions for Hispanic students should focus on improving enrollment rates since these students tend to fare well in postsecondary once enrolled. Given these results and the high poverty rates among Hispanics in North Carolina,⁷ providing greater financial support for these students to attend college may help to bolster overall postsecondary outcomes.⁸

- White students had the second highest enrollment (71 percent), persistence (57 percent), and completion rates (42 percent). These rates were three, seven, and six percentage points lower, respectively, than those of the Asian group, suggesting that college persistence may be a larger factor in these gaps than college access (enrollment).⁹
- Black students had the third highest rates for all milestones, though the gap between Black students and Asian and White students widened significantly over time. For example, the gaps between Asian and Black high school graduates nearly tripled in size between enrollment (9 percentage point gap) and completion (26 percentage point gap). These widening gaps indicate the need to provide support to these students throughout their postsecondary education experience, which may include greater financial support as well as relevant college preparedness programs.¹⁰
- American Indian students had an enrollment rate of 57 percent. While this was the second lowest enrollment rate, it was 12 percentage points higher than that of the Hispanic group and this gap narrowed over time. Although the persistence rate among American Indian students was only three percentage points higher than among Hispanic students (36 percent vs 33 percent), overall completion was slightly lower than that of Hispanic students (less than one percentage point difference). Research suggests that lower attainment among American Indian students is related not only to financial barriers and academic preparedness, but also to social supports on campus.¹¹ For these reasons, a greater focus on cultural support resources on college campuses may help to improve outcomes among American Indian students.

FIG. 5: POSTSECONDARY OUTCOMES BY RACE/ETHNICITY (2009-2011 NC High School Graduates)



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Overall, racial/ethnic differences have important implications for broader postsecondary education policy and intervention. Beyond the large disparities in enrollment rates, **Figure 5** also illustrates how the more and less advantaged racial/ethnic groups diverge over time. In general, Black and American Indian students experience a steeper decline at the persistence and completion milestones compared to Asian and White students, creating two distinct groupings of higher-achieving (Asian and White) and lower-achieving (Black, American Indian, and Hispanic) groups.

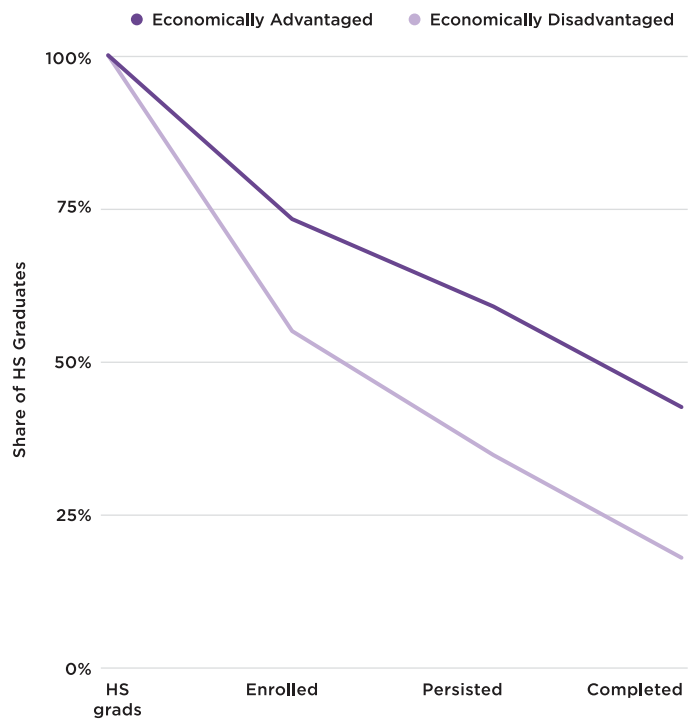
Lower achievement among these students is often attributed to their relative socioeconomic disadvantage. Beyond needing funding for postsecondary education, these students may be academically underprepared for college due to a relative lack of educational resources during their K-12 years.¹² Similarly, North Carolina's American Indian, Black, and Hispanic students are more likely than Asian and White students to be first-generation college students, meaning they may have additional difficulties navigating the college preparation and enrollment process due to limited guidance from family and peers.¹³ For all of these students, interventions that include college counseling during high school and support programs in college can promote postsecondary educational success.¹⁴ While there is a strong relationship between race/ethnicity and socioeconomic disadvantage, many high schoolers from all racial/ethnic backgrounds face economic barriers, meaning these interventions could improve outcomes for all North Carolina students.

Economic Disadvantage

Differences in enrollment, persistence, and completion by economic disadvantage are shown in **Figure 6**.¹⁵ Graduates from economically advantaged backgrounds had higher overall enrollment (74 percent), persistence (59 percent), and completion (43 percent) compared to those from economically disadvantaged backgrounds (55 percent, 35 percent, and 18 percent, respectively).

There was a 19 percentage point gap between these two groups in overall enrollment. The gap increased substantially at persistence to 24 percentage points and had a slight increase at completion to 25 percentage points. The overall gap between these groups in college enrollment and the significant change in the gap between enrollment and persistence is suggestive of how financial barriers may affect these students' ability to access and complete college.¹⁶ Providing access to academic preparedness programs (e.g., SAT preparatory courses), increasing financial aid, and providing postsecondary educational support programs for these students may improve overall outcomes.

FIG. 6: **POSTSECONDARY OUTCOMES BY ECONOMIC DISADVANTAGE**
(2009-2011 NC High School Graduates)



High School Academic Performance

Figure 7 shows trajectories in the postsecondary pipeline by academic performance in high school, which is measured using the student's unweighted grade point average (GPA).¹⁷

Students who performed better in high school courses were more successful across all milestones on the postsecondary pipeline. Specifically, students who received mostly As and some Bs in high school (3.5-4.0 GPA) had the highest rates at every milestone. For every 100 of these high school graduates:

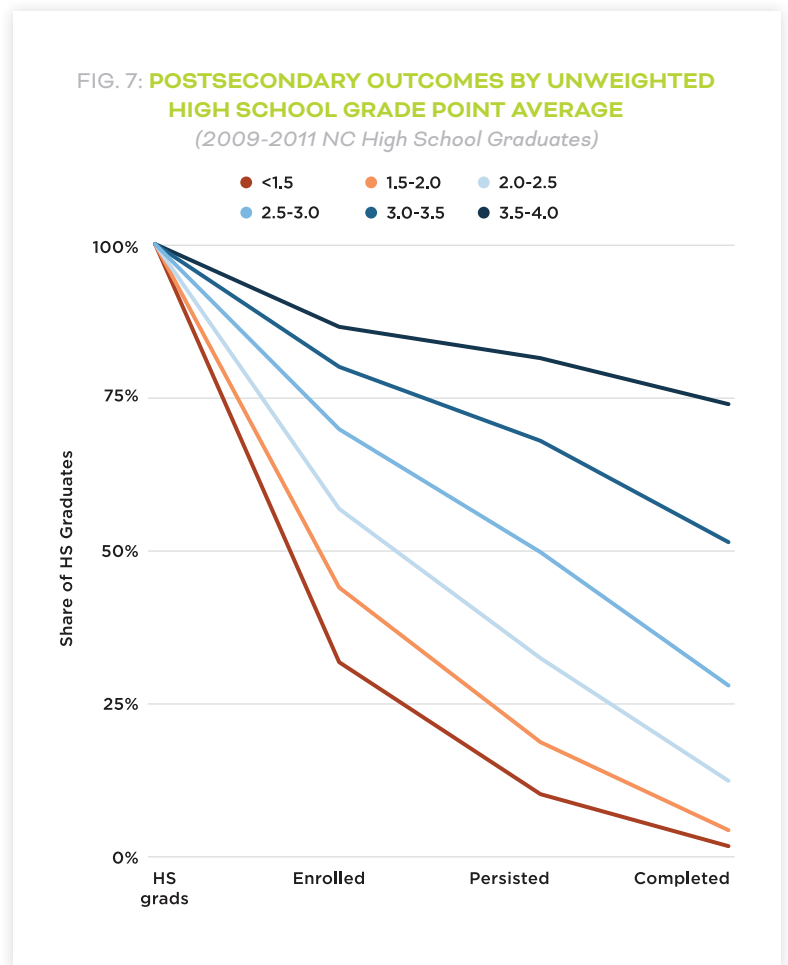
- 87 enrolled in postsecondary;
- 82 continued their postsecondary enrollment to their second year; and
- 74 earned a postsecondary degree or credential within six years.

In contrast, students who received more Ds and Fs (<1.5 GPA) had the lowest rates at every milestone. For every 100 of these high school graduates:

- 31 enrolled in postsecondary (56 fewer than the mostly A students);
- 11 persisted to their second year (71 fewer than the mostly A students); and
- 2 earned a postsecondary degree or credential within six years (72 fewer than the mostly A students).

While these are the largest gaps, similar patterns exist for all other high school GPA groups as compared to the 3.5-4.0 GPA groups: Initial gaps in postsecondary enrollment widen substantially over time.

Overall, these results underscore the importance of academic preparedness for postsecondary success. Students who are more successful in high school courses are more likely to complete the postsecondary pipeline; therefore, greater academic support during high school and access to postsecondary academic preparedness programs may help to improve both high school and college outcomes among these students.



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Conclusions

There is no single point at which an intervention changes the overall outcome for North Carolina students. Rather, there are many points at which students are lost. Small differences in enrollment, persistence, and completion rates can compound to create significantly greater disparities in overall postsecondary pipeline outcomes.

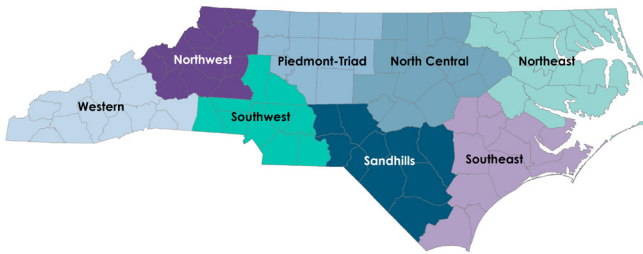
As mentioned earlier in this supplement, the overlaps between economic disadvantage, geography (prosperity zone), racial/ethnic minority identification, and academic performance suggest that some universal interventions (e.g., educational support) would benefit large numbers of North Carolina students. However, some groups may need more targeted attention. For example, while Hispanic and Black high school graduates had similar shares of overall completion (20 and 22 percent, respectively), the largest driver of this outcome for Hispanic graduates was lower enrollment rates, while more Black students were lost between postsecondary enrollment and completion. For these reasons, Hispanic students may benefit more from interventions focused on improving access to financial aid and navigating the admissions and enrollment processes, while Black students may need more educational and social support while enrolled in college.

In summary, although the specific interventions may vary depending on the group being targeted and who is providing the intervention, understanding how enrollment, persistence, and completion rates compound—or not—over time highlights significant areas of opportunity to move all North Carolina students toward postsecondary success.



References

- This report uses postsecondary enrollment and graduation records from the National Student Clearinghouse (NSC) to examine the postsecondary outcomes of North Carolina high school graduates. The NSC is a nonprofit organization that provides postsecondary enrollment data and verification for more than 3,750 colleges and universities in the United States. Collectively, these institutions serve 97 percent of all students nationwide and 98% of students in North Carolina. Though overall coverage is high, the NSC data does not capture students enrolled in the for-profit sector as well as it captures students enrolled in public and nonprofit institutions. Degree coverage is also less robust than enrollment coverage. In a 2017 report, researchers estimated that the NSC database captured 93 percent of the enrollment records for the cohort of students who began postsecondary in fall 2011 but just 84 percent of degrees (Shapiro et al.). This suggests that the estimates of completion rates reported here may be slightly lower than the true completion rates, especially for students enrolled in institutional sectors with lower participation in the NSC's DegreeVerify service, namely private nonprofit and private for-profit institutions. Source: Shapiro, Doug, Afet Dunder, Faye Huie, Phoebe Khasiala Wakhungu, Xin Yuan, Angel Nathan, and Ayesha Bhimdiwala. December 2017. *Completing College: A National View of Student Completion Rates—Fall 2011 Cohort* (Signature Report No. 14). Herndon, VA: National Student Clearinghouse Research Center.
- North Carolina's eight prosperity zones were created as part of the 2014 legislation (HB 1031) that also created the public-private partnership Economic Development Partnership of North Carolina (EDPNC). The main goal of the prosperity zones is to promote enhanced collaboration and cooperation between state, local, and regional entities. Each zone has a dedicated EDPNC representative and ranges in size from 10 to 17 counties each. Regional schools designated as Juvenile Justice and Residential Schools were not included in the prosperity zone analysis.
- North Carolina Department of Commerce, Labor and Economic Analysis Division. 2018 Prosperity Zone Data Books. June 2018. Retrieved from: https://www.nccommerce.com/Portals/47/Publications/Data%20Books/2018Statewide_data_book.pdf
- Schak, Oliver, Ivan Metzger, Jared Bass, Clare McCann, and John English. January 2017. *Developmental Education: Challenges and Strategies for Reform*. Retrieved from: <https://www2.ed.gov/about/offices/list/oeped/education-strategies.pdf>
- This figure only presents changes in the rank and does not indicate the magnitude of changes in rates.
- Racial/ethnic classifications were provided by the student; the identification used here is from the NC Department of Public Instruction. Hispanic included those of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race. All other groups are non-Hispanic. NSC data on Pacific Islanders were not disaggregated until 2011. This group was therefore combined with Asian for the purposes of this analysis. Multiracial students were included in overall calculations, but this group was not included in subgroup analysis due to small sample size and the considerable heterogeneity of its membership.
- Based on the most recent five-year estimates from the United States Census Bureau, 16.8% of North Carolinians live in poverty, though this varies considerably by race/ethnicity. Poverty rates are highest among Hispanics (31.5%), followed by American Indians (28.1%), Blacks (26.1%), Whites (13.0%), and Asians (12.9%). Source: U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates. Retrieved from: <https://factfinder.census.gov>
- Beyond higher poverty rates among Hispanic students, those who are undocumented immigrants to the United States face additional barriers to postsecondary education since they are not eligible for federal financial aid (e.g., Pell Grants) or North Carolina's in-state tuition benefits. Sources: Leisy J. Abrego & Roberto G. Gonzales (2010) *Blocked Paths, Uncertain Futures: The Postsecondary Education and Labor Market Prospects of Undocumented Latino Youth*, *Journal of Education for Students Placed at Risk*, 15:1-2, 144-157, DOI: 10.1080/10824661003635168 | UndocuCarolina website: <http://undocuments.web.unc.edu/funding>
- Although White students perform well on aggregate, those who come from economically disadvantaged backgrounds and/or are academically underprepared could also benefit from the interventions described in this supplement.
- Preston, D. C. (2017). *Untold Barriers for Black Students in Higher Education: Placing Race at the Center of Developmental Education*. Atlanta, GA. Southern Education Foundation. Retrieved from: <http://www.southerneducation.org/Publications/Untold-Barriers-for-Black-Students-in-Higher-ED.aspx>
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- Engle, J. (2007). *Postsecondary access and success for first-generation college students*. American Academic. Retrieved from <https://pdfs.semanticscholar.org/e27f/6b423579e29231e22446c0b7777d7b5946bf.pdf>
- Preston, D. C. (2017) and Adelman et al. (2013).
- Economic disadvantage was determined by the student's free- and reduced-price lunch eligibility (FRPL) during high school.
- Lack of financial resources could be a barrier against completing college and increase dropout rates. Financial resources may also benefit adolescents through the greater availability of extracurricular education (tutoring, ACT/SAT prep courses) during high school. College students who need supplemental financial help may need to take on additional jobs during college, which could distract from coursework. See: Ross, Terris, Grace Kena, Amy Rathbun, Angelina Kewal Ramani, Jijun Zhang, Paul Kristapovich, and Eileen Manning. 2012. *Higher Education: Gaps in Access and Persistence Study*. Washington, DC: U.S. Department of Education, National Center for Education Statistics. | Goldrick-Rab, Sara. 2016. "Paying the Price: College Costs, Financial Aid, and the Betrayal of the American Dream"; The University of Chicago Press. Available at: <http://press.uchicago.edu/ucp/books/book/chicago/P/bo24663096.html>
- The numerical values provided for GPA represent the average of points assigned to letter grades in high school. In general, A=4, B=3, C=2, D=1, and F=0, though pluses and minuses can alter their values. To calculate the unweighted GPA, numerical values for each course are added together and divided by the total number of courses taken by the student. For example, a student represented by the 2.5-3.0 category likely received mostly Bs and some Cs in high school.



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