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# Why Rich Colleges Get Richer & Poor Colleges Get Poorer: The Case for Equity-Based Funding in Higher Education

## WHY RICH COLLEGES GET RICHER & POOR COLLEGES GET POORER:

### The Case for Equity-Based Funding in Higher Education

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Much like America's household income inequality, American colleges and universities are deeply unequal when it comes to their finances. A small handful of colleges hold the vast majority of wealth and financial resources—and these colleges enroll far too few low-income students and students of color.<sup>1</sup> Meanwhile, the colleges enrolling the majority of the nation's low-income students and students of color too often have the *fewest* financial resources. The divide is stark and, if left unaddressed, will only get worse, with rich colleges getting richer and poor colleges getting poorer.

But what would happen if the tables were turned? What if colleges serving the nation's lowest-income students and students of color had the most (or at least equal) resources? This report explores these possibilities by presenting recent college enrollment and financing trends that are—surprisingly—not well documented in policy and research conversations.

In our current era of economic and public health crises and a national racial reckoning, a more equitable allocation of financial resources holds great promise for improving opportunities and outcomes in higher education.<sup>2</sup> This report extends existing research on *where* our nation's underrepresented students enroll relative to *how much* their colleges spend on core educational expenses.<sup>3</sup> Documenting these basic facts will help build an evidence base for policy conversations and, in so doing, should help policymakers imagine new ways of equalizing resources across colleges.

Policymakers ought to take a hard look at the role higher education institutions play in perpetuating—and in repairing—existing racial and economic inequalities in America. It's time for a broader policy conversation about equity-based funding in higher education and the strategies and resources that are necessary to help higher education fulfill its potential as a catalyst for positive social change and economic mobility.

## Why College Financing Matters

A growing number of research studies are making strong links between college spending and student outcomes. When colleges spend more money on teaching, advising, and outreach, they tend to improve key measures of student success like graduation rates and time-to-degree. Bound, Lovenheim, and Turner conducted some of the first major studies on this topic, where they found as much as a quarter of the decline in college completion rates can be attributed to

declines in college spending.<sup>4</sup> This is the largest single factor and is larger than students' academic preparation, suggesting that financial resources matter greatly for student success. Subsequent studies have confirmed and extended these findings, showing that spending on student support services and instruction increases completion rates.<sup>5</sup> This is especially true among community colleges, regional comprehensive universities, and other “broad access” institutions that admit the majority of students who apply.<sup>6</sup> While these colleges often receive little media fanfare and less public policy attention, they are the greatest access points to higher education for low-income students and students of color.<sup>7</sup> And despite having the least financial resources, these very colleges boost students up the income ladder better than most other schools.<sup>8</sup>

As a thought experiment, let's consider two general approaches policymakers can take to improve opportunities and outcomes for low-income students and students of color. On one hand, they could help students find colleges that are a good academic “match.” In this case, underrepresented students have to sort into colleges, sometimes hundreds of miles away, that have proven track records of success in supporting students similar to them well after enrollment. This would largely entail informational interventions and financial aid to help individual students find the “right” college or financial incentives to nudge individual students' enrollment behaviors.

On the other hand, policymakers could meet underrepresented students where they are by investing directly in the broad access colleges where low-income students and students of color enroll. This approach focuses on building up the *institutions* that already serve large proportions of underrepresented students rather than nudging *individuals* to potentially alter their enrollment decisions. Increasing the financial resources of these colleges would serve as a more direct and effective way of combatting structural inequality. And it would serve as an example of how equity-based funding could work: federal and state policymakers could ensure these institutions have additional resources to begin closing resource gaps. Targeted public investments to the colleges with the least resources that also serve the most underrepresented students would start to remedy the financial inequalities that are at the root of many higher education problems today.

## Data and Methodology

All data in this report are publicly available and span the academic years 1999–2000 to 2018–2019. Enrollment, admissions, and expenditures data are all collected from the US Department of Education's (Department's) Integrated Postsecondary Education Data System (IPEDS) while Pell Grant recipient data come from the Department's Federal Student Aid Data Center. The analytical sample includes degree-granting colleges and universities located in the United States that participate in Title IV federal aid programs, excluding specialized institutions, for-profit colleges, and administrative units. In 2018–2019, the sample includes 2,240 institutions enrolling a little more than 12 million full-time equivalent (FTE) undergraduate and graduate students. Central to the analysis, college selectivity is measured in four categories as outlined in Figure 1: highly selective (admitting fewer than 40% of applicants); selective (admitting 40% to 60%); moderately selective (admitting 60% to 80%); and broad access (admitting 80% or more).

**Figure 1: Number of Colleges, Enrollment, and Spending by Selectivity, 2018–2019**

	Broad Access	Moderately Selective	Selective	Highly Selective
	<p>80-100% of Applicants Admitted</p>	<p>60-80% of Applicants Admitted</p>	<p>40-60% of Applicants Admitted</p>	<p>1-40% of Applicants Admitted</p>
NUMBER OF INSTITUTIONS	1,335	526	263	133
FULL-TIME EQUIVALENT STUDENTS	5.87M	3.06M	1.85M	1.31M
TOTAL EDUCATION & RELATED SPENDING	\$87.51B	\$62.11B	\$40.40B	\$68.39B
EDUCATION & RELATED SPENDING PER FTE STUDENT	\$14,945	\$20,390	\$21,851	\$52,129

Source: Author’s calculations using IPEDS.

To measure institutional finances, this analysis focuses on Education & Related (E&R) expenditures per FTE student. The E&R category includes all expenditures attributable to instruction, student services, and a share of academic and institutional support services expenditures. We can think of E&R as representing the “full cost of education” since it captures core expenses most directly attributable to delivering education both inside and outside the classroom.<sup>9</sup> E&R does not include spending on auxiliaries (such as athletics or residence halls), research activity, or public service. As a result, E&R spending offers a conservative and standardized estimate of how much colleges spend per student. In the 2018 fiscal year, US colleges collectively spent over \$258 billion in E&R expenditures, resulting in an average spending of \$20,804 per FTE. As we will see below, this average varies considerably across institutions, over time, and among the very colleges serving our nation’s lowest-income students and students of color.

## Myths vs. Facts in College Enrollment Trends

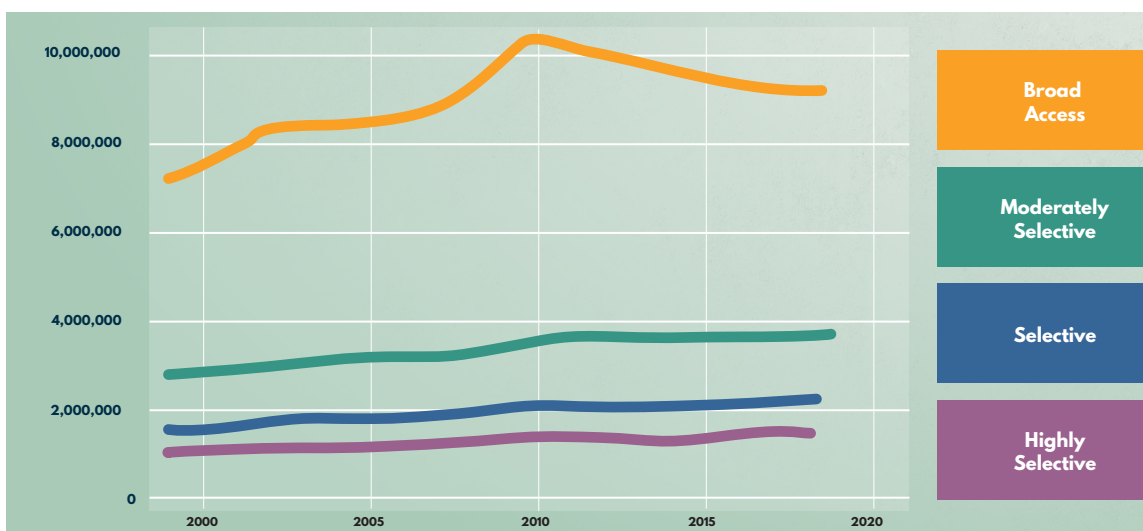
The following charts show how enrollment trends, selectivity, and finances are interconnected in ways that reinforce and perpetuate educational inequality. These trends have not been well documented in the research or policy literature, and the absence of this documentation can easily lead to misconceptions and misunderstandings about which institutions—and subsequently which students—receive the most financial resources to succeed in college. These charts are designed to help bring evidence to bear on conversations around *who* enrolls *where* and with *what* resources.

**Myth: Most students attend selective colleges.**

**Fact: Fewer than 1 in 10 students attend them.**

Even though selective institutions receive outsized attention in the public eye, the nation’s most selective institutions enroll the fewest students as Figure 2 shows. Rather, it’s broad access colleges that admit most (if not all) students that account for the lion’s share of total enrollments, yet often receive little public recognition or appreciation for their role in delivering educational opportunities beyond high school.<sup>10</sup>

**Figure 2: Total Enrollment by Selectivity**



Source: Author’s calculations using IPEDS.

Figure 2 also reveals a second pattern that receives far too little public policy attention and scrutiny. Over the past few years, college leaders, policymakers, and advocates have warned about a “Great Enrollment Cliff” as enrollment rates have steadily fallen since the Great Recession and, at least prior to COVID-19, have been projected to stagnate in coming years. Yet, Figure 2 shows that recent enrollment declines are actually happening in the broad access sector—not among selective institutions. In fact, selective institutions have sustained or even increased their enrollments since the Great Recession, indicating that the “cliff” affects some but not all types of institutions.

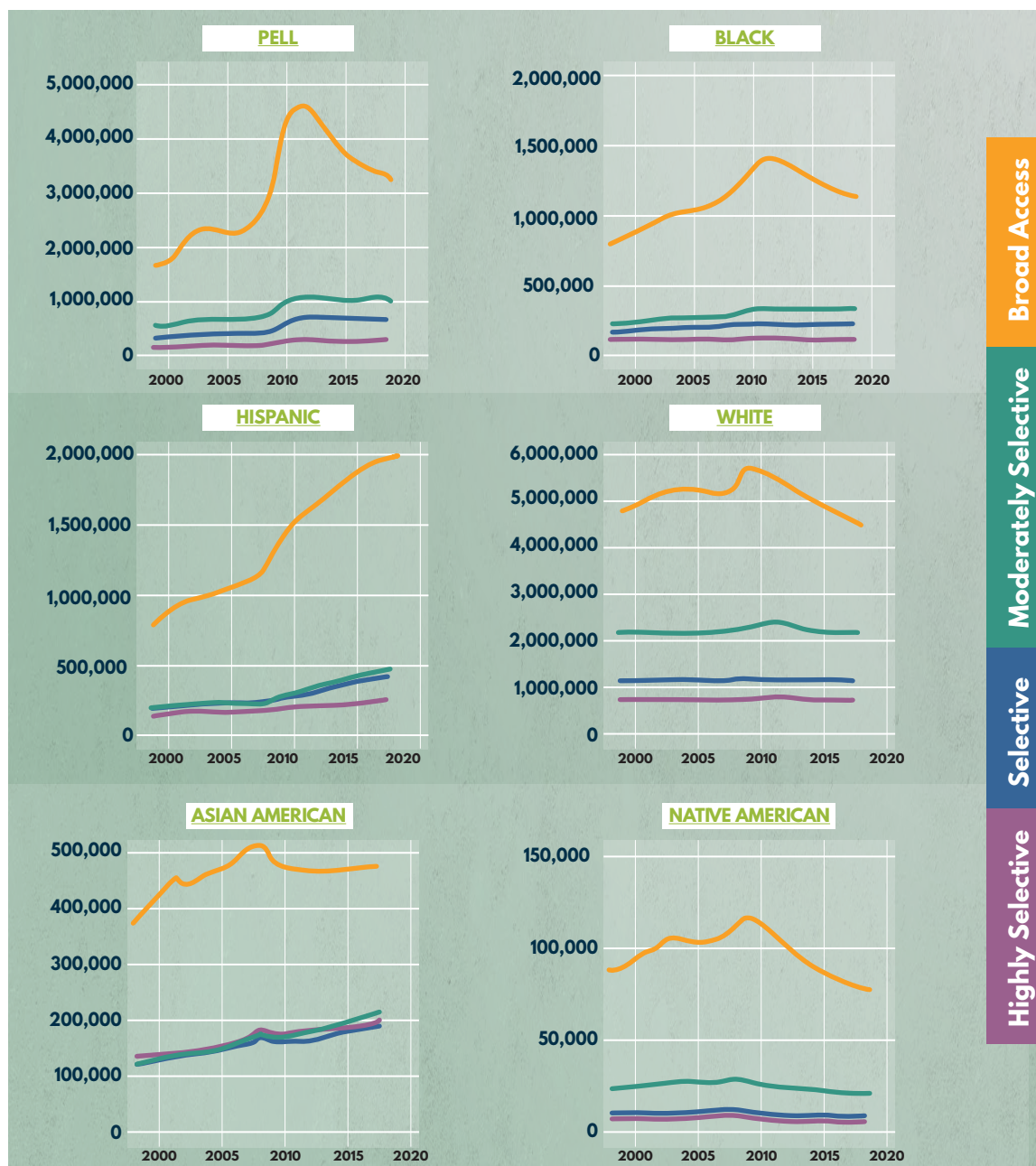
For broad access institutions, such enrollment declines have serious budgetary implications because fewer students mean less (and less predictable) tuition revenue. As a result, broad access colleges have been paring back or even eliminating academic programs, student services, and other resources that support student success. With fewer resources, these colleges have a harder time attracting and retaining students, making it hard to make up lost financial ground. In the most extreme cases, enrollment declines are pushing colleges to the brink of closure. Critically, these trends are dire for broad access institutions but are not nearly as severe or consequential among the nation’s more selective colleges, which have more financial resources to fall back on even amid declining enrollments.

**Myth: Selective colleges are beacons of mobility in the United States.**

**Fact: More often than not, selective colleges exacerbate racial and economic gaps in enrollment.**

Figure 3 shows enrollment trends by students' race/ethnicity and Pell Grant status to gain new insights into where students of color and low-income students attend college. These trends are surprisingly not well documented yet understanding them is key to addressing structural inequalities in higher education. Similar to the previous figure, Figure 3 shows persistent enrollment declines for broad access institutions and steady enrollments for more selective ones. However, it also shows four new patterns that can only be seen by disaggregating the data.

**Figure 3: Total Enrollment by Pell Grant Recipients, Race/Ethnicity, and Selectivity**



Source: Author's calculations using IPEDS and Federal Student Aid Title IV Program Volume Reports.

First, enrollment has been growing for Hispanic students and Asian American students—and this growth is happening across all selectivity bands. The greatest growth rate is occurring among Hispanic students attending broad access institutions, where enrollments have doubled since the early 2000s. Second, Pell enrollments have declined sharply among broad access institutions but held steady across other institutional selectivity groups. Despite this decline, two-thirds of the nation’s Pell recipients still attend broad access institutions. Third, the number of Black students and white students has declined in broad access institutions but has stayed relatively flat for moderately selective, selective, and highly selective institutions. And fourth, Native American enrollments are declining across all selectivity groups, but especially within broad access institutions.

Figure 3 also shows that selective institutions are largely holding steady with respect to the number of students of color and low-income students they enroll. While this means a larger *share* of the nation’s low-income students and students of color attend more selective institutions, this growing share is not because selective institutions are increasing the number of spots for low-income students and students of color, but rather because fewer students are enrolling in broad access institutions overall. Because selective colleges have far more applicants than they can admit, they can keep enrollments steady in ways that broad access institutions often cannot.

Appendix A provides more details about where low-income students enroll. Instead of using the Pell Grant, it uses tax data (for the 1991 birth cohort) available via Opportunity Insights to map the distribution of students by income and college selectivity. The data show that only 4 out of 100 of the nation’s lowest-income students attend highly selective colleges. The vast majority of low-income students—75 out of 100—attend broad access colleges.

*A larger share of the nation’s low-income students and students of color attend more selective institutions, [but] this growing share is not because selective institutions are increasing the number of spots for low-income students and students of color, but rather because fewer students are enrolling in broad access institutions overall.*

**Myth: Similar colleges spend similar amounts on students.**

**Fact: There is wide variation in college spending, even among similar colleges.**

Table 1 shows Education & Related (E&R) expenditures across different types of colleges and selectivity groups for the 2018–2019 academic year. On average, colleges spend \$20,804 per FTE and this varies across public and non-profit sectors. Highly selective research universities in both the public and non-profit sectors spend the most per FTE of any institutional type: \$32,156 and \$75,919, respectively. And public community colleges and comprehensive (BA/MA) institutions spend the least, ranging from a low of \$12,747 to a high of \$16,157. Recall from earlier that E&R excludes research, auxiliaries, and public services, so these cannot explain the differences we see here. These differences likely stem from highly selective colleges competing for faculty and providing robust student support services, both of which drive up college costs.<sup>11</sup>

A key takeaway from this table is that broad access colleges spend the least per-student across the board—among community colleges, public comprehensive universities, and non-profits. Not only do broad access colleges spend the least per student, but they spend far less than highly selective institutions. These differences are not well documented in the literature and they will provide useful context in the following section that examines who enrolls in the lowest-funded colleges. They also help policymakers see how much additional funding it would take to equalize resources across institutions. It would take several thousand dollars per student just to close the gaps between public institutions; it would take even more to close gaps between publics and non-profits.

**Table 1: Enrollment-Weighted E&R Expenditures by Institutional Selectivity and Classification**

	BROAD ACCESS	MODERATELY SELECTIVE	SELECTIVE	HIGHLY SELECTIVE
<b>PUBLIC</b>				
Two-year	\$12,747	—	—	—
BA/MA	\$14,221	\$15,136	\$15,504	\$16,157
Research	\$19,094	\$19,784	\$22,368	\$32,156
<b>NON-PROFIT</b>				
Two-year	\$19,475	—	—	—
BA/MA	\$20,359	\$24,609	\$23,944	\$53,137
Research	\$23,310	\$26,294	\$28,068	\$75,919
<b>TOTAL</b>	<b>\$14,945</b>	<b>\$20,390</b>	<b>\$21,851</b>	<b>\$52,129</b>

Note: “—” denotes small sample size not reported. Source: Author’s calculations using IPEDS.

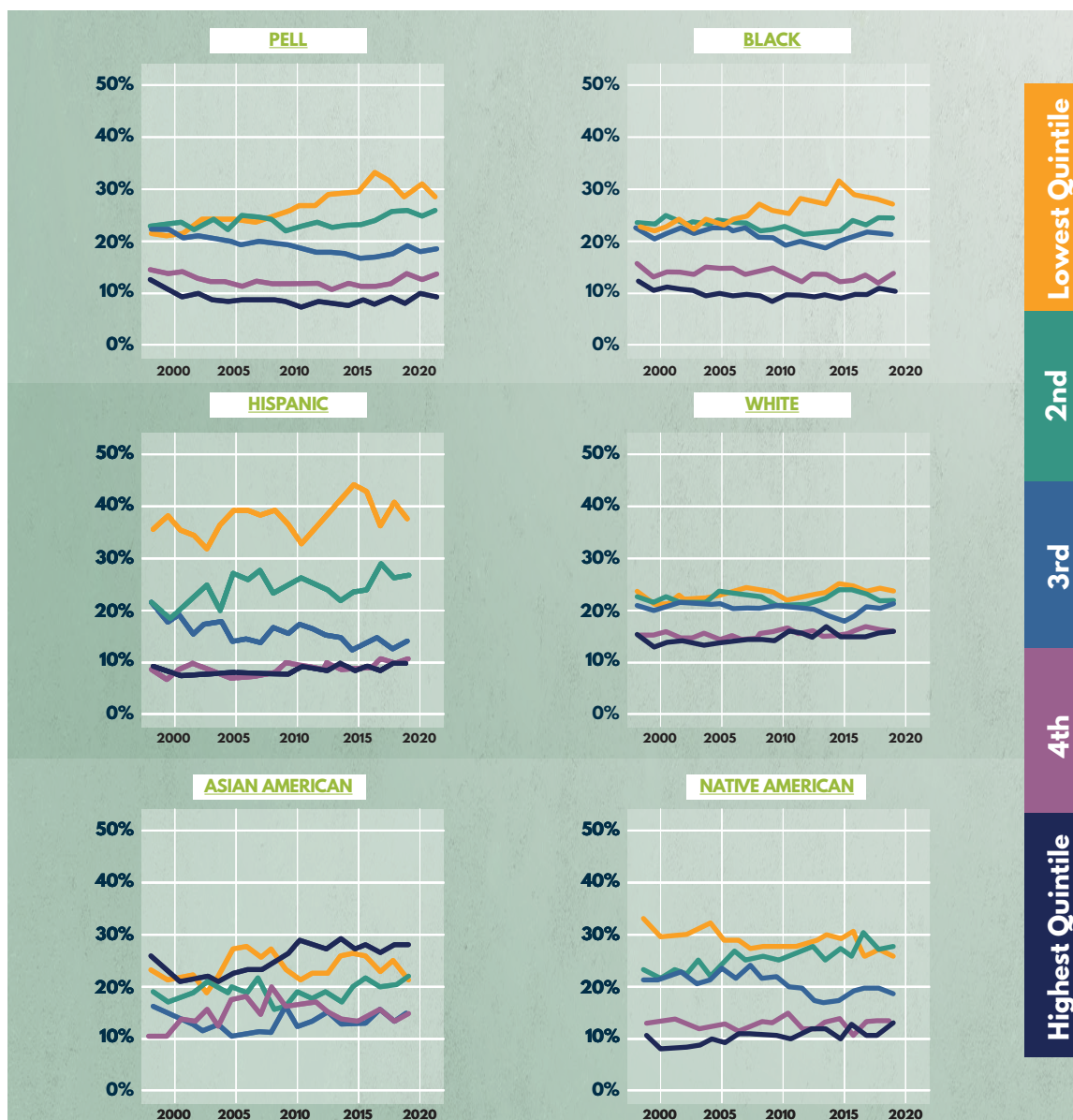


**Myth: Persistent spending gaps hurt all postsecondary students.**

**Fact: These gaps disproportionately affect low-income students and students of color.**

Because Black, Hispanic, Native, Pell recipient, and low-income students disproportionately attend broad access colleges, and broad access colleges spend the least per FTE across all classifications outlined above, persistent spending gaps disproportionately affect low-income students and students of color. Figure 4 summarizes these patterns by showing the share of students enrolled in the nation’s poorest-funded (orange line) and best-funded (dark blue line) colleges. Colleges in the bottom quintile of E&R spending per FTE are considered “poorest-funded” and those in the top quintile are “best-funded.” Imagine if every Pell Grant recipient attended the best-funded institution—this would result in a dark blue line reaching 100%. Of course, Pell recipients are spread across all institutional selectivity bins, and the top-left panel shows that about 30% attend the poorest-funded (lowest-quintile) colleges. Only 10% of Pell recipients attend the best-funded (highest-quintile) colleges.

**Figure 4: Distribution of Students by E&R Spending Quintiles**



Source: Author’s calculations using IPEDS and Federal Student Aid Title IV Program Volume Reports.

Figure 4 shows four key findings. First, a growing share of Pell recipients and Black students are enrolling in the lowest-quintile (poorest-funded) colleges over time. Given the compelling evidence that funding matters in higher education, this trend is likely a leading culprit for the racial/ethnic gaps that persist in college outcomes.<sup>12</sup> The first two panels on the top show this trend where the orange line has slowly risen over time: nearly one in three Pell recipients and Black students attend colleges that spend the least per FTE. Second, there is little variation in spending trends among white students—about 15% attend the highest-spending colleges and about 22% attend the lowest-spending colleges. This pattern is indicative of funding equality where similar proportions of students attend similarly funded institutions. In a perfectly equal distribution, 20% of students would attend the highest-spending colleges and 20% would attend the lowest-spending. This pattern does not hold for any other group in Figure 4.

Third, nearly 40% of Hispanic students attend the nation’s poorest-funded colleges. Like Pell, Black, and Native students, only about 10% of Hispanic students attend the nation’s best-funded colleges. Finally, Asian American and Native American students do not follow the same patterns as the previous groups. Asian American students are disproportionately attending colleges that spend the most per FTE while Native American students are the only group where we see funding gaps between the top and bottom quintiles close over time.

## Policy Implications

The most obvious conclusion to these findings is that federal and state policymakers interested in improving opportunities and outcomes for low-income students and students of color must address the persistent financial inequality that exists across colleges.

At the state level, policymakers should conduct a *funding equity audit* examining trends like those outlined in this report. These audits should be transparent and broadly accessible to the public, and states should show: (a) how much public colleges spend per student; (b) how much they receive in state appropriations and tuition revenue; and (c) how these financial patterns vary across colleges. This basic information will help state policymakers identify funding inequities and then create funding formulas, capacity-building grants, or other policy solutions for equalizing funding across public institutions. States could report inequality metrics as a transparent and actionable way to measure and monitor improvement in this area.<sup>13</sup> This exercise would not only promote equity-based funding but would also lay the groundwork for developing *funding equalization* efforts that are sorely lacking in higher education but common in K-12 education finance.

At the federal level, policymakers have two primary levers for equalizing funding across colleges. One possibility is to develop a grant program similar to *Title I* of the Elementary and Secondary Education Act that allocates federal funds directly to broad access colleges serving large shares of low-income students or students of color. This approach would target resources to many of the nation’s poorest-resourced colleges and, through these investments, would help colleges improve a wide range of student outcomes such as graduation rates, affordability, and time-to-degree. The Biden campaign has already proposed a similar strategy and it appears to be gaining national prominence.<sup>14</sup>

A second possibility is to develop a federal designation for broad access colleges that promote upward mobility and reduce racial inequality. This designation, similar to the *Higher Education Act*'s Minority Serving Institution (MSI) designation, could determine institutional eligibility for supplemental federal aid or other resources to build capacity among poorly resourced colleges serving large shares of low-income students or students of color. For example, a college that enrolls a minimal (or growing) share of Pell-eligible students could receive supplemental funding to help develop various outreach or other supplemental services to support low-income students.

Policymakers are likely more familiar with performance-based or outcomes-based funding models in higher education. However, this report outlines a new and fundamentally different idea—*equity-based funding*—that a growing number of policy and academic researchers believe holds great promise for promoting a fairer and more effective way of financing colleges. As there is currently no standard definition or consensus of what such an equity-based funding model should entail or how to design such models, this report aims to extend these ongoing conversations to help policymakers imagine new solutions to longstanding problems that disproportionately burden our nation's low-income students and students of color.

## Conclusion

By 2028, nearly half (48%) of all college students will be students of color.<sup>15</sup> Yet this analysis found serious racial/ethnic and income stratification across colleges where disproportionate shares of students of color and low-income students attend poorly funded broad access colleges. Evidence suggests that funding boosts student outcomes—especially among broad access colleges. The problem is that many of these institutions have limited financial resources, which in turn makes it more difficult for students to complete college in a timely fashion.

Significant public policy reform is needed to work against these structural inequalities—and it's needed now. In a pivotal moment, as the United States faces the current COVID-19 crisis, a new recession, and a national reckoning on racial justice, policymakers must look to new funding models that equalize resources for institutions of higher education. This long-overdue reform represents a key structural change that would actively work against the injustices and stratification that are so deeply ingrained in our nation's education and finance systems and help ensure all colleges are equally equipped to deliver high-quality educational experiences to all students.

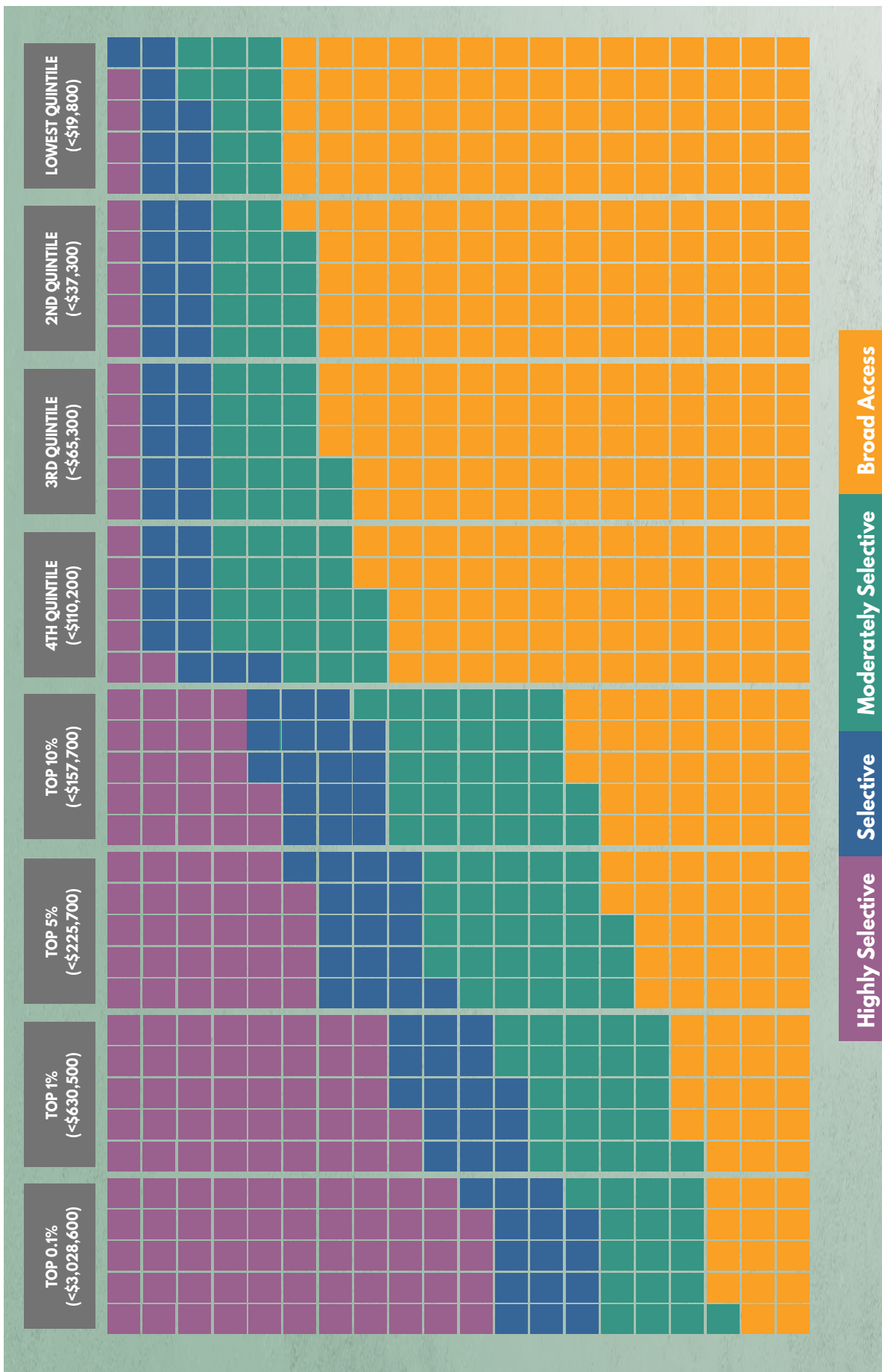
## Appendix A: A Closer Look at Income Gaps by Selectivity

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Figure 3 uses Pell Grant receipt as a proxy for low-income status, which is a common and policy-relevant variable but one that is also imprecise because Pell receipt does not measure family income. Figure A (on the next page) uses data from Opportunity Insights that matches students with their parents' tax records to get a closer look at the distribution of low-income students across colleges. These data include the full income distribution and not just low-income students, so the chart provides greater insights than what Pell Grant receipt alone can tell us.<sup>16</sup> This figure has eight panels arrayed by family income levels, where the first panel includes the lowest-income quintile (bottom 20%) of students and the last shows the highest (top 0.1%) income group.<sup>17</sup> The parentheses show median household income at each threshold; for example, the lowest-income category includes students from households earning less than \$19,800.

In the top panel, we see only 4 out of 100 of the nation's lowest-income students attend highly selective colleges. The vast majority of low-income students—75 out of 100—attend broad access colleges. By the time Figure A moves to the upper-income panels (fifth through eighth panels) the patterns become stark where most upper-income students attend highly-selective institutions—especially at the highest end of the income distribution. For example, only 27 in 100 students in the top 5% of family income attend broad access institutions.

**Figure A: Enrollment by Family Income and Selectivity**



Source: Author's calculations using IPEDS and Opportunity Insights' Income Segregation and Intergenerational Mobility Across College in the United States (Table 3).

## Endnotes

1. Clotfelter, C. (2017). *Unequal Colleges in the Age of Disparity*. Harvard University Press, Cambridge, MA. See also: Cheslock, J. & Shamekhi, Y. (2020). *Decomposing Financial Inequality Across US Higher Education Institutions*. *Economics of Education Review*, [www.sciencedirect.com/science/article/pii/S0272775720305215](http://www.sciencedirect.com/science/article/pii/S0272775720305215); Taylor, B. & Cantwell, B. (2019). *Unequal Higher Education: Wealth, Status, and Student Opportunity*. Rutgers University Press.
2. Carnevale, A. (2020). *White Flight to the Bachelor's Degree*. Georgetown University Center on Education and the Workforce, [medium.com/georgetown-cew/white-flight-to-the-bachelor-degree-e604ee4e3967](https://medium.com/georgetown-cew/white-flight-to-the-bachelor-degree-e604ee4e3967). See also: Dowd, A.; Rosinger, K.; Castro, M. (2020). *Trends and Perspectives on Finance Equity and the Promise of Community Colleges*. *Higher Education: Handbook of Theory and Research*, 35, 517-588.
3. Carnevale, A.; Schmidt, P.; & Strohl, J. (2020). *The Merit Myth: How Our Colleges Favor the Rich and Divide America*. The New Press, New York; NY.
4. Bound, J.; Lovenheim, M. F.; & Turner, S. (2010). *Why Have College Completion Rates Declined? An Analysis of Changing Student Preparation and Collegiate Resources*. *American Economic Journal: Applied Economics*, 2(3), 129-157. See also: Bound, J.; Lovenheim, M. F.; & Turner, S. (2012). *Increasing Time to Baccalaureate Degree in the United States*. *Education Finance and Policy*, 7(4), 375-424, [www.mitpressjournals.org/doi/10.1162/EDFP\\_a\\_00074](http://www.mitpressjournals.org/doi/10.1162/EDFP_a_00074); Bound, J. & Turner, S. (2007). *Cohort Crowding: How Resources Affect College Attainment*. *Journal of Public Economics*, 91(5-6), 877-899.
5. Deming, D. J. & Walters, C. R. (2017). *The Impact of Price Caps and Spending Cuts on U.S. Postsecondary Attainment*. National Bureau of Economic Research Working Paper No. 23736, [scholar.harvard.edu/files/ddeming/files/DW\\_Aug2017.pdf](http://scholar.harvard.edu/files/ddeming/files/DW_Aug2017.pdf). See also: Webber, D. A. & Ehrenberg, R. G. (2010). *Do Expenditures Other Than Instructional Expenditures Affect Graduation and Persistence Rates in American Higher Education?* *Economics of Education Review*, 29(6), 947-958, [www.sciencedirect.com/science/article/abs/pii/S0272775710000488](http://www.sciencedirect.com/science/article/abs/pii/S0272775710000488)
6. In this report, “broad access institutions” refers to schools admitting at least 80% of applicants; See Orphan, C. “Why Regional Public Universities are Vulnerable During Recessions and Must be Protected.” (2020). *Third Way*, [www.thirdway.org/report/why-regional-public-universities-are-vulnerable-during-recessions-and-must-be-protected](http://www.thirdway.org/report/why-regional-public-universities-are-vulnerable-during-recessions-and-must-be-protected). See also Bound, J.; Lovenheim, M. F.; & Turner, S. (2012). *Increasing Time to Baccalaureate Degree in the United States*. *Education Finance and Policy*, 7(4), 375-424, [www.mitpressjournals.org/doi/10.1162/EDFP\\_a\\_00074](http://www.mitpressjournals.org/doi/10.1162/EDFP_a_00074).
7. See for example: Crisp et al. (2019). *Describing and Differentiating Four-Year Broad Access Institutions: An Empirical Typology*. *Review of Higher Education*, 42(4), 1373-1400; Orphan, C. & Miller, G. (2019). *The Company Regional Comprehensive Universities Desire to Keep: Choosing Institutional Membership Associations*. *Journal of Higher Education*, 91(2), 300-325.

8. See Chetty et al. (2020). Income Segregation and Intergenerational Mobility Across Colleges in the United States. Quarterly Journal of Economics. See also: Opportunity Insights, [opportunityinsights.org/paper/undermatching/](https://opportunityinsights.org/paper/undermatching/).
9. See Cheslock, J. J. (2019). Examining Instructional Spending for Accountability and Consumer Information Purposes. The Century Foundation, [tcf.org/content/report/examining-instructional-spending-accountability-consumer-information-purposes/](https://tcf.org/content/report/examining-instructional-spending-accountability-consumer-information-purposes/). See also: Delta Cost Project. (2009). Issue Brief #2: Metrics for Improving Cost Accountability, [deltacostproject.org/sites/default/files/products/issuebrief\\_02.pdf](https://deltacostproject.org/sites/default/files/products/issuebrief_02.pdf), for more details on this measure. The two sources calculate the figure slightly differently, where Delta Cost Project weights by operation and maintenance expenses. Because operation and maintenance reporting changes prevent reliable comparisons between public and private institutions—as described in Delta Cost Project. (2011). Delta Cost Project Documentation of IPEDS Database and Related Products, [nces.ed.gov/ipeds/deltacostproject/download/DCP\\_History\\_Documentation.pdf](https://nces.ed.gov/ipeds/deltacostproject/download/DCP_History_Documentation.pdf)—this analysis follows Cheslock, J. J. (2019) by calculating E&R as: [(instruction + student services)] \* [education share \* (academic support + institution support)] where “education share” is calculated as [(instruction + student services) / (instruction + student services + research + public service)].
10. For more context, see Baker, R.; Klasik, D.; & Reardon, S. F. (2018). Race and Stratification in College Enrollment Over Time. AERA Open, [journals.sagepub.com/doi/10.1177/2332858417751896](https://journals.sagepub.com/doi/10.1177/2332858417751896) and Bastedo, M. N. & Jaquette, O. (2011). Running in Place: Low-Income Students and the Dynamics of Higher Education Stratification. Educational Evaluation and Policy Analysis, 33(3), 318-339.
11. Archibald, R. & Feldman, R. (2012). The Anatomy of College Tuition. American Council on Education. Washington, DC, [www.acenet.edu/Documents/Anatomy-of-College-Tuition.pdf](https://www.acenet.edu/Documents/Anatomy-of-College-Tuition.pdf).
12. Libassi, C. (2018). The Neglected College Race Gap: Racial Disparities Among College Completers. Center for American Progress. Washington, DC, [www.americanprogress.org/issues/education-postsecondary/reports/2018/05/23/451186/neglected-college-race-gap-racial-disparities-among-college-completers/](https://www.americanprogress.org/issues/education-postsecondary/reports/2018/05/23/451186/neglected-college-race-gap-racial-disparities-among-college-completers/).
13. For example, a Gini coefficient measures the degree of resource inequality and can be applied to higher education finance. See for example: Cheslock, J. J. & Shamekhi, Y. (2020). Decomposing Financial Inequality Across US Higher Education Institutions. Economics of Education Review, [www.sciencedirect.com/science/article/pii/S0272775720305215](https://www.sciencedirect.com/science/article/pii/S0272775720305215).
14. See Hiler, T. & Whistle, W. (2018). Creating a “Title I” for Higher Ed. Third Way, [www.thirdway.org/memo/creating-a-title-i-for-higher-ed](https://www.thirdway.org/memo/creating-a-title-i-for-higher-ed) and Whistle, W. (2020). Joe Biden and Bernie Sanders: Free College, Student Loan Forgiveness, and Crack Down on For-Profit Colleges. Forbes, July 8, 2020, [www.forbes.com/sites/wesleywhistle/2020/07/08/biden-sanders-unity-task-force-free-college-student-debt-forgiveness-and-crack-down-on-for-profit-colleges/#60b6252c111a](https://www.forbes.com/sites/wesleywhistle/2020/07/08/biden-sanders-unity-task-force-free-college-student-debt-forgiveness-and-crack-down-on-for-profit-colleges/#60b6252c111a).
15. See Table 19 in US Department of Education’s Projections of Education Statistics to 2028: [nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2020024#:~:text=Description%3A,of%20publications%20initiated%20in%201964.](https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2020024#:~:text=Description%3A,of%20publications%20initiated%20in%201964.)
16. Calculated using the 1991 birth cohort (Table 3) and family percentile ranks, merged to IPEDS based on OPEID excluding non-matched cases: [opportunityinsights.org/data/](https://opportunityinsights.org/data/).
17. Calculated using the 1991 birth cohort (Table 9) and family percentile ranks from Stata code: 

```
// use opportunityinsights.org/wp-content/uploads/2018/04/mrc_table9.dta // table pctile if cohort==1991 & (inlist(pctile,20,40,60,80,90,95,99,99.9)), c(mean par_hh_inc)
```