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School enrollment shifts five years after the pandemic

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ABSTRACT

The pandemic induced a substantial enrollment shift away from public schools in fall 2020 and a partial return of students in fall 2021, leaving longer-term impacts unclear. We use Massachusetts state- and district-level data to explore enrollment patterns five years after the pandemic's onset. Relative to pre-pandemic trends, fall 2024 enrollment is down 2% in local public schools, up 16% in private schools, and up 50% in home schools. The highest income 20% of districts have lost more public school students than the other 80% combined, with these lower income districts having largely recovered. White and Asian public school enrollments have stabilized at levels 3% and 8% below pre-pandemic trends, while Black and Hispanic enrollments have more than fully recovered. Public school losses are almost entirely concentrated in middle grades (5-8), where enrollment is down 8%, suggesting families place particular weight on those ages when making post-pandemic schooling choices. Five years in, the pandemic has had sustained effects on the size and demographic composition of public schools. Many of the changes observed in Massachusetts appear in national data, suggesting these patterns are widespread.

1. Introduction

In the decade prior to the COVID-19 pandemic, U.S. public school enrollment had been steadily growing. In fall 2020, the first school year after the pandemic closed schools in spring 2020, nationwide public school enrollment dropped 3 percent. This was the largest annual decline since 1943, when World War II induced large numbers of teenagers to leave high school. In contrast, the fall 2020 public school enrollment drop was concentrated among younger students, with high school enrollment slightly increasing that first post-pandemic school year (Irwin et al., 2022). Such national trends were reflected in individual states such as Washington, Virginia, and Michigan, which all saw substantial enrollment drops in younger grades, particularly pre-K and kindergarten, and few impacts in high school grades (Musaddiq et al., 2022; Schueler & Miller, 2024; Tuchman & Heyward, 2021).

Fall 2020 also saw clear patterns in public school enrollment drops by race, alternative schooling sector, and instructional mode. Massachusetts and Virginia saw the largest declines among White students and districts serving them (Dee & Murphy, 2021; Schueler & Miller, 2024), while heavily Black and Latino districts such as Detroit and New York City saw relatively little decline (Cordes et al., 2023). Such changes were driven by increases in home schooling and private schools (Schueler & Miller, 2024). Musaddiq et al. (2022) show that, likely due to health fears, home schooling jumped more among low-income and Black families, as well as in areas where instruction was in-person in fall 2020. In contrast, private schooling increased more among higher-income and White families, as well as in areas where instruction was remote in fall 2020. This was likely driven by concerns about the quality of instruction, as families, particularly in higher income areas, reacted to initial school closures by increasingly searching for online learning substitutes for in-person schooling (Bacher-Hicks et al., 2021). Nationally, districts that offered more in-person schooling during the 2020–21 school year had smaller drops in enrollment than districts that relied more on virtual schooling (Jack & Oster, 2023).

By fall 2021, the second school year to start after the pandemic's onset, national public school enrollment had stabilized but not rebounded relative to fall 2020 (Irwin et al., 2023). Across a large set of states, fall 2021 private and home school enrollment were respectively 4 and 30 percent higher than they had been in fall 2019 (Dee, 2023). Carefully controlling for pre-pandemic trends in enrollment, Baum and Jacob (2024) show that fall 2021 enrollment declines by race still varied by the district's learning mode in the prior school year, with White enrollments declining more in districts that had been virtual in fall 2020 and non-White enrollments declining more in districts that had been in-person. Also controlling for pre-pandemic trends, Bacher-Hicks et al. (2024) show three important results relative to fall 2020: fall 2021

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public school enrollment in Michigan had partially recovered for low-income, Black, and Hispanic students, but had declined further for nonlow-income, White, and Asian students; public school exit rates remained elevated for elementary students and accelerated further for middle school students; public school exit was sticky and varied by chosen alternative, with only one-fifth of those who left for private schools and one-half of those who left for home schools in fall 2020 returning to public schools by fall 2021. Their findings, the authors argued, suggested that pandemic-driven public school enrollment declines might persist, particularly among higher income families.

By fall 2022, national public school enrollment had rebounded slightly but researchers' attention to this issue had waned. In fall 2022, the most recent year with nationally available data, public school enrollment across the U.S. rose 0.4 percent relative fall 2021, a small fraction of the drop since fall 2019 (Irwin et al., 2024). We could identify no further research papers on this topic studying details of such enrollment changes in fall 2022 or more recent school years, suggesting a lack of evidence about the persistence of these changes beyond the short-run evidence from the first two years of the pandemic.

We build on this short-run evidence about the pandemic's impact by being the first to measure medium-run impacts on school enrollment patterns five years after the pandemic's onset. We do so using Massachusetts state- and district-level data on public school enrollments by grade and student characteristics, as well as state-level data on private and home school enrollments. This allows us to observe not only changes in public school enrollments but also substitution between public and non-public school options. Massachusetts is unusual for updating such data with relatively little lag, allowing us to study the most recent school year's enrollments. We also compare Massachusetts' data to the most recent public school enrollment data available at the national level, from fall 2023.

Estimating the pandemic's effect on school enrollment patterns five years after its onset requires carefully estimating counterfactual fall 2024 enrollments. Unlike analyses of short-run patterns, pre-pandemic enrollment trends can substantially affect such estimates five years out. Raw enrollment differences between fall 2024 and fall 2019 may misstate the pandemic's impact in the presence of substantial pre-trends. Similar to Bacher-Hicks et al. (2024) and Baum and Jacob (2024), we therefore pay particular attention to estimating pre-pandemic enrollment trends and extrapolating forward in time in order to isolate the pandemic's impact from such trends.

We have three main findings. First, five years after the pandemic's onset, there has been a substantial shift away from public schools and toward non-public options. Relative to pre-pandemic trends, fall 2024 enrollment was down 2 % in Massachusetts local public schools. Conversely, in fall 2024, private school enrollment was up 16 % and home school enrollment was up 50 %. A broad pre-pandemic literature documents determinants of parental demand for private schools (Murnane & Reardon, 2018; Dougherty et al., 2024), home schools (Houston Jr & Toma, 2003; Bhatt, 2014), and charter schools (Walters, 2018). Our results suggest that the pandemic has had a lasting impact on the appeal of private and home school relative to public schools, including charter schools. The net result of these decreases in public school enrollments and increases in private and home school enrollments is that total statewide enrollment is down 1 %, likely due to changing migration patterns.

Second, the demographic composition of local public schooling has substantially changed in the five years since the pandemic's onset. The highest income quintile of districts has lost more public school students than the lower income four quintiles of districts combined, with these lower income districts having largely recovered. White and Asian local public school enrollments have stabilized at levels 3 % and 8 % below pre-pandemic trends. In contrast, Black and Hispanic enrollments have more than fully recovered. High-income communities and White and Asian families were more likely in the early days of the pandemic to switch to private schools in reaction to frustration about school closures and the quality of pandemic-era public schooling. Those dis-enrollments appear to have persisted, as predicted by Bacher-Hicks et al. (2024). Enrollment has largely recovered among middle- and low-income communities, as well as among Black and Hispanic families, who were more likely early in the pandemic to support remote schooling or to switch to home schooling, given health concerns about COVID-19. Those concerns appear to have subsided with the receding threat from the virus itself.

Third, local public school enrollment losses are almost entirely concentrated in middle grades (5–8), where enrollment is down 8 %. The magnitude of middle grade losses accounts for all of the total public school enrollment declines. In contrast, earlier elementary grades have more than fully recovered from a large initial decline. High school enrollments have been fairly stable throughout the post-pandemic period and as of fall 2024 are down only 1 %. We discuss in the conclusion potential reasons for this pattern and for the broader shifts documented above.

Finally, we also show that many of the shifts observed in Massachusetts public school enrollment can also be seen in national data from the prior school year. Four years after the pandemic's onset, nationwide public school enrollments had also dropped between 2 and 3 percent, also driven largely by White and Asian families, and also with losses concentrated in middle grades. This suggests Massachusetts' experience is relatively typical of the US more broadly. Patterns observed in Massachusetts and US data also seem consistent with at least some other countries' post-pandemic experiences. For example, post-pandemic evidence suggests that demand for private schooling has surged in Australia and South Korea, while Canada has seen a persistent increase in homeschooling rates.[1] The changes documented here appear to play a role across a variety of local and international contexts.

2. Data and methods

2.1. Data

We use publicly available Massachusetts data documenting state- and district-level student enrollments over time. We focus on two data sets from the state's Education-to-Career (E2C) website. The first, called "Enrollment: Grade, Race/Ethnicity, Gender, and Selected Populations", contains student enrollments for all Massachusetts public schools and districts since 1994. It further provides the number of students by grade, the percent of students by race and gender, and the number and percent of students in various groups, such as students with disabilities, English learners, and low-income or economically disadvantaged students. District-specific numbers capture students based on their school district of enrollment, not residence. The data runs through fall 2024, allowing us to see public school enrollment details in the fifth school year to start after the pandemic's onset.

The second data set, called "School Attending Children", contains statewide and district-specific information on the number of students enrolled in all types of schools, including public schools, private schools, and home schools, since 1985. District-specific numbers capture students based on their school district of residence, not enrollment. Enrollments in this data are reported only for all students, not broken out

[1] Australian data come from a February 17, 2025 report released by the Australian Bureau of Statistics at https://www.abs.gov.au/statistics/people/education/schools/latest-release. South Korean data come from the Seoul Metropolitan Office of Education and are described at https://www.newspim.com/news/view/20231128000834. Canadian data come from the Canadian Center for Home Education and are described at https://cche.ca/the-state-of-the-homeschool-movement-canada-2019-2024.

by grade level or student characteristics. We merge the statewide private and home school information from this data set to the public school information from the first data set. The district-specific private and home school data is not possible to merge given the differing definitions of district (residence vs. enrollment) across data sets.

Combining these two data sets allows us to explore changing enrollment patterns across school types, grade levels, and geography within Massachusetts. The state does not, however, observe students who are not residents. We there supplement the enrollment data with Census data on the number of school-age children residing in Massachusetts each year. This allows us to estimate changing migration patterns.

2.2. Methods

To quantify changes in enrollment patterns, we first normalize all enrollment numbers to their fall 2019 value, so that values in other years can be interpreted as percent differences relative to the last pre-pandemic school year. We focus on the period spanning the fall 2014 school year to the fall 2024 school year. We start in fall 2014 both because this makes our pre-pandemic data roughly the same length as our post-pandemic data and because the fall 2013 data on non-public schools appears to be partly erroneous.

Carefully estimating counterfactual enrollments had the pandemic not occurred is critical to understanding the pandemic's effects, particularly given that many of the enrollment measures show clear pre-trends prior to fall 2020. The figures that follow thus show actual enrollment (relative to 2019) in all years, as well as predicted enrollment in fall 2024 given pre-pandemic trends. We estimate such trends by fitting a linear model to the four school years from fall 2016 through fall 2019 and then projecting forward through fall 2024. We label that predicted fall 2024 value in most subsequent figures, to highlight the expected counterfactual enrollment in the absence of the pandemic, had pre-pandemic trends continued. In many cases, the estimated effect of the pandemic relative to that trend is substantially different from the simple difference between fall 2024 and fall 2019 enrollments.

We also explore heterogeneity in changing enrollment patterns by stable student characteristics, such as race and gender. Characteristics that may change over time, such as economic disadvantage, special education status, and English learner status, are harder to study. Changing numbers of such students over time combines changes in actual enrollments with changes in the rate of qualification for such services. To study heterogeneity by income, we therefore focus on district-level measures of income, as described in more detail below.

3. Results

3.1. Changes by sector and geography

Public school enrollments dropped precipitously at the pandemic's onset and have barely recovered in the five years since then. Traditional local public schools have lost substantial numbers of students relative to pre-pandemic trends, as seen in panel A of Fig. 1. Local public school enrollment dropped by four percent in fall 2020, was unchanged in fall 2021, and has only slightly recovered since then. Fall 2024 local public school enrollment is 4.2 percent lower than fall 2019 and 1.9 percent lower than predicted, suggesting the state has lost about 16,600 local public school students relative to pre-pandemic trends.

Charter school enrollment, by contrast, had been rising rapidly pre-pandemic and then leveled off starting in fall 2020, as seen in panel B. Fall 2024 charter school enrollment is nearly unchanged since fall 2019 but is 18.9 percent lower than those steep pre-trends had predicted, suggesting the sector has lost 9100 students. Some of this may have to do with charter expansion being restricted by Massachusetts law that caps both the number of charter schools statewide and the share of each district's funds that can flow to charters. We restrict subsequent analysis of public school patterns to local public schools given the challenges of disentangling the effects of the pandemic and the charter cap (Cohodes et al., 2021).[2]

In contrast to declining public school enrollments, private and home school enrollments are substantially above pre-pandemic predictions. As panel D of Fig. 1 shows, private school enrollments had been shrinking pre-pandemic but largely leveled off starting in fall 2020. Fall 2024 private school enrollment is 0.7 percent below fall 2019 but 15.6 percent above predicted levels, suggesting that private schools have gained nearly 11,000 students.

Home school enrollments spiked immediately following the pandemic's onset and have only partially declined since then. As panel E shows, home school enrollment had been stable pre-pandemic but more than doubled from fall 2019 to fall 2020. It has since partially declined so that fall 2024 home school enrollments were 56 percent higher than fall 2019 and 50 percent higher than predicted. This suggests home schools have gained about 3900 students.

Total statewide student enrollment across all of these sectors (public, private, home schools) is below both pre-pandemic levels and pre-pandemic predictions about current levels. Total enrollment dropped by about three percent in fall 2020 and has since leveled off with no sign of recovery.[3] Fall 2024 school enrollment was 2.8 percent lower than fall 2019 and 1.0 percent lower than predicted, suggesting the state has lost over 10,000 students relative to pre-pandemic trends. The 2.8 percent decline matches well with U.S. Census estimates that the number of 5–17 year olds residing in Massachusetts declined by 3.6 percent between April 2020 and July 2023.[4] Some combination of increased out-migration and decreased in-migration likely explains this decline, given that the pandemic's onset was too recent for changing fertility rates to affect the school-age population.

Even given the decreased total student population, the fraction of Massachusetts students enrolled in local public schools is well below pre-pandemic predictions. That fraction hovered around 84.5 percent pre-pandemic, dropped to around 83 percent in fall 2020 and has not recovered much since then.[5] The fraction of Massachusetts students enrolled in local public schools is thus about 1 percentage point lower than pre-pandemic trends would have predicted, suggesting a substantial shift away from that sector independent of migration patterns.

Falling local public school enrollments are widespread across Massachusetts school districts, though accounting for pre-pandemic trends reveals declines in suburbs closer to Boston and gains in districts farther from Boston.[6] Fall 2024 public schools enrollments were lower than in fall 2019 for the vast majority of districts, with a substantial number

[2] There has been little change in enrollment from public schools that are neither local nor charter schools. See Fig. A.1 for more detail on the two categories of public schools other than local and charter schools. Enrollment in vocational technical regional schools has accelerated since the pandemic's onset, while continuing rapid growth in two statewide virtual schools has leveled off since fall 2023.

[3] See panel A of Fig. A.2.

[4] See the bottom row of Table A.1.

[5] See panel B of Fig. A.2.

[6] There is little evidence of heterogeneity by gender in local public school enrollment changes. As Fig. A.4 shows, male and female enrollment changes follow very similar patterns, with fall 2024 enrollments 2.2 percent lower for female students and 1.7 percent lower for male students. See Fig. A.3 for district-level maps of Massachusetts.

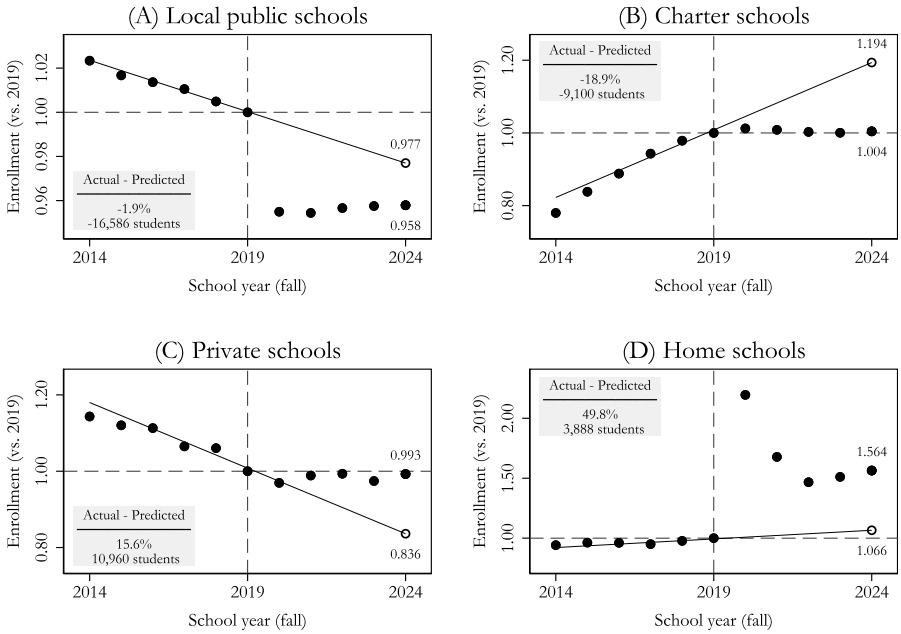

Fig. 1. Enrollment by school sector.
Note: Plotted above are enrollments by school sector relative to fall 2019. Also shown are lines of best fit through the last four pre-pandemic years of 2016 to 2019, labeled with predictions for fall 2024 enrollment. Each gray box shows the difference between actual and predicted enrollment in fall 2024, both in percentage and absolute terms. All data come from the Massachusetts Education-to-Career (E2C) Research and Data Hub.

seeing declines greater than eight percent. Some of those declines represent continuation of district-specific pre-pandemic trends. Accounting for these reveals that the largest declines in local public school enrollment as of fall 2024 were concentrated in suburban districts outside of Boston, while growth occurred largely in districts farther from Boston. Some of this may represent changing residential patterns of families taking advantage of remote work to distance themselves from Boston offices. Many of the districts with declining enrollments are also high income suburbs, so we next analyze heterogeneity by district income.

3.2. *Heterogeneity by income and race*

To study heterogeneity by income, we divide local public school districts into quintiles of income weighted by fall 2019 enrollment. We define income by each district's fraction of economically disadvantaged students as of fall 2019. We label the highest income districts enrolling 20 percent of students as "high income" and group the remaining districts enrolling 80 percent of students as "middle/low income". Defining income as fixed at the district level avoids problems posed by the state's shifting student-level definitions of income (from "low income" to "economically disadvantaged") and changing rates of qualification for such categories over time.

Public school enrollment losses are substantially larger in high income school districts than in middle and low income ones, as seen in Fig. 2. As panel A shows, enrollment in high income districts had been steady pre-pandemic, dropped almost five percent in fall 2020, and has declined every year since then. As a result, fall 2024 enrollment in such districts is 5.7 percent below predicted levels, representing a loss of over 9800 students. In contrast, as panel B shows, enrollment in middle and low income districts had been declining, dropped about three percent in fall 2020 and then a bit more in fall 2021, and has since slightly recovered. As a result, fall 2024 enrollment in such districts is 1.0 percent below predicted levels, representing a loss of about 6700 students. This means that the highest income quintile of districts has lost nearly 50 percent more students than the lower income four quintiles combined.

Local public school enrollment losses in fall 2024 are substantially concentrated among White and Asian students, as seen in Fig. 3. Panel A shows that White public school enrollment had been declining pre-pandemic, dropped over five percent in fall 2020 and has declined steadily since then. As a result, fall 2024 enrollment of White students is 3.1 percent lower than predicted, accounting for nearly 16,200 of the lost public school students. Panel B shows that Asian public school enrollment had been growing rapidly pre-pandemic but has now fallen an even larger 8.1 percent below predicted levels, accounting for 5200 lost public school students. White and Asian enrollments are both changing at the same rate as pre-pandemic but with a level shift downward, suggesting a persistent exodus from Massachusetts public schools of about three percent of White students and eight percent of Asian students.

In contrast, Hispanic and Black enrollment in public schools has recovered to or even exceeded pre-pandemic trends. Panel C shows that Hispanic enrollments were growing quite rapidly pre-pandemic, decreased relative to trend in fall 2020 and fall 2021, but by fall 2024 were 0.8 percent (1500 students) above predicted levels. Panel D shows that Black enrollments were flat pre-pandemic, dropped noticeably for the first few years of the pandemic, but then rapidly rose in the last two years of the data, so that fall 2024 Black enrollments were actually 7.7 percent (5500 students) above predicted levels. The surge in Black enrollment in fall 2023 and 2024 coincides with a rapid influx of Haitian immigrants to Massachusetts, an influx large enough to explain most if

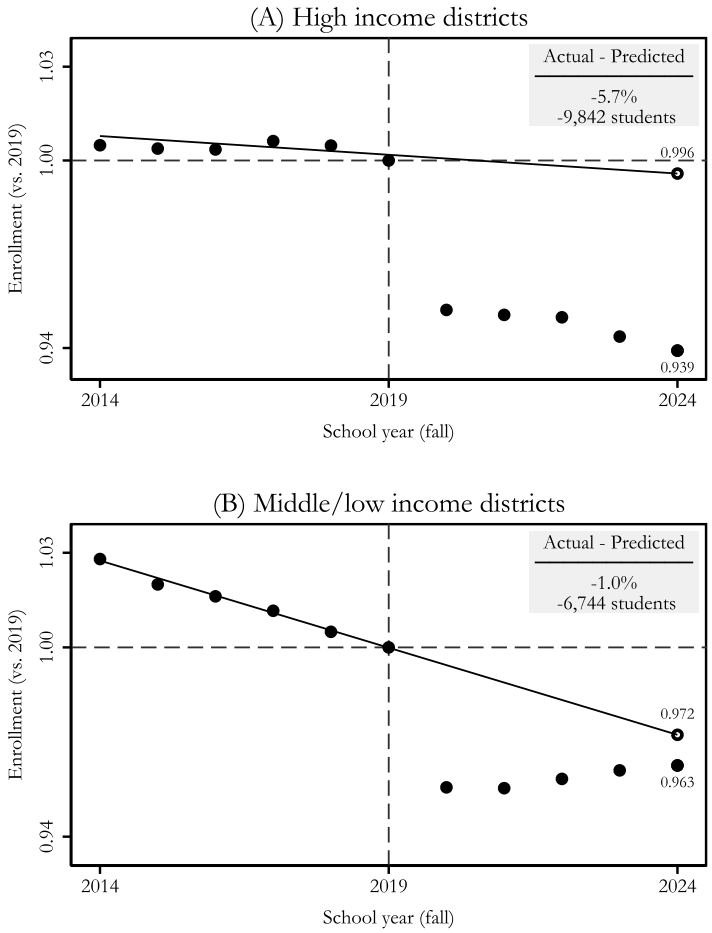

Fig. 2. Local public school enrollment by district income.
Note: Plotted above are local public school enrollments by school district income relative to fall 2019. High income districts (panel A) are the quintile with the lowest fraction of economically disadvantaged students in 2019, while middle/low income districts (panel B) are the remaining four quintiles. Also shown are lines of best fit through the last four pre-pandemic years of 2016 to 2019, labeled with predictions for fall 2024 enrollment. Each gray box shows the difference between actual and predicted enrollment in fall 2024, both in percentage and absolute terms. All data come from the Massachusetts Education-to-Career (E2C) Research and Data Hub.

not all of the observed enrollment increases. This complicates interpretation of Black enrollment trends as solely driven by changes in existing families' schooling choices. Nonetheless, these results overall suggest that the pandemic has substantially shifted the racial/ethnic composition of public schools.

3.3. *Heterogeneity by grade level*

Post-pandemic changes in local public school enrollment vary substantially by grade level, as seen in Fig. 4.[7] Elementary grades have largely recovered to predicted levels, though in somewhat different ways. As panel A shows, pre-kindergarten and kindergarten enrollment was steady pre-pandemic, dropped almost 20 percent in fall 2020, and has largely recovered since then, so that fall 2024 enrollment is only 3.4 percent (3200 students) below predicted levels. As panel B shows, first through fourth grade enrollment dropped more than three percent in fall 2020 but has since leveled off, so that fall 2024 enrollment is 2.7 percent (7000 students) above predicted levels. In total, pre-K through fourth grade enrollments are slightly above predicted levels.

Enrollment patterns in middle and high school grades are quite different, with the magnitude of middle grades enrollment larger than the total decline in public school enrollment. As panel C shows, public school enrollment in grades five through eight declined about two percent in fall 2020 but then continued to decline in each successive year through fall 2023, showing only a slight uptick in fall 2024. Fall 2024 public middle grades enrollment is thus 7.7 percent below predicted levels, suggesting such grades have lost over 20,600 students. This magnitude of lost middle grades enrollment exceeds total public school enrollment losses. Census population estimates also show larger losses of children of middle grade ages than other ages, suggesting changing migration patterns are part of the story.[8] The middle grades enrollment decline is, however, substantially larger than the estimated 5.9 percent decline in middle grades population, implying that some portion must be driven by shifts to private and home schools. In contrast, as panel D shows, high school enrollment has barely budged since the pandemic's onset, with enrollment now up 0.1 percent (200 students) relative to predicted levels.[9]

[7] For more detailed grade-specific enrollment patterns, see Figs. A.5 (PK-K), A.6 (grades 1-4), A.7 (grades 5-8), and A.8 (grades 9-12).

[8] See the first three rows of Table A.1.

[9] In contrast, to local public schools, charter schools have lost students across elementary, middle and high school grades relative to pre-pandemic trends. See Fig. A.9 for details.

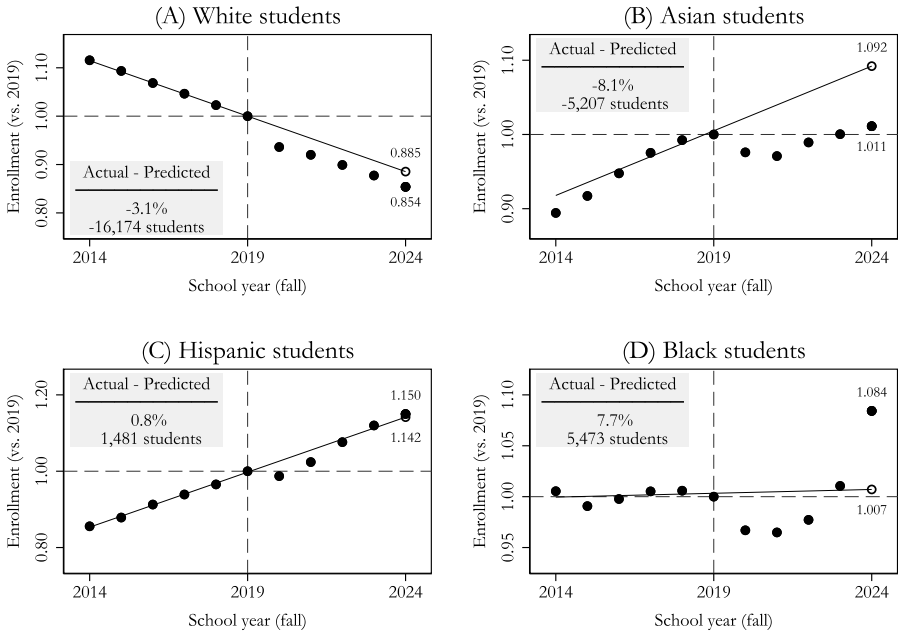

Fig. 3. Local public school enrollment by race/ethnicity.
Note: Plotted above are local public school enrollments by race/ethnicity relative to fall 2019. Also shown are lines of best fit through the last four pre-pandemic years of 2016 to 2019, labeled with predictions for fall 2024 enrollment. Each gray box shows the difference between actual and predicted enrollment in fall 2024, both in percentage and absolute terms. All data come from the Massachusetts Education-to-Career (E2C) Research and Data Hub.

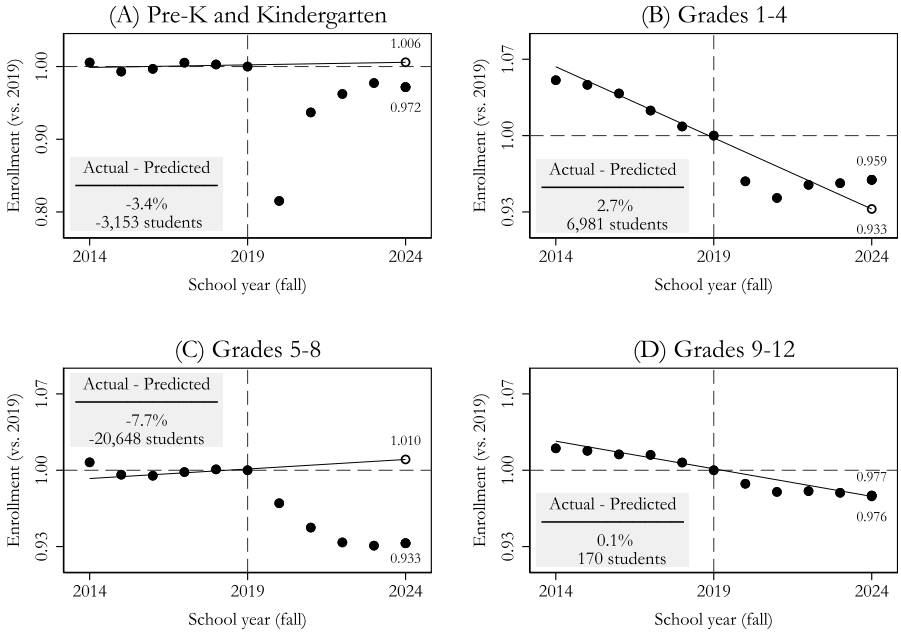

Fig. 4. Local public school enrollment by grade level.
Note: Plotted above are local public school enrollments by grade level relative to fall 2019. Also shown are lines of best fit through the last four pre-pandemic years of 2016 to 2019, labeled with predictions for fall 2024 enrollment. Each gray box shows the difference between actual and predicted enrollment in fall 2024, both in percentage and absolute terms. All data come from the Massachusetts Education-to-Career (E2C) Research and Data Hub.

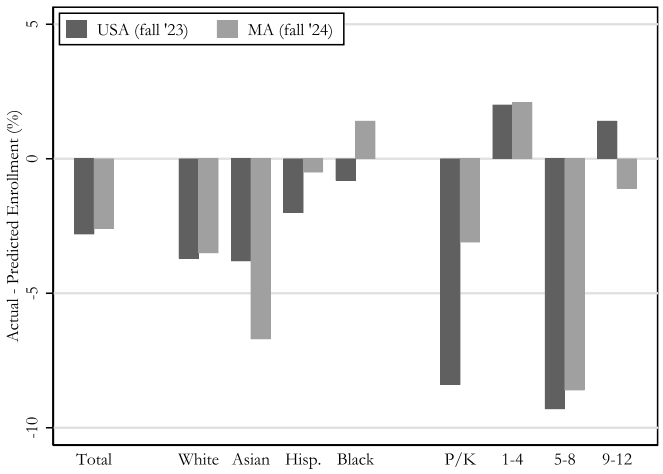

Fig. 5. National vs. Massachusetts changes in public school enrollment.
Note: Shown above are percentage changes in total public school enrollments relative to fall 2019 and accounting for pre-pandemic trends. The bars at left represent nationwide changes as of fall 2023, using data from NCES' Common Core of Data. The bars at right represent changes in Massachusetts as of fall 2024, using data from the Education-to-Career (E2C) Research and Data Hub. Results are shown for total enrollment and by student race/ethnicity and grade level.

3.4. National patterns

To explore whether the enrollment patterns observed in Massachusetts are representative of the nation more broadly, we compare the state's data to the most recent data available at the national level. NCES' Common Core of Data currently makes available total public school enrollment numbers as of fall 2023, four school years after the onset of the pandemic. Similar to our prediction model in Massachusetts, we fit a linear trend to the four pre-pandemic years of 2016–2019, then project forward to fall 2023 to estimate differences between actual and predicted public school enrollments. We do so for total public school enrollments, as well as enrollments by race/ethnicity and grade level.

The patterns observed in Massachusetts as of fall 2024 are remarkably similar to those observed in the nation as a whole in fall 2023. As Fig. 5 shows, fall 2023 public school enrollment nationwide was 2.8 percent below predicted levels, compared to a 2.6 percent drop for Massachusetts. As in Massachusetts, nationwide enrollment drops were substantially larger for White and Asian students than for Hispanic and Black students. Both Massachusetts and the nation saw enrollment recovery in elementary grades and little change in high school enrollments. Both saw massive drops of about nine percent in middle grades enrollment, the magnitude of which accounts for nearly the entirety of total enrollment drops in Massachusetts and the nation. These patterns suggest that Massachusetts' experience is typical of the nation more broadly.

4. Conclusion

Five years after the COVID-19 pandemic's onset, Massachusetts public schools have experienced sustained enrollment declines that differ markedly from the temporary disruptions many expected. Our analysis reveals that 2 % of local public school students have been lost relative to pre-pandemic trends, while private and home school enrollments have grown substantially. These shifts are not evenly distributed: they are concentrated among higher-income districts, White and Asian families, and most dramatically, among middle grades students. The persistence of these patterns suggests that the pandemic catalyzed fundamental changes in how families evaluate schooling options rather than merely creating temporary disruptions. National data suggests that these changes are widespread beyond Massachusetts.

Such changes do not appear to be driven by the supply side of education markets. Over the past decade studied in this paper, Massachusetts has not introduced any statewide voucher programs, education savings accounts, or other mechanisms that would significantly expand the private school sector. The number of private schools in Massachusetts decreased substantially in the past decade, from 559 schools in 2013 to 314 schools in 2023. Similarly, there have been no substantive legislative or regulatory changes to Massachusetts homeschooling policy in the last two decades.

Instead, relative demand for public schooling compared to other options appears to have changed. The sustained decline in public school enrollment observed here is consistent with evidence that Americans, including K-12 parents, have lower satisfaction with public schools even years after school closures ended. Between 2019 and 2025, the fraction of Americans reporting satisfaction with public education dropped by 12 percentage points, as did the fraction of K-12 parents reporting satisfaction with their oldest child's school.[10] The fraction of parents saying K-12 education is heading in the wrong direction was fairly stable from 2019 to 2022 but rose in 2023 and then again in 2024 to its highest level in a decade, suggesting continuing or even growing frustration with schools.[11]

Concerns about the learning environment and behavior of their children's peers may partly explain such increasing parental concerns. Chronic absenteeism among Massachusetts public school students jumped from 13 % in 2019 to 28 % in 2022 before dropping to a still elevated 20 % in 2024.[12] Such absenteeism disrupts the learning environment even for students who are present, as teachers divert time and effort catching up students who have missed instructional time (Goodman, 2014). In 2022, a national sample of school leaders attributed to the pandemic and its lingering effects increased classroom disruptions from student misconduct, acts of disrespect toward teachers, and prohibited use of electronic devices.[13] Though leaders of all school levels reported such increases in bad behavior, middle school leaders reported the highest post-pandemic increases in categories such as: physical fights between students, hate crimes, bullying, rowdiness in hallways, use of forbidden electronics including cell phones, and classrooms disruptions from student misconduct. Early pandemic declines in bullying behavior documented in Bacher-Hicks et al. (2022) thus appear to have later reversed, with the fraction of K-12 parents fearing for their child's physical safety at school rising by 10 percentage points between 2019 and 2024.[14] In late 2024, 72 percent of surveyed educators reported that student behavior was worse than it had been in 2019, a higher percentage than in 2021 and 2023.[15]

[10] See Gallup polling results at https://news.gallup.com/poll/1612/education.aspx.
[11] See EdChoice survey results at https://www.edchoice.org/schooling-in-america-survey-dashboard.
[12] See the Return2Learn Tracker at https://www.returntolearntracker.net.
[13] See NCES School Pulse Survey results at https://nces.ed.gov/surveys/spp/results.asp.
[14] See Gallup polling results at https://news.gallup.com/poll/1612/education.aspx.
[15] See EdWeek survey results at https://www.edweek.org/leadership/is-student-behavior-getting-any-better-what-a-new-su2025/01.

Survey evidence thus suggests that, if anything, parents' and school leaders' perceptions of public school learning environments may be worse now than in the first year or two after the pandemic's onset. Concerns about student behavior are particularly acute in middle schools, consistent with enrollment declines concentrated in such grade levels. The subset of parents turning to private schools and home schooling may be doing so in the hopes of finding their children a safer and less disrupted learning environment. Our analysis of Massachusetts data through fall 2024 provides the first systematic examination of how these concerns have translated into sustained enrollment shifts five years after the pandemic's onset, offering insights into whether the initial disruptions to school choice patterns represent temporary adjustments or more fundamental changes in parental preferences for schooling options.

Our findings also raise important questions about the long-term implications for public education in Massachusetts and the nation as a whole. The sustained exodus of higher-income, White, and Asian families from public schools may reduce political support for public education funding. Understanding whether these patterns represent a new equilibrium or continue to evolve will require ongoing monitoring. Research examining the relationship between specific school policies and enrollment retention could inform efforts to address the apparent mismatch between parental preferences and current public school offerings, particularly in middle grades. Studies tracking individual students who switched sectors could illuminate whether academic and social outcomes differ across schooling choices, helping families and policymakers understand the consequences of these large-scale shifts in enrollment patterns. As the first analysis to document the persistence of pandemic-era enrollment changes five years later, our work establishes a foundation for understanding whether COVID-19 will be seen as a temporary disruption or an inflection point in American educational choices.

Conflict of interest

None of the authors have any financial conflicts to disclose. This work was not funded by any external entity.

Appendix

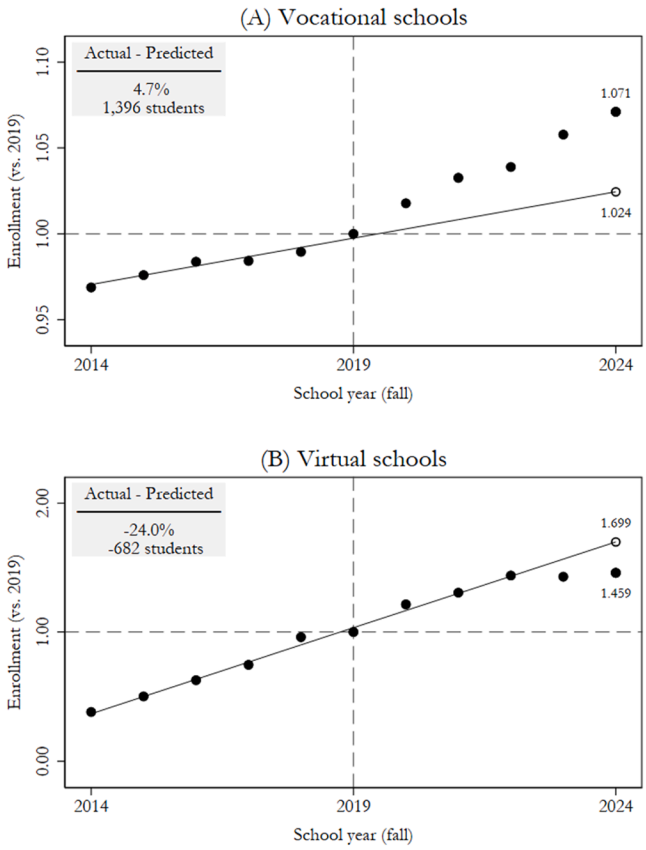

Fig. A.1. Vocational and virtual public school enrollment.
Note: Plotted above are enrollments relative to fall 2019 for two types of public schools: vocational technical regional schools and statewide virtual schools. Also shown are lines of best fit through the last four pre-pandemic years of 2016 to 2019, labeled with predictions for fall 2024 enrollment. Each gray box shows the difference between actual and predicted enrollment in fall 2024, both in percentage and absolute terms. All data come from the Massachusetts Education-to-Career (E2C) Research and Data Hub.

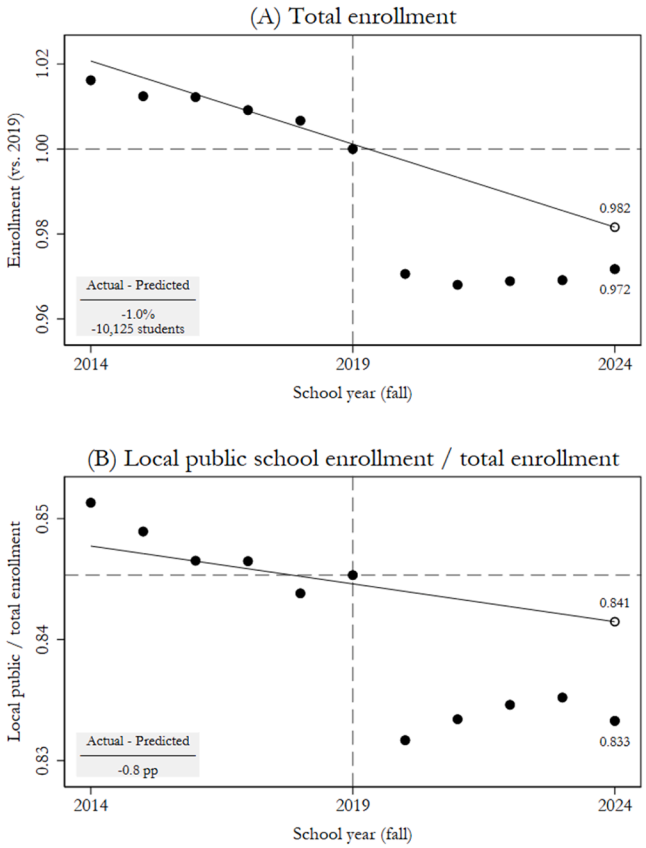

Fig. A.2. Local public school enrollment and total enrollment.
Note: Plotted above are total enrollments across all sectors relative to fall 2019 (panel A) and the ratio of local public school enrollment to total enrollment (panel B). Also shown are lines of best fit through the last four pre-pandemic years of 2016 to 2019, labeled with predictions for fall 2024 enrollment. Each gray box shows the difference between actual and predicted enrollment in fall 2024. All data come from the Massachusetts Education-to-Career (E2C) Research and Data Hub.

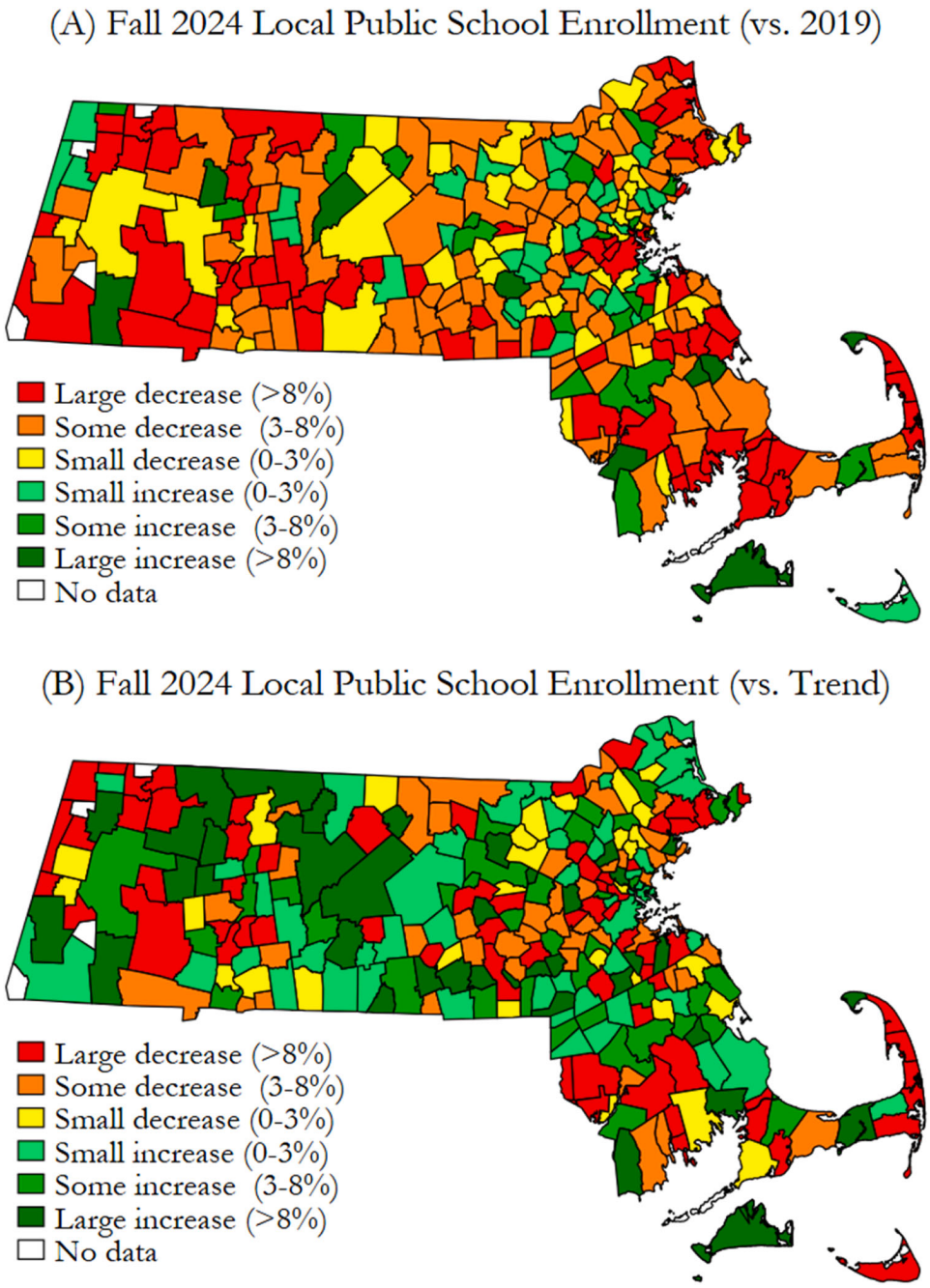

Fig. A.3. Geography of local public school enrollment changes.
Note: The maps above show school district-specific changes in local public school enrollment relative to 2019 (panel A) and relative to predictions from pre-pandemic trends (panel B). All data come from the Massachusetts Education-to-Career (E2C) Research and Data Hub.

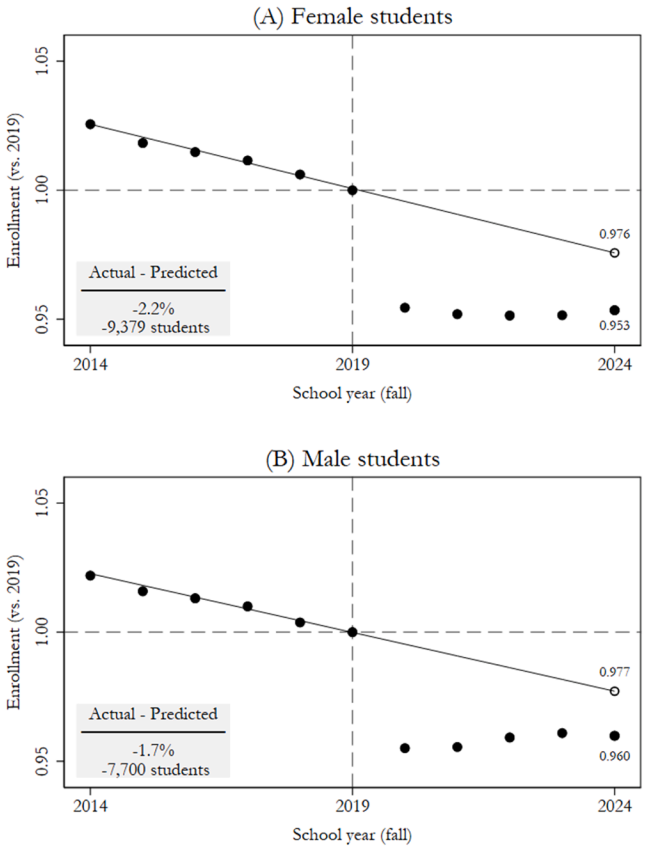

Fig. A.4. Public school enrollment by gender.
Note: Plotted above are local public school enrollments by gender relative to fall 2019. Also shown are lines of best fit through the last four pre-pandemic years of 2016 to 2019, labeled with predictions for fall 2024 enrollment. Each gray box shows the difference between actual and predicted enrollment in fall 2024, both in percentage and absolute terms. All data come from the Massachusetts Education-to-Career (E2C) Research and Data Hub.

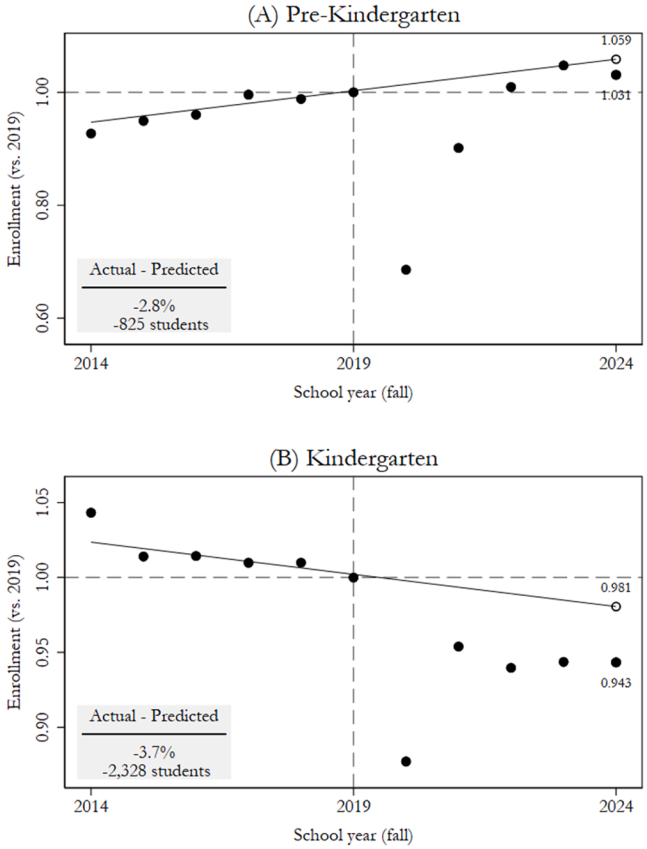

Fig. A.5. Public school enrollment in early grades.
Note: Plotted above are local public school enrollments by grade level (pre-K and kindergarten) relative to fall 2019. Also shown are lines of best fit through the last four pre-pandemic years of 2016 to 2019, labeled with predictions for fall 2024 enrollment. Each gray box shows the difference between actual and predicted enrollment in fall 2024, both in percentage and absolute terms. All data come from the Massachusetts Education-to-Career (E2C) Research and Data Hub.

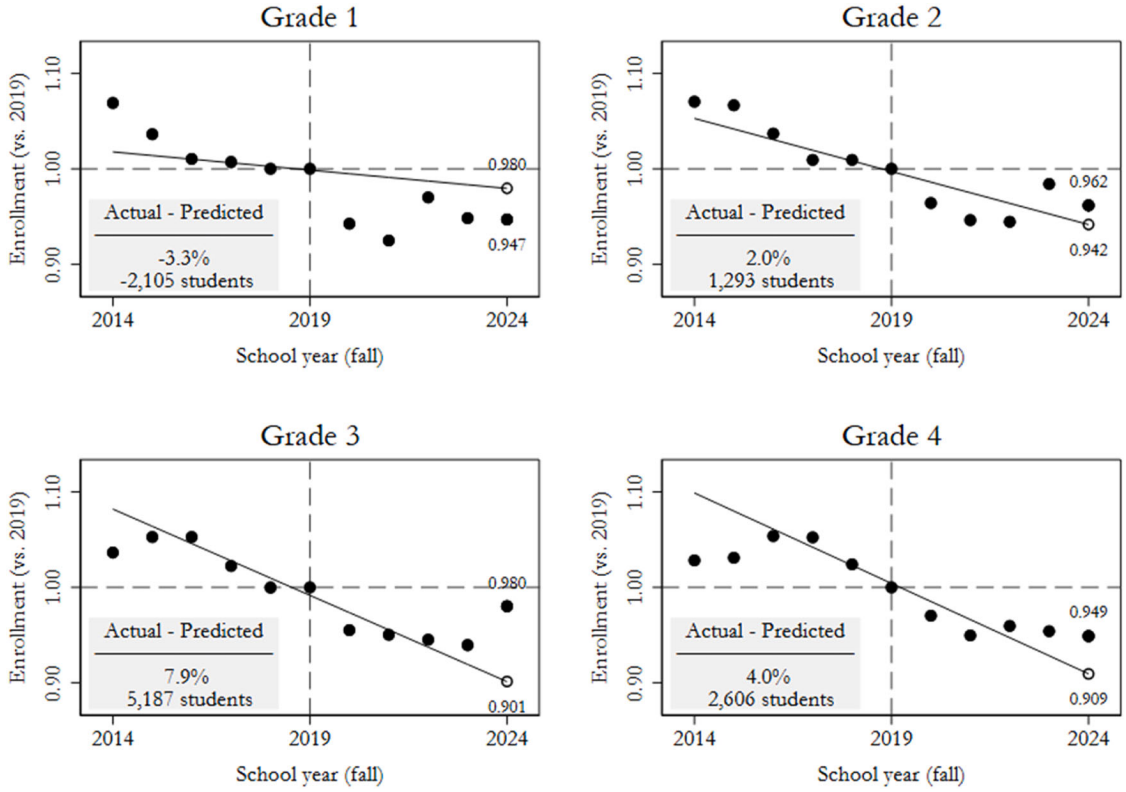

Fig. A.6. Public school enrollment in grades 1–4.
Note: Plotted above are local public school enrollments by grade level (grades 1–4) relative to fall 2019. Also shown are lines of best fit through the last four pre-pandemic years of 2016 to 2019, labeled with predictions for fall 2024 enrollment. Each gray box shows the difference between actual and predicted enrollment in fall 2024, both in percentage and absolute terms. All data come from the Massachusetts Education-to-Career (E2C) Research and Data Hub.

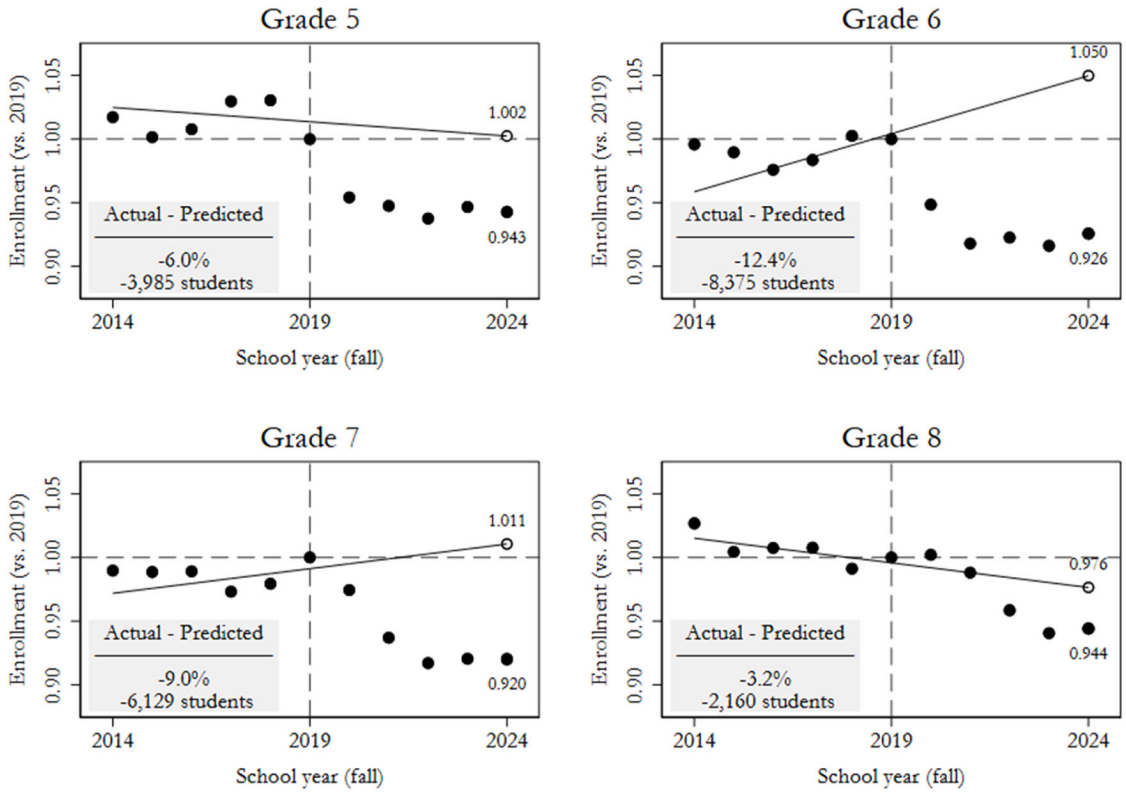

Fig. A.7. Public school enrollment in grades 5–8.
Note: Plotted above are local public school enrollments by grade level (grades 5–8) relative to fall 2019. Also shown are lines of best fit through the last four pre-pandemic years of 2016 to 2019, labeled with predictions for fall 2024 enrollment. Each gray box shows the difference between actual and predicted enrollment in fall 2024, both in percentage and absolute terms. All data come from the Massachusetts Education-to-Career (E2C) Research and Data Hub.

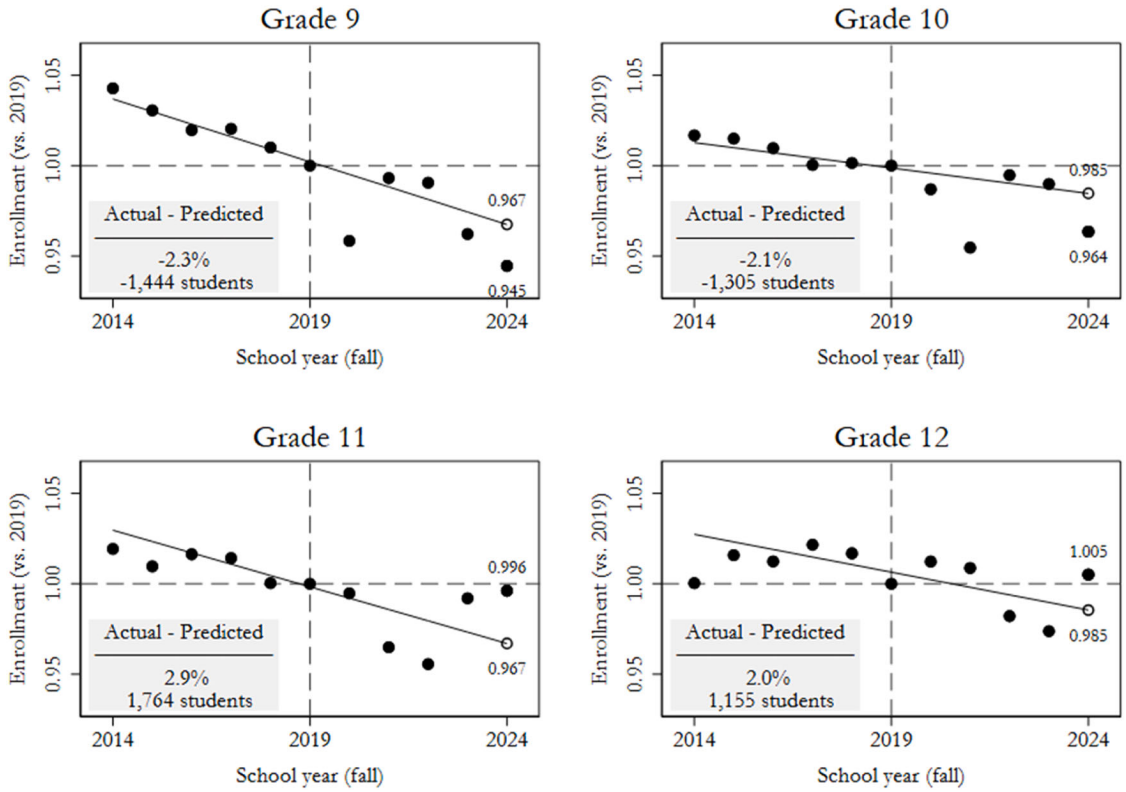

Fig. A.8. Public school enrollment in grades 9–12.
Note: Plotted above are local public school enrollments by grade level (grades 9–12) relative to fall 2019. Also shown are lines of best fit through the last four pre-pandemic years of 2016 to 2019, labeled with predictions for fall 2024 enrollment. Each gray box shows the difference between actual and predicted enrollment in fall 2024, both in percentage and absolute terms. All data come from the Massachusetts Education-to-Career (E2C) Research and Data Hub.

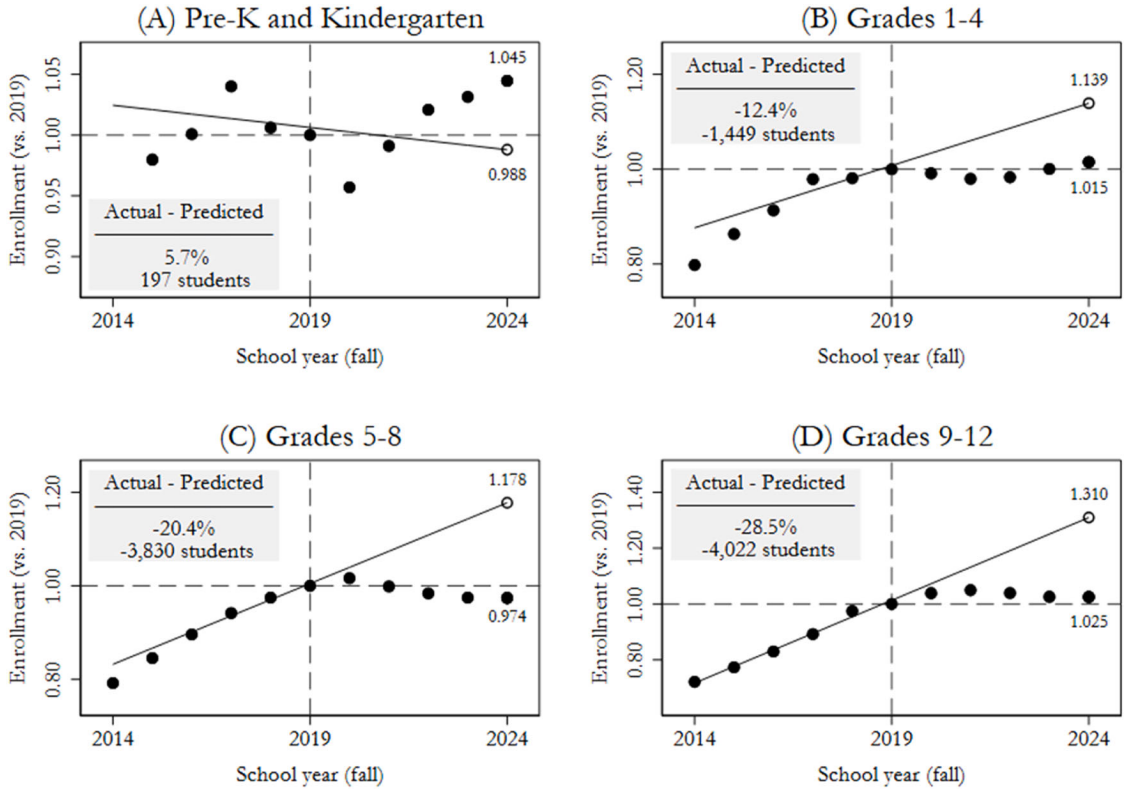

Fig. A.9. Charter school enrollment by grade level.
Note: Plotted above are charter school enrollments by grade level relative to fall 2019. Also shown are lines of best fit through the last four pre-pandemic years of 2016 to 2019, labeled with predictions for fall 2024 enrollment. Each gray box shows the difference between actual and predicted enrollment in fall 2024, both in percentage and absolute terms. All data come from the Massachusetts Education-to-Career (E2C) Research and Data Hub.

Table A.1
Massachusetts population estimates, 2020–2023.

Age	April	July	Absolute	Percent
Group	2020	2023	Change	Change
5–9	376,159	365,200	−10,959	−2.9 %
10–13	322,607	303,668	−18,939	−5.9 %
14–17	336,781	328,990	−7791	−2.3 %
Total	1035,547	997,858	−37,689	−3.6 %

Note: Data on Massachusetts population estimates by age come from the U.S. Census Bureau's "Annual Estimates of the Resident Population by Single Year of Age and Sex: April 1, 2020 to July 1, 2023 (SC-EST2023SYASEX)".

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