

Patterns in the Pandemic Decline of Public School Enrollment

Thomas S. Dee¹ and Mark Murphy² 

Early evidence indicates that the COVID-19 pandemic sharply reduced public school enrollment in many states. However, little is known about the underlying patterns of these declines. Using new district-level data from Massachusetts, we find that these declines were concentrated in traditional districts while charter, virtual, and vocational districts *increased* their enrollment. Though the enrollment declines in traditional districts were widespread, we also find that the percent declines were significantly larger in smaller districts and those serving higher concentrations of White and economically disadvantaged students. The implications for understanding the pandemic's effects on learning opportunities and the anticipated fiscal stress on public schools are discussed.

Keywords: demography; economics of education; educational policy; equity; regression analyses; secondary data analysis

The COVID-19 pandemic has had historically unprecedented and dramatic effects on the developmental experiences of children as well as on parents, teachers, and schools. In particular, during the 2020–2021 school year, a large majority of K–12 schools have adopted an instructional model that features remote learning (Kurtz, 2020). Emerging data are now providing insights into the consequences of these substantial changes for a range of outcomes that include student achievement (Kuhfeld et al., 2020), the social and emotional well-being of students (Leeb, 2020), teacher morale (Diliberti & Kaufman, 2020), and parental stress (Davis et al., 2021). More comprehensive assessments of these diverse changes and their longer term implications will emerge as additional data become available.

Public school enrollment counts for the 2020–2021 school year offer another distinctive and newly available set of leading indicators. A recent news report (Belsha et al., 2020) found that public school enrollment fell by more than 500,000 students in the 33 states with available data. On average, these enrollment declines represent a decrease of about 2%, a stark change from the typical prepandemic annual growth of 0.5% (Belsha et al., 2020). However, the current state-level evidence on enrollment losses may obscure how these declines vary for different types of school districts and communities. In this brief, we use the recently published district-level data from Massachusetts, whose

statewide decline parallels those observed on average across other states, to provide a more nuanced exploration of the various ways in which the pandemic has influenced student enrollment patterns. We focus on Massachusetts for two broad reasons. First, Massachusetts reported district-level enrollment data earlier than other states. Second, the school districts in Massachusetts reflect the diversity of districts nationwide in terms of student demographic and socioeconomic traits and district types (i.e., charter, traditional, virtual, and vocational). Our results provide new insights into the learning adaptations undertaken in response to the pandemic. And they suggest the equity implications of these enrollment declines by identifying which types of districts are most likely to experience fiscal and logistical pressures in the wake of the pandemic.

Data

We study public school enrollment data (i.e., based on census counts conducted in October 2019 and October 2020) from the Massachusetts Department of Elementary and Secondary Education (DESE). The newly available district-level enrollment data for the 2020–2021 school year enable us to explore the

¹Stanford University & National Bureau of Economic Research, Stanford, CA

²University of Hawai'i at Mānoa, Honolulu, HI

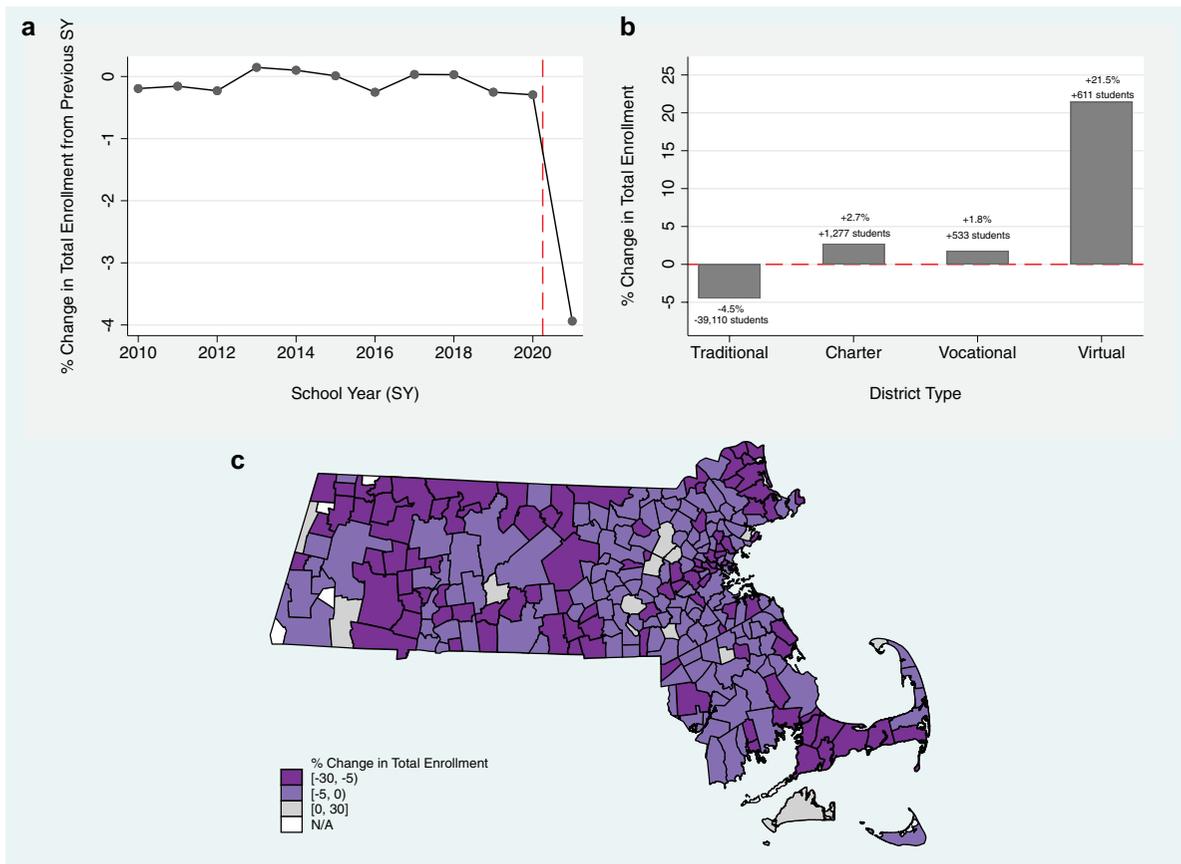


FIGURE 1. Percent changes in total enrollment, overall, by district type, and by district.

Note. The underlying data for Panels (a), (b), and (c) are from the Massachusetts Department of Elementary and Secondary Education Enrollment Reports for School Year (SY) 2009–2010 through SY 2020–2021. The red dashed line in Panel (a) indicates the beginning of the COVID-19 pandemic. The red dashed line in Panel (b) indicates 0% change. The percent change and raw difference in student enrollment is reported above or below each bar in panel (b); Panels (b) and (c) reflect percent changes in total enrollment between SY 2019–2020 and SY 2020–2021. Panel (c) also uses spatial data from the Massachusetts Bureau of Geographic Information.

percent changes in student enrollment relative to the prior year (i.e., prepandemic). We also identified key baseline traits of these districts based on 2019–2020 data. These include district type (i.e., traditional, charter, virtual, or vocational) and prepandemic enrollment counts. For traditional districts, we also organized GIS (geographic information system) data on district boundaries and data on district size (i.e., small ≤ 1000 , medium $\in [1001, 2500]$, and large > 2500), the racial-ethnic composition of students, and the percent classified as economically disadvantaged.

Results

Panel (a) of Figure 1 depicts the trend in annual public school enrollment changes (i.e., 2009–2010 to the present) for Massachusetts. During the prepandemic period, the year-to-year changes were modest (i.e., less than half of a percentage point). However, in the first full year after the pandemic began, public school enrollment fell by 3.9%. This change is more than 10 times the size of the largest year-to-year change experienced by the state over the previous decade and represents a loss of 37,363 students.

To understand the variation in this historic decline, we first consider enrollment changes across Massachusetts' distinct public

school sectors. We categorize each district as traditional ($N = 289$), vocational ($N = 29$), charter ($N = 78$), or virtual (charter) ($N = 2$). Panel (b) of Figure 1 illustrates the postpandemic enrollment change for each of these sectors. Traditional public school districts experienced an enrollment decline of 39,110 students, or 4.5%. In contrast, charter districts enrolled 1,277 additional students, a 2.7% increase. Vocational districts enrolled 533 additional students, a 1.8% increase. Virtual districts enrolled 611 additional students, a 21.5% increase. Supplemental Table 1 (available on the journal website) provides exact enrollment counts, differences, and percent changes by sector. The sharp heterogeneity in our results by sector indicates that many parents pursued untraditional learning opportunities for their children during the pandemic.

Panel (c) of Figure 1 maps the enrollment changes experienced by traditional public school districts ($N = 289$) across the state. These data indicate that enrollment declines were quite common, though not universal. Nearly 95% of districts ($N = 274$) lost enrollment with almost half ($N = 132$) registering a decline of *more than* 5%. Few districts ($N = 15$), often those in wealthy or vacation-oriented regions, saw flat or modestly increased enrollment counts.

Table 1
Regression Results for Traditional Public School Districts

| Independent Variable | Dependent Variable | | | |
|----------------------------------------------------|------------------------------|-------------------|-------------------|-------------------|
| | % Change in Total Enrollment | | | |
| | (1) | (2) | (3) | (4) |
| Small district (1,000 or fewer students) | -3.592*** (0.831) | — | — | -2.408*** (0.779) |
| Medium district (between 1,001 and 2,500 students) | -0.377 (0.355) | — | — | 0.427 (0.410) |
| % Economically disadvantaged | — | -0.022 (0.015) | — | -0.082*** (0.024) |
| % Black in 2019–2020 | — | — | 0.076*** (0.029) | 0.111*** (0.034) |
| % Hispanic in 2019–2020 | — | — | 0.032*** (0.012) | 0.078*** (0.022) |
| % Other in 2019–2020 | — | — | 0.072** (0.030) | 0.008 (0.030) |
| Constant | -4.399*** (0.201) | -4.917*** (0.408) | -6.782*** (0.544) | -4.358*** (0.602) |
| Observations | 289 | 289 | 289 | 289 |
| R ² | 0.1171 | 0.0062 | 0.0480 | 0.1688 |

Note. Robust standard errors are in parentheses. Each column represents a separate unweighted regression. The full sample includes 398 districts observed in both 2019–2020 and 2020–2021 school years. We exclude vocational districts ($N = 29$), charter districts ($N = 78$), and virtual districts ($N = 2$) from these models, resulting in our analytical sample of traditional public school districts in Massachusetts ($N = 289$).
* $p < .1$. ** $p < .05$. *** $p < .01$.

We also examined the characteristics predicting enrollment changes for traditional districts using multiple regressions. Table 1 presents the key results for four models that condition on district size, the prepandemic racial and ethnic composition of the district’s student body, and the share of students who were economically disadvantaged. These results indicate that the enrollment declines were significantly larger for the state’s smallest districts, those serving higher concentrations of economically disadvantaged students, and those serving higher concentrations of White students. Moreover, these differences are large relative to the average state decline (4.5%). For example, the smallest districts experienced enrollment declines 2.4 percentage points larger than the largest districts (Column 3). Similarly, a 10 percentage point increase in the share of economically disadvantaged students implies an enrollment decline that is 0.8 percentage points larger.

Conclusion

The pandemic has powerfully and heterogeneously altered public school enrollment patterns in Massachusetts. Traditional public school districts experienced broad and dramatic enrollment declines (i.e., often more than 5%). In contrast, public school enrollment increased in untraditional districts (charters, virtual, and vocational), but not by nearly enough to compensate for the loss of students in traditional districts. The enrollment declines were most severe among the smallest traditional districts and those serving higher concentrations of poor and White students.

These dramatic changes are important for at least two reasons. First, it indicates that, during the pandemic, large numbers of children are experiencing developmentally consequential changes in their learning environments. Specifically, the DESE estimates that pre-K and kindergarten enrollment fell by approximately 17,100 students while transfers to private schools and to homeschooling increased by approximately 5,900 and 6,400, respectively. Out-of-state transfers grew by about 200 students. Critically, a residual

enrollment decline of more than 7,000 students is unexplained and may be due in part to students dropping out of school and chronic truancy. The grade-specific changes in enrollment are also noteworthy. We observed large declines in kindergarten and grade-1 enrollment as well as non-trivial reductions in other elementary grades and transition grades (i.e., grades 6 and 9). These grade-specific declines in enrollment may also create specific logistical challenges to teaching and learning. If, for example, the drop in kindergarten enrollment simply reflects “redshirting” in response to the pandemic, the next cohort of kindergarten students may be unusually large with corresponding, long-run implications for peer groups, classroom staffing, and class sizes. Understanding these adaptations and addressing their consequences is an important goal for current research and policy. Second, because state and federal aid to public schools reflects student enrollment, these declines may place many school districts in financial peril, potentially compelling teacher layoffs. Navigating this fiscal shock may have sustained relevance because many students who left traditional public schools during the pandemic may not immediately return on the resumption of in-person learning.

ORCID iD

Mark Murphy  <https://orcid.org/0000-0002-5709-8390>

NOTES

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AUTHORS

THOMAS S. DEE, PhD, is the Barnett Family Professor at Stanford University and Faculty Director of the John W. Gardner Center for Youth and Their Communities, 520 Galvez Mall, CERAS Building, 5th Floor, Stanford, CA 94305; tdede@stanford.edu. His research focuses on the application of quasi-experimental and experimental methods that provide rigorous quantitative evidence and inform contemporary policy debates in education.

MARK MURPHY, PhD, is an assistant professor in the Department of Educational Psychology at the University of Hawai'i at Mānoa, 1776 University Avenue, Wist Hall 214, Honolulu, HI 96822; mmurph@hawaii.edu. His research focuses on the use of descriptive and quasi-experimental approaches to inform issues of educational equity, with particular emphasis on immigration, multilingual students, and school finance.

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