Attachment A
1. EXECUTIVE SUMMARY

- The COVID-19 pandemic has caused unprecedented disruptions in the learning opportunities available to children in California. The historically unprecedented changes in school enrollment patterns in California’s public schools provide objective and leading evidence on the character of these disruptions.

- In the 2020/21 school year—the first full school year after the onset of the pandemic—California’s public schools experienced a dramatic 2.6% decline in enrollment (i.e., a loss of over 160,000 students).

- In the 2021/22 school year, public-school enrollment declined by an additional 1.8% (i.e., a further loss of over 110,000 students). Recently released enrollment
data for the 2022/23 school year show a further one-year decline of nearly 40,000 students (0.7%).

- Over half of California’s public-school enrollment loss cannot be explained by the modest increases in private and homeschool enrollment and the decline in the school-age population (Dee, 2023a).

- Currently, we know little about what this disenrollment—and the substantial part of if that is unexplained—indicates about the schooling experiences of California’s children during the pandemic (e.g., disruptive school changes, foregoing kindergarten, unregistered homeschooling, truancy, dropping out).

- However, the available data indicate that the enrollment decline was particularly dramatic in kindergarten (i.e., an 11.6% decline in the 2020/21 school year) and in early elementary grades (e.g., a 3.9% decline in Grade 1 enrollment in the 2020/21 school year).

- The enrollment declines were also particularly large among California’s most educationally vulnerable students (i.e., homeless, socioeconomically disadvantaged) and among certain racial-ethnic groups (i.e., African-American, American Indian/Alaskan Native, White).

- State data on the instability of public-school enrollment during the 2020/21 school year indicate that there was also a sharp increase in the share of kindergarten and early-grade students who did not complete a full year of schooling. In the 2021/22
school year, the instability of public-school enrollment increased at all grade levels, particularly high-school grades.

- During the 2020/21 school year, the prevalence of chronic absenteeism increased substantially to 14%. In the 2021/22 school year, the chronic absenteeism rate more than doubled, increasing to 30%.

- These data on enrollment stability and chronic absenteeism indicate that large numbers of students enrolled in California’s public schools are failing to re-engage in their schooling in the wake of the pandemic.

- These data underscore the imperative (1) to address the serious financial and instructional challenges likely to result from the long-lived nature of pandemic-driven enrollment declines; (2) to build better data systems that can provide rapid, actionable guidance on how to meet the targeted needs of students whose learning opportunities suffered during the pandemic; (3) to design and implement a multi-faceted initiative to remediate the loss of learning opportunities; and (4) to make capital improvements in California’s public schools so that they are better positioned to fulfill their mission in the context of future public-health challenges.

- Because of both its comprehensive data systems and its powerful fiscal and operational capacities, the state of California is in a unique position to provide leadership in better understanding and meeting the serious challenges of academic
recovery. However, to date, the state has not clearly demonstrated such leadership, instead emphasizing responses by local school districts.

SUMMARY OF QUALIFICATIONS

I am the Barnett Family Professor in the Graduate School of Education at Stanford University. I am also a Senior Fellow at the Stanford Institute for Economic Policy Research (SIEPR), a research associate with the National Bureau of Economic Research (NBER), and the faculty director of the John W. Gardner Center for Youth and Their Communities. I also serve on the editorial boards of the American Educational Research Journal, Education Finance and Policy, and the Journal of Policy Analysis and Management. My teaching at the undergraduate and graduate levels has focused on public policy analysis, education policy, and applied quantitative methods. My academic research has generally focused on understanding and informing theoretical and empirical issues relevant to contemporary public policy debates with a particular emphasis on education in the United States. This research has focused on conducting quantitative studies based on experimental designs and on other non-experimental research designs that can credibly support causal inferences (i.e., “quasi-experimental” studies) about the effects of practices and policies. This report is independent of my work as a professor at Stanford University and my other professional affiliations.

METHODOLOGY
The evidence discussed in this report reflects on a review of research studies that examine the learning challenges caused by the COVID-19 pandemic and the earlier research literature relevant to this topic. This report also relies on enrollment data for California’s public and private schools, available publicly through the California Department of Education (CDE), and on federal estimates of the school-age population. In preparing this report, I also relied on my experience as a researcher who often works in partnership with educators and policymakers.

FINDINGS

*The Pandemic Context for School Operations*

On March 11, 2020, the World Health Organization (WHO) declared COVID-19 to be a pandemic. In an effort to stop the early spread of COVID-19, public schools in the United States began an abrupt and dramatic shift to distance learning. By March 25, 2020, all U.S. public schools were closed for in-person instruction (Education Week, 2020). Most public schools (i.e., in all states other than Montana and Wyoming) maintained these remote-learning modes through the remainder of the 2019/20 school year.

During the summer of 2020, state and district school leaders began to confront the question of how to restructure school operations and instruction for the coming 2020/21 school year (i.e., the first full school year during the pandemic). This challenge turned in large part on understanding—and effectively mitigating—the educational and health
tradeoffs implied by keeping schools closed to in-person instruction. More specifically, discussions of this issue turned explicitly on questions of how to balance the developmental harm to children who would participate in remote rather than in-person instruction with the potential risks of spreading COVID-19 infections through in-person instruction. In an effort to meet this challenge, the National Academies of Science, Engineering, and Medicine (2020) convened an expert committee tasked with “providing guidance on the reopening and operation of elementary and secondary schools for the 2020–2021 school year.”

The panel report was released on July 15, 2020, and its leading recommendation stated that schools “should prioritize reopening with an emphasis on providing full-time, in-person instruction in grades K–5 and for students with special needs who would be best served by in-person instruction” (National Academies of Science, Engineering, and Medicine 2020). The panel’s emphasis on in-person instruction, targeted specifically to younger children and students with special needs, reflected the evidence that distance learning was likely to be uniquely difficult to implement among these students as well as particularly detrimental to their academic and socioemotional development. The panel also recommended several “high-priority mitigation strategies” such as masking, physical distancing, and limitations on large gatherings, as well as investments in improving school ventilation and air filtration.
Another central emphasis in the panel report was the importance of remediating “disparities in school facilities, staffing shortages, overcrowding, and remote learning infrastructures,” with particular concern about “access to technology, health care services, ability to provide masks for students.” The report specifically underscored the role of the state in financially supporting the equitable implementation of this guidance stating “. . . state governments should provide significant resources to districts and schools to enable them to implement the suite of measures required to maintain individual and community health and allow schools to remain open.”

As the 2020/21 school year began, adherence to this guidance was uneven. For example, a nationally representative survey of parents with children in Grades K–12 found that, in the fall of 2020, only 18% of private-school students experienced remote-only instruction, while in public schools, the prevalence of remote-only instruction was over three times higher (Henderson, Peterson, West, 2021). Furthermore, the use of remote instruction was not substantially differentiated by age. This survey found that 48% of students in Grades K–2 were participating in remote instruction.

Within California’s public schools, the broad and undifferentiated prevalence of remote-only instruction was striking. During the Summer of 2020, many California school districts were developing plans to teach their students safely in some form of in-person instruction (Freedberg, 2020). However, new state guidance issued by Governor Newsom in mid-July instead required distance learning in most school districts. This guidance left
school districts with relatively little time to prepare for distance learning and exacerbated the challenge of providing equitable educational opportunity “as the state scrambles to come up with devices and ensure internet connectivity to ensure that all students can participate in remote learning” (Freedberg, 2020). As a result, an overwhelming majority of California’s six million public-school students (i.e., at least 73%) began the school year with distance learning “participating in a giant experiment never attempted in the state” (EdSource, 2020; Freedberg, 2020). Later in the 2020/21 school year, as the winter surge of COVID-19 abated and schools across the nation began shifting to in-person instruction, federal data indicate that California ranked as “one of the slowest states to invite students back for fully in-person instruction amid the pandemic” (Johnson, 2021).

In the remaining sections of this report, I present and discuss evidence on the serious effects that the COVID-19 pandemic has had on the learning opportunities available to California’s public-school students. The evidence presented here focuses on novel and important insights from the recent and historically unprecedented changes in school-enrollment patterns as well as complementary evidence from related measures of student engagement (i.e., the stability of enrollment during the school and chronic absenteeism among those enrolled). I also discuss the character of the corresponding state responses to these challenges and offer policy recommendations based on this evidence and the available research literature on effective policies.
Enrollment changes and the educational impact of the pandemic

The dramatic disruptions brought about by the COVID-19 pandemic have motivated a broad interest in measuring and understanding the recent changes in different dimensions of children’s learning and socioemotional well-being. Much of this research has focused on the student testing data available during the pandemic, both through state assessments (Halloran et al., 2021; West et al., 2021; Thorn & Vincent-Horn, 2021) and formative, interim assessments (Lewis et al., 2021; Kuhfeld et al., 2022). These analyses consistently present a sobering portrait of the changes in student learning during the pandemic, documenting declines in both reading and math performance as well as substantial growth in the achievement gaps between low- and high-poverty schools.

Several commentators on these recent findings have noted that these early comparisons are subject to potential caveats because of how the pandemic often changed the mode of test administration, the design and content of the tests, and the population of students taking the test (Barnum, 2021; Gerwetz, 2021; Ho, 2020). However, the recent release of federal test-score data from the 2022 National Assessment of Educational Progress (NAEP), also known as the “The Nation’s Report Card,” confirmed this early evidence, showing historic declines in mathematics and reading achievement during the pandemic. The NAEP data specifically from California, with the exception of Grade 8 reading, showed achievement declines similar to the national changes (Fensterwald, 2022).
Compounding this striking evidence of declines in student achievement, emerging evidence on the state of youth mental health recently motivated several national health organizations to issue a joint statement declaring a “national emergency in child and adolescent mental health” (American Academy of Pediatrics, 2021), noting the role of the pandemic and the “dramatic increases in Emergency Department visits for all mental health emergencies including suspected suicide attempts.” A rare public-health advisory from the U.S. Surgeon General echoed these concerns (Office of the Surgeon General, 2021). A survey of high-school students by the Centers for Disease Control (Stobbe, 2022) found similar evidence of the pandemic’s negative effects on youth mental health (e.g., a sharp increase in students reporting feeling “persistently sad or hopeless”). The available evidence (Hamilton et al., 2021) also suggests that the pandemic’s negative effects on students’ socioemotional well-being are especially prominent, especially among historically marginalized students and those in remote schooling for longer periods.

An important but less widely appreciated issue is that the data we typically have on how the pandemic influenced learning and social-emotional well-being among our children are, while highly important, are also narrow in notable ways. For example, the available federal, state, and local testing data commonly focus on Grades 3–8 and imply that we know much less about how the pandemic has influenced learning among the
youngest students as well as high-school students. Similarly, we also know comparatively little about the pandemic on the mental health of younger students (i.e., ages 5–10). We also know less about students who may no longer be in conventional school settings due to skipping kindergarten, homeschooling, and truancy. Dee (2023b) argues that our tendency to focus largely on the data that are readily available (i.e., a “streetlight effect”) creates important biases in the character of our academic-recovery efforts.

Given this context, the available data on changing enrollment patterns provide uniquely valuable, leading evidence on the character and prevalence of the learning disruptions caused by the pandemic. Specifically, relative to other measures, data on school enrollment make unique contributions because they are consistently and universally measured for children at all grade levels as well as reported publicly in a comparatively timely manner. Furthermore, the insights implied by pandemic-related changes in school enrollment are several. First, pandemic-related changes in public-school enrollment can provide objective evidence on how parents viewed the quality and accessibility of the public schooling being offered (i.e., “revealed preferences” credibly based on instrumental behavior rather than potentially biased self-reports).

Second, changes in student enrollment also provide important insights into the changing character of students’ learning experiences. More specifically, systemwide disenrollment from public schools implies that prior students have either switched schools (e.g., to private schools or home-schooling), dropped out, or become truant. A
substantial academic literature (e.g., Card, 1999) has documented the substantial and negative long-run economic consequences of dropping out of school. Similarly, the available research suggests that merely switching schools—in particular, “reactive” moves like those occasioned by the rapid onset of a pandemic—has meaningful negative effects on student outcomes (e.g., Welsh, 2017).

Declines in kindergarten enrollment in response to the pandemic also raise distinct concerns about the developmental trajectories of these young learners and the schools that serve them. Disenrollment from public-school kindergarten could imply that young children have enrolled in private schools or that they intend to skip or delay kindergarten (e.g., remain in daycare, preschool, or at home). These possible behavioral patterns have important and distinctive implications for teaching and learning. For example, students who skipped kindergarten during the pandemic have foregone an early and formative developmental experience. The absence of these experiences implies that these students may bring unique learning challenges to first grade (i.e., their first year of formal schooling). Alternatively, students who skip kindergarten during the pandemic may subsequently “redshirt” into kindergarten rather than attending first grade. The possible existence of these kindergarten delays implies that later cohorts of kindergarten students will be unusually large. Such “cohort crowding” can imply unique challenges for teachers (i.e., teaching older kindergarten students) and harm student development by raising class sizes at this critical age (i.e., in the absence of responsive staffing). Finally, given the
expectation that many of the students who leave public schools will not return soon (or ever), public-school disenrollment may exacerbate the fiscal pressure on some school districts to close schools. This effect would be particularly long-lived if the disenrollment from public schools occurs predominantly among younger students.

Analyses based on enrollment data for the 2020/21 school year indicate that the first full school year under the pandemic was characterized by an historically unprecedented disenrollment from public schools. Specifically, early results were based on leading state sources of data. For example, Belsha et al. (2020) reported that public school enrollment fell by more than 500,000 students in the 33 states with available data. These enrollment declines represent a decrease of about 2% on average, a stark change from the typical and modest pre-pandemic annual growth of roughly 0.5% (Belsha et al., 2020). A similar analysis with broader data in the *New York Times* (Goldstein and Parlapiano, 2021) indicates that public-school enrollment fell by more than 1 million students in 2020/21, with particularly sharp declines in kindergarten and early grades.

Preliminary data released by the federal government in June 2021 confirmed this pattern (NCES, 2021). Specifically, these data indicated that public-school enrollment fell nationally by over 1 million students. This overall decline of 3% was particularly large in kindergarten (i.e., 13%) and, to a lesser extent, early grades. In response to this evidence, Mark Schneider, director of the federal Institute of Education Sciences (IES), noted, “I’m especially concerned about the steep drop in enrollment for children just getting started
Research shows that these early years are essential in helping students succeed academically and socially.” Similarly, the acting commissioner of the National Center for Education Statistics (NCES), Peggy Carr, characterized these declines as “concerning” and underscored the need to “see what more they can tell us about potentially large losses in learning opportunities.” The enrollment data for the 2021/22 school year only deepened the concerns about the implications of this pandemic exodus for students and public schools. Specifically, we might have expected many students to return to public schools, but that did not occur. In fact, K–12 public-school enrollment in the 50 states and Washington, D.C., actually declined for a second year in a row, though by a more modest amount (i.e., nearly 135,000 students).

Recent research indicates that the instructional choices made by public schools had a substantial influence on the degree of public-school disenrollment. Specifically, a quasi-experimental study by Dee et al. (in press) found that adopting a remote-only instructional mode in the Fall of 2020 contributed significantly to disenrollment from public schools, particularly among younger students. This “revealed preferences” evidence indicates that many parents, particularly those with younger children, found the offer of remote-only school sufficiently objectionable that they were willing to go so far as to change their child’s enrollment. A related study (Halloran et al., 2021) also finds that the unavailability of in-person schooling contributed to declining test scores in Spring 2021.
Enrollment changes in California schools

As noted above, the pandemic changes in enrollment patterns provide leading and objective evidence on how parents viewed the accessibility and quality of schools as well as on how the pandemic influenced students’ learning opportunities. In this section, I discuss how enrollment patterns recently changed, specifically in California’s public schools. Prior to the pandemic, enrollment in California’s K–12 public schools typically changed by only a fraction of a percent per year. However, as illustrated in Figure 1, this enrollment total fell by an unusually large 2.6% in the Fall of 2020. This dramatic, one-year reduction in public-school enrollment reflected a loss of over 160,000 students relative to California’s K–12 public-school enrollment in the prior 2019/20 school year. The sharp change illustrated in this figure is also consistent with the reductions observed in many other states (e.g., NCES, 2021).

The 2021/22 data indicate that enrollment in California’s public schools did not bounce back. Instead, the state’s public-school enrollment declined again by over 110,000 students (i.e., a further annual decline of nearly 2%). Taken together, these data indicate that, over the first two full school years under the pandemic, enrollment in California’s public schools fell by 4.4% (i.e., a decline of nearly 271,000 students). Nationally, this sustained decline places California among the states with the most substantial percent decline in public-school enrollment. Specifically, California has the fourth largest percent decline in public-school enrollment, trailing only Mississippi, Oregon, and New York.
Recently released enrollment data from the California Department of Education indicate that, in the current 2022/23 school year (i.e., the third full school year under the pandemic), the number of K–12 students in the state’s public schools fell yet again (i.e., a 0.7% decline or a loss of nearly 40,000 additional students). This figure likely understates the continued enrollment decline in K–12 grades because the state’s official K–12 enrollment count includes students enrolled in a free pre-kindergarten program (i.e., “transitional kindergarten”) that expanded eligibility to additional 4 year olds and grew during the 2022/23 school year (LaFortune and Prunty, 2023; Hill and Prunty, 2022; Fensterwald and Willis, 2023). This implies that, during the first three school years under the pandemic, K–12 enrollment in California’s public

Figure 1—Annual percent change in K–12 public-school enrollment in California.
schools declined by at least 310,457 students (i.e., a decline of over 5% relative to the 2019/20 school year).

Understanding what this disenrollment implies about the learning environments experienced by children during the pandemic is a vitally important policy question for which the currently available evidence is largely indirect. For example, one possibility is that these enrollment declines reflected schooling disruptions related to the migration of families with school-age children out of the state. In fact, recent evidence does indicate that demographic change (e.g., domestic migration) made a notable contribution to the cross-state variation in enrollment loss during the pandemic (Dee, 2022). Specifically, the percent change in a state’s school-age population during the pandemic does appear to explain a fraction of their corresponding loss in public school enrollment (i.e., roughly 21% nationally; Dee, 2023). California is an illustrative example. Census-based estimates indicate that, between the beginning of the pandemic (i.e., the April 1, 2020, Census Day) and just prior to the beginning of the 2021/22 school year (i.e., the postcensal estimate for July 2021), California’s school-age population fell by nearly 96,000 (Dee, 2023). This is equivalent to just over a third of the K–12 public-school enrollment loss over roughly the same period. This indicates that a large majority of the state’s public-school enrollment loss cannot simply be dismissed as demographic change.

Another possible factor in California’s sustained and substantial decline in public-school enrollment is that it reflected a substantial shift of children from public to private
schools and homeschooling during the pandemic. Until recently, the available data on pandemic shifts to nonpublic schooling have been limited and enigmatic. 18

However, a recent collaboration between the Associated Press and researchers at Stanford University (Toness and Lurye, 2023; Dee, 2023) gathered and analyzed data on private-school and homeschool enrollment from a group of states serving roughly half of the schoolchildren in the United States (i.e., including California). Collectively, these data indicate that private schooling and, to a surprising degree, homeschooling grew during the pandemic and explain some of the enrollment declines in public schools.

In California, entities offering private instruction at the elementary or secondary level (including homeschools) are required to file an affidavit with the CDE. The CDE now reports annual enrollment data based on these affidavits, inclusive of schools with five or fewer students (e.g., those understood informally to be in homeschooling arrangements). Between the 2019/20 and 2021/22 school years, the number of California students officially in these private and homeschool arrangements grew by less than 24,000 (i.e., with most of the growth at the homeschool level). In other words, the modest growth in nonpublic schooling during the pandemic explains less than 10% of the contemporaneous decline in public-school enrollment (i.e., nearly 271,000 students). Overall, these data indicate that California’s pandemic decline in public-school enrollment cannot be meaningfully explained by corresponding increases in privateschool and homeschool enrollment.
Linking together the available data on school enrollment by sector (i.e., public, private, and homeschooling) provides an informative summative indication of where the students of the public-school exodus have gone as well as some suggestions of concerns that remain poorly understood (Dee, 2023). Specifically, in California, 44% of decline in K–12 public-school enrollment (270,928) between Fall 2019 and Fall 2021 can be attributed to the loss of school-age students (95,751) and the growth in private-school and homeschool enrollment (23,598). However, this implies that over half of the students “missing” from the state’s public schools are unexplained. There are at least three possible factors that could explain this missingness, and each raises particular issues with respect to support of education of the state’s children. Specifically, the unexplained enrollment decline could be due to truancy, unregistered homeschooling, and increased skipping of kindergarten. Dee (2023) provides some indirect evidence for the role of increased kindergarten skipping. Specifically, when looking across data from all available states, unexplained enrollment losses are concentrated in states like California where kindergarten attendance is not required.

*Features of California’s public-school enrollment losses*

The nature of the public-school enrollment losses by grade provide further insights into the character of the pandemic disruptions in learning environments. Figure 2 presents the rate of enrollment loss in California’s K–12 public schools by grade between
the 2019/20 and 2020/21 school years (i.e., the first full school year under the pandemic). Consistent with national data on public-school disenrollment, California’s data indicate that the decline in kindergarten enrollment was particularly sharp. 20

Specifically, the one-year decline in kindergarten enrollment of 11.6% represents a loss of nearly 61,000 students (i.e., over a third of the overall pandemic loss of public-school enrollment in California). This striking change raises serious questions about the developmental implications of the pandemic for California’s younger learners. Did a substantial number of these students forego their developmentally critical kindergarten experiences in anticipation of simply advancing to first grade in the Fall of 2021? To what extent did these students instead delay kindergarten (i.e., “redshirt”) until creating other challenges for staffing, teaching, and learning? How many young students may be effectively truant during this period or have switched to private schools?
While the first-year decline in California’s kindergarten enrollment is dramatic, the enrollment data also provide important indicators of educational disruptions among other young learners. Specifically, the data in Figure 2 illustrate that the declining public-school enrollment was also large in elementary-school grades (i.e., declines of 3.1% to 3.9% in Grades 1–3). Similarly, enrollment declines were also large in California’s middle-school grades. In particular, Grade-6 enrollment fell by 5.2% (i.e., a loss of over 24,000 students). Disenrollment from such grades may be particularly likely to happen because they often coincide with an already planned school transition (e.g., from elementary to middle school). Notably, enrollment in high-school grades did not change meaningfully.
during the first full year of the pandemic. While this evidence suggests that high-school students were not dropping out or switching schools in dramatic numbers, it does not preclude the reasonable concern that the pandemic harmed their opportunities to learn and their socioemotional development in significant ways not captured by these particular data.

The grade-specific changes in the recently released enrollment data for the 2021/22 school year provide information on the sustained educational impact of the pandemic. Four features of these data (Figure 3) are particularly notable. The first concerns what these data suggest about last year’s sharp decline in kindergarten enrollment. The fact that first-grade enrollment fell sharply for a second year in a row suggests that the children who skipped public-school kindergarten last year did not skip ahead to public
Figure 3—Percent change in 2021/22 public-school enrollment in California by grade. First grades in substantial numbers. Similarly, the fact that 2021/22 kindergarten enrollment rebounded only modestly suggests that some children who skipped kindergarten last year enrolled at that grade level this year (i.e., “redshirting”), but also that parents of potentially rising kindergarten students are continuing to forgo this developmentally important year of public schooling.

Second, the continued declines in other early-grade enrollment (i.e., Grades 2–5) implies both that last year’s exits from public schools have sustained and that new exits for alternative accommodations have occurred. Third, the fact that Grade-6 enrollment did not meaningfully change in this year (Figure 3) indicates that last year’s middle
school disenrollment has sustained. Furthermore, the sharp decline in this year’s Grade 7 enrollment implies that the children who avoided public middle schools last year continued to do so. Fourth, this year’s decline in Grade-9 enrollment implies that the declines in the prior year’s Grade-8 enrollment have continued and are possibly complemented by parents leveraging a common school-transition year to take up other schooling options.

Recently released enrollment data for the 2022/23 school year show that, while overall enrollment continued to decline (Figure 1), there was some notable variation by grade (Figure 4). In particular, Fall 2022 kindergarten enrollment increased by 5.5%. However, this level of enrollment is still over 5% lower than the final pre-pandemic enrollment count. The declines in enrollment were broad across most other grades with the exceptions of quite small increases in Grades 7 and 11 and particularly large decline in Grade-8 enrollment, which reflects the persisting loss of students who started Grade 6 during the first full school year under the pandemic (i.e., 2020/21).

Another highly relevant concern is that the pandemic disruptions to learning opportunities may have been particularly disruptive to California’s most vulnerable learners. The CDE’s enrollment data on enrollment changes among targeted “program subgroups” provide evidence on this important question. Specifically, Figure 5 shows the annual change in public-school enrollment for each of the three pandemic school years.
Figure 4—Percent change in 2022/23 public-school enrollment in California by grade. Among students designated as socioeconomically disadvantaged, homeless, migrant, and foster youth. Broadly, these data are consistent with the concern that pandemic disruptions in learning environments exacerbated the inequity in opportunities to learn. For example, among the large group of socioeconomically disadvantaged students served by California’s public schools, enrollment declined by amounts in excess of the state average in each of the first two pandemic school years. The combined two-year enrollment decline—6.1%—exceeded the overall percent decline by 39% and implied a loss of over 228,000 students. Notably, these two years of enrollment decline were particularly large among students recognized as homeless and foster youth. The smaller population of students identified as migrant also experienced exceptionally large
Figure 5—Year-to-year percent change in public-school enrollment in California by program subgroup, 2019/20 to 2022/23. Enrollment declines, particularly in the 2021/22 school year. The recently released 2022/23 enrollment data indicate that the enrollment of migrant students changed little in the current school year, whereas the number of socioeconomically disadvantaged students, foster youth, and homeless students increased. The exact interpretation of these enrollment increases, particularly among homeless students, is not clear and merits further scrutiny. It could reflect the return of educationally vulnerable students who have been estranged from school during the first two school years of the pandemic, increased strain on students’ learning opportunities due to other factors (e.g., housing costs driving...
more families into homelessness), or an undiagnosed issue in how these student designations are recorded. This uncertainty in understanding what is occurring with an educationally vulnerable group of students needs further attention. However, given the small size of this subgroup (i.e., roughly 3% of student enrollment at the beginning of the pandemic and now), it does not seriously qualify the overall patterns in the enrollment data.

Figure 6 — Percent change in public-school enrollment in California by race-ethnicity, 2019/20 to 2021/22.

The available data on public-school enrollment by race and ethnicity provide another window into the potentially differentiated impact of the pandemic on students’ learning environments. The data in Figure 6 indicate that the two-year declines in public
school enrollment were common across multiple subgroups, but particularly large among “American Indian/Alaskan Native” students (i.e., 10.8%), White students (i.e., 10.2%), and African-American students (i.e., 7.9%). In contrast, the declines in public school enrollment were comparatively modest among students identified as Asian (i.e., 2.3%) and Hispanic (i.e., 2.7%). Completely accurate data on 2022/23 enrollment by these demographic traits are not yet available due to an unaddressed anomaly in the “Not Reported” group.

Figure 7 — Year-to-year percent change public-school enrollment in California by charter status, 2019/20 to 2022/23.

The pandemic disruptions to education may also differ meaningfully by school context. Figure 7 provides some evidence on this question by reporting the annual enrollment declines across traditional (i.e., non-charter) public schools and public charter schools for each of the three pandemic school years. These results indicate that the decline 28
in public-school enrollment was highly concentrated in traditional public schools, where enrollment declined in each of the three years. Overall, enrollment in traditional public schools fell by nearly 6% during this period. In contrast, charter-school enrollment grew in two of these three years. And overall, charter-school enrollment grew by 1.5% over these three pandemic school years (i.e., despite the declines in the state’s school-age population). Critically, this differentiated pattern indicates that, during the pandemic, charter and non-charter public schools differed in their capacity to meet the needs and expectations of the public-school parents they serve.

The public-school enrollment declines in California also differed substantially by place. For example, on the eve of the COVID-19 pandemic, a single school district in California—Los Angeles Unified (LAUSD)—taught nearly 10% of all the public-school students in the state. Between 2019/20 and the 2022/23, LAUSD lost students at nearly twice the rate as the state (i.e., 10% decline). Stated differently, nearly 20% of the enrollment decline in the entire state over this period was in LAUSD alone. Another district of note—Oakland Unified School District (OUSD)—similarly lost students at a rate (i.e., nearly 8%) well in excess of the statewide rate of 5% over the 2019/20 to 2022/23 period.

Overall, the enrollment data indicate (1) that the pandemic created significant disruptions in the learning opportunities available to California’s students; (2) that these disruptions were particularly dramatic among younger students, especially those in 29
kindergarten during the onset of the pandemic; and (3) that they likely exacerbated the inequality in educational opportunity.

The large and sustained declines in California’s public-school enrollment have several potentially important but poorly understood implications for the educational development of the state’s children. The available evidence suggests that the policy choices made by the state contributed to these patterns (Dee et al., 2021; Meckler, 2022). For example, in a recent budget presentation, Governor Newsom noted that campus closures during the pandemic “pushed parents to consider alternatives to their neighborhood public school.” The Governor also noted that, because of these enrollment declines, “some school districts over the next few years will be faced with difficult choices to remain fiscally solvent.” The recent, highly controversial decision to close seven schools in OUSD—and the mounting financial pressure to do so in other districts—reflects the fiscal reality of enrollment decline (Gomez, 2022) and underscores the need for public schools to be well supported in order to meet the needs and expectations of parents. The coming expiration of federal support under the Elementary and Secondary School Emergency Relief (ESSER) fund (i.e., the “fiscal cliff”) is expected to add to the financial strain on public schools implied by enrollment loss (Jonas, 2023).

Changes in students’ academic engagement

Two other types of state-sourced data provide complementary insights into how academic engagement among California’s public-school students has changed during the
pandemic. One concerns the “stability” of school enrollment. The CDE designs, collects, and reports this measure in order to understand “whether or not students remained enrolled in the same educational setting for all or a significant portion of the academic year.” The rate of “non-stability” identifies the percent of California public school students enrolled during the academic year who did not complete a full year of schooling in one school. Figure 8 presents the trends in these non-stability measures by grade level and year through the 2021/22 school year. The results indicate that, during the first full school-year after the onset of the pandemic, the youngest students were substantially less likely to have completed a full school year in one school. In particular,
between the 2019/20 and the 2020/21 school years, the non-stability rate among kindergarten students increased by 28% (i.e., an increase from 10% to 12.8%). Similarly, the non-stability rate among students in Grades 1–3 increased by 15% (i.e., from 6.5% to 7.5%). As an interesting contrast, the stability of enrollment at the high-school level improved during the first school year under the pandemic (i.e., a change likely due to poor outside labor-market opportunities). Notably, the non-stability rate of enrollment increased at all grade levels with uniquely strong growth in Grades 7-8 and 9-12. These data suggest that, as most instruction returned to in-person instruction, a large number of students failed to re-engage in their schooling.

California’s data on student absenteeism provide further evidence on how the pandemic significantly disrupted the learning experiences of public-school students. Specifically, one key measure of academic engagement is the rate of chronic absenteeism—missing 10% or more of school days. The CDE does not report such attendance data for the pandemic-disrupted 2019/20 school year. However, prior to the pandemic, the chronic-absenteeism rate was 11-12% (Figure 9). However, in the 2020/21 school year, chronic absenteeism among enrolled students jumped to 14.3%
Figure 9—Chronic absenteeism rate in California public schools by year. (Figure 8), an 18.3% increase relative to the 2018/19 school year. In the 2021/22 school year (i.e., when most students returned to in-person instruction), chronic absenteeism more than doubled to 30% (i.e., an extraordinary one-year growth of more than 100%). Both this finding and the parallel increase in the instability of enrollment underscore serious problems with the academic recovery of California’s students. Specifically, it suggests a large-scale failure among many students to re-engage in their education. This evidence severely constrains both current opportunities to restart academic progressions and any efforts designed to promote academic recovery (e.g., tutoring).
State responses to the pandemic declines in enrollment

The state of California described the key elements of its broad responses to the educational challenges caused by the COVID-19 pandemic in outlining its plan (https://edurecoveryhub.org/explore-state-plans/) for using Federal resources available under the American Rescue Plan Elementary and Secondary School Emergency Relief Fund (ARP ESSER). In particular, the state identified three sets of strategies that it claimed “have been most effective in supporting the needs of students in California during the COVID-19 pandemic.” These strategies consisted of (1) “guidance, resources, and flexibility” provided to school districts in support of effective distance learning; (2) expanding access to broadband internet and relevant devices; and (3) guidance to districts “to support the safe return to in-person learning.”

Whether the state strategy of supporting local efforts and expanding internet access has actually been effective is at best uncertain. Overall, the substantial and sustained disenrollment from California’s public schools provide compelling evidence that a substantial number of parents and caregivers found these state initiatives inadequate. Tracking the expenditure of COVID-related resources provides another second set of indicators. Notably, the vast majority of the federal resources made available for California schools remains unspent. Specifically, tracking data collected by the Edunomics Lab at Georgetown University indicate that less than half of California’s ESSER allocation (i.e., over $20 billion) had been spent, though these awards have a 34
“use-it-or-lose-it” deadline of September 2024 (Roza and Silberstein, 2022). State monitoring of whether these resources are spent well also appears to lack transparency. For example, under the American Rescue Plan, states must spend 20% of the third (and largest) round of ESSER funding to address learning loss. And the CDE requires districts to identify what strategies they funded with these resources. However, these data indicate that relatively little was spent on expanding learning opportunities (e.g., longer school days or year, summer learning opportunities), while 78% of spending was simply designated as “other” (Roza and Silberstein, 2022).

A third set of relevant indicators concerns the safety of school facilities. Data on California’s school facilities collected just prior to the pandemic indicate that 38% of students attended schools that failed to meet minimum facility standards (Gao and Lafortune, 2020). Similarly, a pre-pandemic study by Chan et al. (2020) found that only about 15% of classrooms met state ventilation standards. Early in 2021, the costs of ventilation upgrades were characterized as “insurmountable” for some districts, while the newly available funding sources were described as “not adequate to fix all the antiquated or broken ventilation systems in California’s 10,000 schools” (Rosales and Jones, 2021). Similarly, a recent study by Lafortune and Gao (2022) concluded that “California’s K–12 school facilities require significant new and ongoing investments to address aging infrastructure.” Additionally, the California State Auditor (https://www.auditor.ca.gov/reports/2021-115/index.html) recently estimated that the 35
state will need to provide $7.4 billion in additional funding to meet the “modernization requests” made by school districts.

A fourth set of indicators concerns the state’s success in promoting the device and internet access necessary to support effective distance learning. While there appears to have been some early success in reducing the “digital divide” during the early stages of the pandemic, substantial differences remain. In particular, Hayes and Gao (2022) report that, in California, “forty-one percent of low-income households still do not have full digital access to both the internet and a device for educational purposes.” In 2020, the California Department of Education launched the “Digital Divide Innovation Challenge,” a $1 million contest to “spur innovation that could provide broadband to the 20% of California’s student population who lack high-speed internet access at home” (Jones, 2023). After two years, the state has acknowledged no winners, and the contest was deemed “a bust” and closed. Reporting indicate that the state’s management of the contest “left contestants frustrated and disillusioned by bureaucratic delays, bad communication and what appeared to be a focus on public relations rather than public good” (Tucker, 2023).

Information on direct state efforts to understand and to address the dramatic disenrollment from California’s public schools and the reduced attendance among enrolled students appears to be far more limited. For example, recognizing the challenge of sustaining student engagement during the pandemic, the CDE announced in late 2020
the creation of a “Family Engagement Unit” that would work with school districts to support attendance outreach. However, comprehensive information on the staffing and subsequent activities of this unit are not readily available.

What information is available suggests that the activities of the CDE’s Family Engagement Unit have been modest at best. For example, in a deposition conducted on October 27, 2021, Mary Nicely, the chief deputy superintendent to the superintendent of public instruction in California, noted that this unit consisted of only three people. Ms. Nicely also described an ad-hoc effort in late 2020 to understand the causes of absenteeism by conducting phone calls to what appears to be a convenience sample of families in late 2020. She noted that 500–600 phone calls were made, but it was unclear whether this effort began with a clear sampling design or was conducted with structured survey or interview protocols. Also, to place the scale of this CDE effort in perspective, it should be noted that nearly 867,000 public-school students in California were chronically absent at this time.

In general, California’s state-level responses to the educational challenges of the pandemic placed a heavy and explicit emphasis on local control and on simply guiding and supporting the academic-recovery efforts of local school districts. However, the character of the academic-recovery challenges documented here underscore the need for active state leadership and coordination. In particular, state data systems and resources are better positioned than those of any school district to meet the current challenges.
These include (1) understanding what enrollment loss implies for the learning trajectories of California’s children (e.g., truancy, skipping kindergarten); (2) supporting districts as they anticipate the “fiscal cliff” of expiring federal aid; and (3) responding to the challenge of the unprecedented increase in chronic absenteeism as schools returned to in-person instruction. However, state efforts appear to have been quite modest. On April 20, 2022 (i.e., over two years into the pandemic), Tony Thurmond, the state Superintendent of Public Instruction, announced the formation of a task force with what appears to be an otherwise unstructured charge to offer recommendations on declining enrollment and to provide technical assistance to school districts. The activity of the task force is unclear, though the state did recently host a webinar on how districts could address enrollment loss. However, this guidance (e.g., dual-immersion programs, marketing to families) did not appear to be based on evidence-based insights about why this enrollment loss occurred.

RECOMMENDATIONS

The broad and sharp decline in California’s public-school enrollment during the pandemic indicates that parents found the quality and accessibility of the schooling available to their children sufficiently problematic that they were willing to leave. This leading indicator also provides compelling, objective, and representative evidence on the possible disruptions to students’ educational opportunity (e.g., skipping or delaying kindergarten, switching schools, possible truancy, and unregistered homeschooling) and
strongly indicates the need to provide schooling environments that safely meet children’s developmental needs and that remediate the harm done during the course of the pandemic. The evidence presented here and the related concerns they raise combine with the available research literature on effective policy responses to motivate several more specific recommendations.

First, the fact that the enrollment declines in California’s public schools are likely to be long-lived (e.g., beyond the expiration of recent and largely unspent pandemic-related federal funding) implies imminent policy challenges that merit careful state-level attention. In particular, the mechanical decline in state funding for public schools in response to enrollment declines will place unusual financial pressure on school districts, which have fixed costs that do not vary with student enrollment. For example, smaller schools face particular financial challenges in providing an adequate education because teachers and support staff are more likely to need the training and support to take on additional functional responsibilities and because most administrative costs are fixed (Levin et al., 2018). An increasing number of school districts are also likely to experience financial pressure to go so far as to close under-enrolled schools. The political backlash to such school closures underscores how such closures can be acutely harmful to communities. Furthermore, the available research literature suggests that such school closures can be detrimental to the development of educationally vulnerable students who experience schooling disruptions and are often redirected to low-performing schools.
(e.g., Gordon et al., 2018). Active and informed state policymaking to support and guide school districts through these challenges is likely to be important in the near future.

Second, a vitally important complement to virtually all efforts to support student excellence in response to the COVID-19 pandemic is a detailed, data-driven state effort to understand the character of student needs and experiences. This recommendation parallels a similar recommendation from the director of the federal Institute of Education Sciences (Schneider, 2020) who noted: “Accurate and timely information about schools, schooling, and student achievement is critical to both data-driven policymaking and education R&D that meets the needs of students, their families, and their communities. Data collection must be dynamic and local: learning losses are not evenly distributed across the education system, nor are the systemic challenges millions of students face, such as uneven connectivity, inconsistent transportation, and, of course, health disparities. Each of these needs must be understood for effective response and recovery.”

More specifically, the available evidence strongly indicates that students have experienced substantial disruptions in their learning opportunities. However, important questions about the exact nature of the challenges that students have faced remain uncertain. One particularly notable example involves what has happened to the many students, particularly the youngest learners, who did not enroll in public schools during the pandemic. Understanding their experiences (e.g., skipping or delaying kindergarten, finding other accommodations in private or home schools, truancy) is critical for meeting
their individualized learning needs. The fact that half of the state’s public-school enrollment decline cannot be explained by population loss or the increase in nonpublic schooling underscores particularly salient questions (Dee, 2023). This large number of “missing” students could reflect truancy, unregistered homeschooling, and an increased tendency to skip kindergarten. Notably, these poorly understood aspects of the pandemic’s harm to education currently fall outside most academic-recovery initiatives because they involve students who are not necessarily reflected in current data systems.

The pandemic has exposed our existing data systems as inadequate with regard to this challenge. The CDE is in a uniquely propitious position to provide actionable information on this issue (i.e., relative to locally controlled school districts) because of its statewide perspective and its management of a student-level longitudinal data system that can track students who move to other school districts. Another critical data need involves the availability of valid and reliable data on students’ socioemotional wellbeing. Through its compliance with the federal Every Student Succeeds Act (ESSA), the state already engages in data collection along such domains. However, the pandemic has created a need for systems that guide responses to our current challenges in a timelier manner.

Third, informed by new and timely data, an ambitious, multi-faceted, and goal-oriented effort to remediate the educational harm caused by the pandemic is necessary. Recent research commentaries have identified several promising strategies to
achieve these goals with a particular, but not exclusive, emphasis on the promise of high-quality tutoring (e.g., Dadisman and Schneider, 2020). There is also a likely role for expanding the learning time available to students through extended school years and summer learning programs. Another promising strategy emphasizes a renewed focus on improving the quality of classroom instruction with an emphasis on high-quality curricula and a commitment to engaging, grade-level instruction (e.g., Sawchuk, 2020). Education technology can also play an important, supporting role because of its comparative capacity to scale both affordably and with fidelity. More specifically, two broad types of education technology have comparatively strong research base supporting their efficacy (Escueta et al., 2020). One involves computer-assisted learning (CAL), which works particularly well in math, when it provides individualized feedback and when it supports teacher practice in engaging students. The second involves behavioral interventions (e.g., SMS-based nudges and reminders) that promote sustained student and parental engagement. A broad effort on understanding and promoting student engagement is particularly salient given the unprecedented increase in chronic absenteeism (e.g., the possible role of deteriorating youth mental health). Indeed, the failure of many students to re-engage fully in school during the return to in-person instruction is a fundamental impediment to all other efforts at academic recovery (e.g., extended learning time, tutoring, curricular reforms, etc.).
provide proper ventilation and filtration will also be important in allowing public schools to meet the developmental needs of children and the expectations of parents while simultaneously minimizing future public-health risks. A recent federal report (Nowicki, 2020) found that over 40% of school districts need to update the heating, air conditioning, and ventilation systems in half or more of their schools. And classroom ventilation appears to play an important role in COVID-19 transmission (Sparks, 2021). However, in California, the resources currently available to schools to meet these infrastructure challenges are viewed as inadequate (e.g., Rosales and Jones, 2021).

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