



WHERE STUDENTS GO: EXAMINING OUTMIGRATION IN NEW JERSEY

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Abstract

Building upon previous research on outmigration, this report measures the gaps in the New Jersey Statewide Data System (NJSDS) that limit the ability to track New Jersey high school graduates who pursue higher education and/or employment opportunities in other states. This study supplements administrative data from state agencies in NJSDS with a time-limited National Student Clearinghouse extract and AlumniFinder data to examine postsecondary enrollment outside of the state and examine where graduates relocate afterward. In addition to presenting key outcomes, this report illustrates that supplementing administrative data from state agencies with additional data sources like National Student Clearinghouse and AlumniFinder is necessary for understanding the complex nuances of migration patterns for high school graduates in New Jersey.

Executive Summary

Building upon previous studies about the outmigration of high school graduates from New Jersey (Holcomb et al., 2020), the John J. Heldrich Center for Workforce Development at Rutgers, The State University of New Jersey sought to measure gaps in the [New Jersey Statewide Data System \(NJSDS\)](#) that limit researchers' ability to understand what happens to New Jersey high school graduates who pursue higher education and employment opportunities in other states. Researchers supplemented state longitudinal administrative data with the time-limited National Student Clearinghouse extract and AlumniFinder data, enabling the ability to track those who moved out of state for college and determine whether they returned and/or were employed in New Jersey after graduating. [Table 1](#) presents select postsecondary and employment outcomes of New Jersey high school students who graduated from high school in 2014 or 2015 ("the cohort"). The results section in this report delves into this study's findings in greater detail.

Table 1: Postsecondary and Employment Outcomes

Outcomes	Data Points
Postsecondary	<ul style="list-style-type: none"> ▶ Around 76% of the total 2014 and 2015 high school graduating cohorts (147,200 students) enrolled in a postsecondary institution after graduating from high school in 2014 or 2015. ▶ Half of the cohort (50%) enrolled in a postsecondary institution within New Jersey, whereas slightly more than one-quarter pursued postsecondary education in another state. ▶ Approximately 7% of the cohort had postsecondary enrollment in Massachusetts, New York, or Pennsylvania. ▶ Of the 96,000 cohort members with postsecondary enrollment in New Jersey, at least 27% completed a degree in New Jersey and remained in the state. ▶ Of the 51,000 cohort members with postsecondary education in another state, at least 7% completed college and returned to New Jersey. ▶ Fifty-seven percent (57%) of the cohort who moved away for college identified as female compared with 52% of in-state college students. ▶ Seventy-three percent (73%) of those who moved out of state for college identified as white compared to 54% of those who remained in the state.
Employment	<ul style="list-style-type: none"> ▶ Around 172,200 (89%) students in the cohort were employed in New Jersey at some point after they graduated high school in 2014 or 2015. ▶ Employment in New Jersey ranged from 40% to 62% each quarter after graduating from high school. ▶ Between 10% to 12% of the cohort, including in-state college graduates and out-of-state college completers, did not have any records of having Unemployment Insurance (UI)-covered employment in New Jersey.¹

Note: The current state of residence for more than one-third of in-state college graduates is unknown. Researchers attribute substantial missingness for the state of residency to the known limitations of AlumniFinder data. See the data limitations section in this report for more detailed information.

¹ There are several possible explanations for why certain groups may not have records of UI-covered employment in New Jersey. Such individuals may have been unemployed, worked as independent contractors, or worked out of state. It is also possible that these individuals were pursuing graduate programs in other states.



Although this study captures postsecondary and employment outcomes for student populations otherwise missing in previous studies, persistent data gaps prevent researchers from examining the full extent of outmigration. [Table 2](#) presents the remaining data limitations with NJSDS, the National Student Clearinghouse, and AlumniFinder.

Table 2: Data Limitations

Data Sources		Data Gaps
NJSDS	New Jersey Department of Education (NJDOE)	▶ Missing those who pursue postsecondary enrollment outside of New Jersey.
	Office of the Secretary of Higher Education (OSHE)	▶ Does not identify New Jersey residents enrolled in a postsecondary institution in another state.
	New Jersey Department of Labor and Workforce Development (NJDOL)	▶ Does not include the self-employed or people who work for the federal government. ▶ Does not include out-of-state employment.
External	National Student Clearinghouse	▶ Extract used in this analysis does not include information about completion (e.g., degree earned). ▶ Extract used in this analysis is time-limited and does not include postsecondary outcomes beyond 16 months after graduating high school.
	AlumniFinder	▶ Does not include parents' address or otherwise identify location of permanent state residency. ▶ Does not identify state where individuals are working. ▶ Limited reliability of educational level because of inaccurate or missing data.

The lack of institutional and completion data is a persistent limitation for the external data sources used in this study. For example, the National Student Clearinghouse extract used in this analysis does not include information on **degree type, graduation date, or institutional identification (ID)**.² It is important to note that this reflects the limitations of the National Student Clearinghouse extract used in this analysis, not the data source itself. This was due to the type of the National Student Clearinghouse data shared by NJDOE at the time of the analysis compared to the limited sample of enrollment and completion data pulled from the National Student Clearinghouse and procured separately for this study. As such, researchers did not examine postsecondary outcomes among New Jersey high school graduates enrolled in other states to the full extent as those with in-state enrollment — that is, the type of degree completed, where it was earned, or when the degree was completed. Another important data gap is the last known state of residence. This column in the AlumniFinder data likely represents addresses of parents or guardians and/or other permanent mailing addresses, not necessarily the current state of residence for college graduates. Additional data gaps may emerge as researchers continue to use external data sources.

One method of addressing such limitations is a multi-state collaboration. Led by Kentucky, several states have worked to share de-identified data securely to better understand what happens to their postsecondary graduates who move out of state. This work has culminated in the [Multi-State Postsecondary Report](#), an effort around which New Jersey has recently partnered to expand and produce similar analyses. Despite the important progress around this and similar topics to address state data

² Although the National Student Clearinghouse provides these columns in the full file, researchers did not have access during the original analysis. Later in the report, the authors discuss the additional advantages of obtaining the full file from the National Student Clearinghouse.



boundaries, efforts are currently limited to only a few states, and pilot projects such as the Multi-State Postsecondary Report are focused on individuals completing higher education, not the larger population of high school graduates who may enroll in higher education or work out of state. As this work continues to develop, it is important to consider alternate data sources and methods to reduce limitations.

Tracking outmigration can be difficult, yet this study shows that external data sources like the National Student Clearinghouse and AlumniFinder can be used to help researchers identify high school graduates with postsecondary enrollment outside of New Jersey and examine where they relocate afterward. This study found, for example, that around 51,000 (26%) New Jersey high school graduates in 2014 or 2015 pursued postsecondary enrollment in another state and would have been missing if relying solely on NJSDS data. Among those with out-of-state postsecondary enrollment, at least 7% completed college in other states but returned to New Jersey. Of the full cohort, 89% were found in New Jersey wage records at some point following their high school graduation, with the latest data showing approximately 65% of in-state college graduates and 43% of out-of-state college graduates working in UI-covered jobs in the state. [Table 3](#) summarizes some of these key takeaways.

High school graduates choosing to attend out-of-state postsecondary educational institutions do not directly benefit New Jersey, yet it is encouraging that so many return to the state. The high proportion of those returning after higher education raises tax revenues in New Jersey and brings back experience and expertise to the state. Presenting outmigration through one data source — say, the National Center for Education Statistics (NCES) — therefore presents an incomplete picture, as supplementing with multiple data sources allows researchers to understand the complex nuances of migration patterns for high school graduates.

Table 3: Key Takeaways, by Research Question

Research Question	Key Takeaway
1. To what extent do New Jersey's high school graduates stay or leave for college?	▶ High school graduates tend to stay in New Jersey for postsecondary education, but slightly more than one-third enroll in postsecondary institutions in another state.
2. To what extent do students who leave New Jersey for college return after graduation? Are there certain types of students who are more likely to return?	▶ Most students (78%) who completed a degree in another state returned to New Jersey, bringing back experience and expertise and increasing tax revenue in the state. Further research is needed to determine the proportion of non-completers who return.
3. What are the differences by data source in capturing out-of-state graduate data?	▶ Supplemental data sources provide key information about outmigration and are necessary for capturing the experiences of high school graduates with postsecondary enrollment and completion in other states.



Introduction

Given investments in K-12 and higher education and the well-documented challenges of tracking the outmigration of high school graduates — or those who pursue higher education and employment opportunities in other states, New Jersey is interested in exploring other data sources to better understand student migration patterns. Researchers at the Heldrich Center used NJSDS to study the **outmigration** of high school graduates from New Jersey (Holcomb et al., 2020). Yet there are notable limitations to using longitudinal administrative data from state agencies in New Jersey to track those who pursue higher education and employment opportunities in other states. By supplementing NJSDS data with external data sources like National Student Clearinghouse and AlumniFinder data, researchers were able to examine those with postsecondary enrollment in other states and determine whether they returned to and/or became employed in New Jersey.

Researchers found, for example, that 76% of New Jersey high school graduates in 2014 or 2015 (“the cohort”) had postsecondary enrollment, with slightly more than one-quarter pursuing postsecondary education in another state. Many students pursued postsecondary education in states like Massachusetts, New York, and Pennsylvania. Among the 51,000 with postsecondary enrollment out of state, at least 7% completed college and returned to New Jersey. Those with postsecondary enrollment in another state were also more likely to be white than those who enrolled in New Jersey. In addition, 89% of the cohort became employed in New Jersey at some point between 2014 and 2022.

Analyzing the postsecondary and employment outcomes of the cohort illustrates the potential benefit of supplementing existing data with external data sources. By combining NJSDS with external data sources, this study also helps measure the capacity of using NJSDS to track outmigration. By incorporating external data sources to better track outmigration, this study provides the analytical groundwork for future reporting, whereby researchers can capture those who typically fall out of analyses limited to administrative data.

This report includes three sections. The background section provides contextual information on past and current efforts to track migration patterns of high school and college graduates and includes the research questions guiding this study. The methods section discusses the analytical approach and limitations. In the results section, researchers explore the capacity of NJSDS in analyzing outmigration, as well as the advantages of supplementing administrative data with external data sources to track graduates’ higher education and employment outcomes across states.

Background

New Jersey seeks to better understand the extent to which existing data sources from state agencies capture the migration patterns of high school graduates who attend higher education institutions outside of the state — a longstanding and well-documented phenomenon known as outmigration (Holcomb et al., 2020). Researchers built on earlier research conducted by the Heldrich Center in partnership with OSHE that analyzed data collected for the Integrated Postsecondary Education Data System (IPEDS) on student enrollment and completion. Among the findings were that, while the overall number of graduates from New Jersey institutions increased from 2008 to 2018, migrating out of state for college remained consistently high over time in New Jersey. Indeed, New Jersey ranks first among the states in the percentage of high school graduates that it exports. Between 1986 and 2016, approximately 33% to 36% of high school graduates in New Jersey left for college out of state (Ellis, 2020, January 16). NCES (2022) reports that New Jersey experienced the largest net migration of college students in fall 2020, with around 33,000 students leaving to attend out-of-state schools.



Examining enrollment trends at flagship schools in the state's public university system offers an interesting case study within the bigger picture of student migration patterns for college attendance. Research conducted by Brookings analyzed IPEDS data and found that nearly every flagship university has been decreasing its share of in-state students and enrolling more students from out-of-state over the past two decades (Klein, 2022). New Jersey is no exception. Out-of-state students represent 18% of all students at Rutgers–New Brunswick (Rutgers University, n.d.), which is more than the national average of 15% (Klein, 2022). And yet it is not clear whether that statistic has the effect of reducing the level of in-state college enrollment in New Jersey. As Klein (2022) noted, the total number of in-state students remained relatively constant with the overall enrollment rising due to increased numbers of out-of-state students in the student body. Moreover, Rutgers University is only one of the state's 13 public four-year institutions, and there are another 38 private four-year and 36 public and private two-year institutions in the state (OSHE, n.d.). It is important to note, however, that there are fewer degree-granting institutions per capita in New Jersey compared to neighboring states like New York. In New Jersey, there are approximately 94,000 people per institution — nearly twice as much as New York at around 56,000.³

Few studies capture the migration patterns of high school graduates pursuing higher education and/or employment opportunities outside of their home state. The gap in the literature is likely explained by the limitations of state administrative data in capturing postsecondary migration patterns. While researchers can leverage administrative data from various state agencies, these data only reveal high school graduates who enroll in programs and/or complete degrees at institutions in the state of origin. Publicly available data sources like IPEDS are not without their limitations, particularly in that they only include aggregate data and cannot be used to track individual students. Other data sources are therefore needed to shed light on the migratory patterns of diploma holders. The task of identifying potential sources for pertinent data entails assessing the capacity to link records using unique identifiers and other shared data points, as well as estimating how thoroughly those data seem to cover the population of interest.

State agencies have investigated ways to bridge data gaps on high school graduates migrating to other states for higher education and employment opportunities. Kelchen and Webber (2018) used American Community Survey (ACS) data from 2005 to 2015 to examine the number of bachelor's degree holders between the ages of 22 and 24 who moved into and out of each state in conjunction with a baseline of college-educated adults each year. A notable limitation of their analysis, however, is the inability to distinguish whether people moved for employment, graduate/professional education, or some other reason. Another approach to investigating the migratory patterns of recent college graduates utilized the National Longitudinal Survey of Youth from 1979 to 1996 for examining cross-state migration in the five years after completing education (Kodrzycki, 2001). Though the data source offers repeated interviews with a nationally representative sample of 6,000 respondents between the ages of 14 and 22 in 1979, the National Longitudinal Survey of Youth is a general-purpose survey meant to represent an entire cohort. As such, the widely varied educational experiences of the sampled subjects will include people who did not attend college, which makes it less applicable to a targeted analysis.

Other researchers have used innovative methods to address gaps in what is known about migration trends among college graduates. Conzelmann et al. (2023) leveraged data scraped from LinkedIn to “develop a new data set of the destinations of graduates from most colleges and universities in the United States” (p. 1). Using web-scraping tools allowed them to create a dataset with the distribution of each college's recent alumni by local labor market and state. Although the new dataset may not represent the universe of college graduates because some college graduates may not create a LinkedIn page, researchers performing quality checks found that their data “capture about two-thirds of all postsecondary graduates and correlate closely with government data on key measures” (Conzelmann, et al., 2023, p. 2).

³ According to U.S. Census data, there are approximately 7.5 million people age 16 and older in New Jersey. Divided by the 80 degree-granting institutions in the state, there are nearly 94,000 people per institution. See more information here: <https://data.census.gov/table/ACSDP1Y2022.DP05?g=040XX00US34>.



Given these and other innovative efforts used to track migration patterns, the Heldrich Center leveraged external data sources, such as the National Student Clearinghouse and AlumniFinder, to identify existing gaps in NJSDS that limit the capacity to track high school graduates in New Jersey pursuing higher education and/or employment opportunities in other states. This report details the analytical approach to linking NJSDS, which includes data from NJDOE, OSHE, the Higher Education Student Assistance Authority (HESAA), and NJDOL, with external data sources and the development of outcomes. The next section of this report details the analytical approach and limitations associated with this study.

Methods

This study uses NJSDS and external data sources to assess higher education and employment outcomes of high school students in New Jersey who graduated in 2014 or 2015. Guided by the following research questions, researchers identified existing data gaps in NJSDS that limit tracking high school graduates who migrate out of state for higher education and/or employment opportunities.

- 1. To what extent do New Jersey's high school graduates stay or leave the state for college?**
- 2. To what extent do students who leave New Jersey for college return after graduation? Are there certain types of students who are more likely to return?**
- 3. What are the differences by data source in capturing out-of-state graduate data?**

Analytical Approach

Heldrich Center researchers used NJDOE data to develop the cohort of New Jersey high school students who graduated in 2014 or 2015. To increase sample sizes for subgroup analyses and given no notable differences in the outcomes of interest, researchers grouped 2014 and 2015 graduates as the primary analytical sample for this analysis. Because K-12 data do not contain social security numbers (SSNs), researchers relied on probabilistic matching using first name, last name, student ID, and date of birth, to conduct identity resolution. Around 92% of the cohort was captured using this approach. The students for whom no valid SSN was found were assigned non-SSN unique identifiers.

Researchers then created two separate datasets — one that linked the initial cohort to records in the National Student Clearinghouse and AlumniFinder and another that linked to all relevant data sources, including the enrollments and completions tables from OSHE, as well as UI wage records from NJDOL. [Table 4](#) shows each data source, relevant tables, and selected key columns used in this analysis.



Table 4: Data Sources

Data Source		Table	Key Columns
NJSDS	NJDOE	Demographics	<ul style="list-style-type: none"> ▶ Race ▶ Ethnicity
		Graduate	<ul style="list-style-type: none"> ▶ Graduation year ▶ Cohort year
	OSHE	Completions	<ul style="list-style-type: none"> ▶ Award date ▶ Award type ID ▶ Major ID
		Enrollments	<ul style="list-style-type: none"> ▶ State ID ▶ New Jersey county ▶ Academic year
NJDOL	UI Wages	<ul style="list-style-type: none"> ▶ Wages ▶ Weeks worked ▶ File date ▶ Quarter 	
External	National Student Clearinghouse	Postsecondary	<ul style="list-style-type: none"> ▶ Enrolled state institution ▶ College state
	AlumniFinder	Alumni	<ul style="list-style-type: none"> ▶ Education level ▶ State

Note: This table does not provide an exhaustive list of available data and instead highlights key data points that were integral to this analysis.

Researchers used columns from the National Student Clearinghouse extract to distinguish postsecondary enrollment between New Jersey and another state. Grouping by college state allowed researchers to assess the most common states of residence based on the last-known address. Researchers used the award level to track those who earned a bachelor’s degree at postsecondary institutions in New Jersey (referred to as **in-state college graduates**). Because those who enrolled in another state do not have an award level, researchers relied on the educational level listed in the AlumniFinder data. Researchers selected those among the cohort with “completed college” or “college” and refer to them as **college completers** later in the report. To examine whether certain groups were more likely to stay in or return to New Jersey, researchers used the most recent state of residency in the AlumniFinder data. Using the second dataset with all data sources, including UI wage records from NJDOL, researchers identified which cohort members were employed in New Jersey between 2014 and 2022.

Data Limitations

Supplementing NJSDS with external data sources helps reduce the relative error in reporting, but this study is not without limitations. The identity resolution process returned around 16,500 records (8%) that did not correspond to existing SSNs. These individuals were excluded from employment outcomes, as matching to UI wage records requires valid SSNs. Though researchers leveraged hashed student identification numbers for much of the analysis to include **all** cohort members, they used hashed SSNs to identify the proportion of the cohort employed in New Jersey each quarter.

Other limitations stem from the approach to data collection that AlumniFinder employs. AlumniFinder relies on web-scraping tools to pull publicly available data from the Internet, including degrees listed on LinkedIn profiles. This raises questions about the reliability of these data, as sites like LinkedIn do not capture **all** college graduates or their educational attainment. The information about educational attainment level does not distinguish between degree type and instead uses “completed college” or “college” to indicate that someone earned an associate or bachelor’s degree. Researchers compared the educational level in AlumniFinder and award type from OSHE in NJSDS for those who earned a bachelor’s degree in New Jersey and observed notable discrepancies. The award type as shown in the OSHE dataset may indicate a bachelor’s degree, for



example, but the corresponding educational level in the AlumniFinder data was missing. This poses significant limitations for the cohort, but particularly those with postsecondary enrollment in other states, as AlumniFinder likely only captures a fraction of degrees earned at postsecondary institutions outside of New Jersey.

Typical analyses of postsecondary employment outcomes examine employment rates post-completion or dropout. However, the National Student Clearinghouse extract and AlumniFinder data do not contain columns — populated or otherwise — with an exit or graduation date from postsecondary institutions. This limits the ability to calculate the employment rate in the quarters following exit or completion. Heldrich Center researchers present the employment rates by quarter and year regardless of when individuals exited the program, earned a bachelor’s degree from an in-state institution, or completed college elsewhere. It is also important to note that the National Student Clearinghouse data are an extract from NJDOE. As such, the available data from the National Student Clearinghouse are limited to postsecondary enrollment 16 months after high school graduation and do not include all enrollment up until 2022. There may be discrepancies in postsecondary enrollment, particularly for those at in-state institutions, between OSHE data and the National Student Clearinghouse extract. To comply with data confidentiality and user agreements associated with NJSDS, researchers also redacted counts and subsequent outcomes for groups with fewer than 10 records.

Guided by the research questions, the next section of this report presents findings that illustrate the capacity of NJSDS to analyze outmigration, as well as the advantages of supplementing NJSDS with National Student Clearinghouse and AlumniFinder data to track postsecondary and employment outcomes across states.

Results

The cohort includes approximately 193,000 New Jersey high school graduates in 2014 or 2015. Researchers performed additional data manipulation for specific groups, including those with postsecondary enrollment and/or those with UI wage records. [Table 5](#) presents the counts and percentages of the cohort based on the identifier data available at each level.

Table 5: Counts for Groups

Grouping	Group	Year	Count	Percent of Cohort
Student Identification Numbers	Cohort	2014	96,256	100%
		2015	97,072	
		Total	193,328	
	With Postsecondary Enrollment	2014	73,633	76%
		2015	73,584	
		Total	147,217	
SSNs	Employed in New Jersey Within Study Period	2014	84,844	89%
		2015	87,676	
		Total	172,520	

Note: Researchers used the National Student Clearinghouse extract to identify the cohort and postsecondary enrollment groups. The last group includes any individual with UI wage records, including those with \$0 wages. This section does not include those who have valid SSNs but do not show up in the UI wage records at any point during the study period.

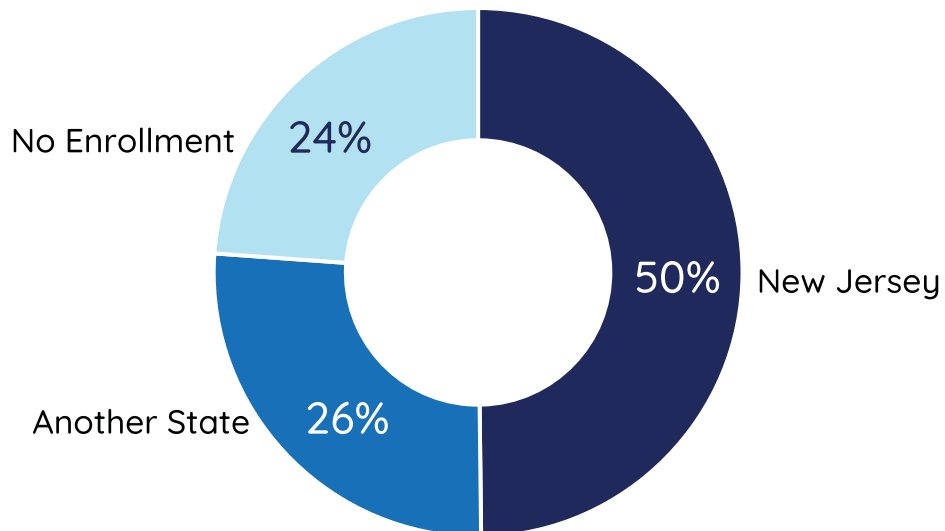


The National Student Clearinghouse extract identified 147,217 individuals in the cohort with postsecondary enrollment. Heldrich Center researchers were able to determine enrollment rates with greater accuracy for those with in-state postsecondary enrollment using administrative data from OSHE, whereas they relied on the time-limited extract for those with out-of-state postsecondary enrollment. The focus of this study is, nevertheless, New Jersey high school graduates who enroll out of state. For additional information on in-state college graduates, please see the [New Jersey Higher Education Outcomes Dashboard](#). The following subsections present postsecondary and employment outcomes by research question.⁴

Research Question #1: To what extent do New Jersey's high school graduates stay or leave for college?

Most of the cohort was enrolled in a postsecondary institution at some point following high school graduation through 2022. [Figure 1](#) shows that half of the cohort was enrolled in New Jersey, whereas slightly more than one-quarter were enrolled out of state. Conversely, 24% of the cohort did not enroll in a postsecondary institution by 2022.

Figure 1: Cohort, by Enrollment Status



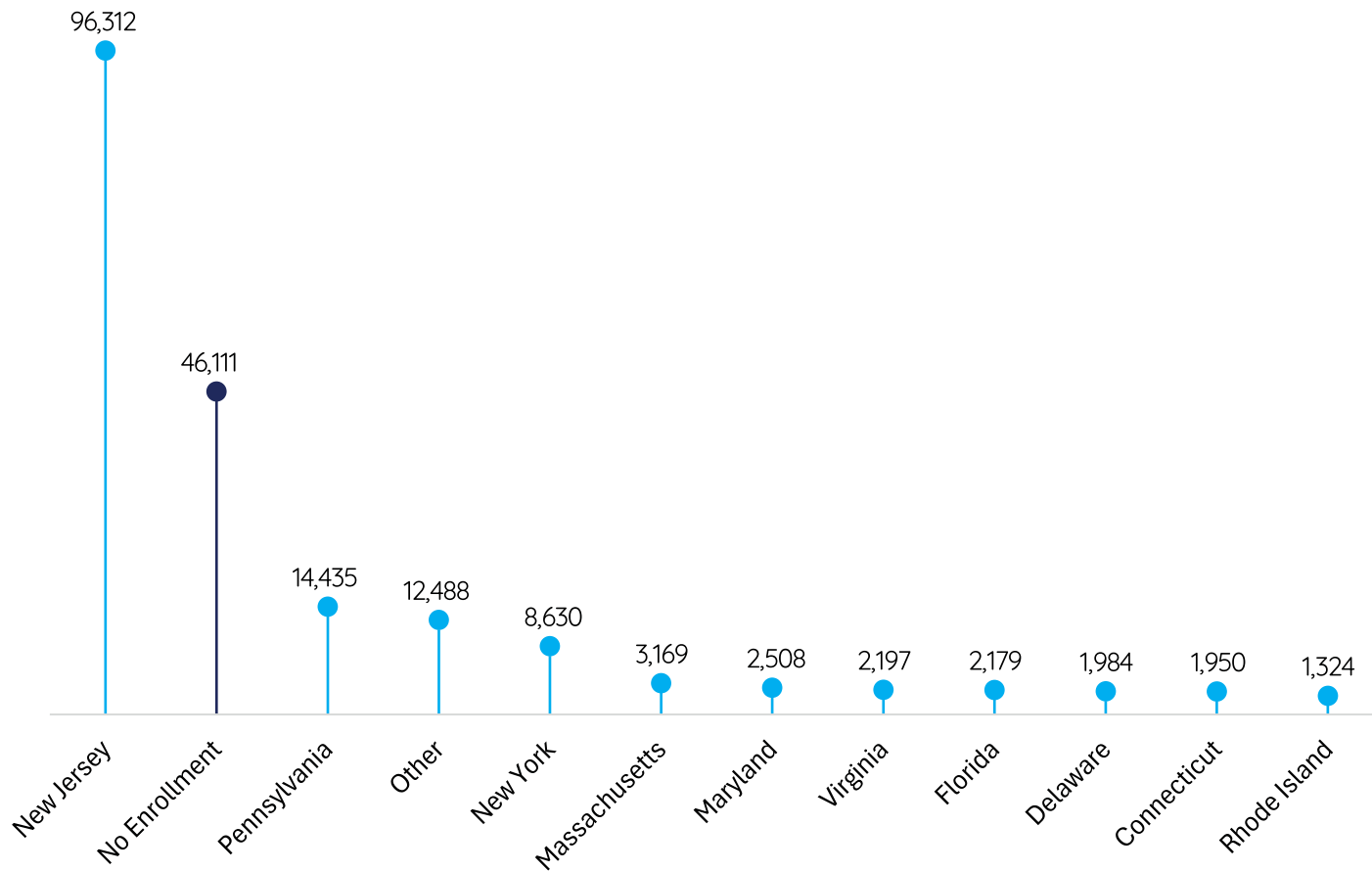
N = 193,328

⁴ The National Student Clearinghouse data extract on those who pursue postsecondary enrollment in another state used in this analysis is time limited. Researchers could only examine long-term enrollment trends for those who enrolled at postsecondary institutions in New Jersey. Researchers separated the New Jersey high school graduates by graduation year where possible, though they were combined for much of the analysis to meet publication requirements. See the appendix for breakdowns by high school graduation year.



Figure 2 shows the top 10 most common college states for the cohort. Aside from New Jersey, 7% were enrolled in Pennsylvania, 5% in New York, and 2% in Massachusetts. Such findings are not surprising given that these states are near New Jersey and offer many competitive colleges and universities.⁵

Figure 2: Top 10 College States



N = 193,287

Research Question #2: To what extent do students who leave New Jersey for college return after graduation? Are there certain types of students who are more likely to return?

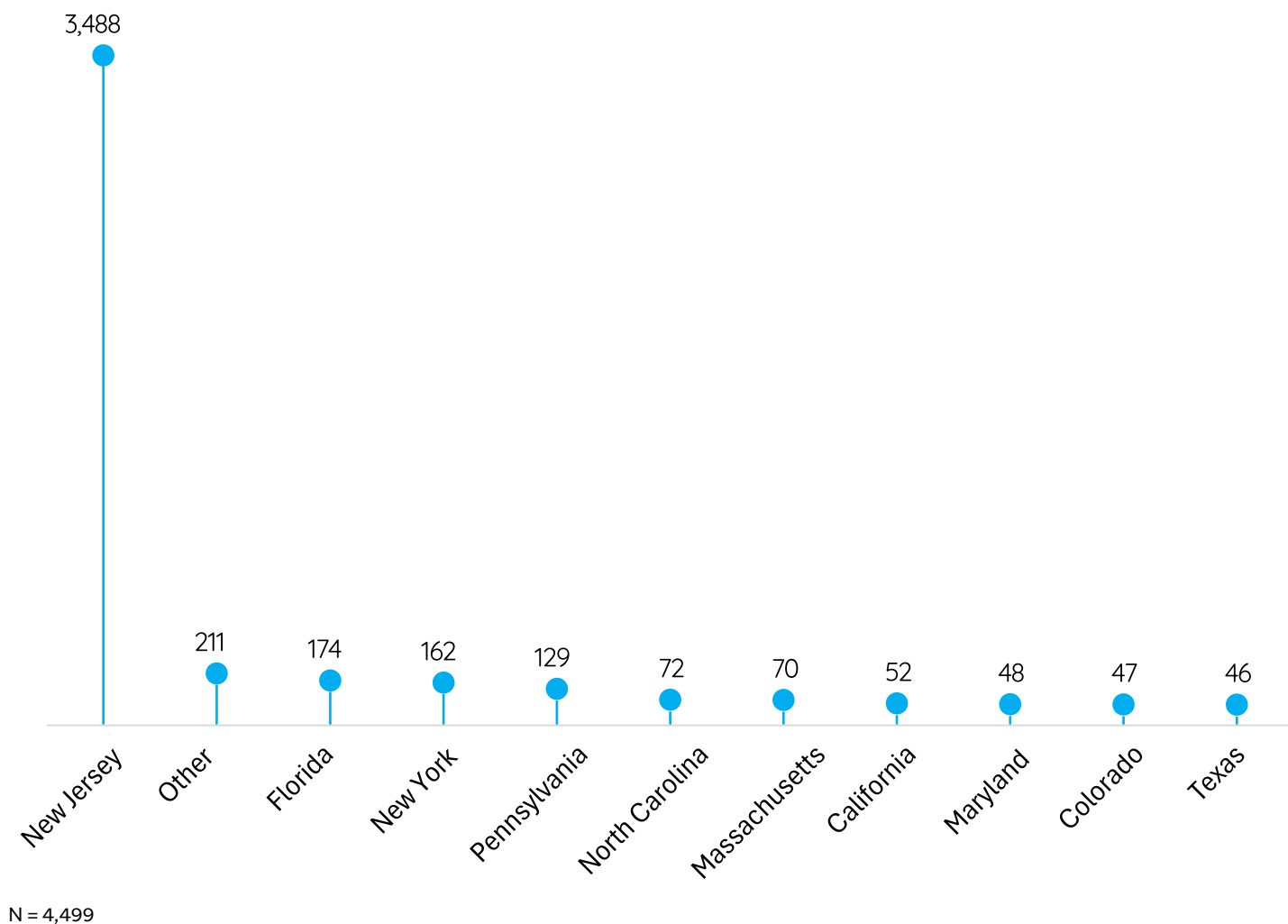
Most college completers in another state returned to New Jersey. Of the 51,000 cohort members with postsecondary enrollment out of state, Figure 3 shows that 3,488 — 7% of those initially enrolling out of state or 78% of those with completion and valid address records — completed college in other states but had New Jersey listed as their last known state of residence. Fewer than 1% of records among the cohort listed Florida, New York, or Pennsylvania as their current state of residence.⁶ Such results are encouraging given the misconceptions of outmigration.

⁵ Future research could consider incorporating IPEDS data, particularly the fall enrollment file, to identify specific out-of-state postsecondary institutions that New Jersey high school graduates attend.

⁶ The National Student Clearinghouse extract used in this analysis is limited to 16 months after the cohort graduated from high school, meaning that many likely had not yet completed their degree by that period. Because the degree earned column in the National Student Clearinghouse extract is not populated, researchers relied on the educational level in the AlumniFinder data as a proxy.



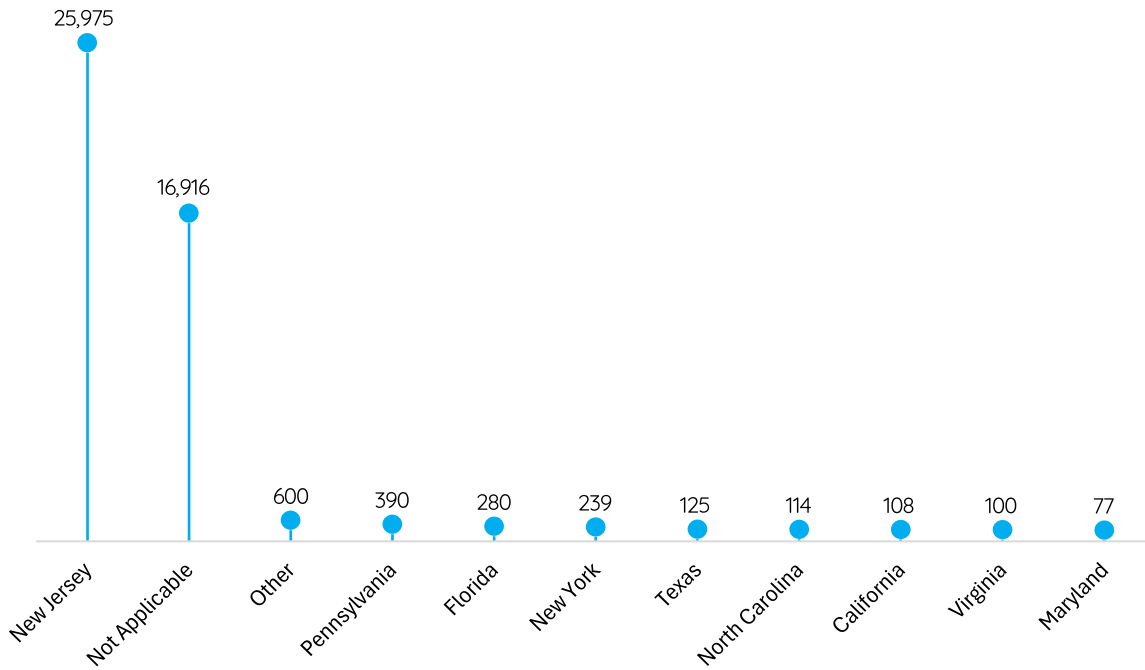
Figure 3: Top 10 States of Residence for College Completers in Another State with Known Address



Most in-state students remained in New Jersey after completing their postsecondary degree. Of the 96,000 with postsecondary enrollment in New Jersey, almost 26,000 (or 27%) completed their degree and remained in the state (see [Figure 4](#)). In-state college graduates who reside in states like Florida, New York, or Pennsylvania represent fewer than 1% of the overall cohort, though the current state of residence for more than one-third of in-state college graduates is unknown. Researchers attribute substantial missingness for the state of residency to the known limitations of AlumniFinder data, as discussed previously in this report.



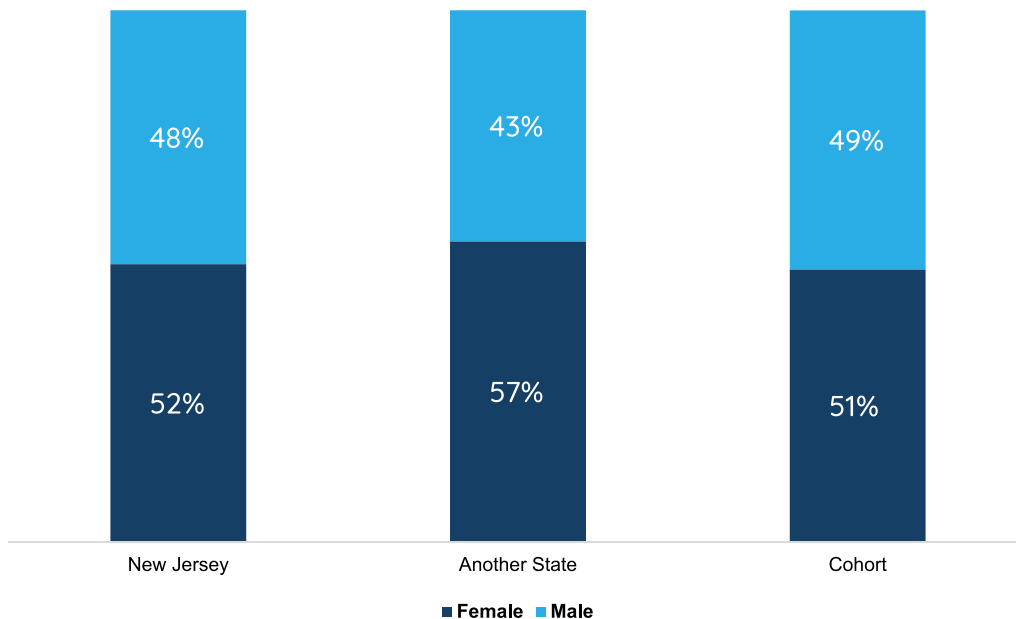
Figure 4: Top States of Residence for In-State College Graduates



N = 44,924

The proportion of male and female students with postsecondary enrollment varied by residency in New Jersey or another state. Figure 5 shows that 57% of New Jersey graduates enrolled out of state were female compared to 52% of individuals attending postsecondary institutions in New Jersey.

Figure 5: Postsecondary Enrollment, by Sex

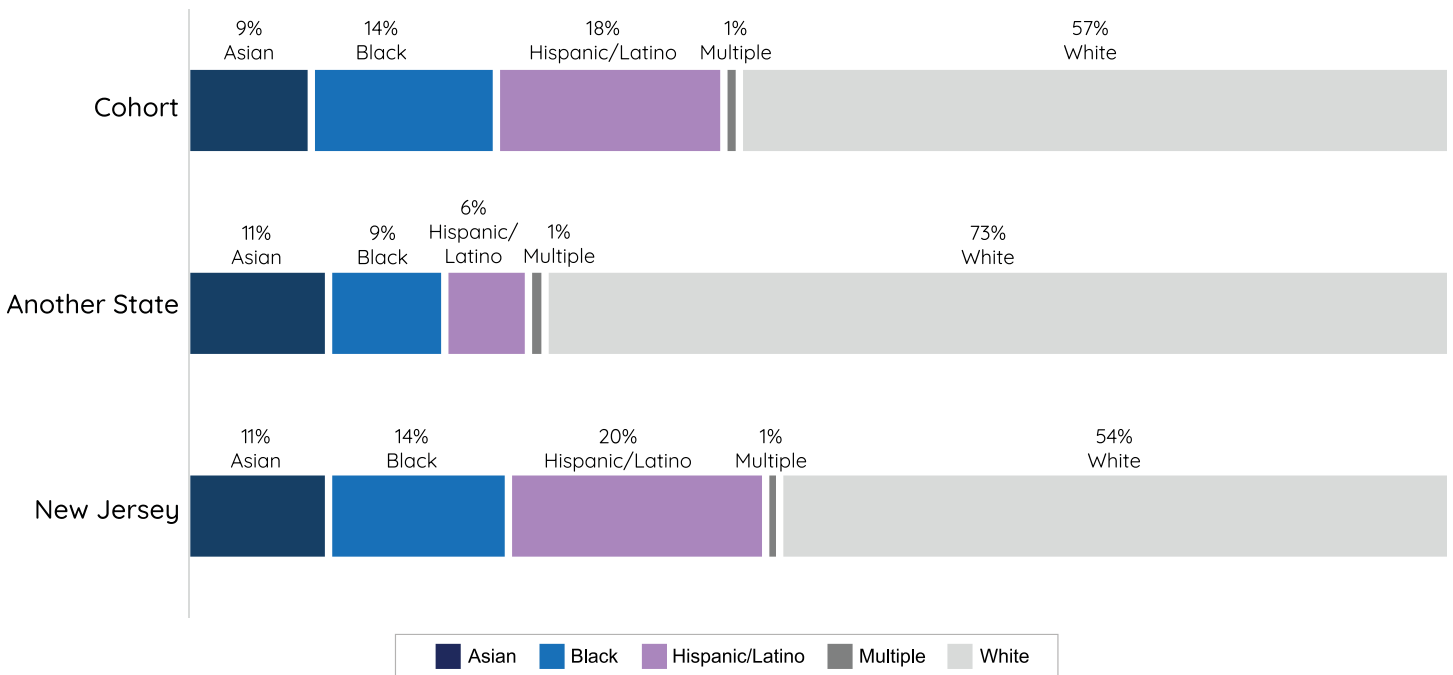


Notes: This figure presents information for the subset of individuals for whom postsecondary enrollment and residency data were available.
N = 193,328



Racial and ethnic diversity also varied among those with postsecondary enrollment and residency in New Jersey or another state. Figure 6 shows that those who enrolled at postsecondary institutions in another state were more likely to be white (73%) than their counterparts who enrolled in New Jersey colleges (54%). The proportion of Asian students appears the same by postsecondary enrollment, but there were substantially more Black and Hispanic/Latino students enrolled in New Jersey than out of state. Indeed, Black and Hispanic/Latino students represented 34% of those enrolled at postsecondary institutions in New Jersey — 19 percentage points higher than those who enrolled in other states.

Figure 6: Postsecondary Enrollment, by Race



Notes: This figure presents information for the subset of individuals for whom postsecondary enrollment and residency data were available.
Ni = 57,326
No = 26,324

There were slight differences in state of residency across race, ethnicity, and sex depending on postsecondary enrollment. Figures 7 and 8 show that those who were enrolled at postsecondary institutions in another state were more likely to be white. It is important to restate that the proportion of white students enrolled elsewhere was significantly higher than those enrolled in New Jersey. Additionally, those with postsecondary enrollment in another state but who lived elsewhere were slightly more likely to be female (59%) compared to those with postsecondary enrollment in another state who returned to New Jersey (55%).



Figure 7: Postsecondary Enrollment and State of Residency, by Sex

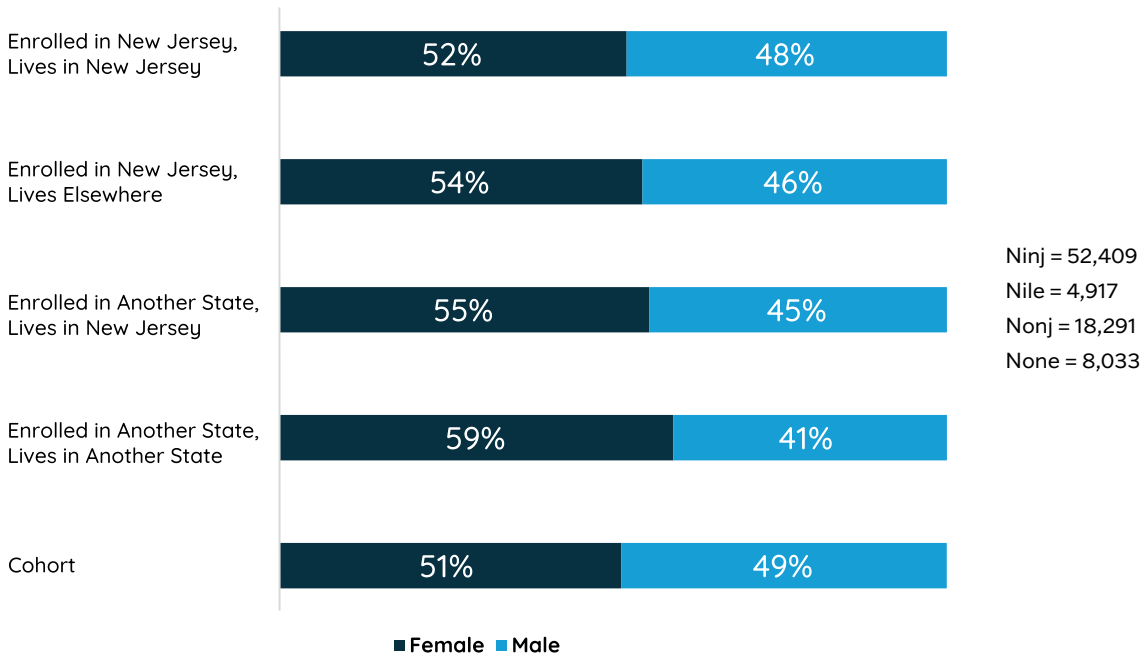
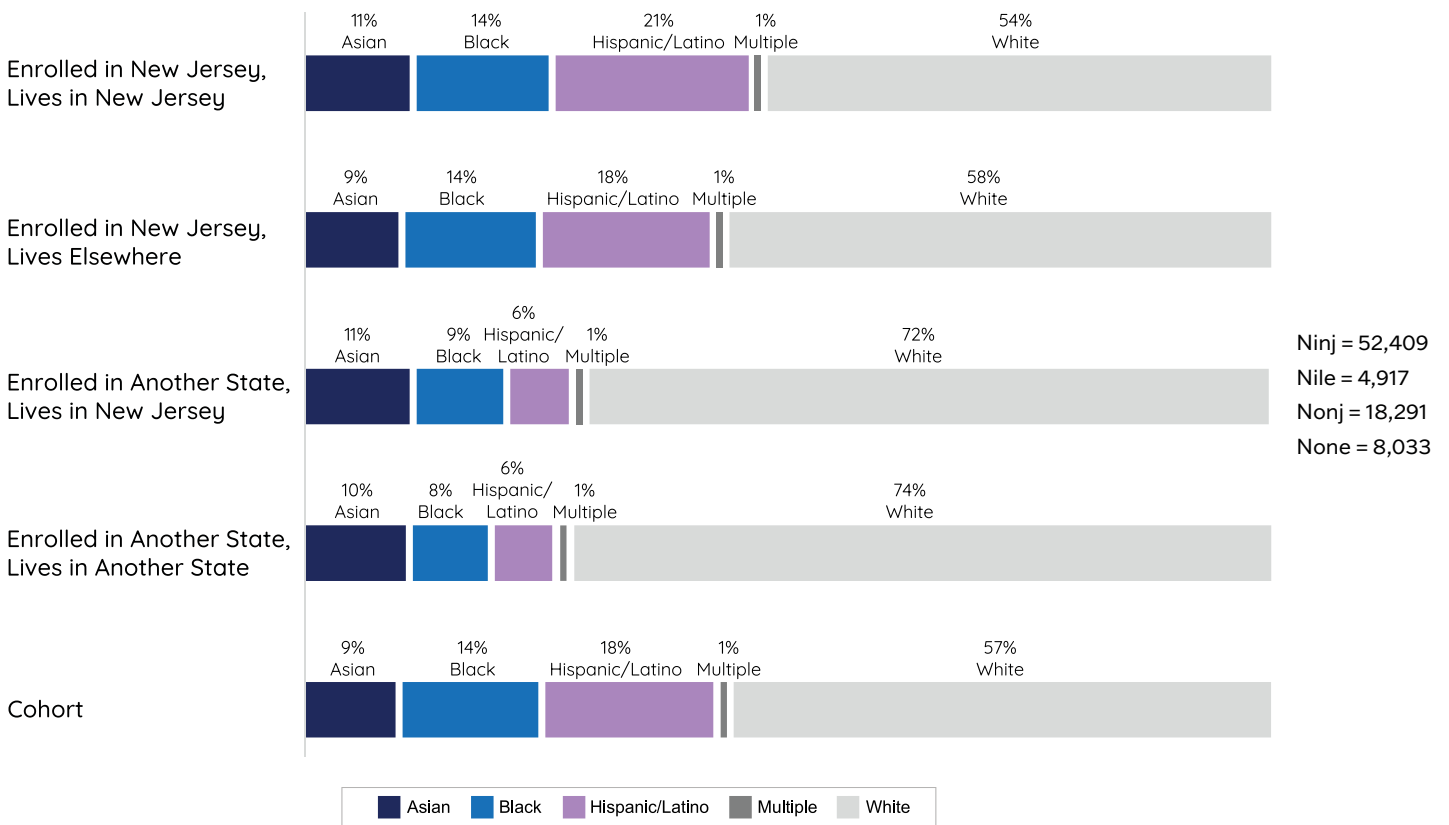


Figure 8: Postsecondary Enrollment and State of Residency, by Race

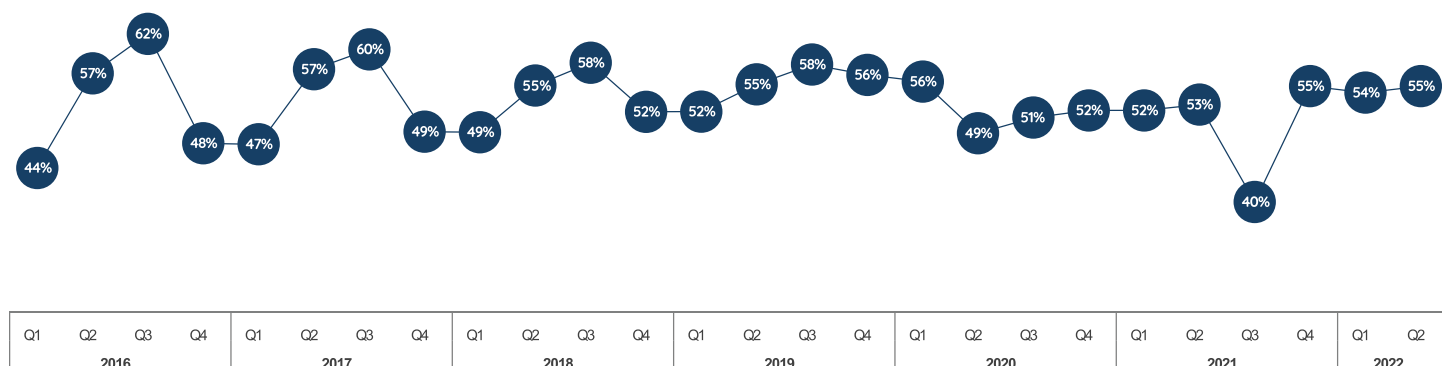


Note: This figure presents information for the subset of individuals for whom postsecondary enrollment and residency data were available.



Examining employment rates for the cohort by postsecondary enrollment reveals notable differences between groups. **Figure 9** shows that the employment rate for the whole cohort ranged between 40% and 62% in the quarters after graduating from high school. Before the COVID-19 pandemic, the employment rate often appeared lower in the first quarter and increased by the fourth quarter of each year. This aligns with higher employment rates during academic breaks among those enrolled at postsecondary institutions. It is important to note that 12% of the cohort was either unemployed or missing from UI wage records between 2016 and 2022. Such missingness may indicate that these individuals were working out of state or as independent contractors, or pursuing graduate study.

Figure 9: Employment in New Jersey for the Cohort

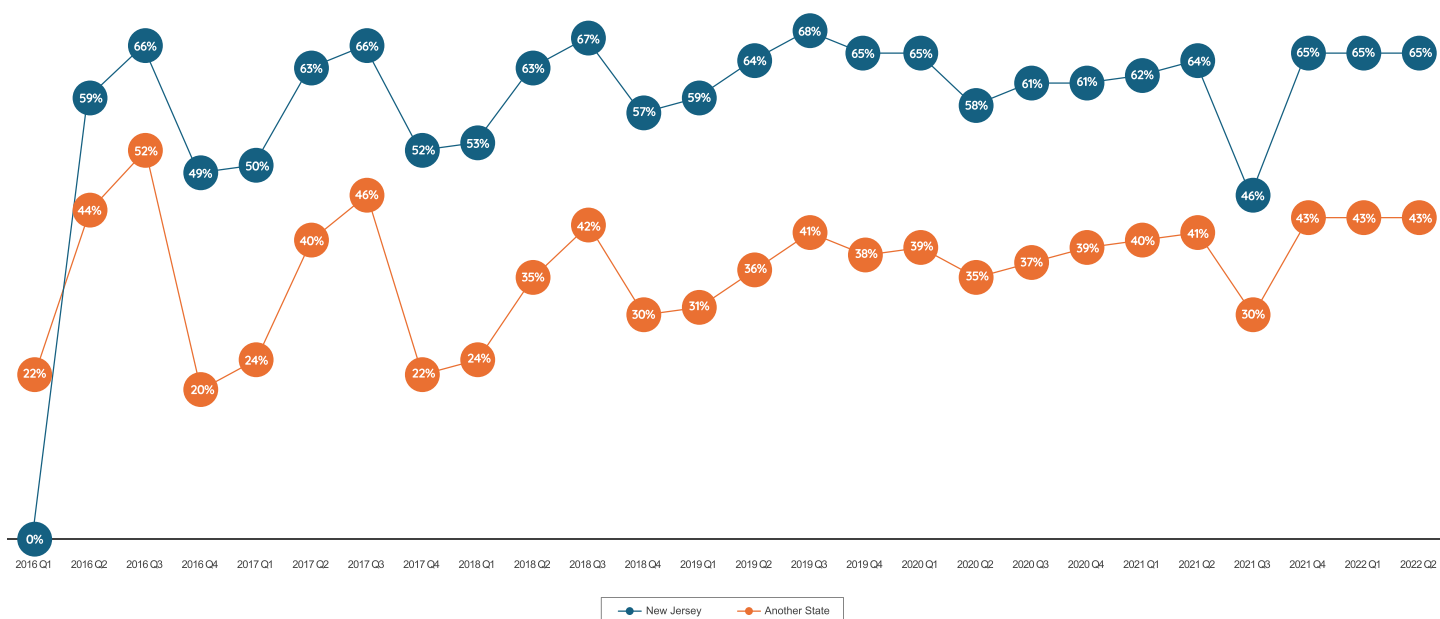


Notes: This figure presents information for the subset of individuals who had valid SSNs. Approximately 16,500 are missing employment information because they do not have valid SSNs, and around 4,600 individuals had not been employed in New Jersey as of 2022.
N = 177,137

A greater proportion of in-state college graduates were employed in New Jersey than those who completed degrees in other states. **Figure 10** shows that, though employment rates were similar immediately following graduating high school, the gap began to widen in 2017. For example, in-state college students who graduated in 2018 or 2019 had substantially higher employment rates than students who completed college elsewhere. In the third quarter of 2018, for example, 67% of in-state college graduates were employed in New Jersey compared with 46% of college completers in other states. Around 11% of in-state college graduates and college completers from another state were unemployed or missing from UI wage records. Missingness here, as previously stated, could suggest that these individuals were employed in another state.



Figure 10: Employment Rate, by Postsecondary Enrollment Location



Notes: This figure presents information for the subset of individuals for whom postsecondary enrollment and residency data were available.

Ni = 41,411

No = 4,462

Such employment outcomes were not surprising given that researchers used UI wage records from New Jersey. Those who graduated in the state are also more likely to become employed at some point in New Jersey. Additionally, some college graduates may live in New Jersey but work in neighboring states like New York and Pennsylvania. Though these individuals work elsewhere, they still contribute to the state’s economy, particularly through income, property, and sales taxes. It should also be noted that lower employment rates among out-of-state college completers may be inflated, as researchers cannot identify cohort members employed in other states.

Research Question #3: What are the differences by data source in capturing out-of-state graduate data?

Supplementing NJSDS data with external data sources helps identify high school graduates who pursue postsecondary and employment opportunities elsewhere, but there are notable differences between the data sources worth discussing. Specific data gaps persist that limit capacity in analyzing the full extent of migration in and out of New Jersey. Table 6 provides each data source used in this study and highlights the corresponding data gaps.



Table 6: Data Gaps, by Source

Data Sources		Data Gaps
NJSDS	NJDOE	<ul style="list-style-type: none"> ▶ Cannot track those who pursue postsecondary enrollment outside of New Jersey
	OSHE	<ul style="list-style-type: none"> ▶ Cannot identify New Jersey residents employed in another state
	NJDOL	<ul style="list-style-type: none"> ▶ Cannot examine those who are self-employed or work for the federal government
External	National Student Clearinghouse	<ul style="list-style-type: none"> ▶ Cannot analyze completions data (e.g., degree earned) because columns from extract are unpopulated
	AlumniFinder	<ul style="list-style-type: none"> ▶ Cannot pinpoint accuracy of state residency (e.g., parent’s address) ▶ Cannot identify state where individuals are working ▶ Cannot assess reliability of educational level because many records are incorrect or missing

Researchers cannot solely rely on NJSDS data to examine outmigration because the data sources do not include those enrolled at postsecondary institutions in another state or identify New Jersey residents who are employed in another state. Such individuals are typically misinterpreted or outright lost from past analyses.

Though external data sources help offset NJSDS’s limited capacity to examine outmigration in New Jersey, National Student Clearinghouse and AlumniFinder data are not without problems. The National Student Clearinghouse extract that researchers received did not include institutional-level data, meaning that researchers cannot ascertain specific postsecondary institutions within states. Though National Student Clearinghouse data contain columns for degree earned, this column was not populated in the extract used for this analysis. It is important to note that this reflects the limitations of the National Student Clearinghouse extract, not the data source itself. As such, researchers could not fully examine postsecondary outcomes for those who completed college in another state.

AlumniFinder shares similar issues. Due to its approach to data collection, researchers cannot confirm the accuracy of state residency. Recent graduates may be more likely to list their parent or guardian’s address, yet those individuals are captured as living in New Jersey. Researchers also bring the reliability of the educational-level column from the AlumniFinder data in question. Restricted to “completed college” or “college,” researchers cannot distinguish between associate and bachelor’s degrees. Moreover, the data collection approach likely does not capture all members of the cohort who completed degrees in another state, as AlumniFinder uses web-scraping tools to pull data from the Internet and it cannot be assumed that everyone has their information listed on sites like LinkedIn or Indeed.

Although these data gaps currently limit analyses of outmigration, NJSDS and participating state agencies could consider acquiring the full file from the National Student Clearinghouse to better understand the experiences of high school graduates in New Jersey. The full file, available for additional fees, is not limited to 16 months after graduating high school like the extract used in this analysis, allowing researchers to examine institutional and completions data for those who pursue postsecondary education in another state for the most recent year available. Researchers could determine, for instance, the proportion of the



cohort by college name, institution type, graduation date, degree earned, major, and more as of 2023. Researchers obtained the full file from the National Student Clearinghouse for cohort members that did not match OSHE records after completing the original analysis. Given the restricted subsample for the full extract, this information was not included in the main analysis but rather to inform limitations and potential areas of improvement. Here, researchers note important contextual information about students' out-of-state postsecondary educational experiences that could prove beneficial for future analyses of outmigration.

Namely, the full file from the National Student Clearinghouse shows that around 11% of the cohort completed a bachelor's degree in another state. Many of these students completed their degrees in New York or Pennsylvania at postsecondary educational institutions like Drexel University, New York University, and Pennsylvania State University. The full file also highlights popular majors among bachelor's degree earners, including business administration, finance, psychology, economics, and marketing. Around 5% of the cohort completed their degree in another state but returned to New Jersey. Additionally, the full file would allow researchers to examine those who pursue graduate programs in other states.

Conclusion

As an important multi-agency partnership, NJSDS helps connect data from four state agencies to inform collaborative evidence-based policymaking, particularly around higher education. Yet the limited capacity to analyze outcomes for New Jersey high school graduates who pursue postsecondary and employment opportunities in other states presents a challenge for researchers. Supplementing NJSDS with external data sources like the National Student Clearinghouse and AlumniFinder can help researchers address this limitation. This study found, for example, that 26% of the cohort would have been missing if researchers relied solely on NJSDS data because those individuals moved out of state for college. By leveraging external data sources, researchers found that, of the 51,000 cohort members with postsecondary education in another state, at least 7% completed college but returned to New Jersey.

The external data sources used in this analysis are not without limitations, as they lack key institutional and completions data necessary to fully document outmigration in New Jersey. Though this study captures many who enrolled at postsecondary institutions in another state, the limitations outlined in previous sections of this report likely exclude certain subgroups. Given the stable and historic trend of outmigration, however, this study offers an important foundation for future analyses that seek to identify those who pursue higher education and employment opportunities in other states.

Although policymakers are divided on the impacts of outmigration on New Jersey's economy, including its postsecondary institutions, high school graduates who complete degrees in other states but return to New Jersey increase the attainment rate. The high proportion of those returning after higher education raises tax revenues in New Jersey and brings back experience and expertise to their home state. It stands to reason that outmigration is not inherently bad for New Jersey, particularly given what the state stands to gain when students return. Previous efforts to track outmigration using one data source, therefore, present an incomplete picture. By supplementing administrative data with external data sources, researchers can better understand the complex nuances of migration patterns for high school graduates pursuing postsecondary education.



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Appendix: Additional Tables

Table A-1: College State, by Cohort Year

State	2014	2015	Grand Total
Alabama	169	163	332
Alaska	-	-	-
Arizona	250	223	473
Arkansas	-	12	12
California	502	474	976
Colorado	166	179	345
Connecticut	926	1,024	1,950
Delaware	907	1,077	1,984
District of Columbia	577	563	1,140
Florida	1,024	1,155	2,179
Georgia	303	318	621
Hawaii	14	12	26
Idaho	11	12	23
Illinois	345	321	666
Indiana	282	299	581
Iowa	53	47	100
Kansas	39	17	56
Kentucky	56	42	98
Louisiana	120	112	232
Maine	102	108	210
Maryland	1,301	1,207	2,508
Massachusetts	1,608	1,561	3,169
Michigan	330	268	598
Minnesota	35	40	75
Mississippi	29	28	57
Missouri	73	71	144
Montana	11	-	11
Nebraska	11	12	23
Nevada	14	17	31
New Hampshire	166	175	341
New Jersey	48,095	48,217	96,312
New Mexico	12	-	12
New York	4,380	4,250	8,630
North Carolina	669	612	1,281
North Dakota	-	-	-
Ohio	411	394	805
Oklahoma	25	15	40
Oregon	20	35	55
Pennsylvania	7,237	7,198	14,435
Puerto Rico	28	14	42
Rhode Island	695	629	1,324
South Carolina	571	571	1,142
South Dakota	-	-	-
Tennessee	124	121	245
Texas	181	175	356
Utah	42	48	90
Vermont	265	246	511
Virginia	1,075	1,122	2,197
Washington	25	26	51
West Virginia	265	255	520
Wisconsin	72	95	167
Wyoming	-	-	-
No Enrollment	22,623	23,488	46,111
Grand Total	96,239	97,048	193,287

N = 193,287



Table A-2: State of Residence for Out-of-State College Completers, by Cohort Year

State	2014	2015	Grand Total
California	31	21	52
Colorado	29	18	47
District of Columbia	12	14	26
Florida	93	81	174
Georgia	17	-	17
Illinois	12	-	12
Maryland	31	17	48
Massachusetts	43	27	70
New Jersey	1,933	1,555	3,488
New York	100	62	162
North Carolina	34	38	72
Pennsylvania	81	48	129
South Carolina	15	-	15
Texas	29	17	46
Washington	11	-	11
Other	Suppressed	Suppressed	Suppressed
Grand Total	2,471	1,898	4,369

N = 4,369

Table A-3: State of Residence for In-State College Graduates, by Cohort Year

State	2014	2015	Grand Total
Arizona	16	-	16
California	59	49	108
Colorado	28	24	52
Connecticut	22	15	37
Delaware	19	18	37
Florida	150	130	280
Georgia	28	23	51
Illinois	15	15	30
Maryland	44	33	77
Massachusetts	37	34	71
New Jersey	12,779	13,196	25,975
New York	137	102	239
North Carolina	58	56	114
Ohio	17	16	33
Pennsylvania	219	171	390
South Carolina	19	18	37
Tennessee	11	16	27
Texas	75	50	125
Virginia	56	44	100
Washington	15	12	27
Other	Suppressed	Suppressed	Suppressed
Unknown	8,941	7,975	16,916
Grand Total	22,745	21,997	44,742

N = 44,742



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About the New Jersey Statewide Data System

The New Jersey Statewide Data System (NJSDS) is the State of New Jersey's centralized longitudinal data system for education and workforce data. Its mission is to safely use the state's existing administrative data for evidence-based policymaking. Developed in 2012 through a grant from the U.S. Department of Education, NJSDS creates a single place where state education, postsecondary education, employment, and workforce longitudinal data are securely stored to help stakeholders make data-informed decisions to improve student learning and labor market outcomes. The data system is owned by the State of New Jersey and operated by the John J. Heldrich Center for Workforce Development at Rutgers, The State University of New Jersey. NJSDS is a collaboration between the New Jersey Office of the Secretary of Higher Education, the New Jersey Department of Labor and Workforce Development, the New Jersey Department of Education, and the New Jersey Higher Education Student Assistance Authority.

About the Heldrich Center for Workforce Development

The John J. Heldrich Center for Workforce Development at Rutgers University is devoted to transforming the workforce development system at the local, state, and federal levels. The center, based at the Edward J. Bloustein School of Planning and Public Policy, provides an independent source of analysis for reform and innovation in policymaking and employs cutting-edge research and evaluation methods to identify best practices in workforce development, education, and employment policy. It is also engaged in significant partnerships with the private sector, workforce organizations, and educational institutions to design effective education and training programs. It is deeply committed to assisting job seekers and workers attain the information, education, and skills training they need to move up the economic ladder.

As captured in its slogan, "Solutions at Work," the Heldrich Center is guided by a commitment to translate the strongest research and analysis into practices and programs that companies, community-based organizations, philanthropy, and government officials can use to strengthen workforce and workforce readiness programs, create jobs, and remain competitive. The center's work strives to build an efficient labor market that matches workers' skills and knowledge with the evolving demands of employers.