RESEARCH BRIEF NOVEMBER 2025

Tracking persistence in STEMM

Part 2: STEMM degree pathways state-by-state

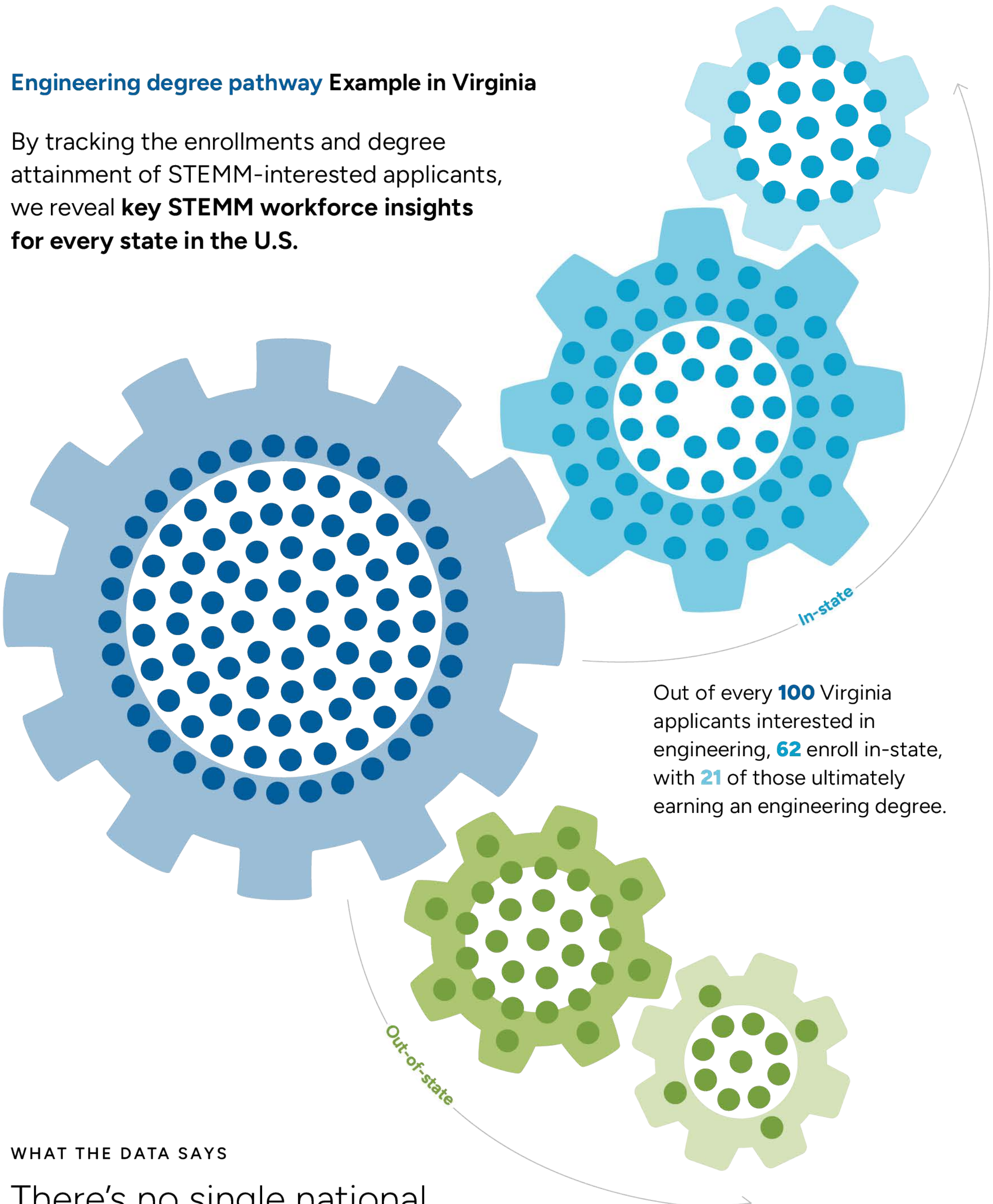
KEY FINDINGS

Tracking persistence in STEMM

Part 2: STEMM degree pathways state-by-state

Engineering degree pathway Example in Virginia

By tracking the enrollments and degree attainment of STEMM-interested applicants, we reveal **key STEMM workforce insights for every state in the U.S.**



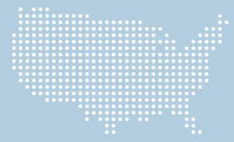
Out of every **100** Virginia applicants interested in engineering, **62** enroll in-state, with **21** of those ultimately earning an engineering degree.

Out of every **100** Virginia applicants interested in engineering, **29** enroll out of state, with **12** of those ultimately earning an engineering degree.

WHAT THE DATA SAYS

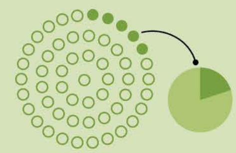
There's no single national story when it comes to STEMM pathways—each **state has its own unique picture** to consider.

EXPLORE MORE



5,500+
data points reported

TOP FIVE: INTEREST IN STEMM MAJOR

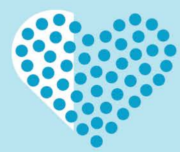


The states with the highest percentage of applicants interested in **engineering** are:

- **21%** Tennessee
- **21%** Alabama
- **21%** Arizona
- **20%** Texas
- **20%** Colorado

The national average is **16%**.

TOP FIVE: EARNED DEGREE IN MAJOR INTEREST



The states with the highest percentage of in-state enrollees interested in **health** who earn a degree in that subject:

- **37%** Pennsylvania
- **32%** Ohio
- **31%** Connecticut
- **30%** Massachussetts
- **29%** Oregon

The national average is **26%**.

common app

Tracking persistence in STEMM, part 2: degree pathways state-by-state

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Introduction

As demand for college-educated workers in Science, Technology, Engineering, Mathematics and Medicine (STEMM) fields continues to grow, understanding how young people develop their career interests, progress through their education, earn postsecondary degrees, and ultimately begin their careers has become an issue of national importance.[1] In our first research brief on STEMM persistence, we took a national snapshot of STEMM college pathways. We found that about half of STEMM aspirants ultimately earned a degree in STEMM, a rate that falls to ~33% for STEMM aspirants from underrepresented groups.

While these national statistics reveal the scope of the challenge, the steps STEMM aspirants take toward a career are ultimately along a much more local path: K-12 schools, nearby colleges, and employers near college campuses. Given this fundamentally local nature of educational and career trajectories, how can these and other local supporters come together to support STEMM aspirants from high school to career?

[1] For example, "A need to re-build STEM education and build a robust STEM workforce" is one of three key considerations in a recent National Science Board publication. Nationally, STEMM occupations are some of the fastest growing and highest paid positions requiring Bachelor's degrees

Answering this question requires nuanced analysis, tracking students through their high school experiences, developing major interests, college enrollment, persistence and degree outcomes. By identifying where many aspirants leave the path, we can bring stakeholders, including K-12 schools, colleges, employers, state legislators, governors' offices, and workforce development boards, to the table to dig deeper into uncovering specific obstacles, take concerted action, and measure progress over time.

While the value of data following students along their STEMM paths is clear, accessing such data remains a challenge. Schools and colleges have dedicated student information systems, but these are typically internal and do not follow students who relocate or track their outcomes in the next step along the path. Some states have state-wide education-to-workforce student tracking systems, but these may only focus on public schools and colleges and/or often lose visibility on students leaving or entering the state.

This research brief offers a rare glimpse beyond these restrictions, using a novel combination of Common App's data warehouse and National Student Clearinghouse StudentTracker data.[2] We follow over 778,000 applicants, as they share their major interests, enroll in college, and earn degrees in their chosen fields. Our data allows us to compare pathways by applicants' home states, including applicants who leave the state for college, and to compare pathway routes for engineering, health, computer science, and other STEMM major groups.

Our findings reveal that every state faces unique challenges. There is no one-size-fits-all strategy for developing tomorrow's workforce. However, our state- and major-specific data can help local stakeholders prioritize coordination and resources. Some states might strengthen awareness of and enrollment in computer science majors at local colleges to encourage high school graduates to remain in state. Other states could focus on improving degree completion rates in Health once enrolled. Still others may need to recruit out-of-state graduates in engineering back home for early career positions

This research brief has two components. The main text works through a "case-study" using our state-major data, focusing on engineering in Virginia, Common App's home state. It illustrates the three main "steps" on the pathway we are able to observe: application major interest, enrollment, and degree completion, and also provides a review of these three steps. After review of this case-study, we broaden our examination in the appendix to all states, the District of Columbia and Puerto Rico

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[2] This report is based on research funded by the Gates Foundation. The findings and conclusions contained within are those of the authors and do not necessarily reflect positions or policies of the Gates Foundation.

1. Step 1: To what extent are Virginia's college applicants interested in engineering?
2. Step 2: Are Virginia's applicants who are interested in engineering enrolling in colleges in state, nearby, or further afield?
3. Step 3: Once enrolled, what percent of these students ultimately earn degrees in engineering? Are students who do not earn engineering degrees switching to other majors, or are they not earning degrees in any field?
4. Reviewing the path: Out of every 100 Virginia students interested in engineering, how many ultimately earn engineering degrees (applicant-to-engineer rate)?
5. Reviewing the path: What percentage of Virginia's engineering degree earners studied in their home state, a border state or further away?

After illustrating how readers might interpret these statistics to examine Virginia's engineering pathway, we then provide visualizations and statistical tables for every other state and STEMM-interest combination. Downloadable data tables allow readers to pose similar questions and comparisons for their own interests, comparing outcomes across STEMM interests within a state, or comparing one outcome across peer states. In total, we provide over 5,500 data points across state, major interest, and application to degree outcome combinations.

This state-level data can help stakeholders assess a wide array of key questions related to education pathways and workforce development in their state, such as those highlighted as Essential Questions in the Education-to-Workforce Indicator Framework ("E-W Framework"). These include assessing pathways for students that lead to employment in quality jobs (15), and whether students are completing credentials of value that set them up for success in the workforce (19), with disaggregation by student major and state. In answering these questions, we hope to provide the field with insights about the needs and pivotal support opportunities for STEMM aspirants across the country.

Contents

Key findings

1. By following each state's applicants from application major interests to degrees earned, we provide over 5,500 data points on STEMM pathways, within and across state lines, empowering readers to track their own pathways of interest. These statistics provide key state-level context for K-12 schools, colleges, employers, state legislators, governors' offices, and workforce development boards working to improve the STEMM pathways.
2. We break down each state's applicants' major interests by specific STEMM fields, providing **a uniquely early snapshot of the STEMM pathway.**
    a. Nationally, Biology, Health, Engineering and Computer Science are the most popular STEMM majors of interest among Common App applicants (Figure 1).
    b. Our example state, Virginia, resembles national interest patterns. Fourteen percent of Virginia applicants are interested in Engineering, slightly lower than the national average of 16%.
3. States can observe the in-state enrollment rate of their applicants interested in specific STEMM fields, and observe for **which fields of interest they have the highest rates of retaining applicants in-state** and in which fields applicants are more likely to enroll out of state.
    a. 68% of Virginia's applicants interested in engineering enroll in-state – higher than the national average of 62%, but lower than neighboring North Carolina at 75% (Figure 2).
    b. Nevertheless, Virginia's applicants interested in engineering actually have lower rates of in-state enrollment than other applicants in Virginia (Figure 3). In short, Virginia applicants tend to enroll in-state across interests, but students interested in engineering seem more likely than other Virginia applicants to leave the state.
4. After enrollment, we identify what percentage of applicants from each state are ultimately able to earn a degree in their field of interest, alongside rates of switching majors within or outside of STEMM, or not earning a degree in any subject. This allows for more **granular diagnostics of and possible interventions for workforce pathways for specific fields** – are issues arising from low graduation rates in general, or instead students switching from their initial interests and graduating in different fields?

    a. To unpack that finding, we show that among Virginia engineering applicants enrolled in the state, **almost half earned a degree in another subject** (Figure 4). About one fifth do not earn a degree in any subject, a rate that is relatively similar to neighboring states and the national average.

5. Reviewing the path from aspiration to college graduation, **we calculate the number of degrees earned in a field of interest per every 100 interested applicants -an "Applicant-to-engineer rate."** This distills the previous three steps into one number to help decisionmakers understand the overall efficiency of a STEMM pathway.
    a. For every **100 Virginia Common app applicants interested in engineering, 33 ultimately earned a degree in engineering**, with 21 applicants earning that degree in Virginia, 3 earning degrees in a bordering state, and 9 earning degrees in a more distant state.
    b. Neighboring states have similar overall rates, but different balances of in and out-of-state degrees. For example, Maryland produces 32 engineering degrees per every 100 engineering applicants, with 8 of those degrees earned in a bordering state.
6. States can see where their applicants who ultimately earned a degree in a given STEMM field graduated from, regardless of initial interests, and **inform their efforts to recruit early career workers** with pre-college ties to their states.
    a. Even though many Virginia applicants interested in engineering switch majors (shown in Figure 4), overall 65% of Virginia applicants with engineering degrees earned those degrees in state (Figure 6). This might suggest strong partnerships with state universities and engineering employers as an effective route to support Virginia's engineering workforce
    b. Conversely, other states like Maryland, where more engineering graduates earned their degrees out of state (52%), might consider attracting successful graduates back to their home state for work.
7. **State-specific STEMM workforce challenges require tailored strategies.** Every state faces unique combinations of student interest levels, enrollment patterns, and degree completion rates. The [full set of data tables] allow states to explore these nuanced STEMM workforce pathway data **using their own perspectives and priorities**, while also facilitating comparisons against any set of peer and neighboring states.

Applicants, degrees, and STEMM interest definitions

Similar to our first brief in the "Tracking persistence in STEMM" series, the **study sample** for this analysis covers over 778,000 Common App applicants in the 2016-2017 application season. We follow this cohort's degree completion rates six years after their expected enrollment (Fall 2017 - Spring 2023). More specifically, this analysis includes any applicant residing in the United States, who is not exclusively a citizen of a non-U.S. country, who indicated they planned to enroll in college for the first time in the 2017-2018 academic year, and submitted at least one application using the Common App. This research brief provides data on Common App applicants only, as we do not observe outcomes for applicants applying via other methods.[3]

We use data from the National Student Clearinghouse's (NSC) StudentTracker service to follow Common App applicants over the following six years through enrollment, persistence, and degree completion. NSC is a nonprofit organization that verifies enrollment and graduation outcomes in the United States. NSC's data allows us to observe applicant trajectories through most U.S. institutions, including those that do not use Common App for applications. NSC's record-level data provides information on over 98% of U.S. higher education enrollments during this time period.[4]

We label the state an applicant resides in while filling out their Common App application as their **"home state"**, and caution that categorization would include applicants who recently moved to a new state alongside lifelong residents. We determine an **applicant's state of enrollment** as the state where they completed the most enrollment terms in a 4-year institution. For an **applicant's degree state**, we consider each applicant's first Bachelor's degree earned. Throughout this research brief, all analyses focus exclusively on enrollments in 4-year institutions and

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[3] For some context on the size of a state's Common App applicant count, interested readers can compare against the count of high school graduates per state, from the Western Interstate Commission for Higher Education (WICHE). For example, there were 33,807 Common App applicants in Virginia in the 2016-17 season and 92,778 graduating seniors in spring 2017. Complicating the comparison, note that not all high school seniors apply to four-year college, and some four-year college applicants are not graduating seniors when they apply.

[4] This research brief does not capture enrollment and degree outcomes for students who have blocked their records under the Family Educational Rights and Privacy Act (FERPA). As a result, our estimates of enrollment and degree rates may be slightly lower than actual enrollment and degree rates for the applicants in this study. This poses a larger issue for applicants who enroll in states with high block rates, particularly New Jersey and Puerto Rico.For more information on coverage and blocks, see National Student Clearinghouse's report, and updated summary tables, FERPA Block Rate Details

Bachelor's degrees earned. While 2-year institutions are a critical component of the STEMM skill development ecosystem, our data on this cohort of primarily 4-year college enrollees does not allow for a sufficiently thorough analysis of 2-year pathways.[5]

STEMM fields have been defined in various ways across academic and policy research. In this research brief, we use the U.S. Department of Education's Classification of Instructional Programs (CIP) codes and the National Science Foundation's (NSF) Science & Engineering categorizations of 2020 CIP codes to assign each applicant's career interests, intended majors, and degrees into disciplinary fields.[6] However, we exclude majors categorized as Social Science, Psychology, and Interdisciplinary studies by NSF in our definition of STEMM.[7] This exclusion is in line with prior studies.[8] Examples of top majors of interest and degrees earned in each STEMM category can be found in Appendix Table 2. We define **STEMM interest at application** by summarizing applicant responses to questions asking about intended majors. Note that each applicant can have multiple interests, within and outside of STEMM.[9]

Step 1: STEMM major interest

Our analysis begins by examining applicants' intended majors when applying on Common App. What majors, and associated career options, are top of mind for a state's college applicants? How do these expectations align with projected job openings? If applicants turn those interests into majors, and then into Bachelor's degrees, will they be able to find work in their field? Are there more job openings forecasted than applicants interested? Understanding major interests at application can provide important context for these workforce questions.

Unpacking which majors attract the most interest reveals what job market information and pre-college experiences are resonating with a state's college applicants. Most Common App applicants in the 2016-17 season are high school

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[5] Note that applicants who enrolled in both 2-year and 4-year programs are still present in our data, but only their 4-year experiences are summarized in this brief.
[6] This crosswalk is available from the National Student Clearinghouse under "CIP Code Lookup Table"
[7] NSF's STEMM field code of "Multidisciplinary Studies" was excluded because it was both a small portion of majors and many of the top majors were hard to categorize, for example, "Other", "General", or "International/Globalization Studies.
[8] See for example, Chen (2014)
[9] For the roughly 10% of applicants who did not apply to an institution asking about intended majors, we instead categorize their responses using their career interests, a question asked to every applicant. We assign each career option an indicator of STEMM/non-STEMM, and, if STEMM, a STEMM disciplinary field using the same CIP classification scheme as for intended majors.

seniors or recent graduates.[10] Their major interests may be shaped by positive high school classroom experiences, after-school programming, summer and part-time jobs, experiences of friends and family, and awareness of college and career options. We explore rates of applicant experiences with many of these STEMM experiences in our prior research brief.

Stakeholders observing a mismatch between applicant interest and projected job openings might consider increasing support for career-oriented after-school programs, student clubs, dual-enrollment opportunities, internships, job shadowing opportunities, information and awareness campaigns, and partnering with high school college and career counselors. Many of these strategies are elaborated in the E-W framework as evidence-based practices, including enhanced college advising and career pathway programs.

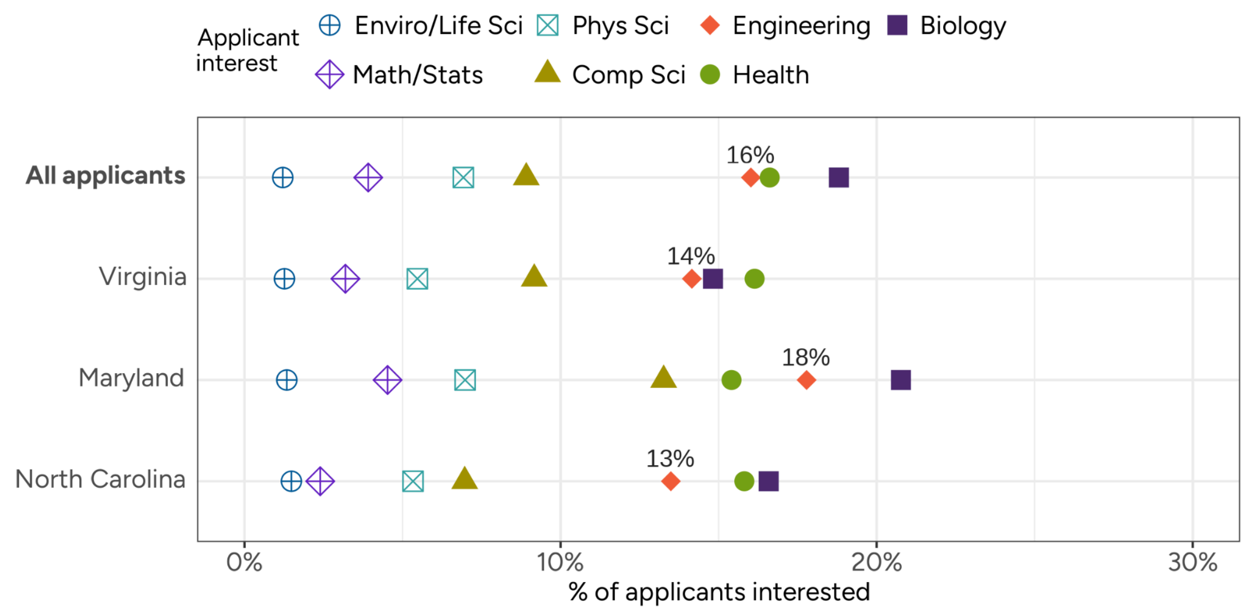
As an example of the types of questions this data can help explore, we examine rates of interest in engineering in Virginia. Forecasts suggest that Virginia will need more engineers in the coming years. The Virginia Office of Education and Employment maintains a dashboard of High Demand Careers, listing 116 careers which typically require a Bachelor's degree on entry. Forty-one of those careers are in STEMM, and 13 are in engineering. High-demand engineering careers have an average 3.5% growth rate over the next five years, with a median annual income of $120,800.

In Figure 1, we show the percentage of Virginia's Common App applicants interested in engineering, in comparison to other STEMM majors among Virginia Common App applicants, neighboring states, and the national Common App applicant population. For a national breakdown of applicant interests by student demographic groups, see Figure 3 in our prior research brief. For additional states and STEMM-interest categories, see Appendix Figure 1 and/or the Figure 1 data table.

Figure 1 shows that 14% of Virginia's Common App applicants are interested in majoring in engineering, slightly under the national average of 17% and Maryland (18%), but above North Carolina (13%). Engineering is the third most popular STEMM interest in Virginia, and among Common App applicants more generally. Biology and health are both more popular, with almost one out of 5 Common App applicants expressing an interest in biology nationally (19%).

[10] Note that adult applicants and other independent student groups have an increasing presence on Common App's platform in more recent years, as shown in our brief Highlighting independent students

Figure 1. Percentage of applicants interested in STEMM fields, by applicant home state
Among 2016-17 U.S. resident Common App applicants



Is Virginia's rate of 14% of applicants interested in engineering "good?" Identifying majors with over and undersupply of applicants interested per state is beyond the scope of this brief, especially given the focus on Common App applicants, rather than the full cohort of all college applicants. Nevertheless, engineering's rank among the most popular major interests is a promising first step for this in-demand pathway. Still, whether this foundation is sufficient depends a great deal on how many of these interested applicants enroll and earn degrees, a point we further develop in the next two steps.

Step 2: College enrollment destinations

In the next step along the pathway, we turn from college applicants to considering college enrollees, and ask to what extent are a state's aspiring engineers (or health care professionals, or computer scientists, etc.), enrolling in state, or leaving the state to pursue their desired major?[11] In-state enrollment may or may not be a priority for a state, specifically, but it's likely worthy of strong consideration for

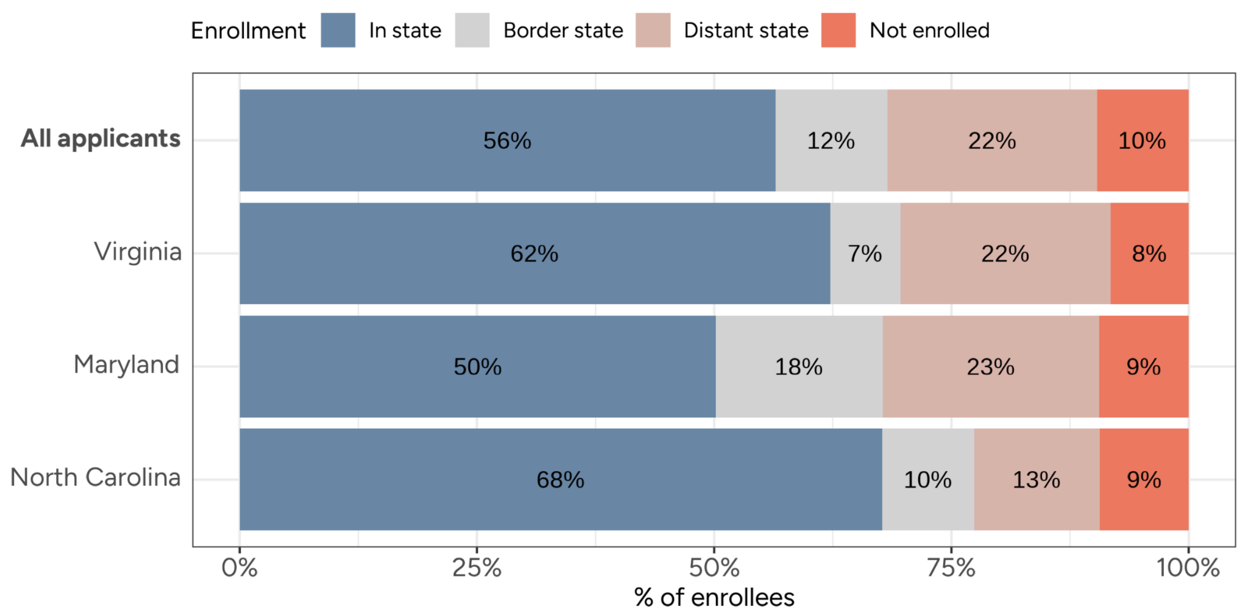
[11] We define each applicant's "enrollment state" as the state in which they recorded the highest number of enrollment terms. For example, if an applicant enrolls in a college in state A for two terms before transferring to a college in State B, enrolling for six terms and completing a degree, we consider the applicant as enrolled in State B.

many states given that recent research has found that most college graduates find their first post-graduate work near their alma mater.[12]

We thus break college enrollment destinations into four categories: in-state, border state, distant state, or not enrolled in any 4-year college. These rough categories reflect that a college student enrolling in a campus a 30 minute drive away from home across a state line might have a very different perspective on their connection to their home state and post-grad work opportunities than a student who is flying cross-country on college move-in day. Cross-border partnerships between colleges, K-12 school districts, employers, state agencies and other actors may also be easier to establish than efforts to recruit graduates from an array of distant states.

Nationally, 56% of applicants interested in engineering enroll in-state, as shown in Figure 2. Virginia's applicants interested in engineering enroll in-state at even higher rates, with 62% staying in-state. In Maryland, applicants interested in engineering have slightly lower rates of in-state enrollment, but higher rates of enrollment in bordering states, likely reflecting Maryland's small size and interconnectedness in the region. To Virginia's south, North Carolina has the highest rates of in-state enrollment, at 68%. Rates of not enrolling in any 4-year college are relatively similar across states, between 8 and 9% of applicants[13].

Figure 2. Applicants interested in engineering's enrollments by home state
Among applicants interested in engineering



[12] Conzelmann et al (2024)
[13] All states and major interest combinations available in Appendix Figure 2A and corresponding data table.

How does Virginia's engineering in-state enrollment rates compare to other STEMM interests?

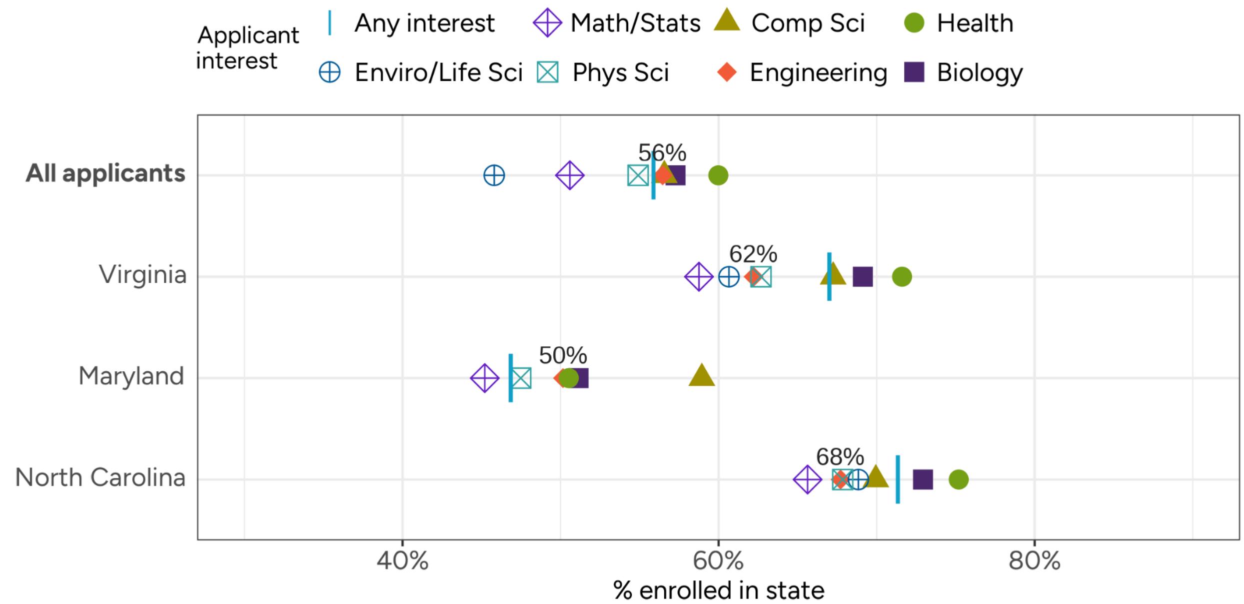
Some applicants leaving a state for college should be expected, and constraints from geography and capacity on local campuses mean each state will have different patterns of in-state enrollment, regardless of the quality of in-state options. However, if a state observes that a disproportionate percentage of its applicants interested in a particular major are leaving the state, it should spur further investigation. Are applicants unable to find in-state colleges with compelling options in their major of interest? Is there a disconnect in applicant awareness of existing programs? Are majors in specific colleges known to have limited capacity or support for enrolled students? Is affordability for a specific major presenting a roadblock?

By comparing majors within a state, we can roughly control for state-level features that shape in-state enrollment (e.g., fewer college seats, major population areas near state borders), and focus on the relative awareness, availability or attractiveness of in-state major offerings. Figure 3 shows the percentage of applicants from each state who remained in state, matching the in-state engineering rates shown in Figure 2 but now also showing in-state rates for other major interests. Text labels highlight engineering in-state enrollment rates.

Nationally, about 56% of applicants remain in their home state, as shown in the "any interest" category in Figure 3. Applicants interested in engineering, computer science, biology, and physical sciences match this overall in-state enrollment rate. Applicants who want to major in health have higher rates of in-state enrollment (60%), while those interested in environmental/life science and mathematics/statistics have lower rates, at 46% and 51% respectively.[14]

[14] Additional states shown on Appendix Figure 3A, and in corresponding data table

Figure 3. Percent of enrolled applicants who enrolled in state, by applicant major interest



Moving down Figure 3, we see that Virginia's engineering in-state enrollment rate of 62% is among the medium to low end of in-state enrollment by major interest. In contrast, 72% of Virginia's health enrollees stay in state.

Maryland presents a different pattern. While Maryland has lower overall in-state enrollment, engineering applicants stay in state at slightly higher rates than the average Maryland applicant. In fact, all four top STEMM fields exceed Maryland's overall in-state enrollment rate, particularly computer science. This suggests Maryland's STEMM programs may be especially compelling relative to other in-state options. These strong programs may also help explain why Maryland applicants show above-average interest in engineering and computer science, as demonstrated in Figure 1.

As in Step 1, there are no "good" or "bad" in-state enrollment rates. These numbers offer a chance for stakeholders to reflect on the paths their interested students are taking, and consider what policy decisions might shape those choices. A state might choose to prioritize efforts to retain applicants in one major group with many projected job openings, or form partnerships with stakeholders in nearby states that help students crossing state lines connect with opportunities in either location. Alternatively, leaders may accept current patterns of enrollment and instead re-focus efforts on supporting students to graduation once enrolled.

Step 3: Degree completion

Next, we consider what percentage of enrolled engineering applicants ultimately earn a degree in engineering. While the prior steps set a foundation for a robust STEMM workforce, applicants need to learn the skills necessary to fill these positions, and that means taking classes, earning credits, participating in extra-curricular experiences including student organizations, research, internships and more. All this work culminates in earning a degree with a major within engineering (or biology, etc.). Although we can't observe every step an applicant takes toward gaining these skills, we are able to determine which applicants earn a Bachelor's degree in their field of interest.

We focus on a state's applicants who are enrolled in state, allowing each state's stakeholders to focus on potential policies within their state. We consider four possible outcomes for each enrolled student: 1. Earning a degree in their initial major of interest (in this example engineering), 2. Earning a degree in another STEMM subject, 3. Earning a degree in a non-STEMM subject, and 4. No degree.

Disentangling these outcomes allows for stakeholders to narrow in on specific major pathways which appear to function well within the state, and others that may push more students toward other majors. We consider degrees earned in other STEMM fields as their own category to help state assess the general accessibility of STEMM degrees in their state, and also to capture that some STEMM major categories intersect and could prepare students for various careers (e.g., Biomedical engineering). Finally, understanding the extent to which students do not complete in any subject (No degree) can spur further investigation on barriers and mobilize student support.

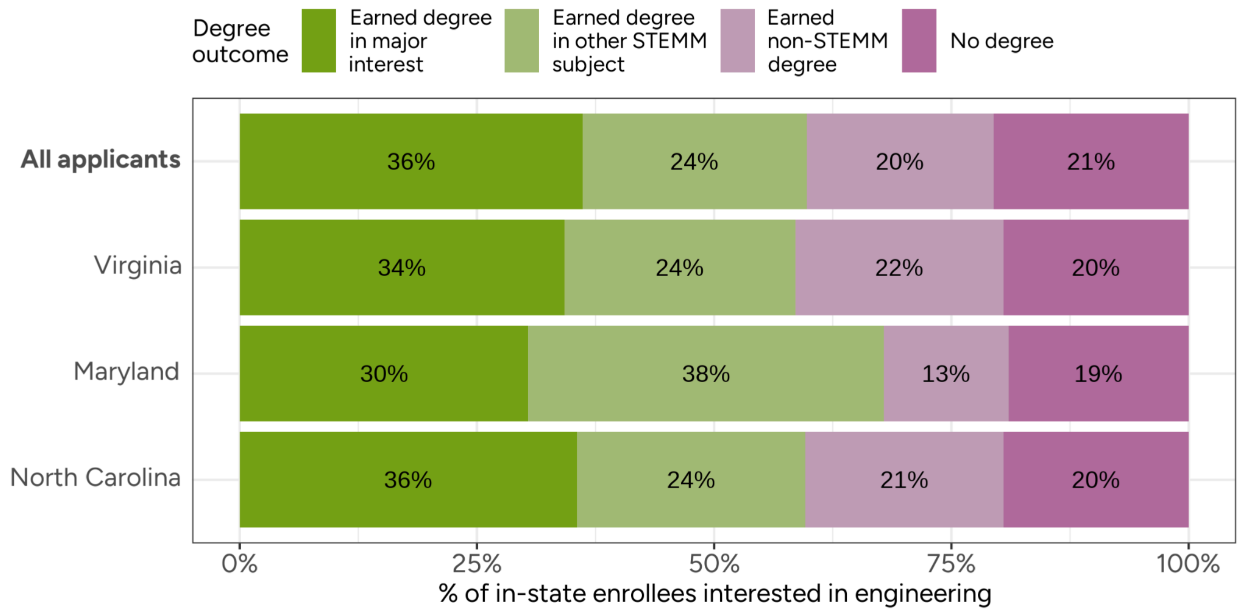
Nationally, 36% of engineering applicants enrolled in state ultimately earned an engineering degree, as shown in Figure 4. The rate for Virginia is similar, at 34%, meaning about one out of every three Virginia in-state engineering enrollees earns an engineering degree. Almost half of Virginia's and North Carolina's in-state engineering enrollees end up earning a degree in other majors, including ~20-22% who earn a degree outside of STEMM entirely.[15]

Maryland's in-state students switched out of engineering at slightly higher rates: almost 40% ultimately earned degrees in other STEMM subjects. It's possible that some alternate STEMM majors have more clear paths to graduation in Maryland's higher education system. Rates of not earning a degree in any field are quite similar in each state. About 20% of in-state engineering interested students ultimately do

[15] Additional state and major combinations shown in Appendix Figures 4 and in the corresponding data table

not earn a degree, across the states shown here. Reducing the proportion of students who do not complete presents another opportunity to increase the number of graduating engineers. Note that these rates do not include students who did not initially plan to major in engineering when applying, but ultimately switch majors and earn degrees in that subject. We include these "switch-in" students in our later section, "Where are degrees earned."

Figure 4. Degree outcomes among applicants interested in engineering, who enrolled in state



How does earning a degree in engineering among engineering applicants compare to earning a degree in computer science among computer science applicants, or any of the other STEMM pathways? Figure 5 shows the percentage of applicants enrolled in state who earned a degree in their subject of interest. For engineering, these rates are the same as the dark green "earned degree in major interest" in Figure 4.[16]

Engineering emerges as having the highest completion within initial major interest rates among in-state enrollees in comparison to other STEMM pathways, both nationally and in Virginia. Among the most popular STEMM pathways, health tends to have the lowest completion rates. Smaller STEMM pathways including environmental and life sciences, mathematics and statistics, and physical sciences tend to have lower completion rates as well.[17] Despite these general trends, we do observe variation by state, even among the three neighboring states shown below.

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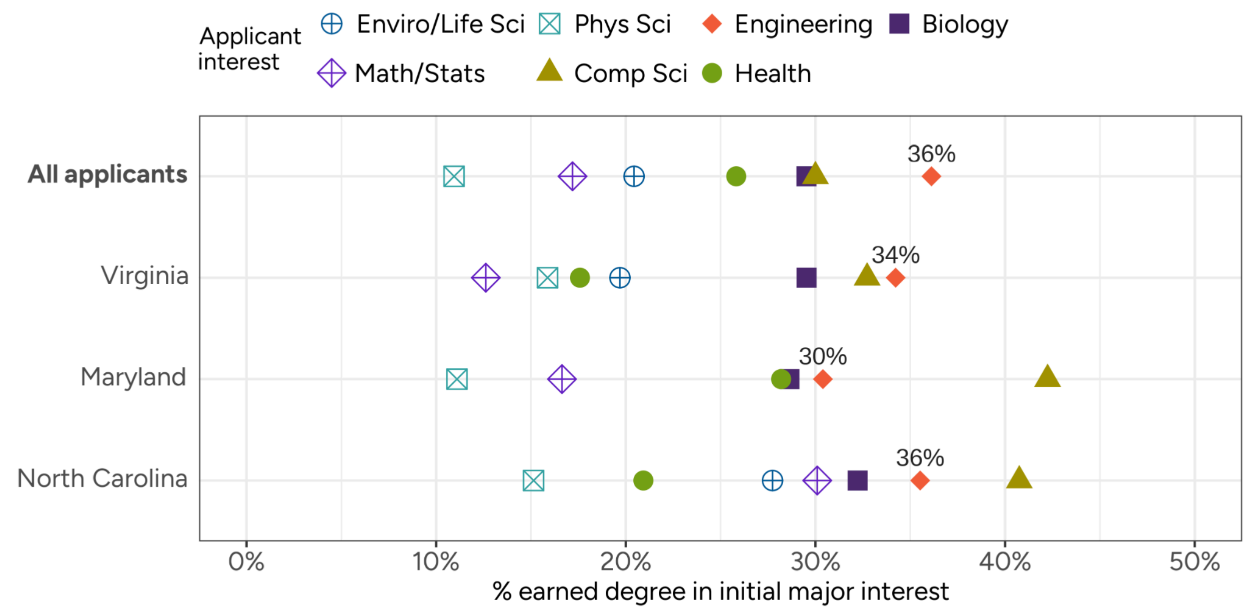
[16] Additional states shown on Appendix Figure 5 and corresponding data table
[17] Note that we have suppressed data on environmentals/life science degree rates in Maryland given small number of interested applicants enrolled in state

Are there features of North Carolina's higher education landscape that encourage aspiring math majors to persist along the pathway that are absent elsewhere? Why do we see higher rates of computer science persistence in Maryland and North Carolina? Readers can dig into these and other examples within our appendix figures.

Figure 5. Rates of earning a degree in initial interest among applicants enrolled in state



Reviewing the path and putting it all together

In the preceding step-by-step analysis, we unpack the steps applicants progress through in detail, providing important context for stakeholders who shape policy decisions at these key transition points. Some of our readers might be taking the perspective of a high school counselor who helps students cultivate their initial career interests (Figure 1), while others are focused on building navigable college curricular pathways and completion success (Figure 4), to name just a few stakeholders involved in these pathways.

However, it can also be helpful to take a broader perspective and examine how well a particular STEMM workforce pathway works as a whole to facilitate broad takeaways and bigger picture success metrics. While we lack visibility on which graduates find work in their particular field, we can show how many degrees a state's Common App applicants earn, and where they earn them from. As illustrative examples, we provide two ways to review each state-major path: an "Applicant-to-engineer rate," and the percentage of all major-specific degrees earned by a state's applicants that are earned in-state, in a border state, or a more distant state. Recall that these rates are calculated based on Common App applicants only, and we are not able to observe the interests and outcomes of applicants who did not use Common App.

Applicant-to-engineer rates

One way to characterize the full pathway is to ask: Out of all Common App applicants interested in becoming an engineer in a given state, how many earned a degree in engineering, and from where? Table 1 shows these "applicant-to-engineer" rates, expressing the concrete number of degree-holding engineers per 100 interested applicants. The first column shows the total degrees earned per 100 interested applicants, and columns 2-4 break out the total by where the degree was earned. Appendix Table 1 shows these same rates for other STEMM subjects (e.g., "applicant-to-computer-scientist" rates etc.).[18] These rates distill the more detailed pathway-step analysis in previous steps into one takeaway number, complementing our prior analysis.

For every 100 Virginia applicants interested in engineering, 33 ultimately earned a degree in engineering, with 21 earning that degree in Virginia, 2 earning degrees in a bordering state, and 10 earning degrees in a more distant state.

Table 1 Applicant-to-engineer rate: For every 100 Common App applicants **interested in engineering**, how many **ultimately earned a degree in engineering**?

	Total	In-state	Border state	Distant state
All applicants	33	20	5	8
Virginia	33	21	2.5	9.5
Maryland	32	15	7.5	9
North Carolina	33	24	4	4.5

Following this logic, states interested in increasing the number of recent graduates with STEMM degrees could:

1. Increase their "base": the starting number of college applicants interested in engineering
2. Increase the in-state and border state "yield": the number of engineers produced per 100 applicants in-state or in a border state

[18] Data also shown in corresponding data table.

Most states will likely consider both strategies in tandem. Increasing the base number of college applicants means supporting K-12 student college awareness, aspirations and application efforts – in general, and for a specific field. Greatly expanding postsecondary opportunities for low- and middle-income students across the country in this vein is essential to Common App's own Next Chapter work.

However, these efforts are best complemented by strategies that enable students to cross the finish line to an engineering (or health, computer science, etc.) degree accessible to the state/regional labor market (increasing the "yield."). Recent concerns on the forecasted smaller number of high school graduates over the coming years, sometimes referred to as a "demographic cliff", further underscore the importance of considering both strategies in workforce policy.[19] Our step-by-step analysis above can help highlight potential intervention points.

Where are degrees earned?

Another way to think about overall pathway success rates for a given field is to unpack who successfully completes a degree, focusing on outcomes rather than origins (e.g., the rates of applicants who complete certain steps as shown in Figures 2-5 above). To illustrate in Figure 6, we focus on Virginia's applicants who did ultimately earn an engineering degree, regardless of their initial interest when they applied.[20] Rather than analyzing attrition along the path to a degree in engineering, these questions instead compare between those who reached the end step, an engineering degree, through various pathways (e.g., starting in English and switching into engineering). This information may be particularly useful to stakeholders interested in the end of the pathway we observe (graduation) and the next step for these graduated students: finding work in their field.

We once again consider our Virginia-engineering example in Figure 6. If Virginia were interested in sharing opportunities to work in engineering in Virginia to former high school students, to what extent should they target local campuses, bordering states, or further afield?

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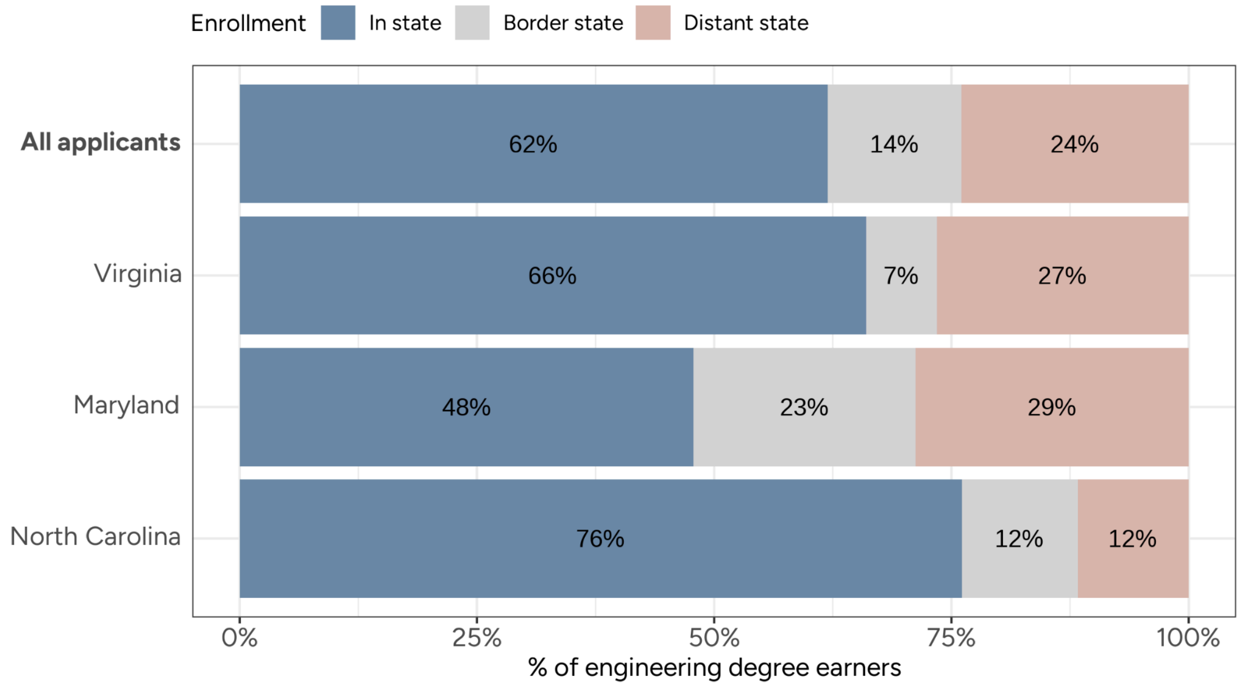
[19] The Western Interstate Commission for Higher Education explores these demographics nationally and by state in Knocking at the College Door:Projections of High School Graduates

[20] Additional states shown in Appendix Figures 6, and corresponding data table

Figure 6. State where degree earned, by applicant home state
Among engineering degree earners



Virginia has slightly higher than average rates of engineering degree earners (66%) graduating from within the state, while North Carolina has the highest rate (76%) among these three states, as shown in Figure 5. Cultivating connections between colleges, employers and recent graduates might be an effective strategy for these states. Conversely, among Maryland applicants who ultimately earned an engineering degree, 48% earned a degree in-state. With almost a quarter of engineering degrees earned in bordering states, Maryland could consider outreach to neighboring campuses, ensuring its local employers are present at career fairs a little further afield.

Conclusion

Many college aspirants apply, enroll and choose their majors while considering their future career aspirations. While each student makes their own decisions and puts in the work needed to earn a degree, all these individual choices, added together, ultimately shape a region's supply of workers with specialized skills. Policy decisions that shape where college students decide to enroll and what to major in have impacts well beyond the college classroom. These decisions ultimately shape recent graduates' job seeking experiences, as well as the economic dynamism of local economies.

The rates we've shared throughout this brief tell a story, revealing where along the STEMM pathway students advance, pivot, or fall away. If 33 out of every 100 applicants wanting to major in engineering ultimately earns a degree in engineering in state or beyond, we can use these rates to consider and diagnose the outcomes for the other 67 aspirants. Some may have struggled to afford the tuition or living expenses associated with their college of choice, or struggled to get into a capped engineering major at the college they do attend, or decided they would rather study political science, or they studied engineering for three years before ultimately stopping out. Some aspirants leave the path as they change interests and aspirations, others encounter issues with their specific major, while others are struggling to make college work with any major. All these factors make having summary statistics a crucial starting point to diagnosing problems.

Ultimately, this brief can help states consider the extent to which their current pathways are both encouraging students to complete credentials of value that set them up for success in the workforce,[21] and also meeting their own projected workforce needs. Common App data is not perfect: we can only analyze outcomes for Common App applicants rather than all a state's college applicants. Reflecting Common App's applicants in 2016-17, this brief focuses on STEMM pathways built around Bachelor's degrees, and primarily on students transitioning from high school to college rather than seeking new credentials mid-career. Still, we identify key bottlenecks along even this more "traditional" path that can help states support both students and their growing workforce.

Once these bottlenecks are better identified and understood, the next question is often: What are some possible solutions? While we cannot speak to the appropriateness and possible efficacy of any particular intervention, state-level actors interested in shifting outcomes have a few promising policy directions to consider.

Step 1: STEMM major interest: At the start of the STEMM pathway, states can strengthen K-12 STEMM preparation, via coursework opportunities, extracurricular activities, mentorship programs and more.[22] As we highlight in our first STEMM research brief, there remain significant gaps in access to these STEMM experiences by applicant first-generation status, income, and race/ethnicity. Engaging local employers in in-demand industries in K-12 outreach may also help build interest within specific STEMM fields.

[21] E-W Framework Essential Question 19

[22] See E-W framework evidence-based practices Career pathway programs, Enhanced college advising, Employer partnerships

Step 2: College enrollment: Efforts which support in-state enrollment more broadly, including in-state tuition rates and financial aid, also benefit STEMM-interested applicants. Interventions providing students higher amounts of grant aid generally improve persistence and graduation rates.[23] Some states offer scholarships specific to students interested in studying and working in STEMM fields, including the New York STEM Incentive Program, or Choose Ohio First. Many of these programs are in early years, and evaluations of their impact on state STEMM workforce supply are not yet available.

Step 3: Degree completion: Increasing the percentage of enrolled students who ultimately earn a degree in their preferred major offers perhaps the largest opportunity for increasing STEMM degree completers. Many students planning to major in STEMM switch majors, or fail to earn Bachelor's degrees in any subject, a particular challenge for students from underrepresented groups, as we found in our first STEMM research brief.

On many campuses, student demand for some STEMM majors exceeds classroom capacity. In some cases, formal criteria limit which students can pursue these "impacted" or "selective" majors, a policy research has found particularly limits participation from students in underrepresented groups.[24] On other campuses, students enrolled in some STEMM and other high demand majors pay higher tuition, a practice called differential tuition.[25] Even when these formal barriers are not present, when students struggle to get a spot in gateway courses, succeed in courses with high student to instructor ratios, or sequence courses efficiently, many may simply switch majors in hopes of a clear path to graduation.

State-level actors may wish to assess the extent to which college capacity matches both student interest and workforce needs, and whether additional funding to expand STEMM major capacity might prove a wise investment toward tomorrow's workforce. Additional supports, including summer bridge programs, academic support, mentoring programs and academically aligned internships and work experiences, career advising and coaching may also boost student persistence to a STEMM degree, and ultimately a STEMM career.[26]

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[23] See Eng & Matsudaira (2021) and Nguyen et al (2019) for recent examinations of grant aid on enrollment, persistence and completion, as well as E-W evidence based practice Financial Incentives for Students

[24] For more on major restrictions, see Bleemer & Mehta (2024), also summarized in a non-technical article

[25] For more on differential pricing, see Stange (2015), and a recent discussion by Baker (2024)

[26] See for example Murphy et al (2010), and E-W framework evidence-based practices Comprehensive, Integrated Advising and Mentoring and Coaching

All said, there are myriad evidence-based opportunities to explore pending the individual circumstances and needs for a given state. Each state has a unique series of challenges and opportunities in growing its STEMM workforce. In this research brief, we share Common App's unique view of STEMM education pathways, with a hope that readers will find data that speaks to their own school, college, policy or industry experiences. Students flow across schools, majors, and state lines in pursuit of their degrees and careers, and so must collaboration to serve these students. Common App will continue to share insights to inform the critical policy decisions enabling today's students to meet their full potential, and shape tomorrow's innovation and excellence in STEMM.

Appendix

The following pages show Figures 1-6 and Table 1 for all states, District of Columbia, and Puerto Rico and STEMM-interest combinations. The data presented in each figure is available for download at this link.

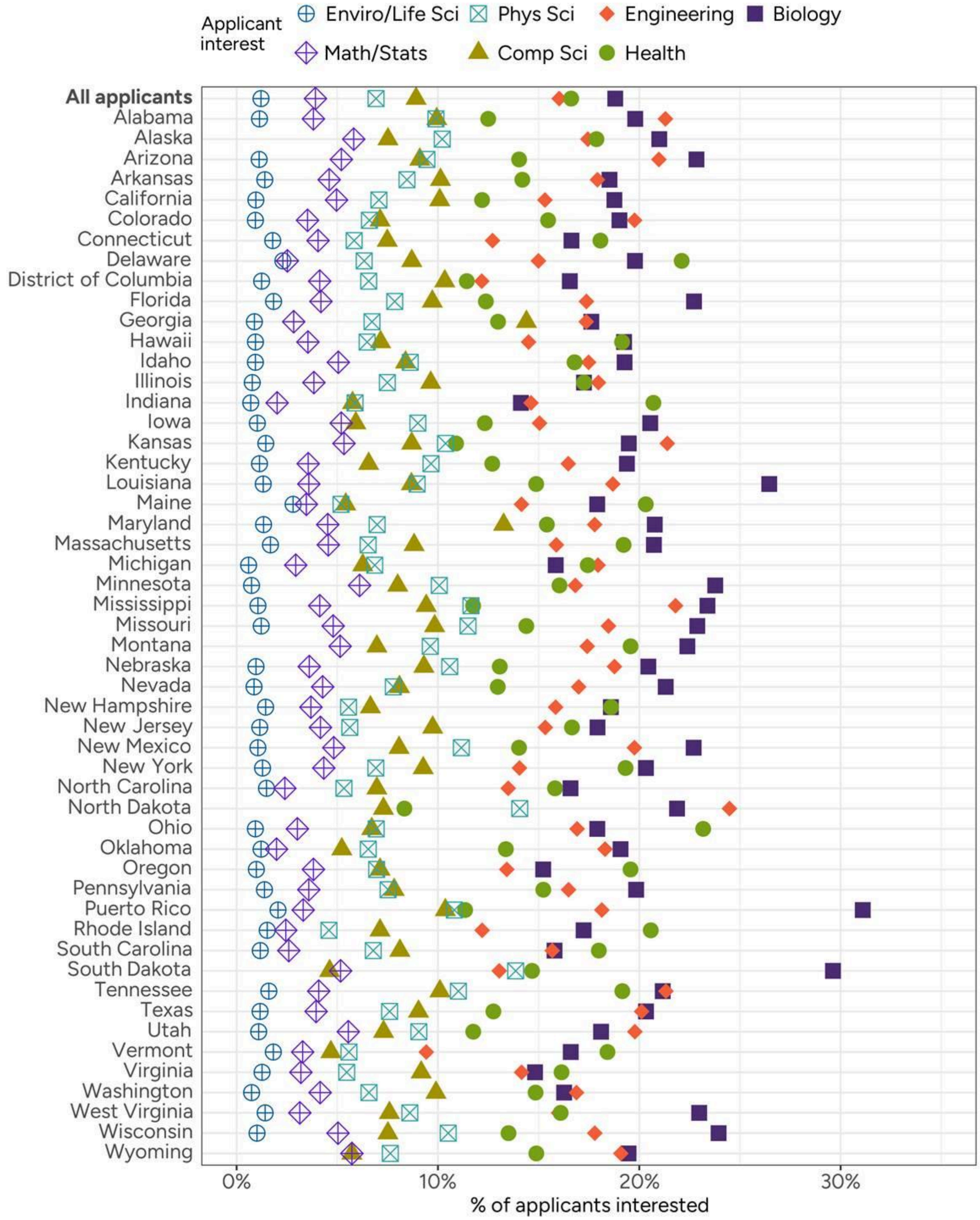
Number of applicant restrictions: Note that when we observe fewer than 10 applicants in a category, we do not show that result, nor other results within that outcome if doing so would allow for identification of the suppressed small group. For example, if a state has just 9 applicants interested in engineering enrolling in a distant state, we would also not show the number and percentage of applicants enrolling in-state, border state, or not enrolling.

We also do not show data where fewer than 50 individuals are present at that stage along the pathway: for example we would not show the degree outcomes for applicants enrolled in-state who are interested in physical science if there are fewer than 50 such applicants enrolled in-state.

In short, across the six figures and one table shown in this paper, we are able to provide 5,663 data points and restrict an additional 1,576 data points.

Figure A1

Figure A1. Percentage of applicants interested in STEMM fields by applicant home state
Among 2016-17 U.S. resident Common App applicants



Figures A2

Figure A2a. Enrollments by home state among all applicants

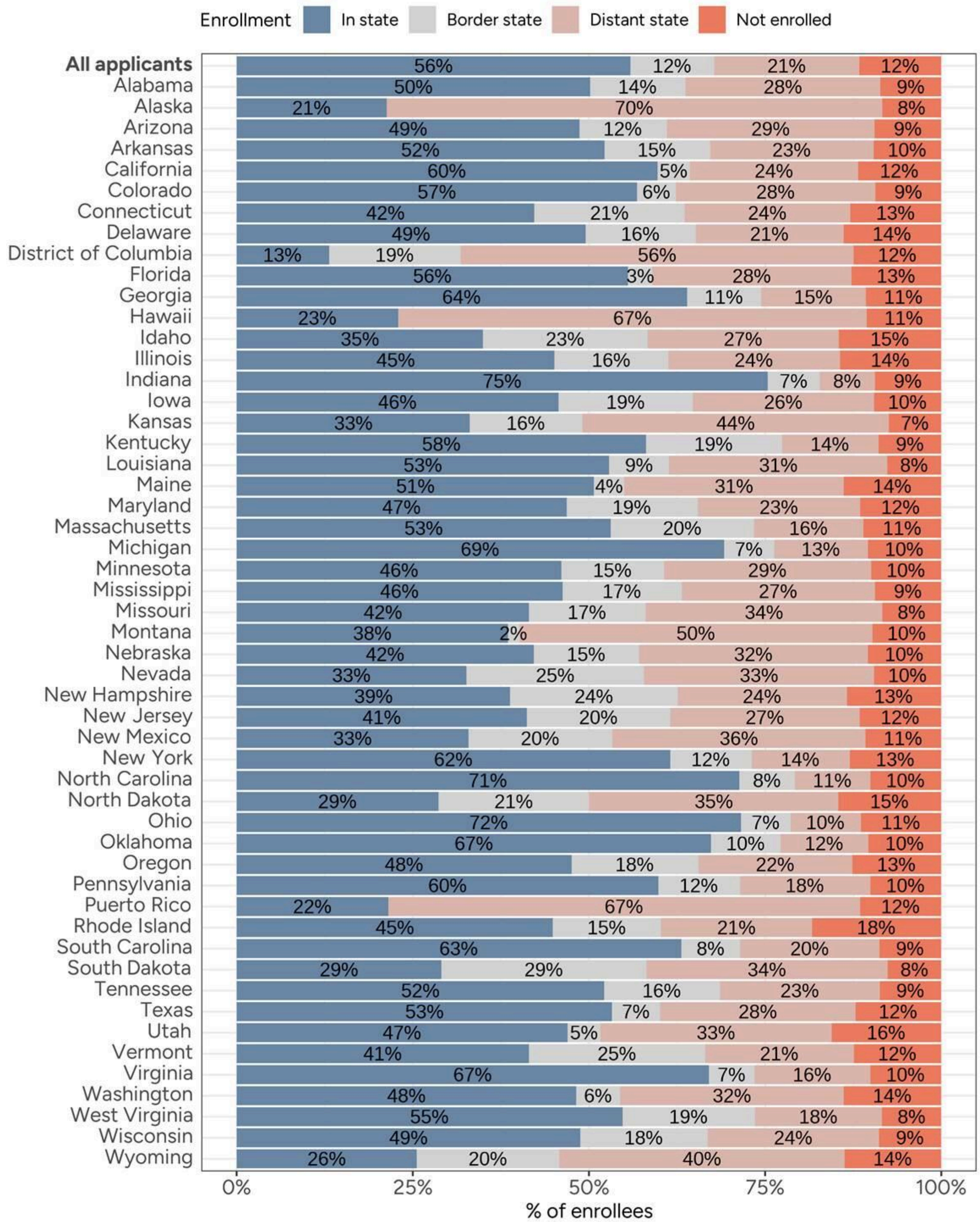


Figure A2b. Enrollments by home state among applicants interested in STEMM

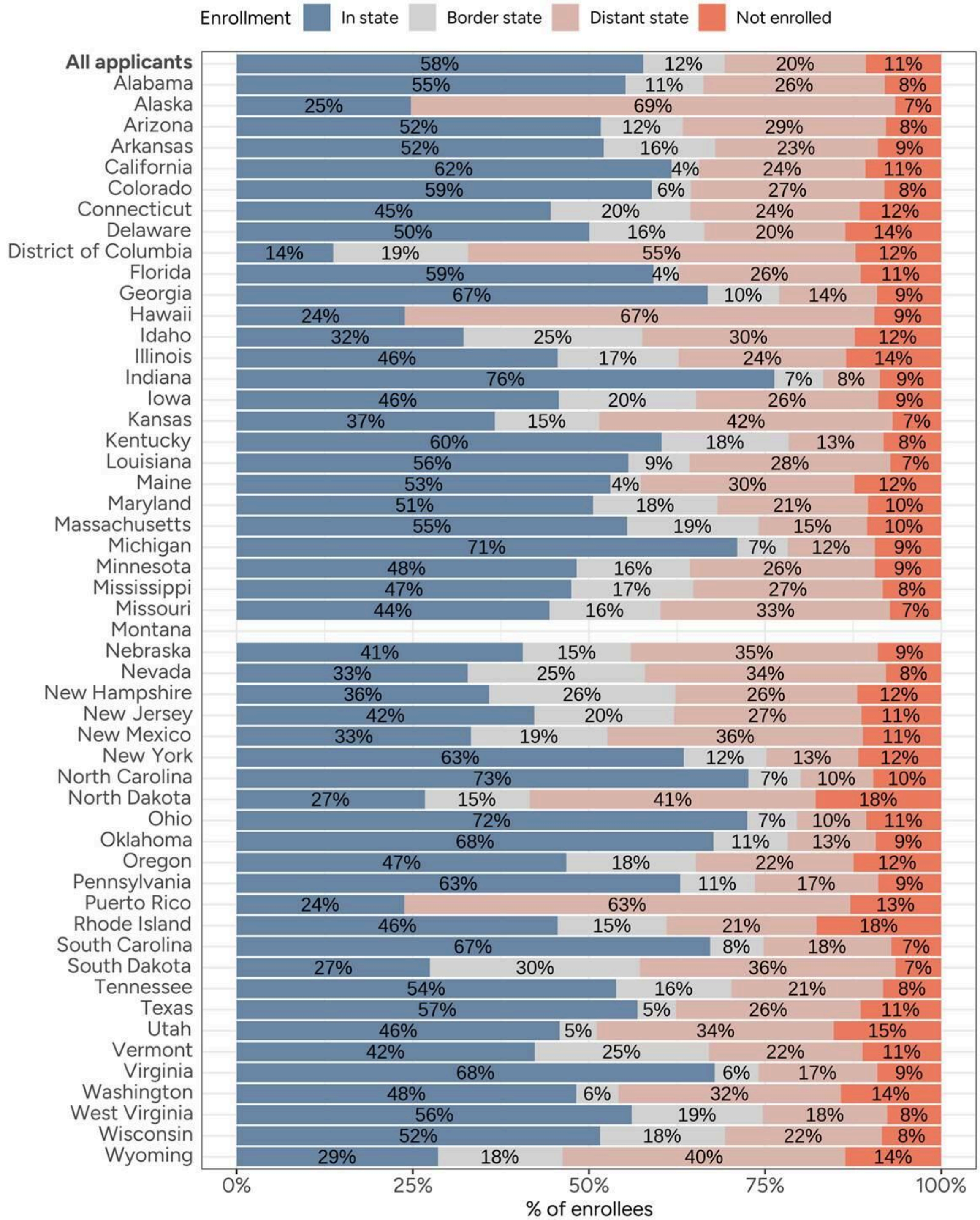


Figure A2c. Enrollments by home state among applicants interested in Biology

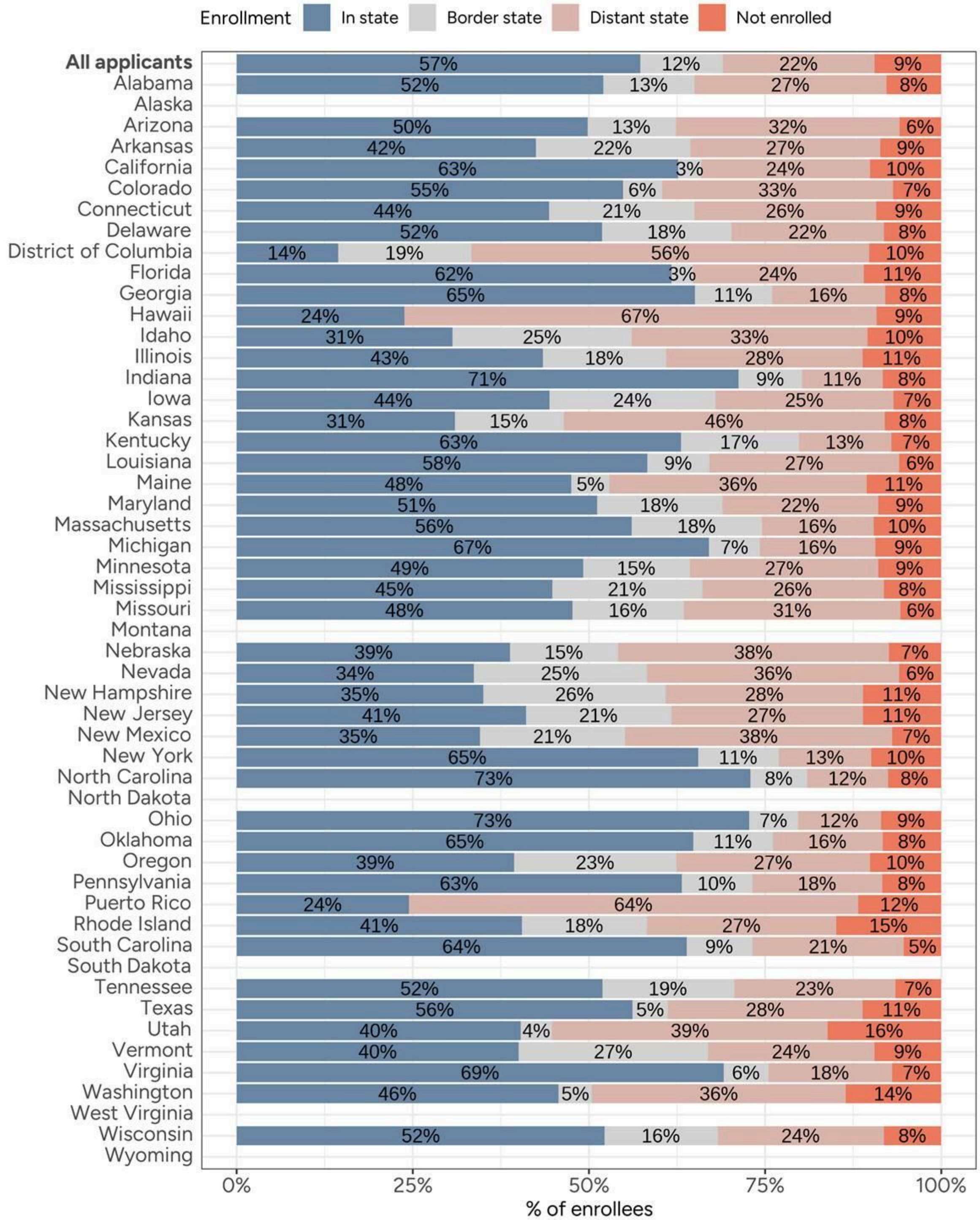


Figure A2d. Enrollments by home state among applicants interested in Computer Science

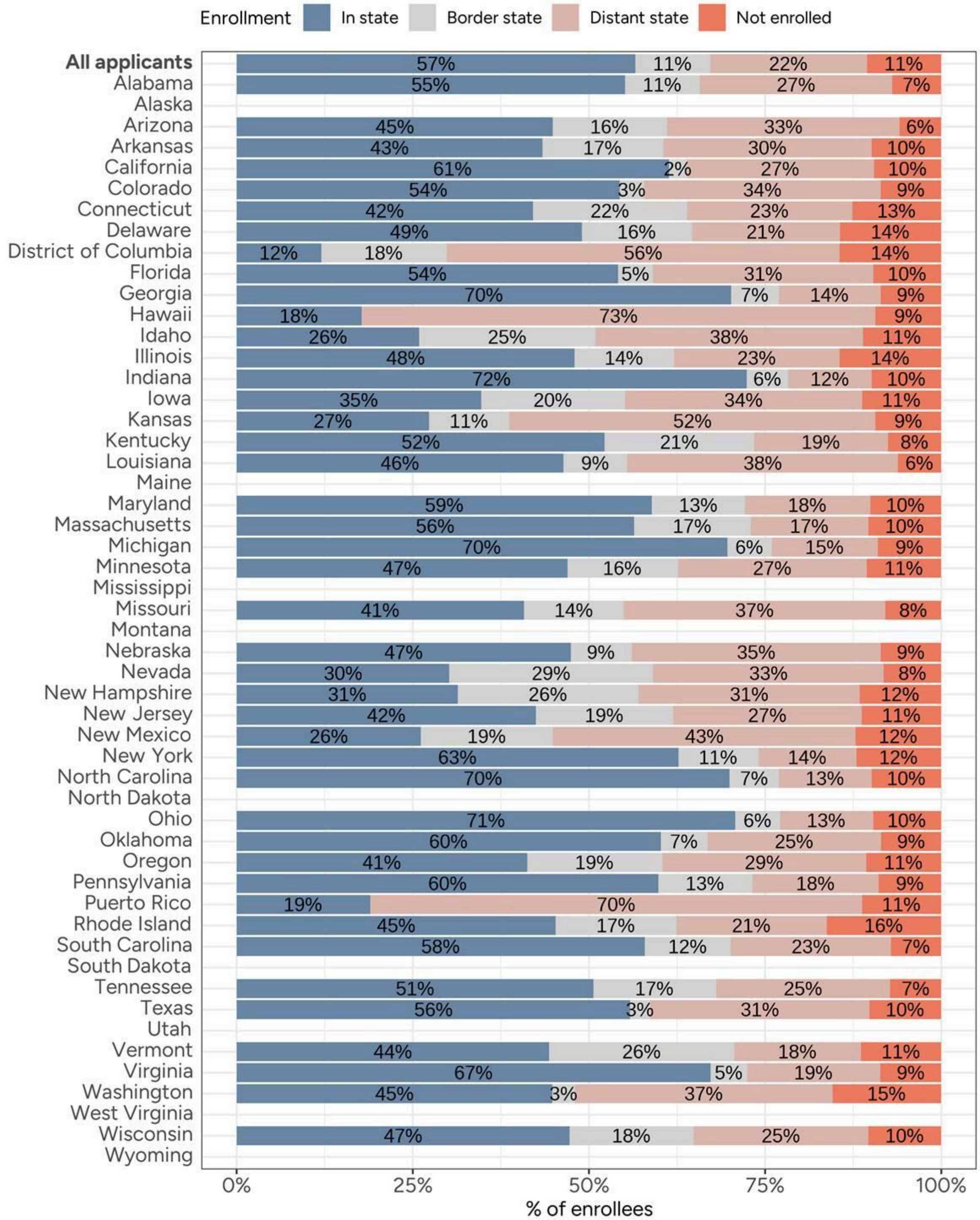


Figure A2e. Enrollments by home state among applicants interested in Engineering

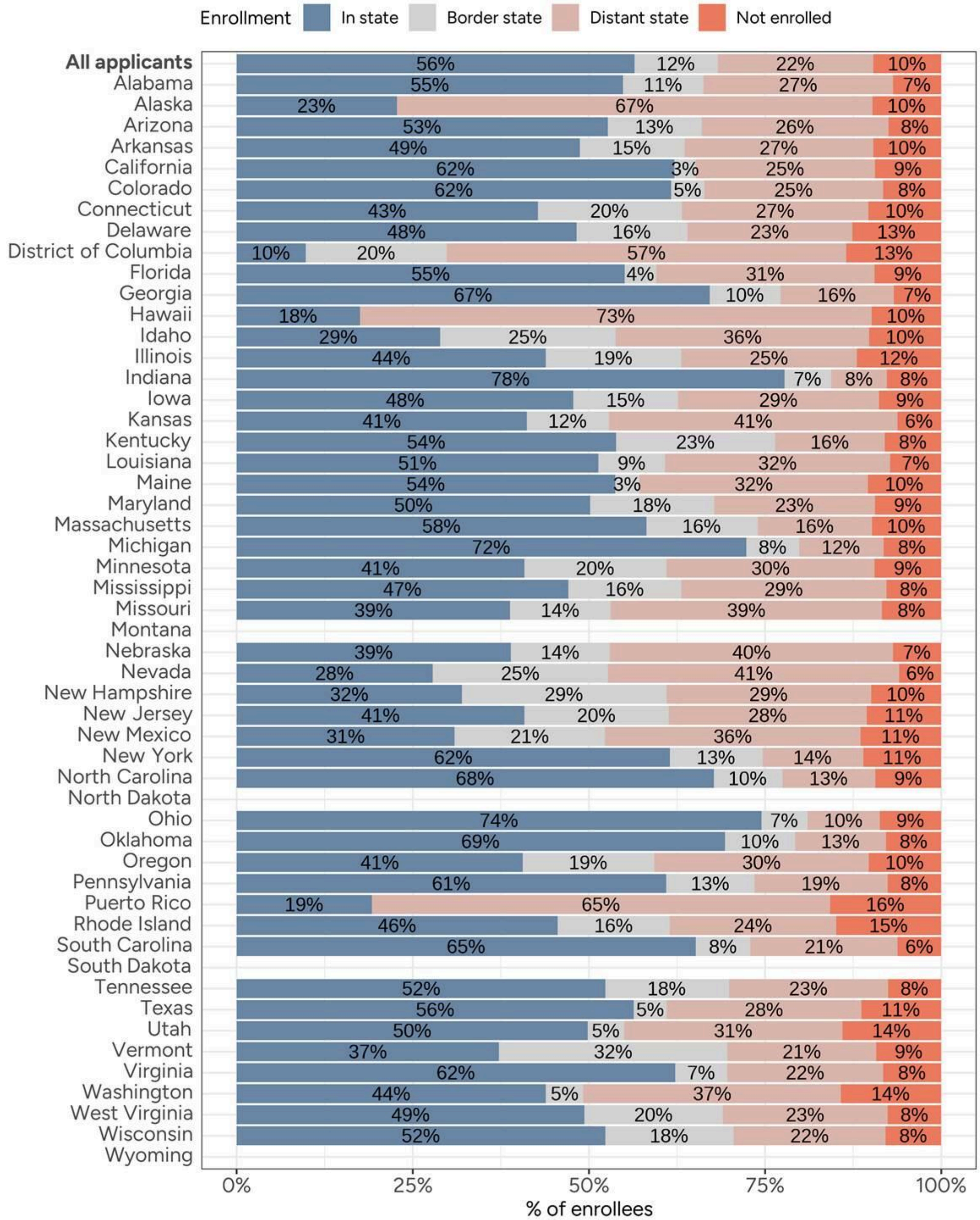


Figure A2f. Enrollments by home state among applicants interested in Environmental/Life Sciences

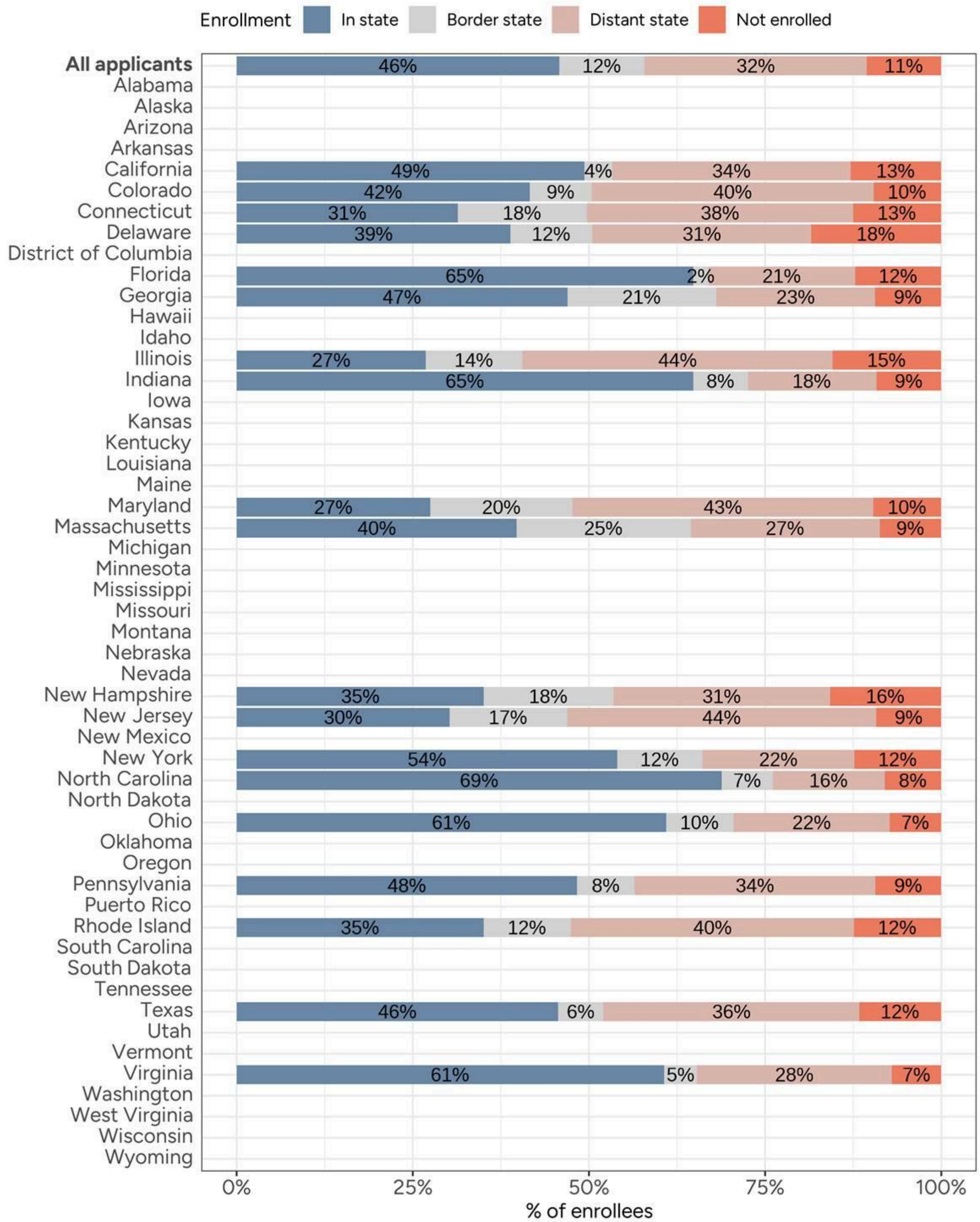


Figure A2g. Enrollments by home state among applicants interested in Health

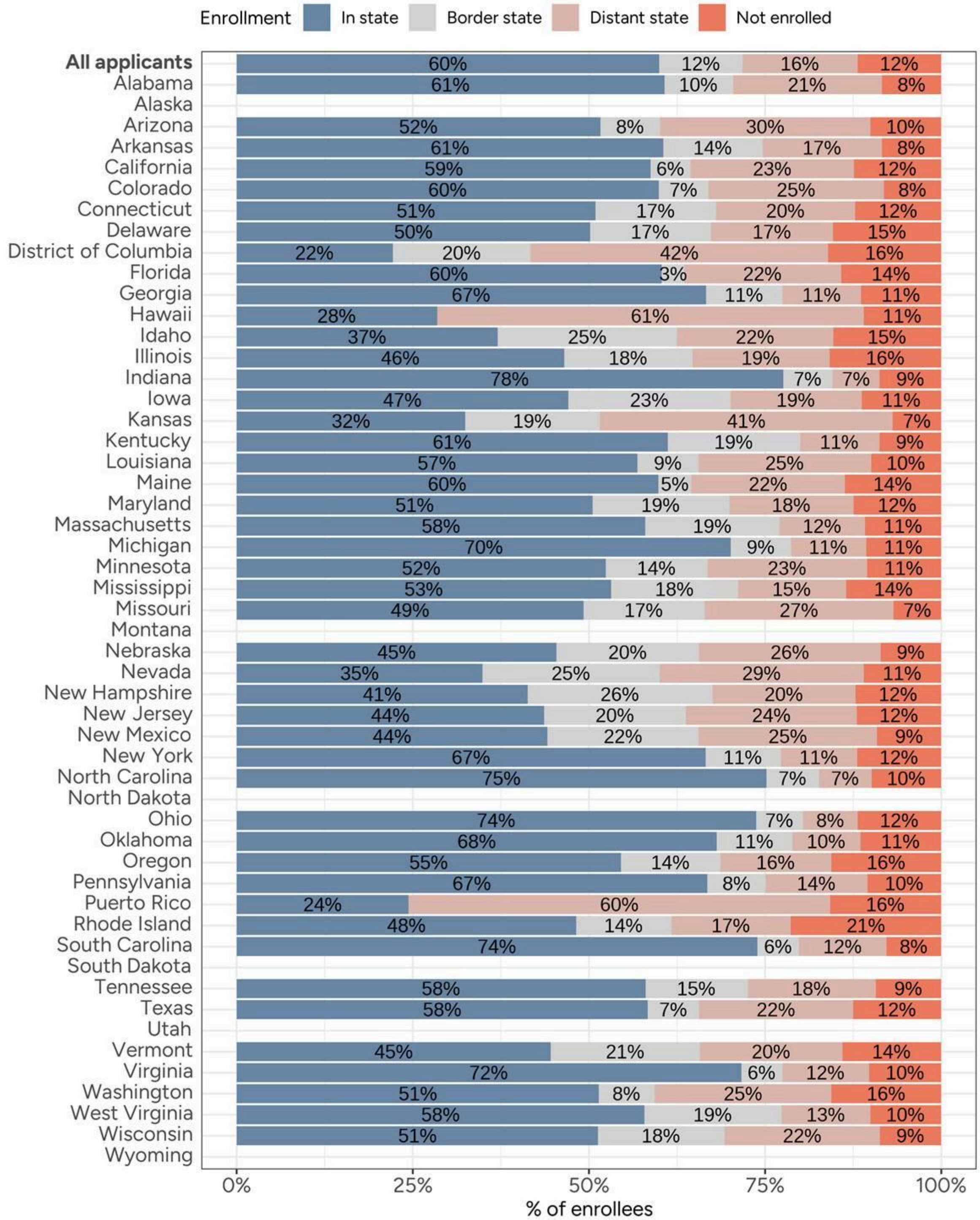


Figure A2h. Enrollments by home state among applicants interested in Mathematics and Statistics

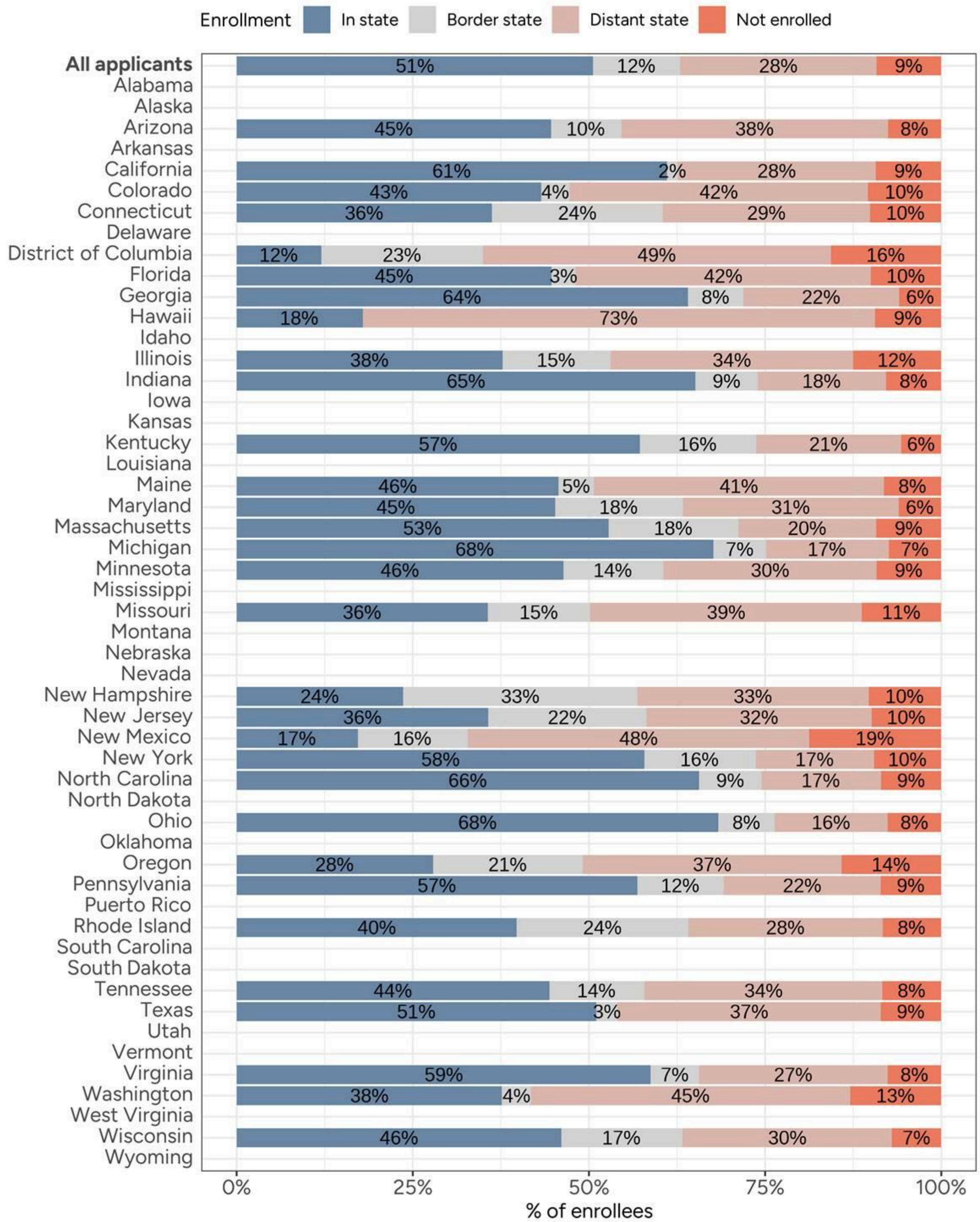


Figure A2i. Enrollments by home state among applicants interested in Physical Sciences

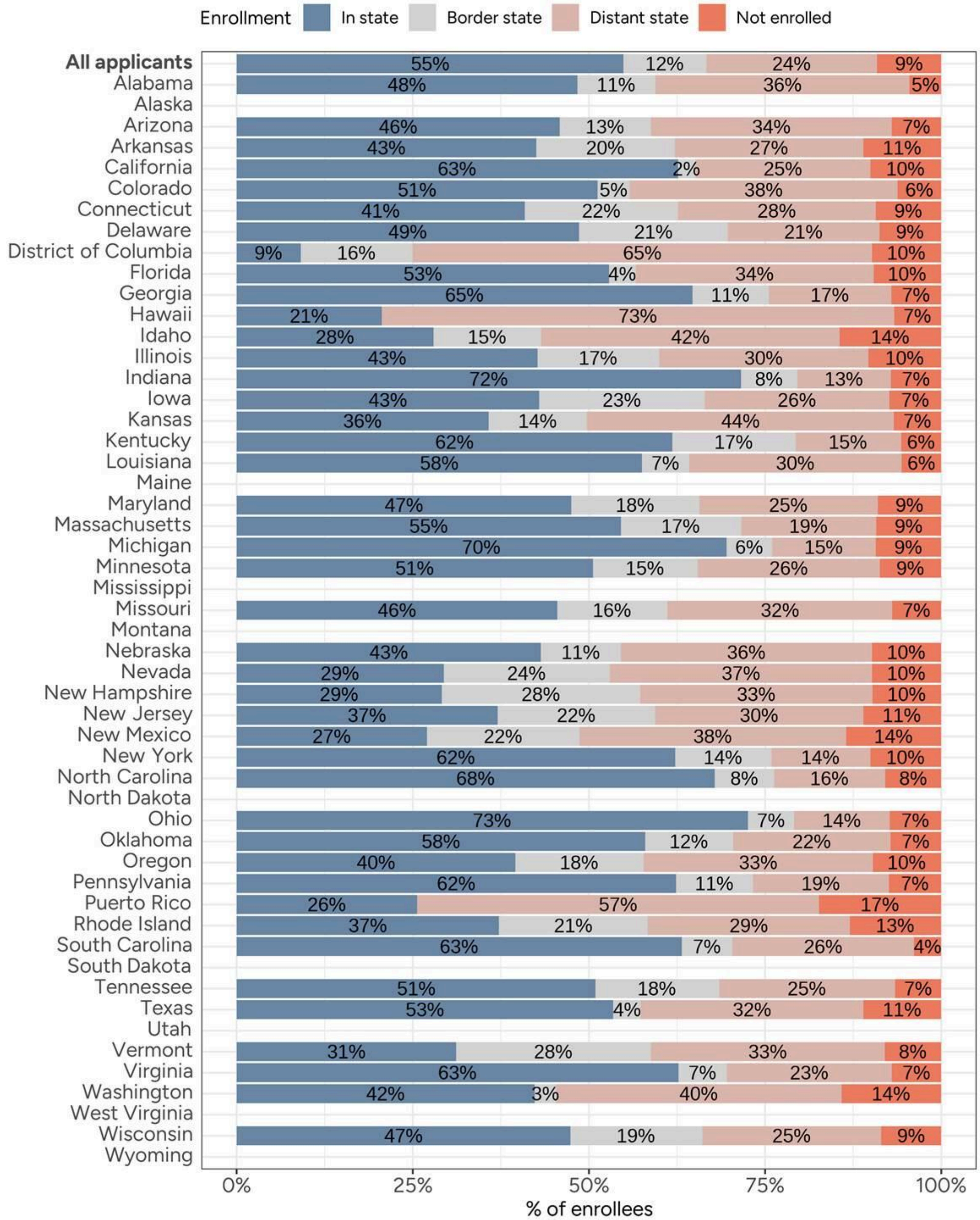


Figure A3

Figure A3. Percent of enrolled applicants who enrolled in state by applicant major interest
Among 2016-17 U.S. resident Common App applicants

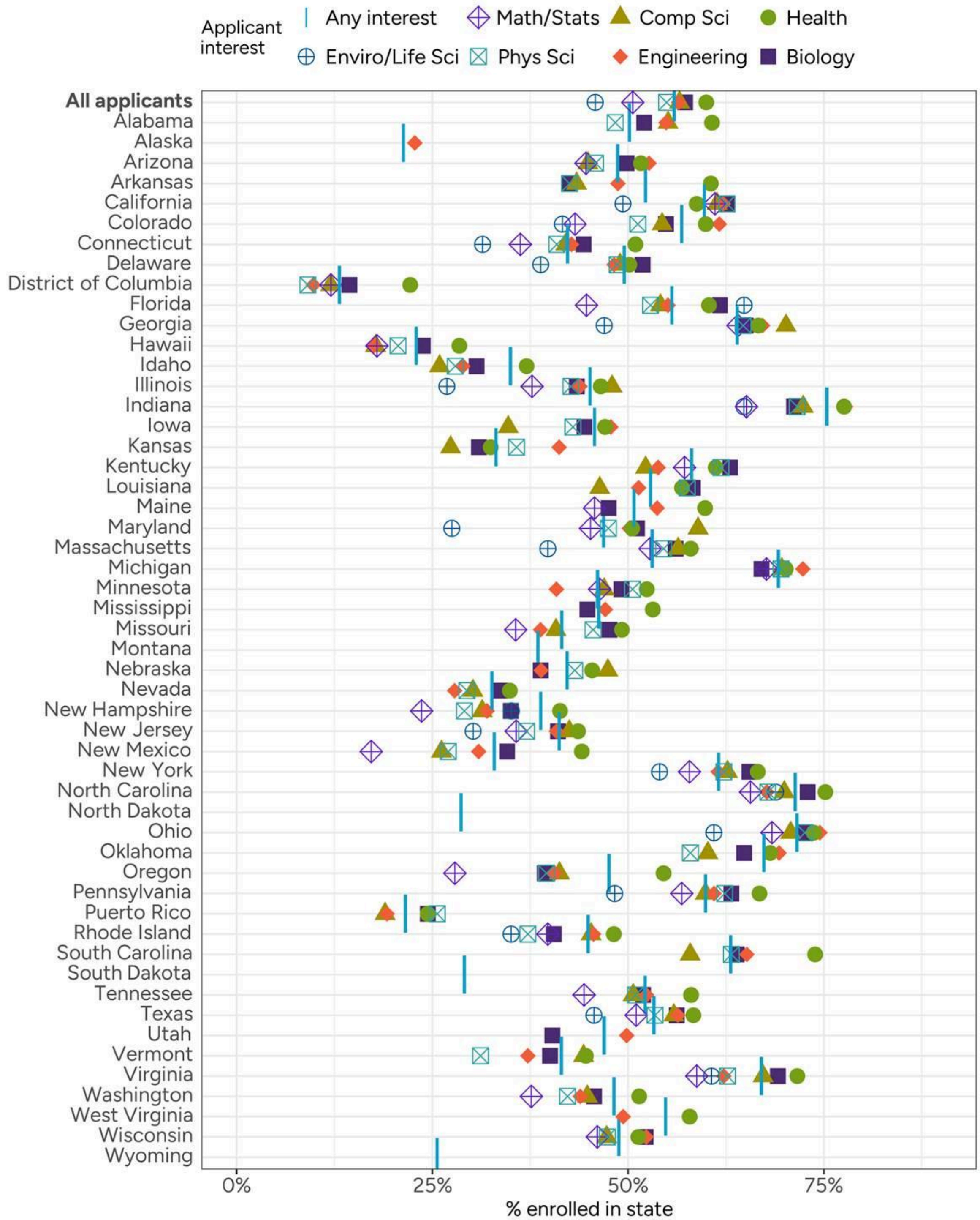


Figure A4

Figure A4a. Degree outcomes among all applicants enrolling in state

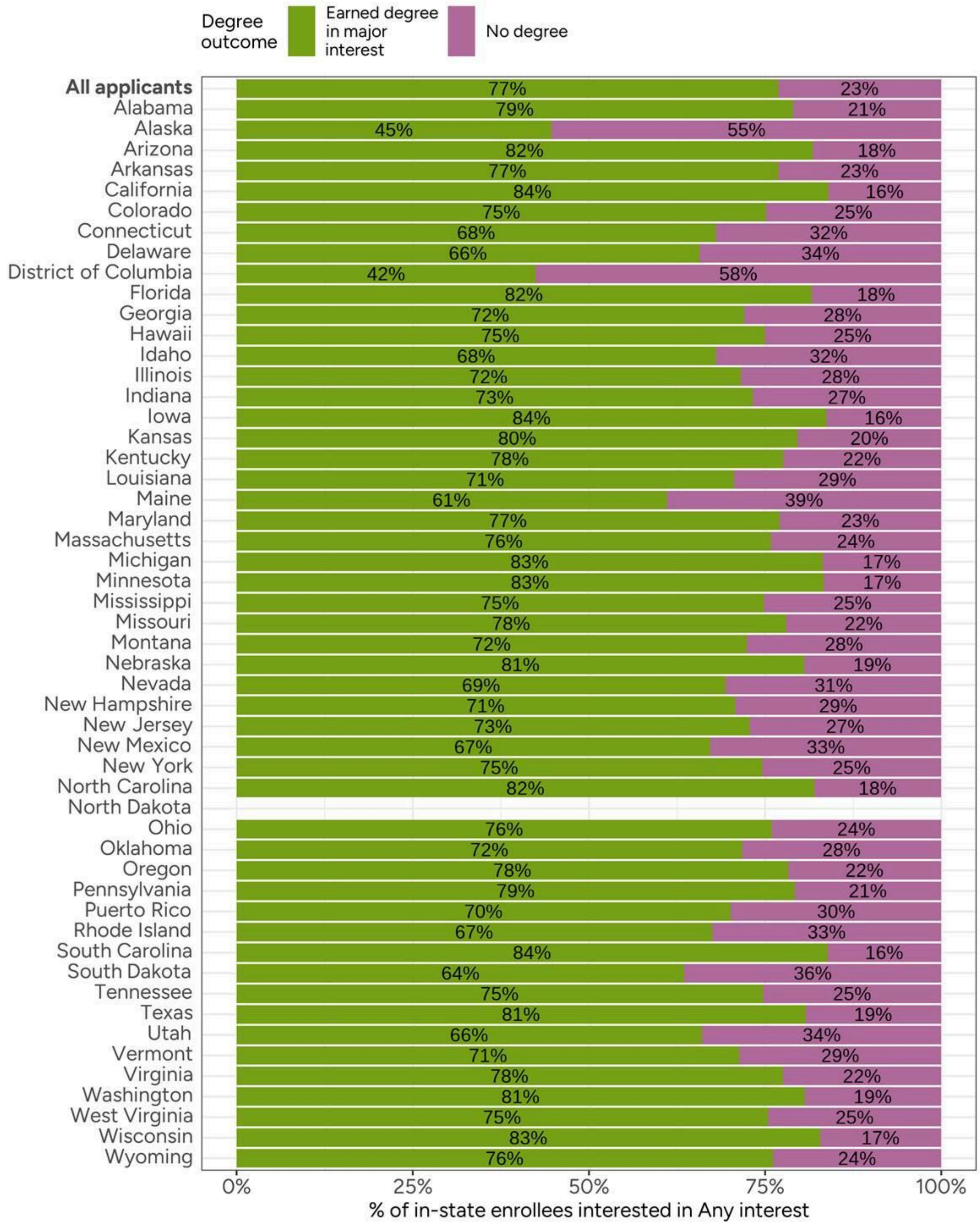


Figure A4b. Degree outcomes among applicants interested in STEMM enrolling in state

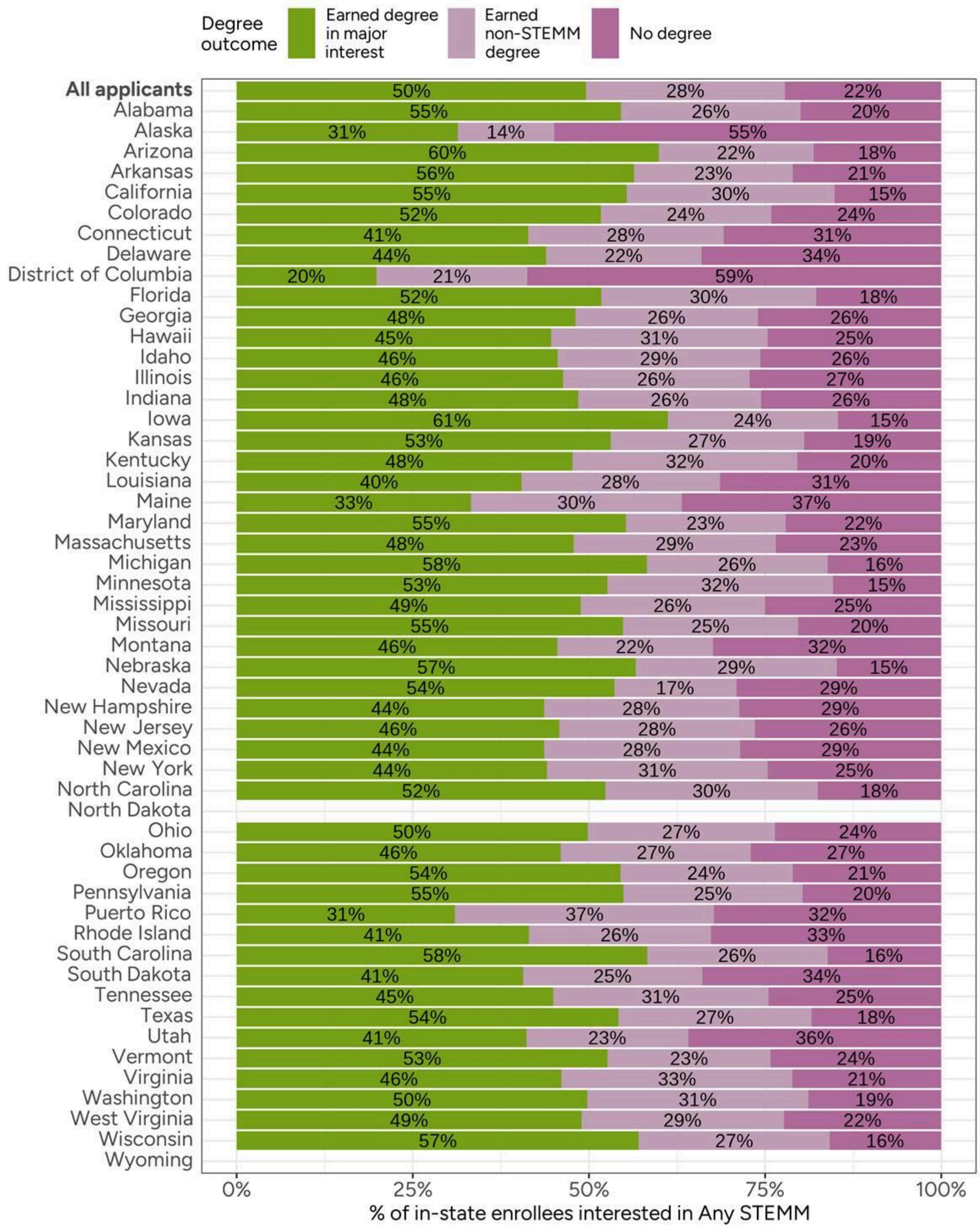


Figure A4c. Degree outcomes among applicants interested in Biology enrolling in state

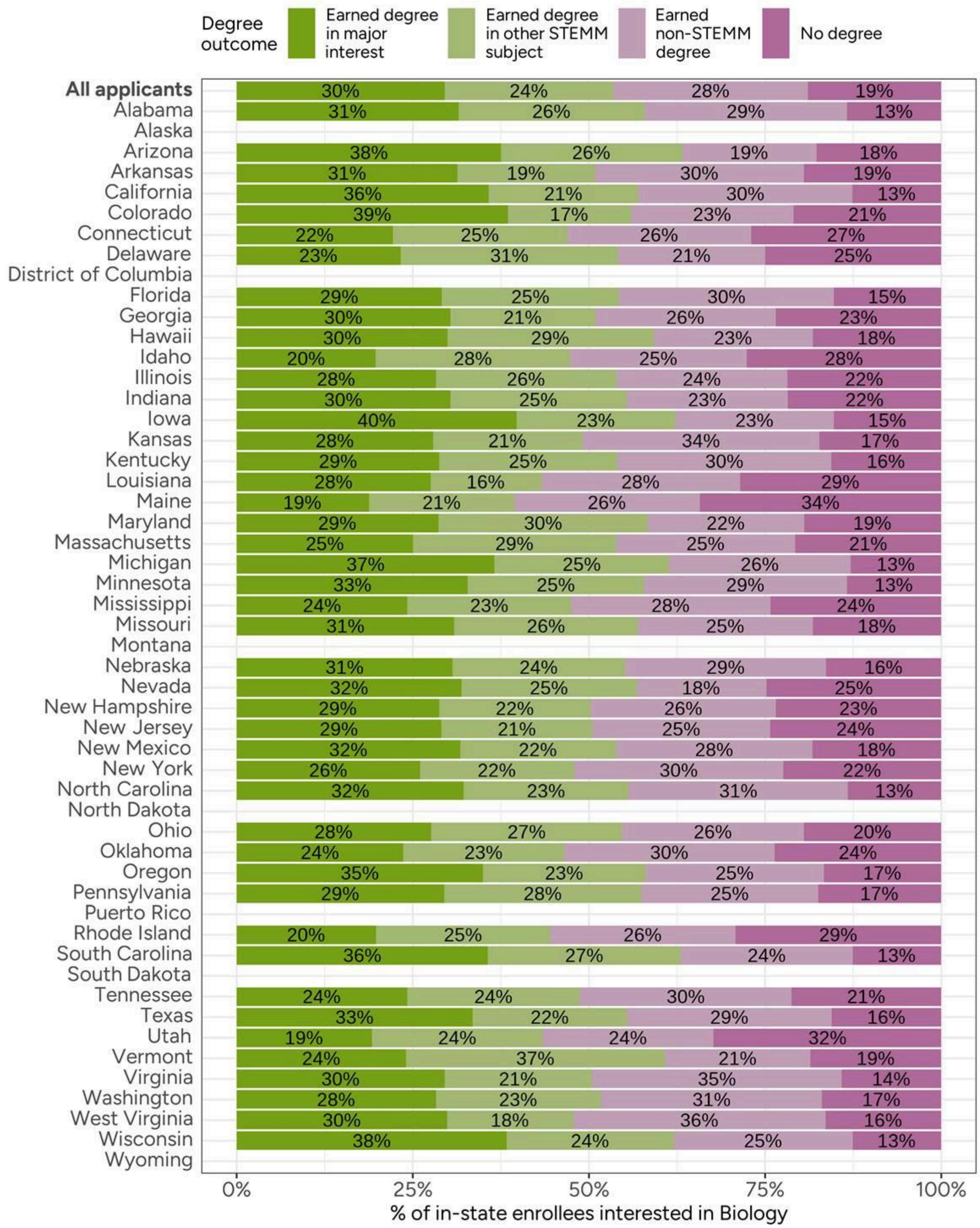


Figure A4d. Degree outcomes among applicants interested in Computer Science enrolling in state

Figure A4e. Degree outcomes among applicants interested in Engineering enrolling in state

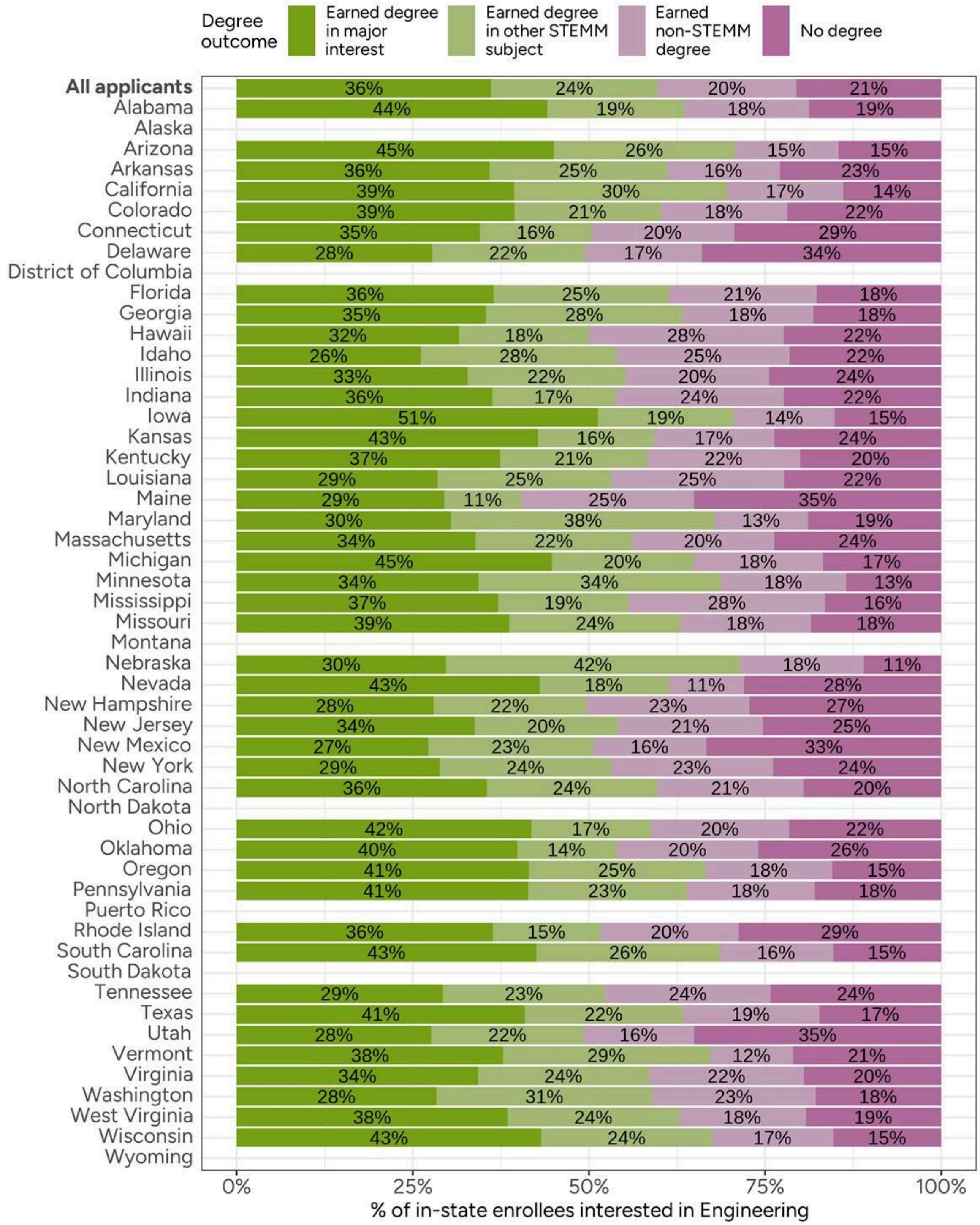


Figure A4f. Degree outcomes among applicants interested in Environmental/Life Sciences enrolling in state

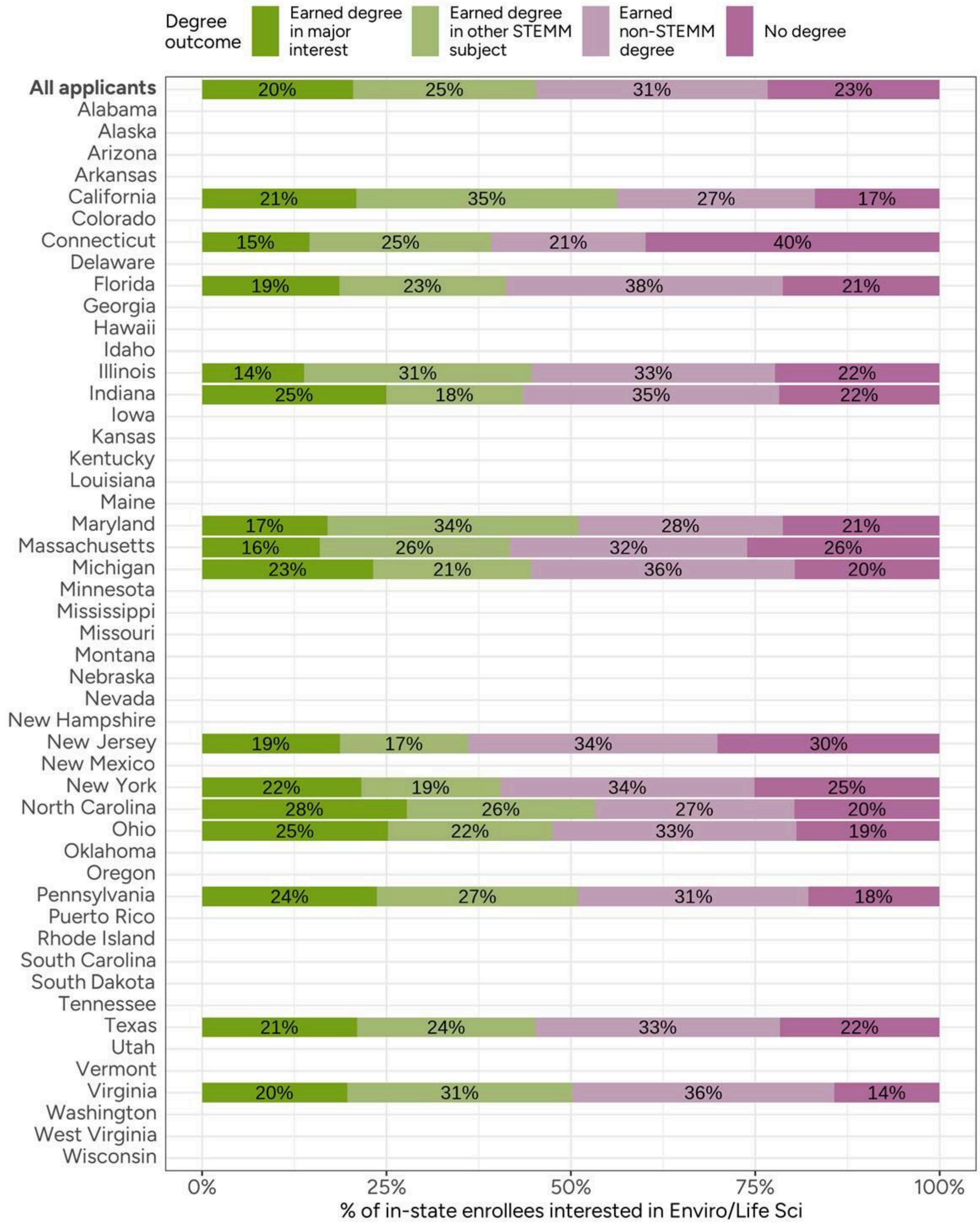


Figure A4g. Degree outcomes among applicants interested in Health enrolling in state

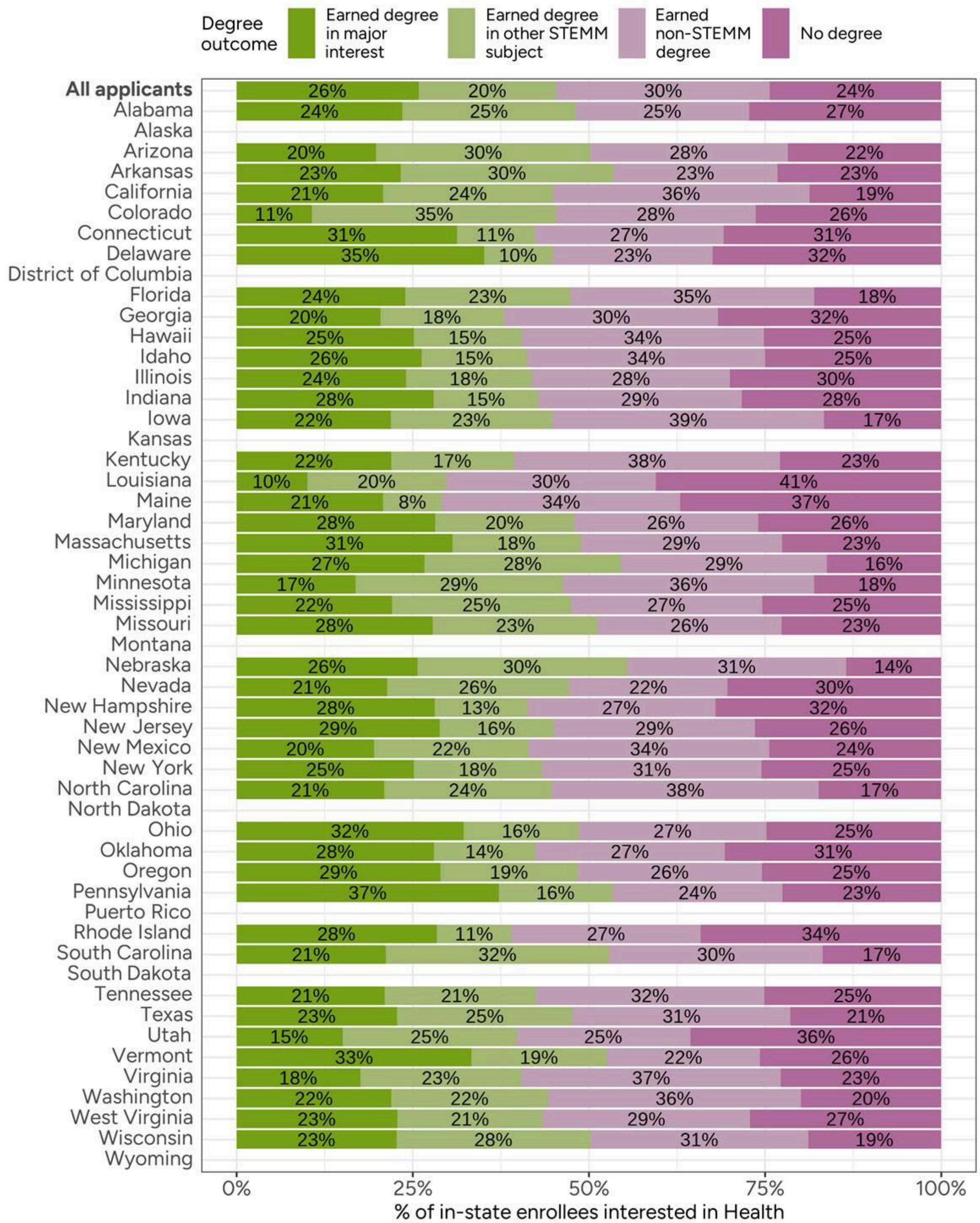


Figure A4h. Degree outcomes among applicants interested in Mathematics and Statistics enrolling in state

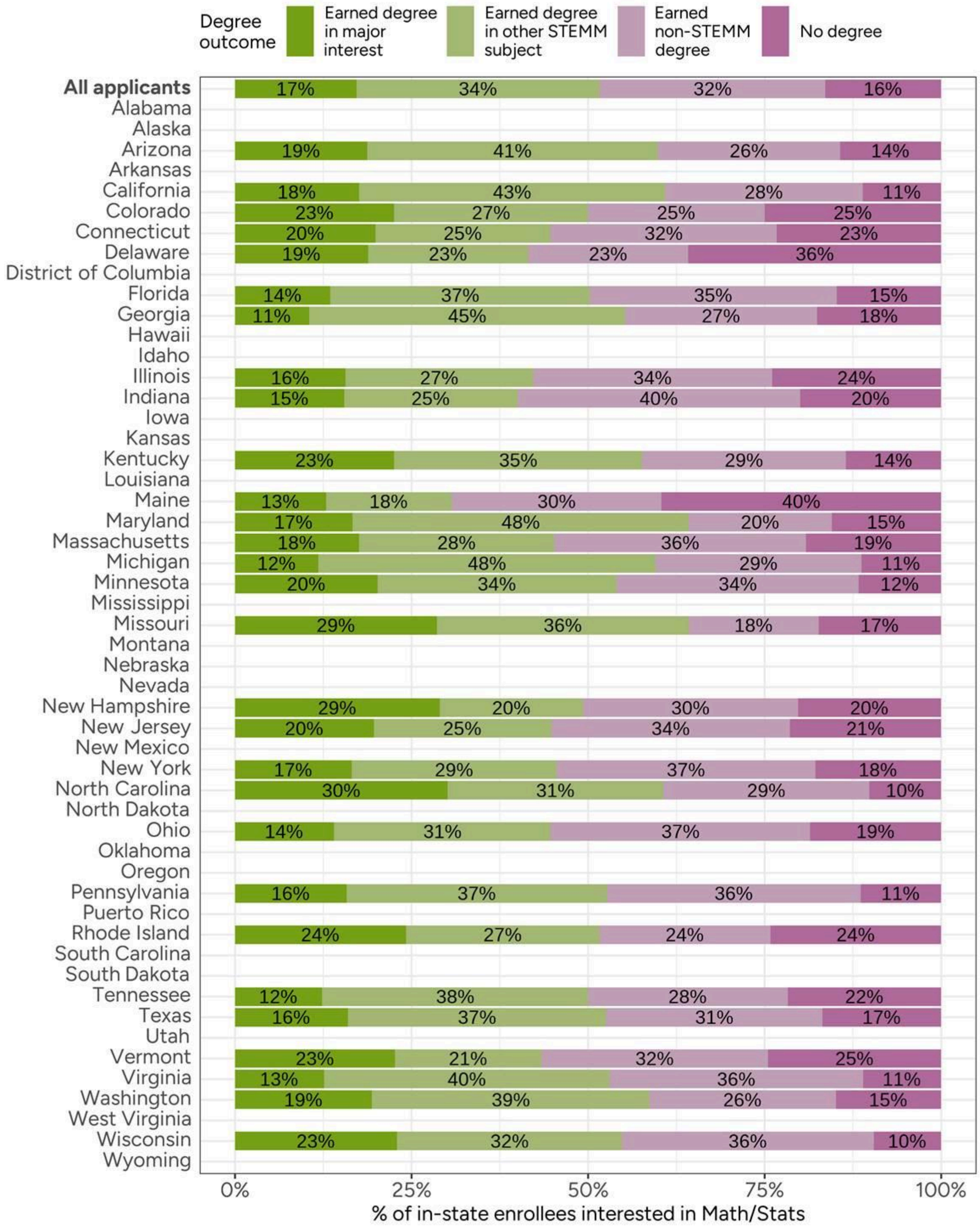


Figure A4i. Degree outcomes among applicants interested in Physical Sciences enrolling in state

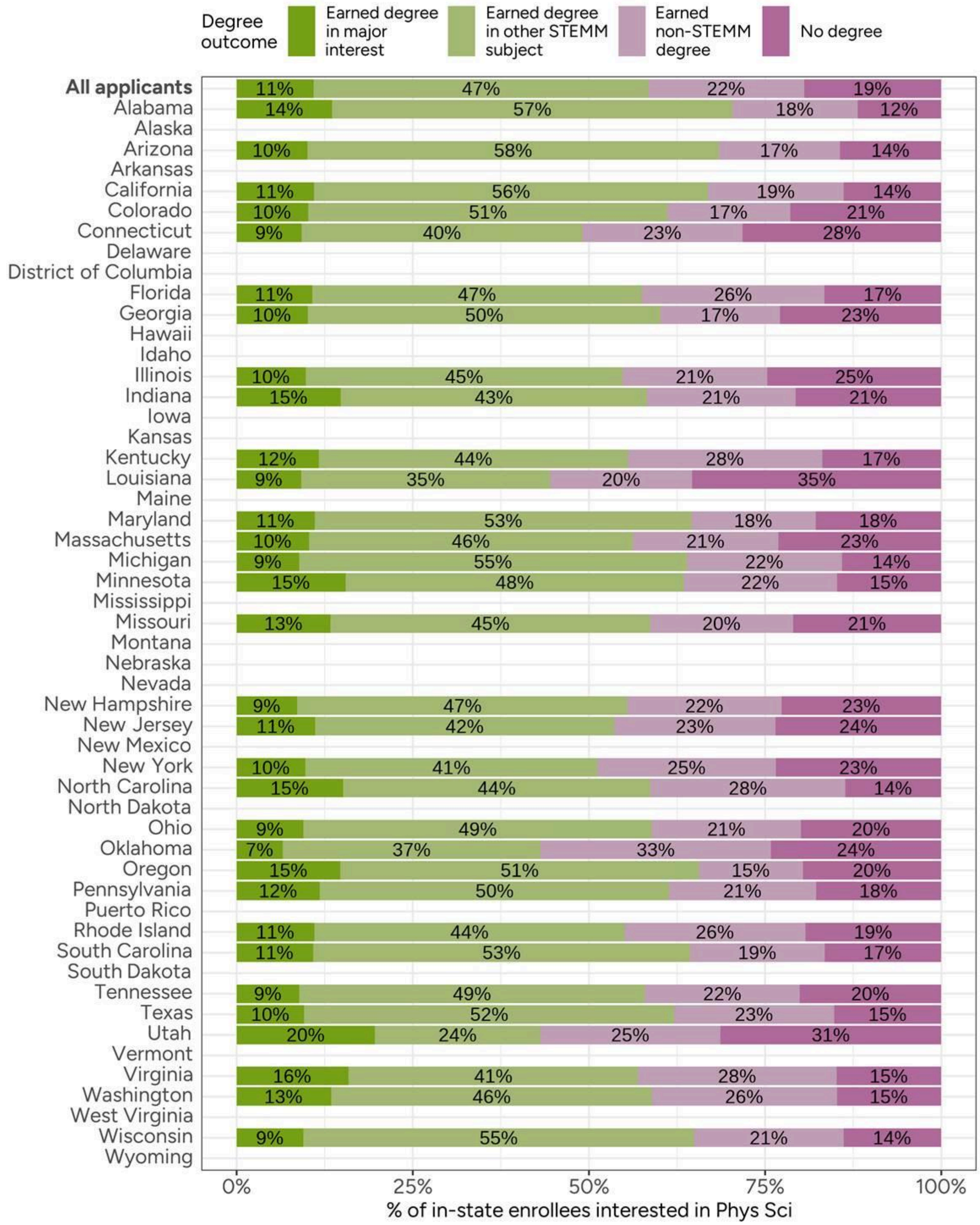


Figure A5

Figure A5. Rates of earning a degree in initial interest among applicants enrolled in state
Among 2016-17 U.S. resident Common App applicants

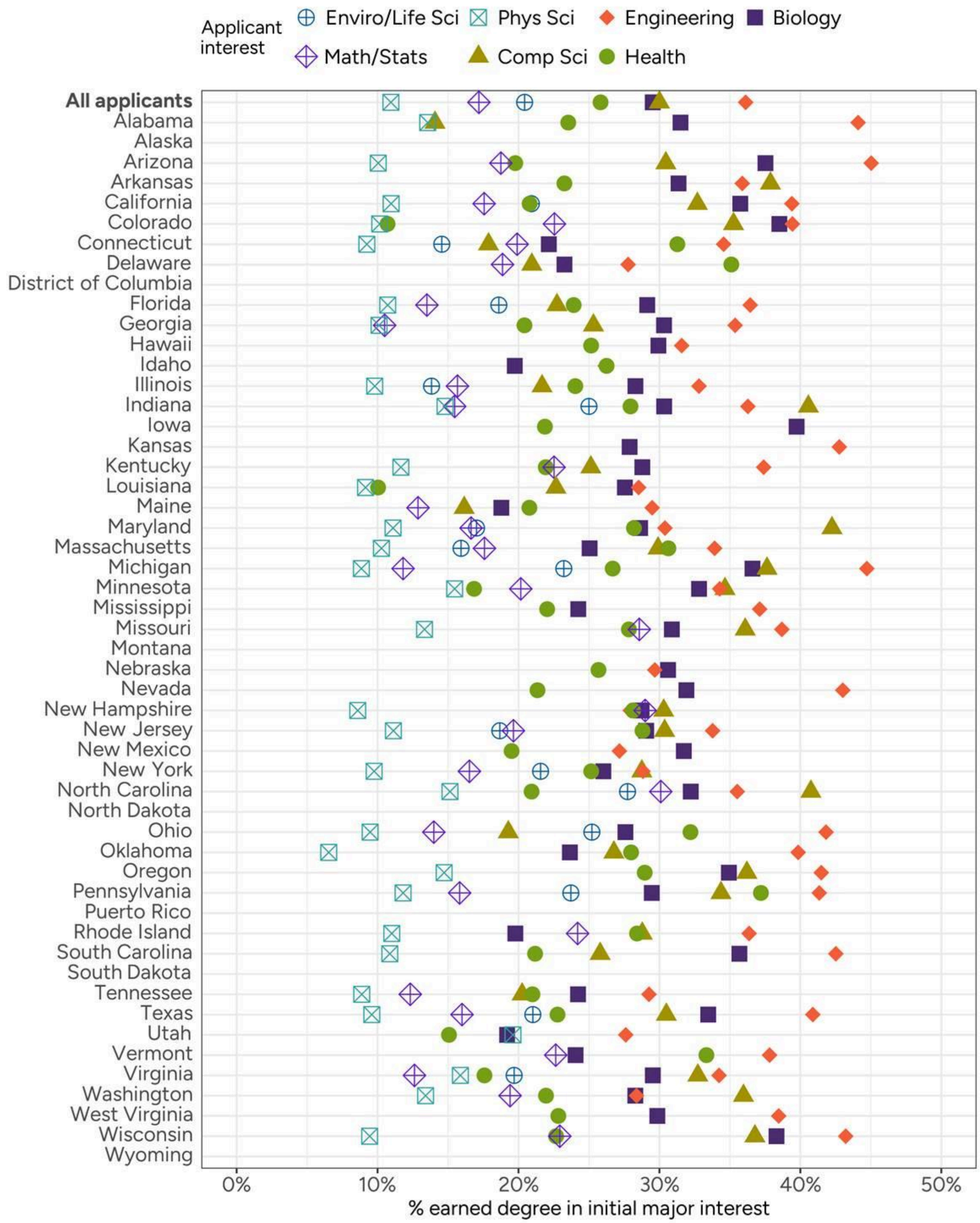


Table A1. Applicant to degree rates

Table A1.a Applicant-to-Any interest degree rate:
For every 100 Common App applicants interested in Any interest how many ultimately earned a degree in Any interest?

	Total	In-state	Border state	Distant state
All applicants	**69**	**42**	**10**	**17**
Alabama	74	40	11	23
Alaska	66	10	NA	56
Arizona	75	40	11	25
Arkansas	72	40	13	19
California	74	50	3	20
Colorado	71	43	4	25
Connecticut	65	29	18	19
Delaware	59	32	12	16
District of Columbia	57	6	10	41
Florida	71	45	3	23
Georgia	66	46	8	11
Hawaii	71	17	NA	54
Idaho	67	24	20	23
Illinois	66	32	14	20
Indiana	67	55	6	6
Iowa	78	38	17	22
Kansas	79	26	14	39
Kentucky	73	45	16	12
Louisiana	70	37	7	25
Maine	59	31	3	25
Maryland	70	36	15	19
Massachusetts	70	40	17	13
Michigan	74	58	6	11
Minnesota	76	38	13	25
Mississippi	68	35	13	21
Missouri	75	32	14	29
Montana	73	28	2	44
Nebraska	75	34	12	29
Nevada	69	23	20	26
New Hampshire	66	27	19	20
New Jersey	66	26	17	23
New Mexico	69	22	16	32
New York	66	45	10	11
North Carolina	73	58	7	8
North Dakota	72	24	18	30
Ohio	67	54	5	8
Oklahoma	66	48	8	10
Oregon	71	37	16	18
Pennsylvania	72	47	10	15
Puerto Rico	72	15	NA	57
Rhode Island	58	30	12	16
South Carolina	75	53	7	15
South Dakota	71	18	25	27
Tennessee	72	39	14	19
Texas	71	43	5	23
Utah	61	30	3	27
Vermont	64	29	19	16
Virginia	70	52	5	13
Washington	70	39	5	26
West Virginia	72	41	16	15
Wisconsin	77	40	16	21
Wyoming	68	19	15	33

Table A1.b Applicant-to-Any STEMM degree rate:
For every 100 Common App applicants interested in Any STEMM how many ultimately earned a degree in Any STEMM?

	Total	In-state	Border state	Distant state
All applicants	**45**	**28**	**6**	**10**
Alabama	50	30	6	14
Alaska	45	8	NA	37
Arizona	54	31	6	17
Arkansas	51	29	9	12
California	49	34	2	13
Colorado	49	30	2	16
Connecticut	40	18	10	11
Delaware	39	22	8	9
District of Columbia	27	3	5	19
Florida	45	30	2	13
Georgia	43	32	5	6
Hawaii	48	11	NA	37
Idaho	47	15	16	16
Illinois	43	21	10	12
Indiana	44	37	3	4
Iowa	54	28	12	14
Kansas	53	19	8	25
Kentucky	46	29	10	7
Louisiana	41	22	4	14
Maine	34	18	2	15
Maryland	48	28	9	11
Massachusetts	44	26	9	8
Michigan	52	41	4	7
Minnesota	49	25	10	14
Mississippi	44	23	9	11
Missouri	52	24	8	19
Montana	46	NA	NA	NA
Nebraska	52	23	9	20
Nevada	49	18	13	18
New Hampshire	44	16	15	14
New Jersey	41	16	11	14
New Mexico	45	15	10	20
New York	40	28	6	6
North Carolina	47	38	4	5
North Dakota	49	NA	NA	NA
Ohio	44	36	4	5
Oklahoma	42	31	5	6
Oregon	49	26	10	13
Pennsylvania	50	34	6	10
Puerto Rico	41	7	NA	33
Rhode Island	37	19	8	10
South Carolina	51	39	4	8
South Dakota	42	11	15	16
Tennessee	43	24	9	10
Texas	47	31	3	14
Utah	41	19	3	20
Vermont	45	22	13	11
Virginia	43	31	3	9
Washington	45	24	3	18
West Virginia	48	27	10	10
Wisconsin	53	29	11	12
Wyoming	43	16	7	20

Table A1.c Applicant-to-Biology degree rate:
For every 100 Common App applicants interested in Biology how many ultimately earned a degree in Biology?

	Total	In-state	Border state	Distant state
All applicants	**26**	**17**	**3**	**6**
Alabama	28	16	3	9
Alaska	21	NA	NA	NA
Arizona	32	19	4	9
Arkansas	33	13	10	10
California	30	22	1	7
Colorado	34	21	1	11
Connecticut	22	10	6	6
Delaware	24	12	4	7
District of Columbia	14	NA	NA	NA
Florida	26	18	1	7
Georgia	27	20	3	5
Hawaii	31	7	NA	23
Idaho	22	6	8	8
Illinois	25	12	5	8
Indiana	28	22	2	4
Iowa	37	18	9	10
Kansas	29	9	5	15
Kentucky	27	18	5	3
Louisiana	28	16	3	9
Maine	22	9	2	11
Maryland	26	15	5	6
Massachusetts	23	14	5	4
Michigan	32	25	3	5
Minnesota	29	16	6	7
Mississippi	24	11	7	6
Missouri	29	15	5	10
Montana	26	8	NA	18
Nebraska	27	12	5	11
Nevada	28	11	9	9
New Hampshire	27	10	8	8
New Jersey	23	9	6	7
New Mexico	27	11	4	12
New York	23	17	3	3
North Carolina	29	23	2	3
North Dakota	NA	NA	NA	NA
Ohio	25	20	2	3
Oklahoma	23	15	3	4
Oregon	31	14	8	10
Pennsylvania	28	19	3	6
Puerto Rico	29	7	NA	22
Rhode Island	21	8	5	8
South Carolina	30	23	3	5
South Dakota	22	NA	NA	NA
Tennessee	24	13	6	5
Texas	28	19	1	8
Utah	21	NA	NA	NA
Vermont	23	10	7	6
Virginia	27	20	2	5
Washington	26	13	2	11
West Virginia	31	18	7	6
Wisconsin	34	20	7	7
Wyoming	NA	NA	NA	NA

Table A1.d Applicant-to-Computer Science degree rate:
For every 100 Common App applicants interested in Computer Science how many ultimately earned a degree in Computer Science?

	Total	In-state	Border state	Distant state
All applicants	**26**	**17**	**3**	**6**
Alabama	16	NA	NA	NA
Alaska	NA	NA	NA	NA
Arizona	30	14	4	12
Arkansas	32	16	7	8
California	30	20	1	10
Colorado	29	NA	NA	NA
Connecticut	20	8	7	6
Delaware	18	10	4	4
District of Columbia	15	NA	NA	NA
Florida	20	12	1	7
Georgia	22	18	1	3
Hawaii	26	NA	NA	NA
Idaho	26	NA	NA	NA
Illinois	21	10	5	6
Indiana	33	29	1	3
Iowa	26	NA	NA	NA
Kansas	23	NA	NA	NA
Kentucky	25	13	5	7
Louisiana	18	NA	NA	NA
Maine	17	NA	NA	NA
Maryland	32	25	3	5
Massachusetts	26	17	5	5
Michigan	31	26	1	4
Minnesota	27	16	5	6
Mississippi	17	NA	NA	NA
Missouri	30	15	4	11
Montana	NA	NA	NA	NA
Nebraska	36	NA	NA	NA
Nevada	23	NA	NA	NA
New Hampshire	29	10	9	10
New Jersey	24	10	7	7
New Mexico	17	NA	NA	NA
New York	24	18	3	3
North Carolina	35	29	2	4
North Dakota	NA	NA	NA	NA
Ohio	20	14	2	4
Oklahoma	25	NA	NA	NA
Oregon	30	15	5	10
Pennsylvania	30	21	5	5
Puerto Rico	13	NA	NA	NA
Rhode Island	24	13	5	6
South Carolina	24	15	3	5
South Dakota	NA	NA	NA	NA
Tennessee	20	10	3	7
Texas	27	17	1	9
Utah	26	NA	NA	NA
Vermont	31	19	6	6
Virginia	31	22	2	7
Washington	30	16	2	12
West Virginia	28	NA	NA	NA
Wisconsin	30	17	6	6
Wyoming	NA	NA	NA	NA

Table A1.e Applicant-to-Engineering degree rate:
For every 100 Common App applicants interested in Engineering how many ultimately earned a degree in Engineering?

	Total	In-state	Border state	Distant state
All applicants	**33**	**20**	**5**	**8**
Alabama	38	24	4	10
Alaska	37	10	NA	28
Arizona	40	24	6	11
Arkansas	31	NA	NA	NA
California	34	24	1	9
Colorado	36	24	2	10
Connecticut	32	15	8	9
Delaware	27	13	5	9
District of Columbia	18	NA	NA	NA
Florida	34	20	2	11
Georgia	31	24	4	4
Hawaii	38	6	NA	33
Idaho	32	8	12	13
Illinois	35	14	10	10
Indiana	34	28	3	3
Iowa	42	24	6	12
Kansas	40	18	5	17
Kentucky	38	20	12	6
Louisiana	29	15	4	10
Maine	31	16	1	14
Maryland	32	15	7	9
Massachusetts	30	20	5	5
Michigan	41	32	4	5
Minnesota	36	14	10	12
Mississippi	31	17	5	8
Missouri	38	15	6	18
Montana	40	20	NA	20
Nebraska	34	12	6	16
Nevada	33	12	7	13
New Hampshire	35	9	14	13
New Jersey	30	10	8	11
New Mexico	32	8	10	14
New York	28	18	5	5
North Carolina	33	24	5	5
North Dakota	NA	NA	NA	NA
Ohio	37	31	3	3
Oklahoma	36	28	4	5
Oregon	37	17	9	11
Pennsylvania	39	25	6	8
Puerto Rico	30	NA	NA	NA
Rhode Island	32	16	7	8
South Carolina	39	28	4	8
South Dakota	NA	NA	NA	NA
Tennessee	28	15	6	6
Texas	35	23	2	11
Utah	27	NA	NA	NA
Vermont	35	13	13	9
Virginia	33	21	3	10
Washington	30	12	3	15
West Virginia	36	19	9	8
Wisconsin	42	23	9	10
Wyoming	32	NA	NA	NA

Table A1.f Applicant-to-Environmental/Life Science degree rate:
For every 100 Common App applicants interested in Environmental/Life Science how many ultimately earned a degree in Environmental/Life Science?

	Total	In-state	Border state	Distant state
All applicants	**21**	**9**	**3**	**9**
Alabama	NA	NA	NA	NA
Alaska	NA	NA	NA	NA
Arizona	24	NA	NA	NA
Arkansas	NA	NA	NA	NA
California	18	NA	NA	NA
Colorado	24	NA	NA	NA
Connecticut	21	5	5	11
Delaware	17	NA	NA	NA
District of Columbia	NA	NA	NA	NA
Florida	16	NA	NA	NA
Georgia	19	NA	NA	NA
Hawaii	NA	NA	NA	NA
Idaho	NA	NA	NA	NA
Illinois	18	NA	NA	NA
Indiana	27	NA	NA	NA
Iowa	NA	NA	NA	NA
Kansas	NA	NA	NA	NA
Kentucky	NA	NA	NA	NA
Louisiana	NA	NA	NA	NA
Maine	18	NA	NA	NA
Maryland	24	5	5	14
Massachusetts	20	6	7	7
Michigan	25	NA	NA	NA
Minnesota	26	NA	NA	NA
Missouri	29	NA	NA	NA
Montana	NA	NA	NA	NA
Nebraska	NA	NA	NA	NA
Nevada	NA	NA	NA	NA
New Hampshire	18	NA	NA	NA
New Jersey	23	5	4	14
New Mexico	NA	NA	NA	NA
New York	20	12	3	5
North Carolina	25	NA	NA	NA
Ohio	25	NA	NA	NA
Oklahoma	NA	NA	NA	NA
Oregon	21	NA	NA	NA
Pennsylvania	24	NA	NA	NA
Puerto Rico	NA	NA	NA	NA
Rhode Island	21	NA	NA	NA
South Carolina	25	NA	NA	NA
South Dakota	NA	NA	NA	NA
Tennessee	10	NA	NA	NA
Texas	22	NA	NA	NA
Utah	NA	NA	NA	NA
Vermont	28	NA	NA	NA
Virginia	23	NA	NA	NA
Washington	19	NA	NA	NA
West Virginia	NA	NA	NA	NA
Wisconsin	25	NA	NA	NA
Wyoming	NA	NA	NA	NA

Table A1.g Applicant-to-Health degree rate:
For every 100 Common App applicants interested in Health how many ultimately earned a degree in Health?

	Total	In-state	Border state	Distant state
All applicants	**23**	**15**	**4**	**4**
Alabama	18	NA	NA	NA
Alaska	22	NA	NA	NA
Arizona	18	NA	NA	NA
Arkansas	20	NA	NA	NA
California	20	12	2	6
Colorado	13	6	2	5
Connecticut	28	16	6	6
Delaware	27	17	6	4
District of Columbia	10	NA	NA	NA
Florida	19	14	1	4
Georgia	18	13	2	2
Hawaii	23	7	NA	16
Idaho	19	10	5	5
Illinois	23	11	7	5
Indiana	25	22	2	1
Iowa	23	10	8	5
Kansas	22	7	6	9
Kentucky	20	13	4	2
Louisiana	12	NA	NA	NA
Maine	19	12	2	5
Maryland	24	14	6	4
Massachusetts	28	18	7	3
Michigan	24	19	3	3
Minnesota	17	9	3	5
Mississippi	20	NA	NA	NA
Missouri	22	14	4	5
Montana	21	NA	NA	NA
Nebraska	22	NA	NA	NA
Nevada	15	NA	NA	NA
New Hampshire	27	12	10	5
New Jersey	27	11	8	8
New Mexico	17	NA	NA	NA
New York	23	17	4	3
North Carolina	19	16	2	2
North Dakota	NA	NA	NA	NA
Ohio	28	24	2	1
Oklahoma	24	NA	NA	NA
Oregon	25	16	4	4
Pennsylvania	32	25	2	4
Puerto Rico	12	NA	NA	NA
Rhode Island	23	14	5	4
South Carolina	19	NA	NA	NA
South Dakota	24	NA	NA	NA
Tennessee	19	12	4	2
Texas	20	13	2	4
Utah	12	NA	NA	NA
Vermont	29	15	8	6
Virginia	16	13	1	2
Washington	19	11	3	5
West Virginia	20	NA	NA	NA
Wisconsin	20	12	4	4
Wyoming	NA	NA	NA	NA

Table A1.h Applicant-to-Mathematics and Statistics degree rate:
For every 100 Common App applicants interested in Mathematics and Statistics how many ultimately earned a degree in Mathematics and Statistics?

	Total	In-state	Border state	Distant state
All applicants	**16**	**9**	**2**	**5**
Alabama	19	NA	NA	NA
Alaska	NA	NA	NA	NA
Arizona	16	8	NA	8
Arkansas	19	NA	NA	NA
California	16	NA	NA	NA
Colorado	20	NA	NA	NA
Connecticut	16	7	4	5
Delaware	19	NA	NA	NA
District of Columbia	14	NA	NA	NA
Florida	13	NA	NA	NA
Georgia	13	7	2	5
Hawaii	10	NA	NA	NA
Idaho	20	NA	NA	NA
Illinois	15	6	3	7
Indiana	16	NA	NA	NA
Iowa	24	NA	NA	NA
Kansas	30	NA	NA	NA
Kentucky	22	NA	NA	NA
Louisiana	13	NA	NA	NA
Maine	14	NA	NA	NA
Maryland	16	8	2	6
Massachusetts	17	9	5	3
Michigan	13	NA	NA	NA
Minnesota	19	9	3	7
Mississippi	NA	NA	NA	NA
Missouri	23	NA	NA	NA
Montana	NA	NA	NA	NA
Nebraska	NA	NA	NA	NA
Nevada	21	NA	NA	NA
New Hampshire	21	7	6	9
New Jersey	15	5	4	6
New Mexico	16	NA	NA	NA
New York	15	10	3	2
North Carolina	23	NA	NA	NA
Ohio	14	10	1	3
Oklahoma	NA	NA	NA	NA
Oregon	20	6	4	10
Pennsylvania	15	9	2	5
Puerto Rico	NA	NA	NA	NA
Rhode Island	17	NA	NA	NA
South Carolina	22	NA	NA	NA
South Dakota	NA	NA	NA	NA
Tennessee	14	NA	NA	NA
Texas	15	NA	NA	NA
Utah	14	NA	NA	NA
Vermont	23	NA	NA	NA
Virginia	14	7	2	5
Washington	18	NA	NA	NA
West Virginia	NA	NA	NA	NA
Wisconsin	19	10	3	5
Wyoming	NA	NA	NA	NA

Table A1.i Applicant-to-Physical Science degree rate:
For every 100 Common App applicants interested in Physical Science how many ultimately earned a degree in Physical Science?

	Total	In-state	Border state	Distant state
All applicants	**10**	**6**	**1**	**3**
Alabama	13	NA	NA	NA
Alaska	14	NA	NA	NA
Arizona	11	NA	NA	NA
Arkansas	15	NA	NA	NA
California	11	7	0	3
Colorado	12	NA	NA	NA
Connecticut	9	4	2	3
Delaware	7	NA	NA	NA
District of Columbia	8	NA	NA	NA
Florida	10	6	1	3
Georgia	9	7	1	1
Hawaii	9	NA	NA	NA
Idaho	16	NA	NA	NA
Illinois	9	4	1	4
Indiana	14	11	2	1
Iowa	19	NA	NA	NA
Kansas	14	NA	NA	NA
Kentucky	12	7	2	2
Louisiana	9	NA	NA	NA
Maine	10	NA	NA	NA
Maryland	11	5	2	3
Massachusetts	10	6	2	3
Michigan	9	NA	NA	NA
Minnesota	12	8	2	2
Mississippi	15	NA	NA	NA
Missouri	13	6	2	4
Montana	NA	NA	NA	NA
Nebraska	11	NA	NA	NA
Nevada	14	NA	NA	NA
New Hampshire	12	3	4	6
New Jersey	9	3	3	4
New Mexico	13	NA	NA	NA
New York	9	6	1	1
North Carolina	13	NA	NA	NA
Ohio	9	7	1	2
Oklahoma	6	NA	NA	NA
Oregon	13	NA	NA	NA
Pennsylvania	12	7	2	3
Puerto Rico	NA	NA	NA	NA
Rhode Island	9	NA	NA	NA
South Carolina	11	NA	NA	NA
South Dakota	NA	NA	NA	NA
Tennessee	9	5	2	3
Texas	9	NA	NA	NA
Utah	16	NA	NA	NA
Vermont	11	NA	NA	NA
Virginia	14	10	1	3
Washington	12	NA	NA	NA
West Virginia	NA	NA	NA	NA
Wisconsin	10	4	3	3
Wyoming	NA	NA	NA	NA

Figure A6

Figure A6a. State where degree earned among all degree earners, by applicant home state

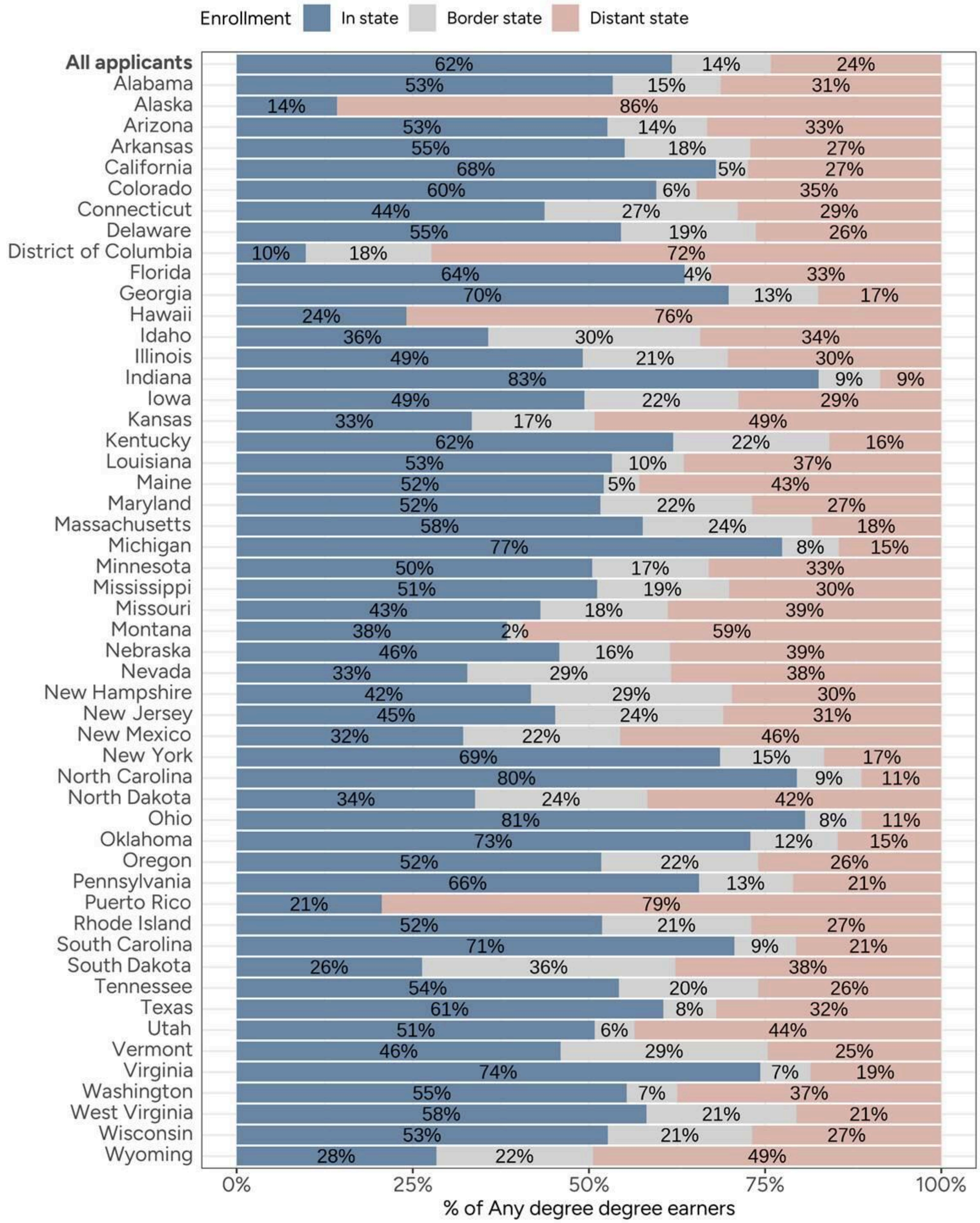


Figure A6b. State where degree earned among degree earners interested in STEMM, by applicant home state

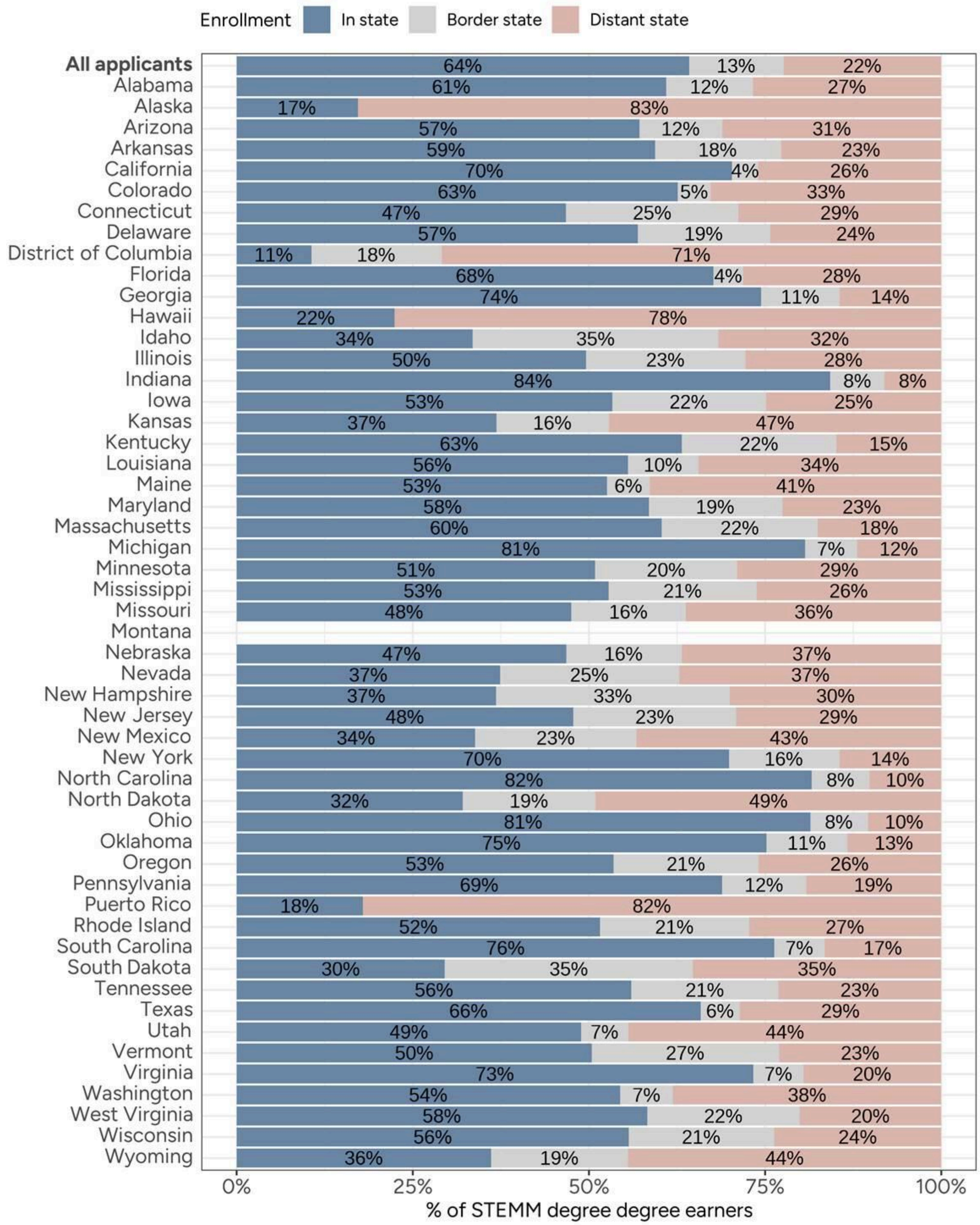


Figure A6c. State where degree earned among Biology degree earners, by applicant home state

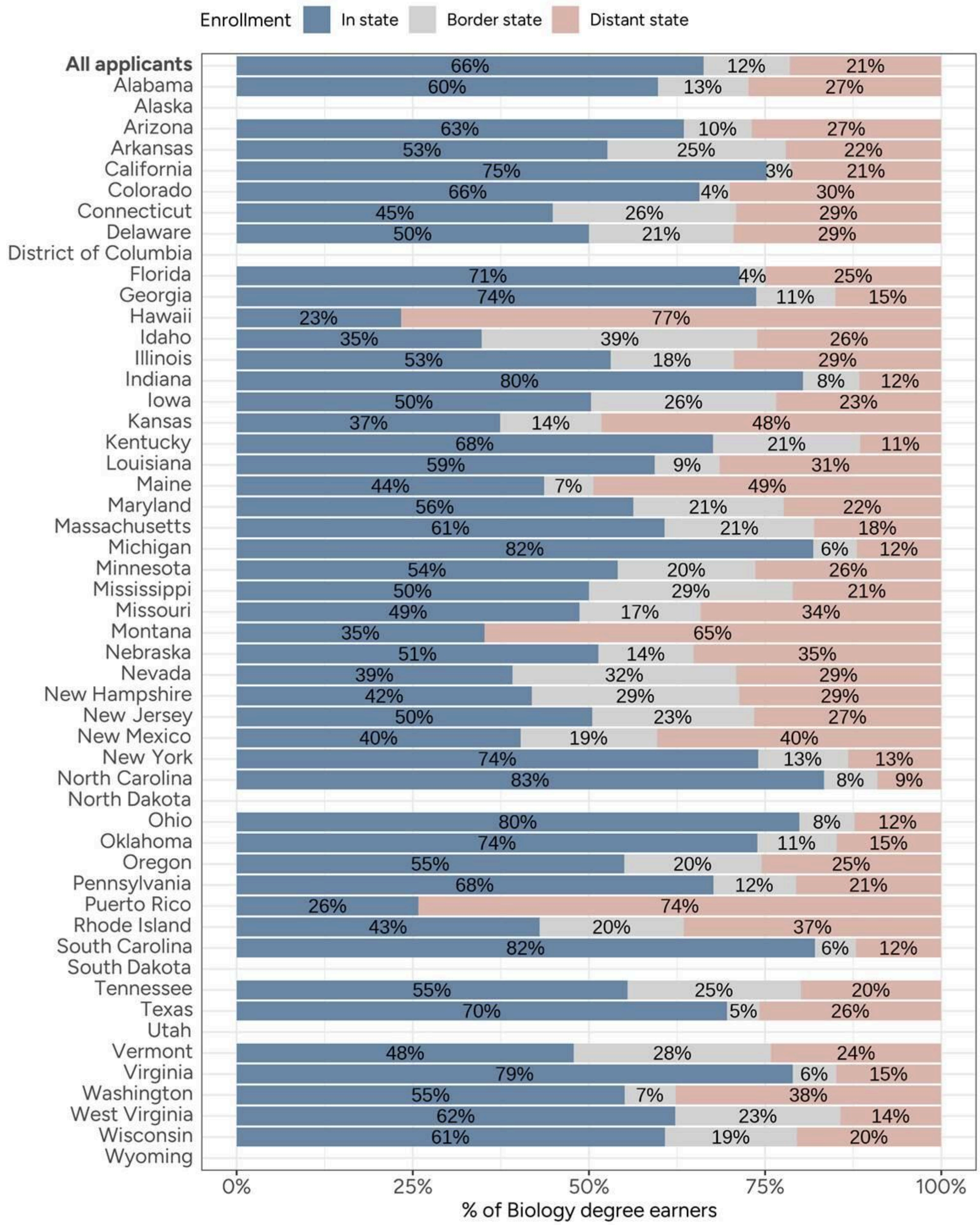


Figure A6d. State where degree earned among Computer Science degree earners, by applicant home state

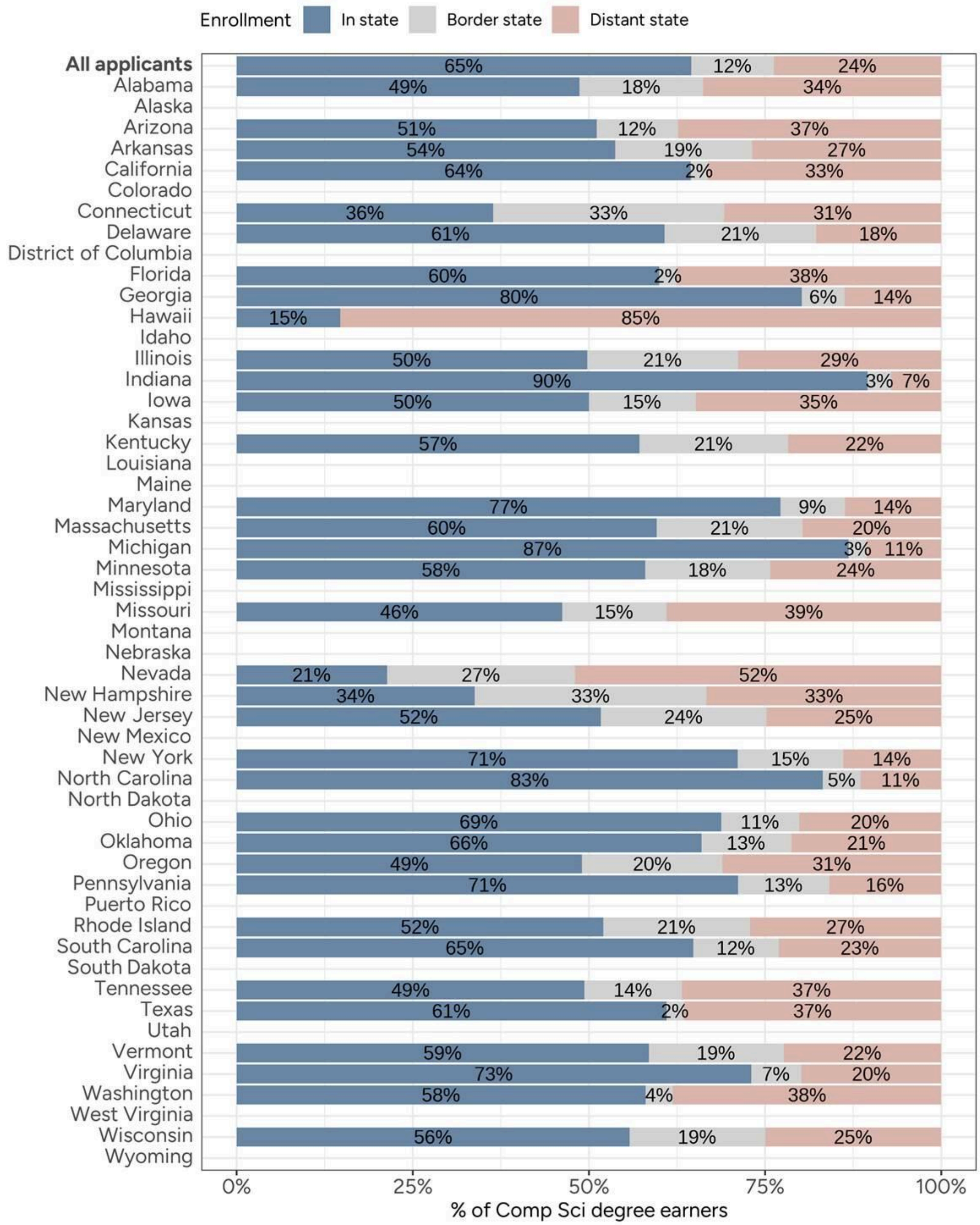


Figure A6e. State where degree earned among Engineering degree earners, by applicant home state

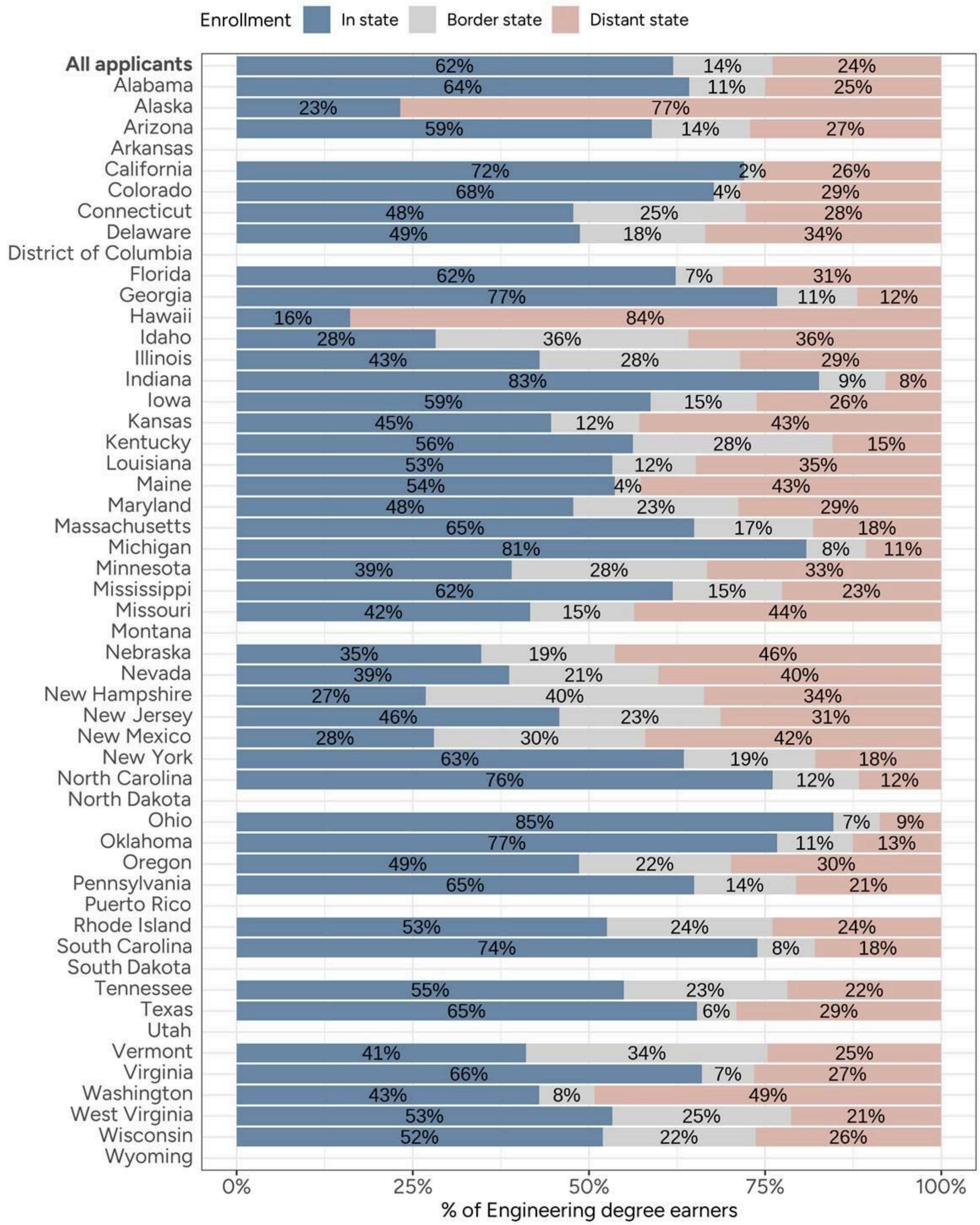


Figure A6f. State where degree earned among Environmental/Life Sciences degree earners, by applicant home state

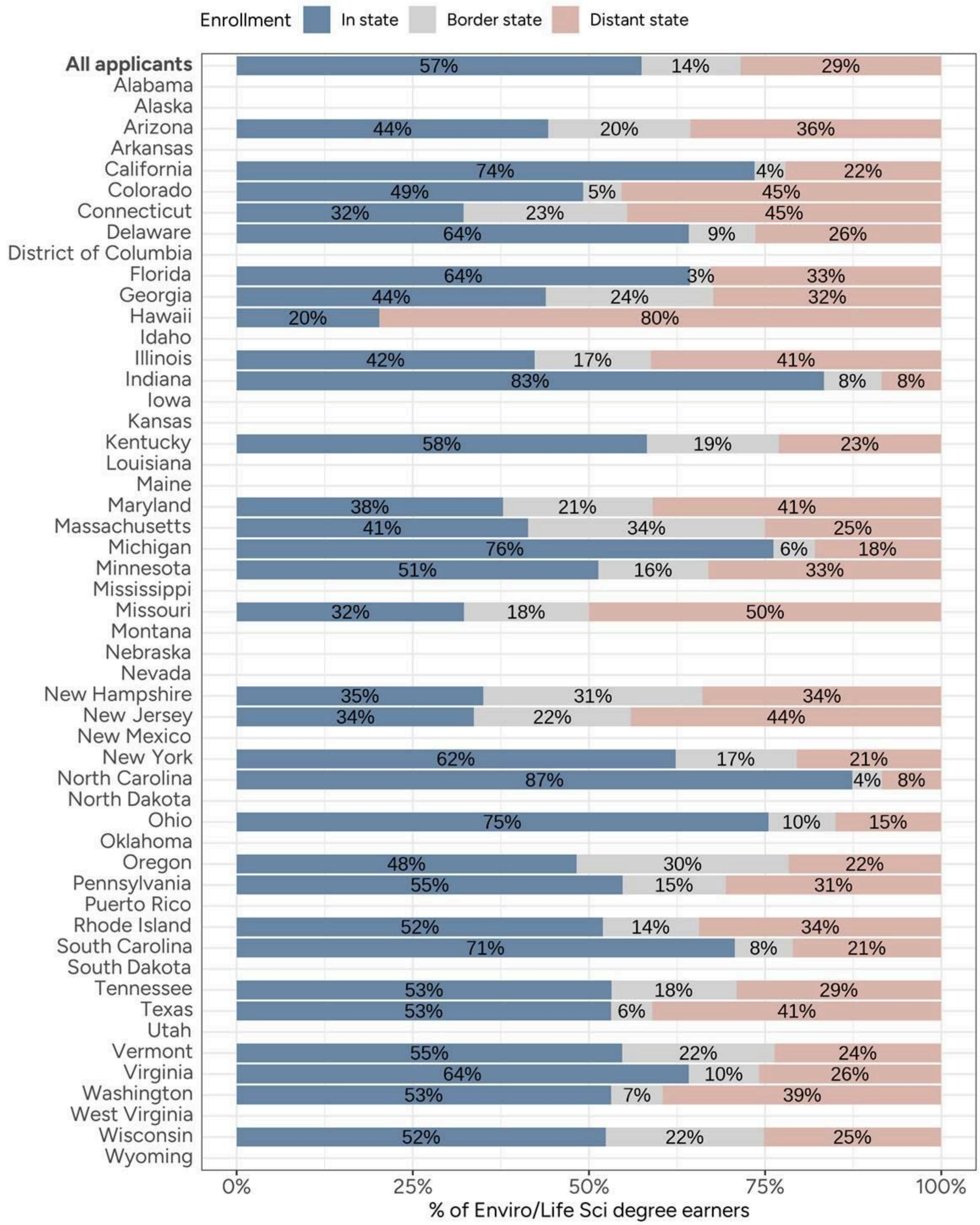


Figure A6g. State where degree earned among Health degree earners, by applicant home state

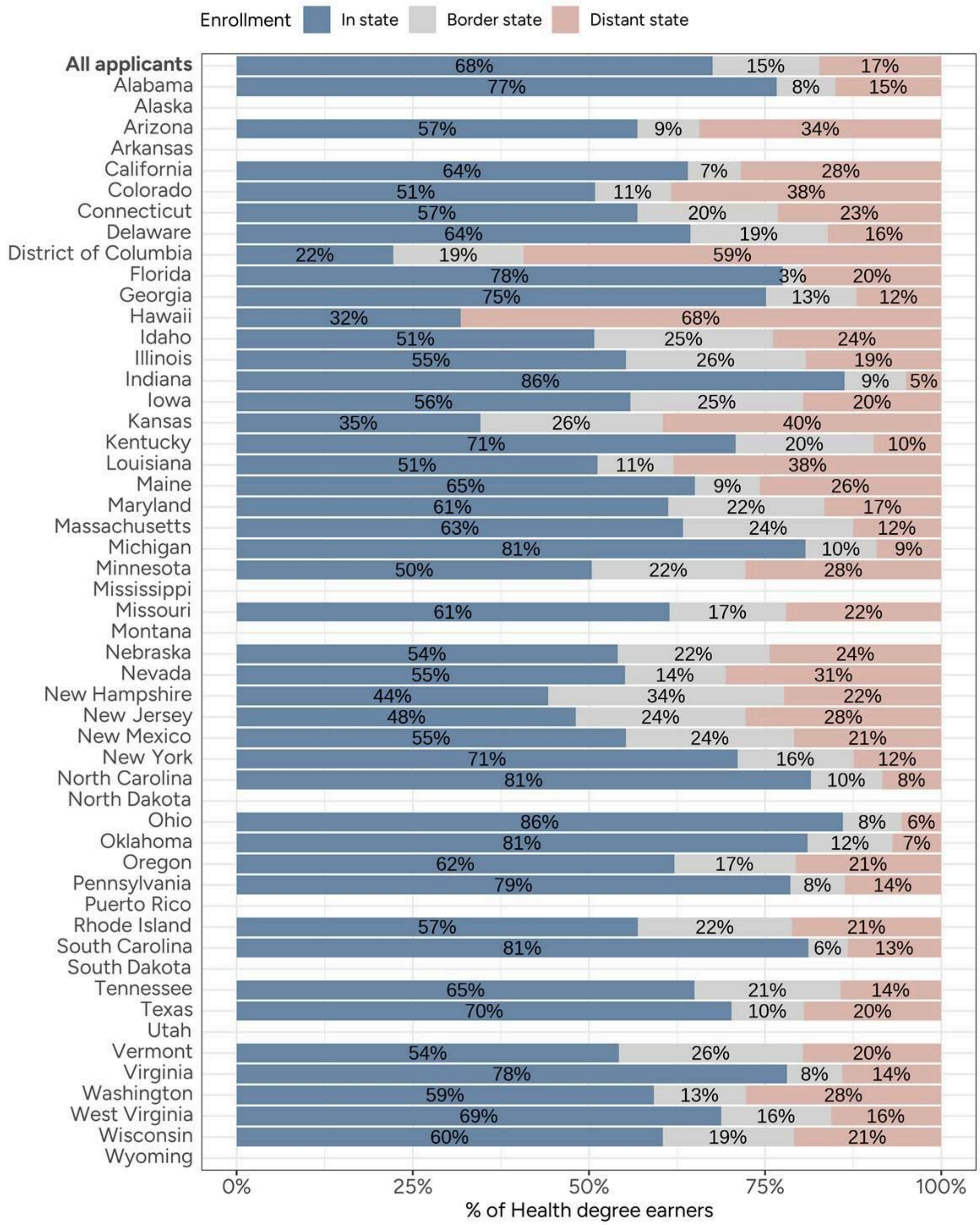


Figure A6h. State where degree earned among Mathematics and Statistics degree earners, by applicant home state

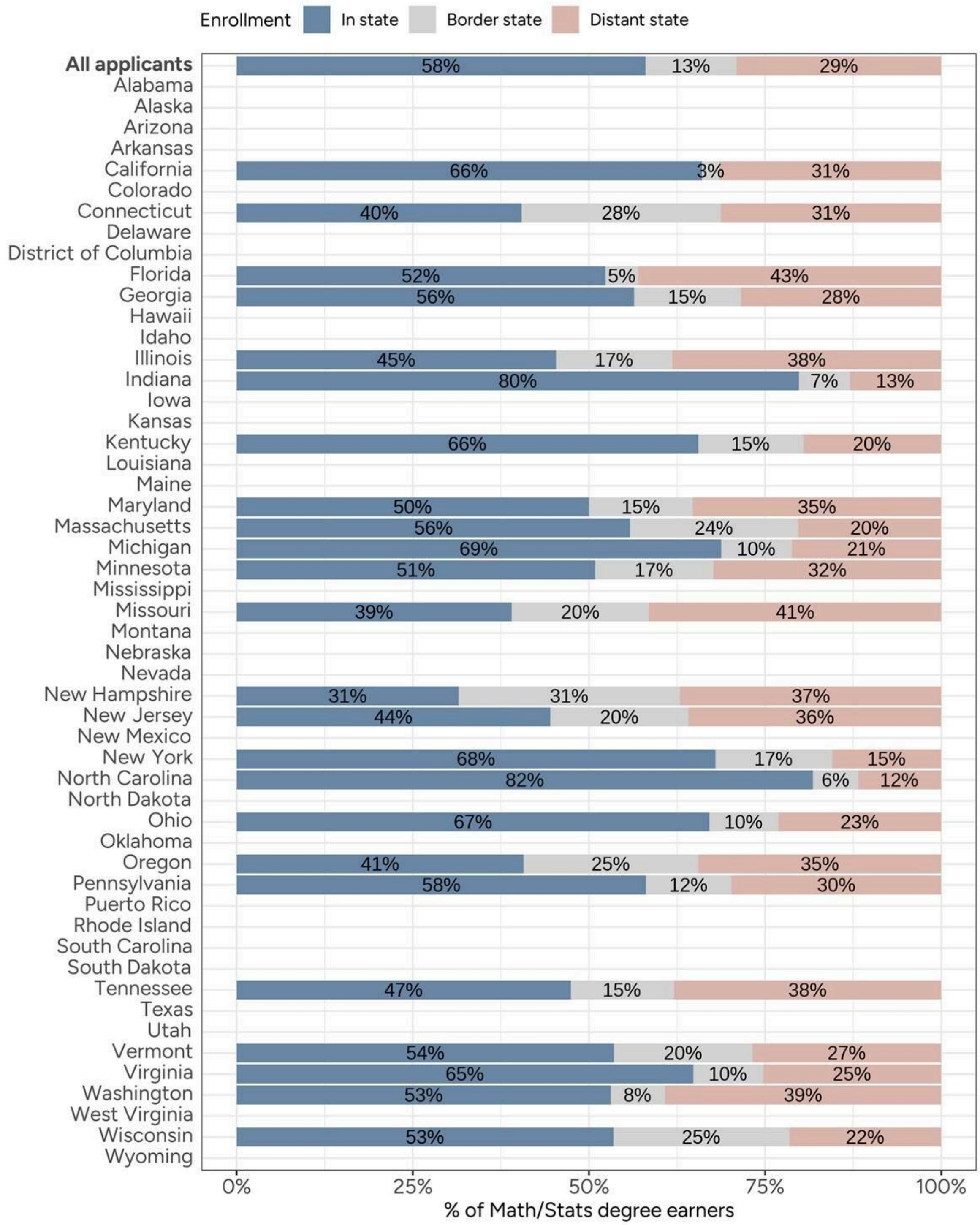


Figure A6i. State where degree earned among Physical Sciences degree earners, by applicant home state

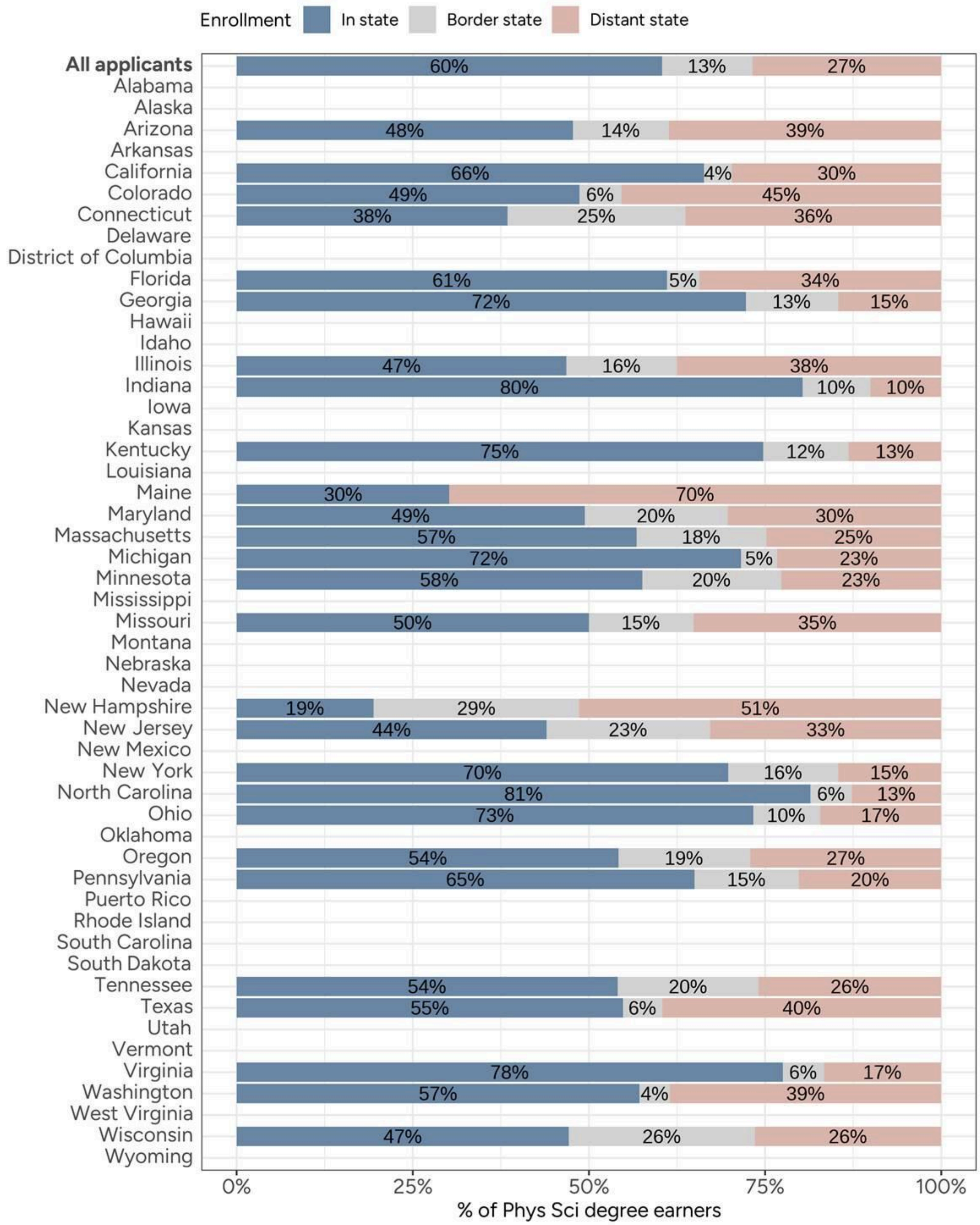


Table A2. Common majors in each STEMM field

Note that "degrees earned" in this table does not condition on applicant interest during application. The number of applicants are slightly different from those reported in Tracking persistence in STEMM: Part 1 due to different sample restrictions.

STEMM field (this analysis)	NSF Science and Engineering Field	CIP Code	CIP Title	Number of Applicants intended major	Number of Applicants earned bachelor's degree
Biology	Biological and Biomedical Sciences	260101	Biology/Biological Sciences, General.	272,267	30,630
		261501	Neuroscience.	43,247	5,851
		260202	Biochemistry.	45,563	4,150
		260406	Cell/Cellular and Molecular Biology.	7,489	1,839
		260102	Biomedical Sciences, General.	7,604	1,723
Computer Science	Computer Science	110701	Computer Science.	109,816	14,313
		110101	Computer and Information Sciences, General.	22,056	7,867
		110401	Information Science/Studies.	2,671	2,652
		110103	Information Technology.	3,298	2,036
		111003	Computer and Information Systems Security/Auditing/Information Assurance.	1,422	863
Engineering	Engineering	141901	Mechanical Engineering.	63,084	13,101

STEMM field (this analysis)	NSF Science and Engineering Field	CIP Code	CIP Title	Number of Applicants intended major	Number of Applicants earned bachelor's degree
		141001	Electrical and Electronics Engineering.	38,910	5,215
		140501	Bioengineering and Biomedical Engineering.	49,625	5,050
		140801	Civil Engineering, General.	20,430	4,700
		140701	Chemical Engineering.	24,000	4,349
Environmental /Life Science	Natural Resources and Conservation	30103	Environmental Studies.	18,057	3,786
		30104	Environmental Science.	16,619	2,766
	Life Sciences	10901	Animal Sciences, General.	6,334	1,779
	Geosciences, Atmospheric, and Ocean Sciences	400601	Geology/Earth Science, General.	5,104	1,286
		261302	Marine Biology and Biological Oceanography.	7,833	723
Health	Health Sciences	513801	Registered Nursing/Registered Nurse.	97,499	16,937
	Medical Residency/Fellowship Programs	310505	Exercise Science and Kinesiology.	17,617	6,105
	Medical Residency/Fellowship Programs	510000	Health Services/Allied Health/Health Sciences, General.	16,707	3,550

STEMM field (this analysis)	NSF Science and Engineering Field	CIP Code	CIP Title	Number of Applicants intended major	Number of Applicants earned bachelor's degree
	Health Sciences	512201	Public Health, General.	8,748	3,388
	Medical Residency/Fellowship Programs	519999	Health Professions and Related Clinical Sciences, Other.	3,718	1,649
Mathematics/ Statistics	Mathematics and Statistics	270101	Mathematics, General.	44,449	7,542
		270501	Statistics, General.	4,922	1,554
		270301	Applied Mathematics, General.	6,737	1,279
		270305	Financial Mathematics.	1,774	226
		279999	Mathematics and Statistics, Other.	1,043	212
Physics	Physical Sciences	400501	Chemistry, General.	67,760	5,489
		400801	Physics, General.	34,773	3,545
		400201	Astronomy.	2,771	277
		400202	Astrophysics.	2,738	185
		400599	Chemistry, Other.	1,076	181