Differential Student Uptake of In-Person Instruction During the 2020-21 School Year: Evidence from Michigan

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236 ERICKSON HALL, 620 FARM LANE, EAST LANSING, MI 48824 | www.EPICedpolicy.org

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AUTHORS

Bryant Hopkins, *EPIC, Michigan State University*

Katharine O. Strunk, *EPIC Faculty Director, Professor of Education Policy, MSU*

Tara Kilbride, EPIC, *Michigan State University*

ABSTRACT

For most of the 2020-21 school year, Michigan was among the roughly 70% of states that let local school districts, with guidance from local health authorities, determine how and when students were welcomed back into school buildings. Using instructional modality data collected throughout the 2020-21 school year, this paper uncovers not only how district-provided opportunities for in-person and remote instruction varied across Michigan, but how different student groups actually learned during the first full school year of the pandemic and the extent to which family preferences contributed to these outcomes. Our results suggest that many students continued to choose hybrid or remote options even when provided the opportunity to learn in person. Further, we find that student demographics, urbanicity, and county-level political affiliation were all strong predictors of uptake of in-person versus remote instruction, while the relationships between uptake and county-level COVID-19 infection and death rates were generally not significant.

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1. INTRODUCTION

For most of 2020-21 school year, local school district administrators were tasked with making difficult decisions about whether and when to offer in-person or remote instruction (e.g., Grossman et al., 2021; Burbio, n.d.). A growing literature has documented that this local control over reopening decisions led to clear disparities in access to in-person instruction, particularly as historically underserved students and those in urban areas were considerably more likely than their higher-income, White, and/or rural peers to be enrolled in districts operating remotely (Burbio, n.d.; EdWeek, 2020; Gross et al., 2021; Haderlein et al., 2021; Harris & Oliver, 2021; Hartney & Finger, 2020; Marianno et al., 2022; Oster et at., 2021). In light of mounting evidence that remote learning was detrimental for students' learning, socioemotional development, and mental health (e.g., Baron et al., 2020; Bauer, 2020; Golberstein et al., 2020; Hawrilenko et al., 2021; Kilbride et al., 2022; West & Lake, 2021), reopening decisions across the country have been critiqued for potentially restricting students' access to in-person learning during the 2020-21 school year and exacerbating already existing disparities in educational opportunities and success between students of color and low-income students and their white and wealthier peers (e.g., Hutchinson, 2020; Pollock & Swaby, 2020; NASEM, 2020; Tingley, 2020).

However, differential receipt of in-person learning during the 2020-21 school year was not only a result of local decision-making. Survey data collected throughout the 2020-21 school year suggest that parental and familial choices also drove students' receipt of in-person instruction, with lower-income, urban, and families of color more frequently expressing preferences for remote learning in order to keep their children, families, and communities safe (Calarco et al., 2021; Camera, 2021; Camp & Zamarro, 2021; Cotto Jr. & Woulfin, 2021; Kogan, 2021; Parolin & Lee, 2021). If families' preferences were in part

responsible for the extent of remote learning that took place in 2020-21, it may be that critiques of local school districts are at least partially misplaced.

Given the intense politicization of school reopening decisions and the attribution of blame to local and state decision-makers for the harms caused to students during the pandemic (Chicago Tribune, 2020; Mahnken, 2020; Silva, 2020; Winter 2022), it is important to try to disaggregate the factors that led to remote learning. Doing so will enable a more nuanced and thoughtful conversation about what happened during the 2020-21 school year, and what kinds of understanding and communication must be fostered in the event of future concerns about student health and safety in schools. However, few studies have disaggregated preference-driven uptake from constrained access to in person learning. In the studies that do, many of the demographic and socioeconomic disparities in receipt of in-person instruction are attenuated when accounting for districts' offers of multiple modalities (Calarco et al., 2021; Camp & Zamarro, 2021).

In this paper, we investigate inequalities both in access (districts' offerings) and in uptake (families' preferences) of different instructional modalities (e.g. in-person, remote, or hybrid). We link monthly modality data for Michigan school districts to other district and community characteristics to answer three key questions: 1) *How did Michigan students' access to different instructional modalities change throughout the 2020-21 school year?*; 2) *How did the proportion of students who had access to, received, and selected each modality vary across districts with differing student populations?*; and 3) *What district- and community-level characteristics are related to uptake of each modality given that many students and families had the option to choose their instructional modality?*

Our results suggest that the choices to provide and to receive schooling through different modalities were complex and changed quickly during the school year. Between September 2020 and May 2021, the share of Michigan districts that offered fully in-person instruction increased and those that only offered fully remote instruction decreased. While these trends signal an increase in the total number of districts that *offered* students the opportunity to learn in person, they do not reflect *actual* student uptake for each mode. Rather, we find that many students continued to choose hybrid or fully remote options even when provided the opportunity to learn fully in person. Further, students in wealthier, Whiter, and rural districts were all significantly more likely to be offered *and* to opt in to fully in-person instruction, whereas students in lower-income districts, districts with larger Black student populations, and urban districts were all more likely to be offered *and* to opt into fully remote instruction. Finally, our regression analyses show that student demographics, urbanicity, and county-level political affiliation were all strong predictors of uptake of in-person versus remote instruction, while the relationship between uptake and county-level COVID-19 infection and death rates were generally not significant.

BACKGROUND

Many studies have and will continue to try to understand the impact of the pandemic on student outcomes (e.g., Cohodes et al., 2022; Curriculum Associates, 2021; Kuhfeld et al., 2020; Lewis et al., 2021; Kilbride et al., 2022). To answer this question, it is critical to understand what opportunities were provided to students during the 2020-21 school year. Several studies have tried to address this question by using nationally representative samples to document trends and disparities in access to different instructional modalities during the 2020-21 school year. In general, these studies find that districts became less reliant on remote instruction over the course of the school year, and a majority offered students the option to learn in person by the spring of 2021 (e.g., Burbio, n.d.; EdWeek, 2020; Gross et al., 2021; Oster et at., 2021).

In addition to identifying trends in what opportunities were provided to students, studies also have documented what district and community characteristics were correlated with reopening plans during the 2020-21 school year. Most of these studies utilize cross-sectional data collected at a single time point during the school year, with clear patterns emerging. For instance, district-level student demographic characteristics were highly associated with reopening decisions; districts with larger Black, Latino, and lower-income student populations were more likely to educate students remotely compared to districts with larger White and advantaged student populations (Haderlein et al., 2021; Harris & Oliver, 2021; Hartney & Finger, 2020; Marianno et al., 2022). Districts in counties with larger shares of Republican voters were also more likely to provide in-person instruction while districts with stronger teachers' union typically provided only fully remote instruction (DeAngelis & Makridis, 2021; Grossman et al., 2021; Harris & Oliver, 2021; Hartney & Finger, 2020; Marianno et al., 2022; Valant, 2020). COVID-19 incidence was not a significant deterrent to districts offering in-person instruction (DeAngelis & Makridis, 2021; Hartney & Finger, 2020; Marianno et al., 2022; Valant, 2020), however, two studies found that districts in counties with higher COVID-19 positivity or case rates were more likely to offer fully remote instruction rather than bring students back to school buildings, although COVID risk appeared to be less influential in re-opening decisions than some other factors (Grossman et al., 2021; Harris & Oliver, 2021).

While informative, these types of analyses may not uncover disparities in students' true opportunities to learn in person. This is because – for a variety of reasons ranging from safety concerns to family and childcare responsibilities – not all students whose districts offered them the opportunity to return to school buildings during the 2020-21 school year chose to do so. A third set of studies has examined *receipt* of each instructional modality and the characteristics of those students, where receipt can be dictated by either the provision of or selection into different modalities (e.g., see Collins, 2021; Cotto Jr. & Woulfin, 2021; and Dee et al., 2021). These studies show that non-White, urban, and low-income students, as well as those in large districts, were

considerably more likely to learn remotely rather than in person during the 2020-21 school year (Camera, 2021; Camp & Zamarro, 2021; Kogan, 2021; Parolin & Lee, 2021).

Some of the studies examining receipt do so through the lens of parental preferences for each instructional modality. The importance of parental preferences in modality decisions were immediately made clear at the start of the 2020-21 school year when families had to decide if they would enroll their children in public schools. In fall 2020, overall public school enrollment declined in Michigan and across the country, with particularly low enrollment in early grade levels compared to previous school years (Dee et al., 2021; Musaddiq et al., 2021). For those students that continued in public education, multiple studies highlight racial/ethnic and socioeconomic disparities in hesitancy to return to the classroom for in-person instruction. In line with previous results surrounding receipt of different modalities, Black and Latino parents were more likely than White parents to prefer their children learn remotely (Calarco et al., 2021; Camp & Zamarro, 2021; Cotto Jr. & Woulfin, 2021; Kogan, 2021). Similarly, lower-income parents who were either unemployed or not employed full-time were more likely to prefer that their child learn remotely given their ability to support their student's learning outside of the classroom or inability to afford childcare (Calarco et al., 2021; Cotto Jr. & Woulfin, 2021). However, observed racial/ethnic and socioeconomic disparities in preferences for in-person or remote instruction dissipated over the 2020-21 school year as districts increasingly offered fully in-person instruction (Calarco et al., 2021; Camp & Zamarro, 2021; Kogan, 2021).

The consequences of the instructional modality students experienced during the 2020-21 school year are becoming more broadly understood, and they appear to be substantial. Students who received more in-person instruction learned more during the 2020-21 school year compared to students participating in virtual instruction (e.g., Cohodes et al., 2022; Goldhaber et al., 2022). For instance, Kilbride, Strunk, Hopkins, and Imberman (2022) and Sass and Goldring (2022) show that in Michigan and Georgia, respectively, students learned more each month they were enrolled in or their district offered in-person instruction. School building closures and remote instruction also had a negative impact on youth health outcomes. Students learning remotely suffered worse physical, cognitive, and emotional health relative to their peers (Baron et al., 2020; Golberstein et al., 2020; Hawrilenko et al., 2021; Gross & Lake, 2021). They also exhibited worsening behavioral problems, increased rates of suicide risk, higher rates of domestic and child abuse, and increased food insecurity as parents lost employment and students had less access to school meal programs (Bauer, 2020; Campbell, 2020; Lee et al., 2021).

In summary, the extant research suggests that districts' provision of different instructional modalities mattered for disparities in students' receipt of varied modalities of instruction, but that families' preferences likely contributed as well. However, little is known about the extent to which each factor played a part in students' instructional experiences during the 2020-21 school year. Given the

substantial consequences associated with learning remotely, and doing so for greater periods of time, it is critical to better understand the extent to which family preferences relative to district decision-making led to students' receipt of various kinds of instructional modalities. With this knowledge, policymakers will be better able to target solutions in the future, if – and when – we are faced with similar concerns about the safety of K-12 students learning inside school building.

DATA AND METHODS

We use multiple data sources to assess student uptake of each instructional modality offered by Michigan districts during the 2020-21 school year, where we define *uptake* as families' decisions to enroll in each modality *when given multiple options*. This differs from most other studies' measurement of receipt because we account for the fact that students cannot select, or opt in to, a modality if the district is not offering it. Primarily, we rely on districts' responses to the Reconfirmed Extended COVID-19 Learning Plan Monthly Questionnaire collected by the Michigan Department of Education (MDE) and Center for Educational Performance and Information between September 2020 and May 2021. Most Michigan school districts (*N*=814, 92% of all Michigan school districts) were required to submit responses to the questionnaire, including 537 traditional public school districts and 277 charter school districts.[1]

Instructional Modality

District Offers

In order for the state to track student's access to each instructional modality, districts were asked to indicate if they planned to provide instruction to K-12 students in a fully in-person, fully remote, or hybrid format (students attend school in person and participate in remote instruction for part of the school day or week) for each month of the 2020-21 school year.[2] The majority of districts planned to give families a choice between two or more modes of instruction, thus, the questionnaire allowed responding districts to identify more than one modality. We use this information to group districts into five mutually exclusive categories each month: fully in-person only, fully in-person option, hybrid only, hybrid option, and fully remote only. Fully in-person only, hybrid only, and fully remote only districts indicated that they planned to offer only those modalities to all students, respectively. "Fully in-person option" districts indicated that they planned to provide fully in-person instruction to some students and hybrid or remote instruction to others. Similarly, "hybrid option" districts planned to provide hybrid instruction to some students and remote instruction to others.[3]

Student Receipt

The questionnaire also captured data that enabled us to calculate measures of student receipt and uptake of each instructional modality when more than one modality was offered. Districts were asked to estimate the percentage of students to whom they planned to provide each specific modality (asked in ranges of 1-24%, 25-

49%, 50-74%, 75-99%, and 100%), thus differentiating between the offer of each modality and estimated student receipt. We combine these responses with district-level enrollment counts to estimate the share of students that received each instructional modality. For districts that indicated all students received a single modality, we count their entire enrollment in the selected modality. For districts that planned to offer families the choice between instructional modalities or to provide different subsets of students with different instructional modalities (e.g., by grade level), we divide total district enrollment based on the indicated percentage range of students receiving each modality. For example, if a district with 1,000 students indicated that they planned to educate 25 to 49% of their students in person and 50 to 74% remotely, we allocate 250 to 490 students and 500 to 740 students to each modality, respectively.

Student Uptake

Finally, we calculate average uptake by dividing the average estimated percentage of students who opted into each modality (i.e., the estimated range of students that received each modality, excluding those without a choice) by the percentage of students offered multiple modalities (i.e., the percentage of students offered at least two options). As an example, consider a month where 100% of students were offered remote instruction, 24% of students were only offered remote instruction, and 44 to 62% of students received remote instruction. In this instance, the average estimated percentage of students who opted into remote instruction equals 29% (calculated by subtracting 24 from the average of 44 and 62) and the percentage of students offered remote instruction in addition to one or more other modalities is 76% (calculated by subtracting 24 from 100). Thus, average uptake of remote instruction equals 38% (i.e., 29 divided by 76).

Resources for Students Learning Remotely

Given the challenges of educating students remotely, many school districts across Michigan offered additional resources and supports to aid students receiving instruction outside of the traditional classroom setting. Districts were required to provide information about some of these resources in their questionnaires each month, including whether districts provided fully remote students at each grade level with electronic devices, Wi-Fi hotspots, broadband internet subscriptions, or access to facilities where students can use district-provided technology or get assistance from a teacher to complete remote work. We create indicators from these data that identify districts that planned to offer each resource to at least one grade level in each month and use them to investigate how these offers influenced estimated student uptake of different modalities.

District and Community Characteristics

To understand how the offer, receipt, and uptake of different instructional modalities differs across districts and the communities they serve, we match district

modality plans to district- and county-level datasets that include measures of demographic, economic, and political contextual factors that likely influence modality decisions by districts and families. Given the documented relationships between sociodemographic characteristics and modality decisions at both the student and district levels, we merge district modality plans with administrative data from MDE to estimate the relationships in Michigan. These district-level data include indicators for urbanicity (i.e., urban, suburb/town, rural), as well as total enrollment and specific student counts by race/ethnicity and economically disadvantaged,[4] special education, and English learner status, which we use to create district-level student shares for each subgroup. Since district modality offerings were often tied to community incidence of COVID-19, we also link district modality plans with daily counts of county-level COVID-19 cases, deaths, and vaccinations collected and distributed by the Michigan Department of Health and Human Services. For cases and deaths, we calculate 7-day average rates per 100,000 residents for the first day of each month. Similarly, we calculate the cumulative number of COVID-19 vaccination administered per 100,000 residents on the first day of each month.

Finally, we match our modality data to county-level measures of broadband internet access and individual poverty rates from the 2014-18 American Community Survey (ACS), the 2019 unemployment rate from the U.S. Bureau of Labor Statistics, and 2016 presidential election returns from MIT's Election Data and Science Lab. Our measure of broadband internet access helps us estimate the share of students in a district with sufficient access to the internet if they opted to learn remotely. Similarly, the unemployment and individual poverty rates provide information regarding parents' ability to support and/or monitor students during remote schooling (e.g., ability to afford additional tutoring or childcare while at work). Given the contentious political debates surrounding school reopenings, including the presidential election returns approximate political attitudes across Michigan and the share of students who may be willing to return to school buildings to receive in-person instruction.

Summary Statistics

Table 1 shows average district-level summary statistics for all districts that completed the monthly questionnaire (Column 1), as well as separately for those that indicated they planned to offer in-person, hybrid, or remote instruction for a majority of the 2020-21 school year (Columns 2-4; these categories are not mutually exclusive as districts could offer multiple modalities each month). Column 1 shows that, on average, districts offered in-person instruction for 62%, hybrid for 32%, and remote instruction for 93% of the school year. As seen in columns 2 through 4, districts that offered a given modality for the majority of the school year by definition offered that modality for large proportions of that year. Additionally, districts consistently offered remote instruction as at least an option (each modality type district offered remote instruction for at least 94% of the year).

There are also notable district- and county-level differences across districts offering different instructional modalities. As has been shown in other studies, districts that predominantly offered in-person instruction have smaller shares of Black and economically disadvantaged students compared to districts that predominantly offered hybrid or remote instruction. In particular, the share of Black students in predominantly in-person districts (10%) is approximately half as large as similar shares in districts that offered hybrid or remote instruction for a majority of the 2020-21 school year (17% in hybrid and 21% in remote). Districts that offered in-person instruction for most of the year also tend to be less urban, more rural, and have a larger share of the population who voted for Donald Trump in the 2016 election.

Regardless of the instructional modalities offered, districts indicated that they planned to provide students with electronic devices (92 to 95%) for most of the school year. For internet access, districts were considerably more likely to provide students with Wi-Fi hotspots (69 to 77%) over broadband internet access (10 to 11%). Students were given access to facilities where they can use technology provided by the district (27 to 32%) or get assistance from a teacher to complete remote work (41 to 48%) for less than half of the school year.

Methods

In the discussion of our state-level results (Tables 2 through 4), we focus on disparities across three district characteristics: the share of students who are economically disadvantaged, the share who are Black, and urbanicity. We focus on these characteristics for descriptive study because districts with different modality types vary the most across these characteristics and the characteristics have been broadly discussed in the extant literature (e.g., see Collins, 2021; Cotto Jr. & Woulfin, 2021; and Dee et al., 2021). Using information in the MDE administrative data and ACS, we classify districts into "low," "medium," and "high" categories based on the distributions of each characteristic and compare student uptake of each instructional modality across districts in the lowest ("low") and highest quartiles ("high"). Similar analyses examining modality uptake for districts with varying shares of Latino or Asian students, total enrollment, and rates of broadband internet access are presented in Appendix Tables A2 through A5. We do not provide them in the main text because the Latino and Asian student populations in Michigan are relatively small compared to the Black student population, the distribution of economically disadvantaged students is generally consistent with broadband internet access, and enrollment maps strongly to urbanicity.

Within each analysis, we provide five unique values that describe offers, receipt, and uptake of each modality: *only option,* the percentage of Michigan students who were only offered a single mode of instruction and could not choose; *offered,* the percentage of students offered each modality; *minimum and maximum receipt,* the minimum and maximum estimated percentages of students receiving each modality (because districts provided estimates of student receipt in ranges); and *average uptake*, the

average proportion of students who opted in to each modality considering the options given to them.

We focus our regression analyses on *uptake*, as this is the key indicator of interest in our study and the one about which we know the least given the extant literature base. We assess the relationship between uptake of each instructional modality and different district- and community-level characteristics by estimating:

$$Y_{mdt} = \alpha + \boldsymbol{\beta_1 DCHAR_{dt}} + \beta_2 Offer2_{dt} + \beta_3 Offer3_{dt} + \boldsymbol{\beta_3 COVID_{c,t-1}} + \beta_4 PA_c + \boldsymbol{\beta_5 CCHAR_c} + \boldsymbol{\beta_6 Resources_{dt}} + \delta_t + \epsilon \quad (1)$$

where Y_{mdt} represents uptake of modality *m* (i.e., in-person, hybrid, or remote instruction) in district, *d*, and month, *t*. In this district-level analysis, we define uptake for each modality as the midpoint in the estimated range of students receiving each modality. For example, if a district indicated that 75 to 99% of their students would receive a particular modality, uptake for that modality would be 87%.[5] Uptake of modality *m* equals 100% in districts that only offered that modality. $DCHAR_{dt}$ is a vector of district-level characteristics (i.e., percent of students in a district by race/ethnicity, economically disadvantaged status, special education status, and English learner status, as well as indicators for urbanicity), where each coefficient in β_1 tells us how uptake of modality *m* would change given a percentage point increase in each student population or a hypothetical change in the district's urbanicity. $Offer2_{dt}$ and $Offer3_{dt}$ are indicators identifying districts that chose to offer one or both of the other instructional modalities not described by Y_{mdt}, and β_2 and β_3 estimate the change in uptake if districts offered students a choice between instructional modalities. $COVID_{c,t-1}$ is a vector of COVID-19 cases, deaths, and vaccinations per 100,000 residents from the first day of the previous month. The coefficients in β_3 summarize the change in uptake of modality *m* given a one unit increase in COVID-19 cases, deaths, or vaccinations per 100,000 county residents. PA_c indicates "party affiliation" and is proxied by the percentage of individuals in a county that voted for Donald Trump, the Republican candidate, in the 2016 presidential election. β_4 is interpreted as the change in uptake if Trump's vote share increased by one percentage point. $CCHAR_c$ is a vector of county-level characteristics (i.e., 2019 unemployment rate and individual poverty rate) and the coefficients in β_5 represent the change in uptake associated with a percentage point increase in the unemployment or individual poverty rate. $Resources_{dt}$ is a vector of indicators for the additional resources that districts could provide to remote students during the 2020-21 school year, allowing us to interpret the elements of β_6 as the change in uptake given the offer of each specific resource. Finally, δ_t is a month fixed-effect and ϵ is an error term clustered at the county level in order to correct for potential correlations in the errors among districts within counties. We estimate model 1 separately for each instructional modality using samples of districts that offered in-person, hybrid, or remote instruction in a given month. In other words, all district-month observations where a district offered in-person instruction are included in the "in-person sample." If a district did not offer in-

person instruction in a particular month, that district-month observation is not included in the sample.

RESULTS

How Did Michigan Students' Access to Different Instructional Modalities Change Throughout the 2020-21 School Year?

Figure 1 answers our first research question, showing the distribution of districts' planned instructional modalities for the 2020-21 school year, as well the proportion of students enrolled in districts offering each modality. In September, three quarters of all school districts (75%) planned to offer some amount of in-person instruction (58% fully in-person only or fully in-person option; 17% hybrid only or hybrid option), increasing to 84% by November. At the same time, nearly one-quarter (23%) of districts planned to provide only fully remote instruction in September, and that share decreased to 16% through November. There were significant fluctuations in the percentage of districts offering in-person instruction between December and March because of an executive order at the end of the fall semester mandating a return to remote learning for at least high school grades following a state-wide increase in COVID-19 infection rates[6] and policy incentives in the spring that required districts to provide of at least 20 hours a week of in-person instruction (2021 PA 3). By May, 74% of districts planned to offer fully in-person instruction, 19% planned to offer hybrid instruction, and only 5% planned to offer only fully remote instruction.

We can get an initial sense of how district offerings might translate into opportunities for students' in-person learning by examining the bottom panel of Figure 1, which shows the proportion of students enrolled in districts offering each modality. In September, the 56% of Michigan districts that planned to offer fully in-person instruction were typically smaller than average and educated only 47% of students across the state. Conversely, 35% of Michigan's student population was enrolled in the 23% of districts offering remote only instruction at the start of the year. By May, this was no longer the case, largely because most of the remaining remote-only districts were charter schools with fewer students compared to traditional public schools. Specifically, the 74% of districts planning to offer fully in-person schooling in May enrolled 73% of Michigan's student population, while the 19% and 5% of hybrid and fully remote districts educated 23% and 3% of Michigan students, respectively.

How Did the Proportion of Students Who Had Access to, Received, and Selected Each Modality Vary Across Districts With Differing Student Populations?

Notably, the bottom panel of Figure 1 does not reflect actual uptake for each modality. If policymakers relied on this figure alone, they would see an overly optimistic picture

of the number of Michigan students who received in-person instruction during the 2020-21 school year. Figure 2 uses the district-provided approximate percentages of students that received each modality in each month to estimate the share of all Michigan students that received each instructional modality. The ranges depicted in Figure 2 represent the estimated student shares aggregated from the low and high ends of the percentage ranges indicated by each district.

In September, districts estimated that 25 to 38% of all Michigan students planned to receive fully in-person instruction, increasing slightly in October and November (approximately 28 to 43% across both months). This is substantially lower than the percentage of students that attended districts *offering* fully in-person instruction (47%, 56%, and 55% in each fall month, respectively, shown in Figure 1). By contrast, a greater percentage of Michigan students planned to participate in fully remote instruction throughout the first three months of the school year relative to the percentage of students enrolled in districts offering only this modality, suggesting that more students were selecting to learn in a fully remote setting even if their districts provided the option to participate in in-person instruction. For example, in November, approximately one-third to one-half of students planned to participate in fully remote instruction while only 18% of students attended schools in districts that only offered remote instruction.

By May, between 40 and 57% of all students planned to receive fully in-person instruction. Although this was the greatest proportion of students receiving in-person instruction during the 2020-21 school year, it was still substantially lower than the 73% of Michigan students enrolled in districts that offered the option of fully in-person instruction. At the same time, the proportion of students learning remotely reached its lowest point since the beginning of the 2020-21 school year (between 22 and 42% of all students across the state); however, this was still far greater than the 3% of students that attended districts only offering remote instruction. Finally, across all nine months, hybrid instruction was the least utilized mode of instruction (16 to 27%), but more students enrolled in hybrid modality than were constrained to do so. Together, these results again suggest that students continued to choose hybrid or fully remote options even when provided the opportunity to learn fully in-person.

Tables 2 through 4 begin to answer the critical questions of disparities in students' access to, receipt, and uptake of in-person learning modalities. Similar to Figure 2, these tables use the district-provided approximate percentages of students that received each modality in each month to show how student access, receipt, and uptake of in-person, hybrid, and remote schooling varied across time and across districts with different characteristics.

As described earlier, these tables present five unique values that help us examine student uptake of each instructional modality. With these values, we make multiple observations regarding student modality offers and decisions. First, the percent of

students offered each modality shows what share of students were *offered* the opportunity to learn in each instructional modality. Second, the percentage of students only offered one modality tells us the share of students who *did not have a choice* in how they were instructed. Third, the minimum and maximum estimated percentages of students receiving each modality tell us what share of students *received* each modality. Finally, average uptake tells us the average estimated percentage of students who *chose to* learn in each modality. We use this terminology throughout the discussion that follows.

There are several takeaways concerning the offer, receipt, and uptake of both fully in-person and fully remote instruction. First, across all three tables, students in wealthier (low proportion economically disadvantage), Whiter (low proportion Black student populations), and rural districts were significantly *more likely to be offered* fully in-person instruction compared to students in lower-income districts, districts with larger Black student populations, and urban districts. For example, in May, 80% of students in districts with the lowest economically disadvantaged student populations, 90% of students in districts with the lowest Black student populations, and 84% of rural students were offered fully in-person instruction. At the same time, only 57% students in districts with the highest economically disadvantaged student populations, 55% of students in districts with the highest Black student populations, and 48% of urban students were offered fully in-person instruction. This means that there were wide disparities in the opportunities to learn in-person generated simply by which districts were more likely to offer in-person instruction.

Second, students in wealthier, Whiter, and rural districts were significantly *more likely to receive* fully in-person instruction than were their peers in lower-income districts, districts with larger Black student populations, and urban districts. In May, 48 to 67% of students in districts with the wealthiest student populations, 62 to 82% of students in districts with the lowest Black student population, and 53 to 73% of rural students received fully in-person instruction. In contrast, only 11 to 26% of all students in districts with large economically disadvantaged student populations, large Black student populations, or urban districts received fully in-person instruction.

Notably, however, given the small percentage of students who were *only* offered fully in-person instruction, almost all students that received fully in-person instruction voluntarily *opted* to learn through this modality; on average, 71% of students in districts with low economically disadvantaged student populations, 79% of students in districts with low Black student populations, and 74% of rural students offered multiple modalities *chose to* learn in person. By contrast, since no more than 2% of students in high-share economically disadvantaged, high-share Black, and urban districts were only offered fully in-person instruction, we find that only 34% of students in the lowest-income districts, 32% of students in districts with the largest Black student populations, and 35% of students in urban districts offered multiple modalities *chose to* participate in fully in-person instruction. These trends in uptake of

fully in-person instruction were generally consistent across time and suggest that not only were students in urban districts and districts with the highest proportions of low-income and Black students less frequently offered in-person instruction than their peers in rural districts and districts with the highest proportions of White and wealthier students, they were also less likely to select in-person instruction when offered.

Finally, regardless of district or community characteristics, almost all Michigan students – between 89 and 100% – were at least offered the option to learn remotely each month. Average student uptake of fully remote instruction, however, varied across district type. In May, 48 to 69% of students in low-income districts, 49 to 68% of students in districts with the greatest Black student populations, and 43 to 62% of urban students all received fully remote instruction. Approximately 10% of students in these districts were only offered fully remote instruction; hence, between 53 and 59% of students in low-income, high-share Black, and urban districts with the option to learn in-person or in a hybrid format *chose to* participate remotely. Conversely, only 12 to 33% of students in the state's highest-income districts, 9 to 29% of students in districts with the lowest shares of Black students, and 13 to 34% of rural students received fully remote instruction. Given that only 1% of students in rural districts were only offered fully remote instruction, along with no students in districts with small economically disadvantage or Black student populations, nearly all of these students – a quarter of fewer on average – voluntarily *chose* fully remote instruction. Again, these trends in uptake of fully remote instruction were generally consistent across time and again indicate substantial disparities in not only the provision but also families' selection of remote instruction.

As mentioned above, we present similar analyses for districts with different Latino and Asian student populations, total enrollment, and broadband internet access in the Appendix. In the fall 2020 semester, students in districts with the lowest proportions of Latino and Asian students, smaller districts, and districts with the highest share of households that have broadband internet access were more likely to *choose* in-person instruction compared to students in districts at the opposite end of each distribution. By the spring, however, students in both small and large districts, as well as students in districts with the lowest and highest proportions of Latino and Asian students, were almost equally likely to *choose* in-person instruction in April and May 2021.[7]

What District- and Community-Level Characteristics Are Related to Uptake of Each Modality Given That Many Students and Families Had the Option to Choose Their Instructional Modality?

To further investigate the relationship between student uptake and district- and community-level characteristics, Tables 5 and 6 present estimates for six unique specifications of model 1 which add our district- and community-level characteristics

sequentially. The outcome of interest in Tables 5 and 6 are district-level uptake of in-person and remote instruction, respectively. Similar models where we estimate the relationship between student uptake of hybrid instruction and district- and community-level characteristics can be found in Appendix Table A6.

As seen in column 1of Table 5, several characteristics significantly predict uptake of in-person instruction during the 2020-21 school year. As expected given the discussion above, district-level Asian and Black student shares are both negatively correlated with uptake of in-person instruction; a 10 percentage point increase in either share is associated with an approximately five percentage point decrease in uptake of in-person instruction. We also find that uptake of in-person instruction in rural school districts is more than five percentage points higher compared to suburban districts. Once controlling for other factors, however, being located in a rural area is not significantly associated with in-person uptake, although the coefficients remain positive and substantively meaningful.

Importantly, the specification in column 2 shows that student uptake of in-person instruction decreased when districts offered the choice of multiple instructional modalities. We also find that offering students and families a choice between multiple instructional modalities explains some of the disparities in uptake of in-person instruction seen both in our earlier results and in other research on the topic. In other words, the relationships between in-person uptake and student demographics and geographic location are attenuated when controlling for the offer of other instructional modalities. In particular, the offer of hybrid instruction decreased in-person uptake by 14 percentage points while the offer of remote instruction encouraged an even larger share of students to opt out of in-person instruction (22 percentage point decrease). At the same time, the statistically significant coefficients on district-level Asian and Black student shares remain negatively correlated with in-person uptake (-0.54 and -0.44, respectively), however, each new estimate is slightly smaller than those presented in column 1. The most striking difference when controlling for the offer of other instructional modalities is found among rural districts, where the relationship between being located in a rural area and in-person uptake is approximately half as large previously estimated (5.37 compared to 2.75). This suggests that when students in rural areas were offered the option to learn in a hybrid or remote modality, many students elected to do so.

Columns 3 and 4 add our lagged measures of COVID-19 case and death rates per 100,00 individuals, cumulative vaccines administered per 100,000 individuals, and our proxy for party affiliation – Trump's 2016 vote shares. Across both specifications, we find that party affiliation is a significant predictor of in-person uptake while COVID-19 incidence is not. Specifically, districts in counties with higher vote shares for Donald Trump in the 2016 election had higher uptake of in-person instruction compared to more Democrat-leaning counties: a 10 percentage point increase in Trump vote share is associated with a five percentage point increase in uptake of in-person instruction. Similar to the

previous specification, district-level Asian and Black student shares remain statistically significant, yet smaller, predictors of in-person uptake. However, in columns 3 and 4, our estimates for urban and rural districts are imprecisely estimated and statistically insignificant, suggesting that party affiliation more than geographic location predicted students' choices to learn in-person during the 2020-21 school year.

Finally, column 5 includes our county-level measures of unemployment and the individual poverty rate, while column 6 also adds the vector of indicators for the additional resources that districts could provide to students learning remotely during the 2020-21 school year. Across both specifications, the unemployment rate is negatively correlated with the uptake of in-person instruction: a 10 percentage-point increase in the percentage of unemployed individuals is associated with a 13 to 14 percentage-point decrease in in-person uptake, controlling for a measure of the income level of families residing in those districts. Thus, it seems likely that this relationship may be less of a measure of preferences across income brackets and more of preferences when parents or guardians are available to be at home with their children, echoing findings reported by Calarco and colleagues (2021).

Additionally, most of the extra resources that districts could offer students learning remotely during the pandemic do not seem to be important factors for families when choosing an instructional modality. Estimates of the offer of a Wi-Fi hotspot or broadband internet access, as well as access to facilities where students can use technology provided by the district or get assistance from a teacher to complete remote work, are all imprecisely estimated and statistically insignificant. However, we do find that a district's offer of electronic devices to students was marginally significant and associated with an increase in in-person uptake by slightly more than six percentage points. While the resource questions in the questionnaire were only answered by districts that planned to offer remote instruction in a given month, it is unclear if these resources were consistently available only to students who opted to learn in a fully remote modality. If districts made electronic devices available to students in other modalities, it is possible that the offer encouraged students to opt into an in-person modality rather than fully remote instruction to supplement learning while outside of the classroom.

Table 6 presents a similar analysis examining the relationship between student uptake of remote instruction and district- and community-level characteristics. We find many of the same relationships between remote uptake and the district and community characteristics, however the relationships are typically in the opposite direction compared to what is present for uptake of in-person instruction. For example, the fully specified model in column 6 shows that some student demographic shares and urbanicity are significant predictors of remote uptake, and the point estimates of each relationship are considerable smaller than those estimated in the model controlling only for district-level characteristics. Additionally, district-level Asian and Black student shares are now positively associated with remote uptake (0.33 and 0.12, respectively),

implying that an increase in either share is associated with an increase in uptake of remote instruction. The relationships for urban and rural districts are also reversed: uptake of remote instruction in urban districts is almost five percentage points higher compared to suburban districts, while uptake in rural districts is more than three percentage points below their rural counterparts. Both of these estimates remain statistically significant in the fully specified model, unlike the relationships estimated for in-person uptake.

Measures of community-level COVID-19 cases and deaths are not strong or significant predictors of uptake of remote instruction. We also find that the relationship between party affiliation and remote uptake is similar in magnitude and significance compared to the estimate for in-person uptake, however in the opposite direction: a 10 percentage-point increase in Trump vote share is associated with more than a five percentage-point decrease in uptake of remote instruction. Finally, none of the extra resources that districts could offer students learning remotely during the pandemic seemed to have a significant impact on uptake of remote instruction.

DISCUSSION

As a result of the pandemic, students were asked to learn in new ways and contexts, and it has become clear over time that remote learning was both less effective in promoting academic achievement growth (e.g., Kilbride et al., 2022; Kuhfeld et al., 2020; Sass & Goldirng, 2021; West & Lake, 2021) and concentrated more in urban districts and districts with high proportions of traditionally marginalized students (Hopkins et al, 2021; Gross et al., 2021; Oster et at., 2021). As a result, there has been a growing sense that recovery from the pandemic, particularly for low-income, Black, and urban students, will take time and require significant resources (e.g., Kane, 2022; Kuhfeld & Lewis, 2022; Trust, 2021). Using instructional modality data collected by the state of Michigan throughout the 2020-21 school year, this paper uncovers not only how district-provided opportunities for in-person and remote instruction varied across Michigan, but also how different student groups actually learned during the first full school year of the pandemic and the extent to which family preferences contributed to these outcomes.

There are several implications from this research that can inform policy conversations about the ways students learn during the 2022-23 school year and beyond. However, before delving into these implications, it is important to highlight the limitations of these data. Even though the longitudinal nature of these data is unique relative to other sources compiling modality decisions during the pandemic, district responses to the monthly questionnaire still only represent a snapshot of modality decisions. Those plans could, and did, change quickly. As a result, any modality changes that occurred after districts submitted their monthly questionnaire were not captured, and students may have had more or fewer opportunities to learn in-person or remotely each month.

Additionally, the district-reported percentages of students learning in each modality do not provide information about the exact student populations that received each modality. Therefore, it is possible that the composition of students that received each modality did not match the overall student composition at the district level. Given the patterns we detect using these coarse data, however, it seems plausible and even likely that our results are underestimates of historically marginalized students' receipt of in-person instruction during the 2020-21 school year. Relatedly, we are not able to observe individual families' stated preferences, and we infer choices by the expressed preferences inherent in districts' estimates of the proportions of students learning in each modality. We do not have any reason to believe that these estimates are inaccurate given that the data collection as mandated by the state, but there was no accountability attached to modality receipt and as such there was no incentive for districts to over or under report.

Even with these limitations, this work can and should be informative for policymakers. Importantly, the results from our study may be generalizable to a majority of states that also followed a "hands off" approach to school reopenings. Michigan was among the roughly 70% of states that let schools and districts, with guidance from local health authorities, determine how and when districts welcomed students back into school buildings (EdWeek, 2020; IPPSR, 2020). The absence of centralized reopening mandates created considerable heterogeneity in learning opportunities. Even though our results suggest that many Michigan school districts attempted to return to pre-pandemic normalcy by the end of the 2020-21 school year, there remain inequities in which kinds of students were offered the opportunity to learn in-person and in families' decisions to return to in-person learning.

It will be critical to keep these differences in students' learning opportunities at the fore as policymakers consider the best ways to support districts, educators, and students. The COVID-19 pandemic is not over in the United States; the emergence of new COVID-19 variants has induced cyclical, nation-wide increases in cases, hospitalizations, and deaths throughout the 2021-22 school year, and as of the time of writing, only 45% school-aged children are fully vaccinated (CDC, 2022). As more children are educated in school buildings, and transmission of COVID-19 variants that affect larger portions of the school-aged population continues, significant in-school outbreaks forced some schools to transition back to fully remote instruction during the 2021-22 school year and will likely continue to occur throughout the coming school year. Moreover, the emergence of other potentially dangerous diseases, such as Monkeypox, could cause some school districts to elect to shutter their schools for periods of time and could impact families' choices about instructional modalities for their students. In addition, there are other threats to students' physical safety that will likely cause some parents to consider whether and if to send their students to school in-person, including the rise in school shootings (e.g., Sandoval, 2022; Taite, 2022). The results discussed above help to identify which schools and districts are educating students that may be hesitant to return to the classroom and participate in person

when learning remotely is a potential option. This knowledge can help federal, state, and local policymakers and health officials target information appropriately to inform districts and families about the tradeoffs inherent in these choices so that they can make evidence-based decisions about their students' schooling.

ENDNOTES

1. Nearly all (806, or 99%) of required districts submitted plans each month. The 8% of Michigan districts that were exempt from this requirement include districts that provided only virtual education prior to the pandemic, state-run districts, and intermediate school districts who typically do not offer general education services. The questionnaire allowed districts to submit plans for months with previously missing data. Thus, for example, data submitted in May incorporates new plans submitted for the current month as well as any missing information for September through April plans that had not yet been submitted in previous months. This also explains the relatively larger number of districts (n=15) with missing modality information for May; districts only had one opportunity to submit responses to the May questionnaire.

2. Although districts were asked about their "plans" for a given month, the submission form for September through November was not available until October 26, 2020. Thus, responses for September were completed after the month had already ended, and responses for October were completed after the month had already started. The November submission, and submissions for all subsequent months, reflect how districts "planned" to deliver instruction during the upcoming month. Districts were asked to indicate how they planned to instruct K 12 general education students because this subgroup represents the majority of public school students and instruction during the pandemic often differed for students with disabilities. In Michigan, districts were encouraged to develop "contingency learning plans" for students with disabilities to ensure these students still received the supports and services outlined in their Individualized Education Programs (MDE, 2020).

3. Each month, approximately 1% of districts submitted plans but did not specify how instruction would be provided for general education students. These districts could not be classified into one of the five mutually exclusive categories described above and are labeled "No Modality Data" in the tables and figures that follow. As noted above, less than 1% of districts did not submit responses to the questionnaire in any month. When applicable, we label these districts "No Plan Submitted".

4. In Michigan, students are identified as economically disadvantaged if they qualify for free or reduced-price milk or meals through the National School Lunch Program (i.e., Supplemental Nutrition Eligibility). This includes homeless-identified students who are categorically eligible for free meals.

5. We repeat this analysis using both the lower and upper boundaries for each estimated range. The results are similar to those discussed in this paper and the results are available from the authors upon request.
6. Michigan experienced a dramatic rise in COVID-19 infections over the course of the fall, especially in November (Bartkowiak, 2020). On November 15th, the Michigan Department of Health and Human Services issued an Emergency Order under MCL 333.2253 that mandated all high schools halt in-person instruction between November 18th and December 20th, 2020. While the order only pertained to high school level, many districts altered their December modality for all grade levels.
7. In Michigan, district enrollment is not always correlated with urbanicity, and districts that are considered "large" in this analysis (at least 1,824 enrolled students) are not all concentrated in urban areas. Specifically, 15% of large districts are in urban locales, 70% are in suburban/town locales, and 15% are in rural locales.

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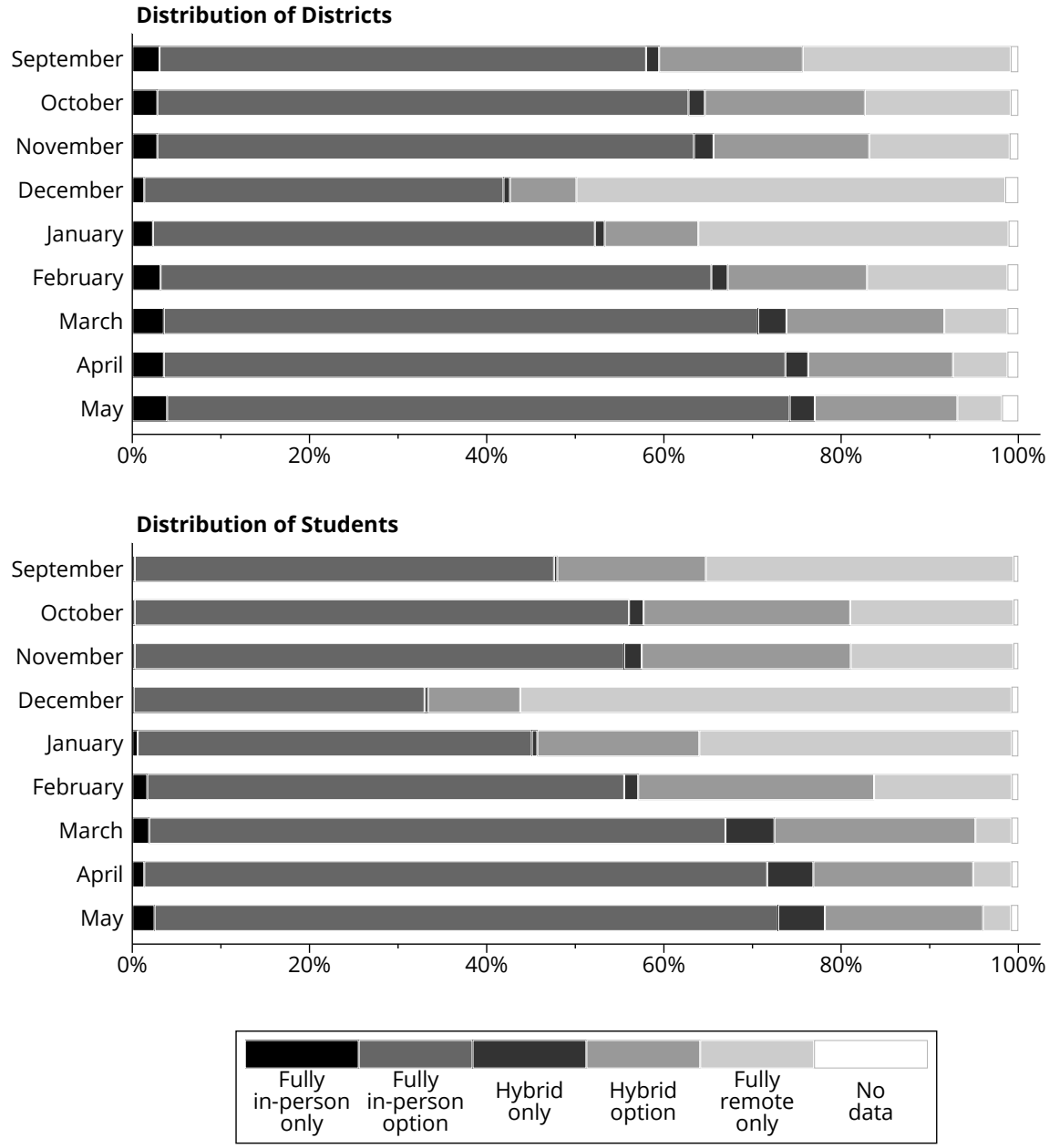
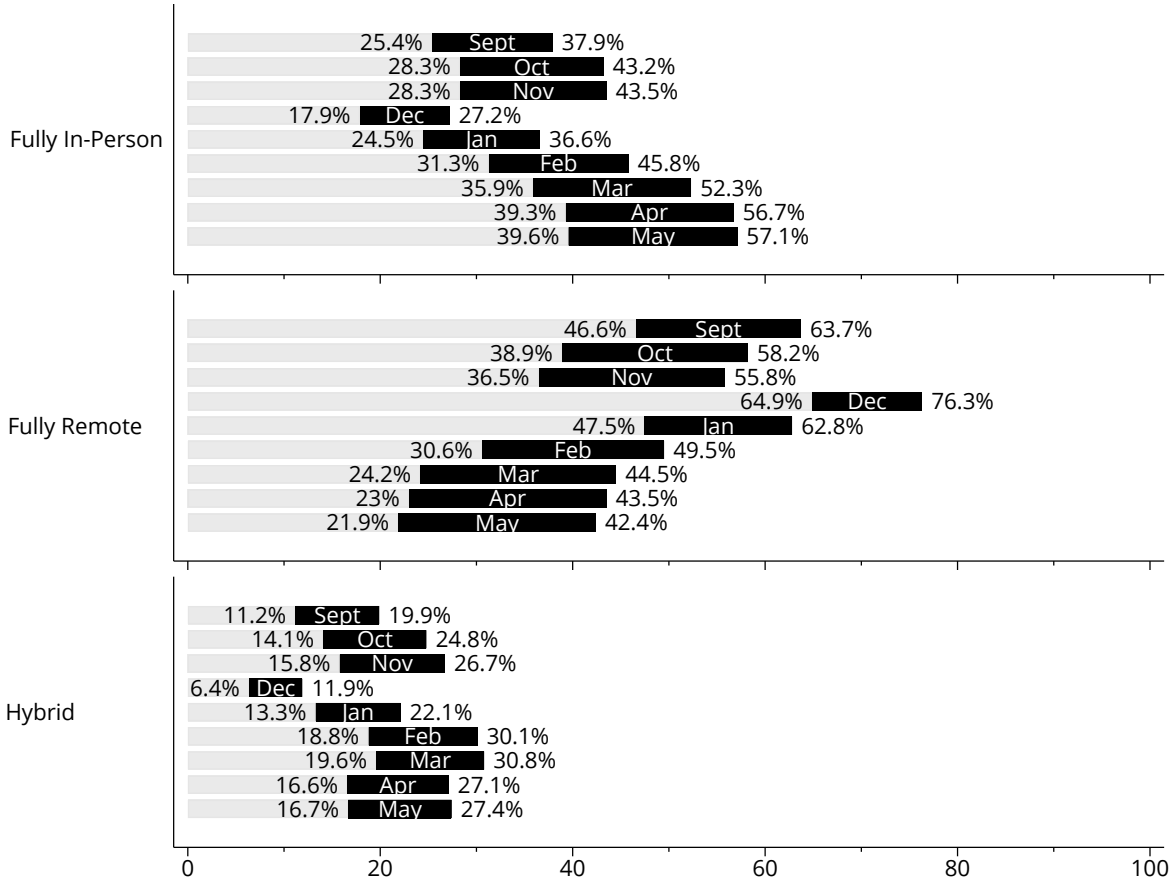
Figure 1. Distribution of Districts and Students by Planned Instructional Modality and Month



Notes: Data reflect plans submitted by 11:59 pm on 5/10/2021. The "No Data" category includes districts that submitted plans but did not provide information about their planned instructional modality for general education students, as well as districts that did not submit any information in the MDE/CEPI data collection instrument for the month. Appendix Table A1 provides the percentages behind this figure. Source: Data collected from school districts' monthly reconfirmation of Extended COVID-19 Learning Plans through a collaboration between MDE, CEPI, and EPIC.

Figure 2. Estimated Percentage of Students by Planned Instructional Modality and Month



Notes: We calculate the percent of students by multiplying district-reported ranges of plans for students to be served by each instructional modality by their total student counts and then summing across all the districts offering each modality. For example, the top bar for September Fully In-Person can be interpreted as "Between 25.4 and 37.9 percent of Michigan students were receiving fully in-person instruction in September." Data reflect plans submitted by 11:59 pm on 5/10/2021. Source: Data collected from school districts' monthly reconfirmation of Extended COVID-19 Learning Plans through a collaboration between MDE, CEPI, and EPIC; enrollment data from the Center for Educational Performance and Information, Student Count Report (2020-21, Statewide, accessed April 1, 2021).

Table 1: Average District-Level Summary Statistics for All, In-Person, Hybrid, or Remote Instruction Districts				
	Offer Modality for Majority of 2020-21			
	All Districts (1)	In-Person (2)	Hybrid (3)	Remote (4)
MODALITY (%)				
In-Person Offer	61.5	91.7	48.5	62.5
Hybrid Offer	32.1	23.0	81.8	32.9
Remote Offer	92.6	94.7	94.3	97.7
DISTRICT CHARACTERISTICS (%)				
Asian Enrollment	1.9	1.2	2.2	2.0
Black Enrollment	20.5	9.5	16.7	21.1
Latino/a/x Enrollment	7.7	7.6	8.1	7.8
White Enrollment	63.9	75.5	67.3	63.2
Other Enrollment	6.0	6.3	5.6	5.9
Economically Disadvantaged	60.6	55.7	56.4	60.5
Households with Broadband	75.3	75.8	77.0	75.3
Urban	18.6	9.2	13.6	19.0
Suburb/Town	42.8	40.1	53.6	43.4
Rural	38.6	50.7	32.8	37.5
COVID (PER 100,000)				
Lagged Cases	22.7	23.2	23.2	23.0
Lagged Deaths	4.0	4.3	4.0	4.1
Vaccinated	17,414.6	17,459.5	16,984.1	17,012.1
POLITICAL AFFILIATION (%)				
Trump Vote Share 2016	49.9	54.6	48.7	49.7
COUNTY CHARACTERISTICS (%)				
Unemployment Rate, 2019	4.4	4.5	4.2	4.4
Individual Poverty Rate 2014-18	15.6	14.8	15.5	15.7
RESOURCES (%)				
Electronic Devices	92.1	92.4	94.9	94.4
Wi-Fi	70.5	68.2	76.9	72.8
Broadband	10.4	9.5	10.9	10.6
Facility Assistance	40.4	39.7	46.8	41.4
Facility Technology	27.1	30.3	32.7	27.6
***N* districts**	**814**	**511**	**446**	**802**

Notes: Each value represents average within-district summary statistics for the 814 districts that completed the Reconfirmed COVID-19 Learning Plan Monthly Questionnaire during the 2020-21 school year. For lagged COVID-19 cases and deaths, we calculate 7-day average rates per 100,000 residents for the first day of each month. Similarly, we also calculate the cumulative number of COVID-19 vaccination administered per 100,000 residents on the first day of each month.

Table 2. Estimated Percentage of Students by Planned Instructional Modality and Economically Disadvantaged Student Population																		
	Low Economically Disadvantaged Student Population									High Economically Disadvantaged Student Population								
	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
FULLY IN-PERSON																		
Only Option	0%	0%	0%	0%	0%	1%	2%	2%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Offered	44%	56%	57%	36%	49%	59%	70%	78%	80%	43%	48%	47%	9%	10%	27%	57%	56%	57%
Min Receipt	27%	32%	31%	20%	27%	34%	41%	48%	48%	7%	9%	9%	3%	4%	10%	12%	12%	13%
Max Receipt	40%	48%	48%	32%	41%	50%	59%	67%	67%	17%	20%	21%	6%	7%	16%	25%	26%	26%
Ave. Uptake	76%	71%	69%	72%	69%	71%	71%	73%	71%	28%	30%	32%	50%	55%	48%	32%	34%	34%
HYBRID																		
Only Option	0%	3%	4%	1%	1%	3%	6%	6%	6%	1%	1%	1%	0%	0%	2%	3%	2%	3%
Offered	33%	52%	56%	30%	47%	56%	53%	42%	42%	13%	20%	22%	2%	12%	29%	40%	62%	62%
Min Receipt	15%	20%	24%	10%	21%	27%	25%	20%	20%	5%	7%	7%	1%	5%	12%	17%	16%	16%
Max Receipt	25%	33%	37%	18%	33%	41%	37%	28%	29%	9%	13%	13%	2%	9%	19%	26%	30%	31%
Ave. Uptake	61%	48%	51%	45%	57%	58%	53%	50%	51%	50%	47%	43%	75%	58%	50%	50%	35%	35%
FULLY REMOTE																		
Only Option	24%	6%	5%	38%	17%	4%	0%	0%	0%	40%	30%	28%	81%	71%	45%	8%	8%	6%
Offered	100%	96%	96%	98%	97%	96%	90%	92%	92%	97%	97%	97%	97%	98%	96%	95%	96%	95%
Min Receipt	44%	30%	25%	57%	36%	20%	16%	13%	12%	74%	69%	67%	90%	83%	66%	48%	48%	48%
Max Receipt	62%	51%	46%	71%	54%	41%	37%	34%	33%	88%	84%	83%	93%	89%	77%	69%	69%	69%
Ave. Uptake	38%	38%	34%	43%	35%	29%	29%	26%	24%	72%	69%	68%	66%	56%	52%	58%	57%	59%

Notes: There are 221 districts in the "Low" group (≤45% economically disadvantaged), 381 in "Middle" (45-79% economically disadvantage), and 212 in the "High" group (>79% economically disadvantaged. Data reflect plans submitted by 11:59 pm on 5/10/2021. Source: Data collected from school districts' monthly reconfirmation of Extended COVID-19 Learning Plans through a collaboration between MDE, CEPI, and EPIC; enrollment data from the Center for Educational Performance and Information, Student Count Report (202021, Statewide, accessed April 1, 2021).

Table 3. Estimated Percentage of Students by Planned Instructional Modality and Black Student Population

	Low Black Student Population									High Black Student Population								
	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
FULLY IN-PERSON																		
Only Option	0%	0%	0%	0%	2%	5%	6%	6%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Offered	86%	86%	86%	60%	79%	85%	88%	89%	90%	30%	34%	36%	8%	13%	22%	43%	50%	55%
Min Receipt	57%	58%	57%	38%	50%	58%	60%	62%	62%	4%	5%	6%	2%	4%	8%	9%	10%	11%
Max Receipt	77%	78%	78%	53%	69%	77%	80%	82%	82%	12%	15%	15%	5%	8%	14%	20%	22%	24%
Ave. Uptake	78%	79%	78%	76%	75%	78%	78%	80%	79%	27%	29%	29%	44%	46%	50%	34%	32%	32%
HYBRID																		
Only Option	1%	1%	2%	1%	3%	4%	2%	1%	1%	1%	1%	1%	0%	0%	1%	4%	4%	4%
Offered	33%	35%	37%	25%	30%	33%	32%	29%	30%	16%	21%	19%	2%	16%	32%	46%	63%	63%
Min Receipt	14%	15%	16%	10%	14%	15%	13%	11%	11%	4%	5%	5%	0%	6%	13%	20%	21%	21%
Max Receipt	22%	23%	24%	16%	21%	21%	20%	17%	18%	9%	11%	11%	1%	11%	21%	31%	35%	35%
Ave. Uptake	53%	53%	51%	50%	54%	48%	48%	46%	47%	37%	35%	39%	25%	53%	52%	51%	41%	41%
FULLY REMOTE																		
Only Option	2%	1%	1%	25%	9%	0%	1%	1%	0%	49%	40%	41%	86%	67%	45%	15%	12%	11%
Offered	99%	98%	97%	98%	91%	90%	90%	91%	91%	97%	97%	97%	99%	98%	97%	95%	95%	96%
Min Receipt	11%	10%	10%	39%	20%	9%	9%	9%	9%	78%	73%	73%	96%	83%	67%	52%	50%	49%
Max Receipt	33%	32%	32%	55%	38%	30%	30%	30%	29%	89%	86%	86%	98%	90%	79%	70%	69%	68%
Ave. Uptake	21%	21%	21%	30%	24%	22%	21%	21%	21%	72%	69%	69%	85%	63%	54%	58%	57%	56%

Notes: There are 262 districts in the "Low" group (≤1% Black students), 342 in "Middle" (1-24% Black students), and 210 in the "High" group (>24% Black students. Data reflect plans submitted by 11:59 pm on 5/10/2021. Source: Data collected from school districts' monthly reconfirmation of Extended COVID-19 Learning Plans through a collaboration between MDE, CEPI, and EPIC; enrollment data from the Center for Educational Performance and Information, Student Count Report (2020-21, Statewide, accessed April 1, 2021).

Table 4. Estimated Percentage of Students by Planned Instructional Modality and Urbanicity

	Urban									Rural								
	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
FULLY IN-PERSON																		
Only Option	0%	0%	0%	0%	0%	2%	2%	0%	2%	0%	0%	0%	0%	1%	1%	1%	2%	2%
Offered	36%	37%	39%	5%	16%	22%	43%	47%	48%	77%	79%	77%	63%	73%	83%	84%	85%	84%
Min Receipt	10%	9%	10%	2%	7%	10%	12%	11%	12%	49%	51%	50%	38%	45%	52%	53%	54%	53%
Max Receipt	19%	20%	21%	5%	12%	17%	23%	23%	24%	67%	71%	68%	53%	63%	72%	73%	74%	73%
Ave. Uptake	40%	39%	40%	70%	59%	58%	38%	36%	35%	75%	77%	77%	72%	74%	74%	75%	75%	74%
HYBRID																		
Only Option	1%	1%	1%	0%	0%	1%	7%	7%	7%	1%	2%	2%	1%	2%	1%	1%	1%	1%
Offered	22%	28%	28%	7%	19%	38%	48%	64%	63%	34%	34%	37%	25%	28%	35%	34%	31%	33%
Min Receipt	3%	4%	3%	2%	7%	11%	19%	24%	24%	15%	14%	16%	9%	12%	13%	13%	12%	13%
Max Receipt	10%	12%	12%	4%	12%	21%	29%	38%	37%	23%	22%	24%	15%	19%	21%	21%	20%	20%
Ave. Uptake	26%	26%	24%	43%	50%	41%	41%	42%	42%	55%	50%	51%	46%	52%	47%	48%	50%	48%
FULLY REMOTE																		
Only Option	42%	31%	31%	84%	63%	40%	13%	10%	11%	5%	2%	4%	24%	12%	2%	1%	1%	1%
Offered	99%	99%	99%	100%	100%	96%	90%	92%	90%	98%	97%	97%	99%	97%	97%	97%	97%	95%
Min Receipt	78%	73%	71%	93%	77%	60%	48%	44%	43%	16%	15%	16%	42%	28%	15%	13%	13%	13%
Max Receipt	90%	87%	87%	96%	85%	73%	67%	64%	62%	38%	37%	38%	58%	47%	37%	35%	35%	34%
Ave. Uptake	74%	72%	71%	66%	49%	47%	58%	54%	53%	24%	25%	25%	35%	30%	25%	24%	24%	24%

Notes: There are 152 districts in the "Urban" group, 314 in "Rural," and 337 in the "Suburb/Town" group. Data reflect plans submitted by 11:59 pm on 5/10/2021. Source: Data collected from school districts' monthly reconfirmation of Extended COVID-19 Learning Plans through a collaboration between MDE, CEPI, and EPIC; enrollment data from the Center for Educational Performance and Information, Student Count Report (2020-21, Statewide, accessed April 1, 2021).

Table 5. In-Person Uptake Given the Offer of Other Modalities						
	(1)	(2)	(3)	(4)	(5)	(6)
Asian Enrollment Share	-0.555*** (0.119)	-0.543*** (0.100)	-0.545*** (0.100)	-0.354*** (0.094)	-0.348*** (0.091)	-0.346*** (0.088)
Black Enrollment Share	-0.459*** (0.052)	-0.444*** (0.048)	-0.445*** (0.048)	-0.317*** (0.051)	-0.321*** (0.052)	-0.313*** (0.052)
Latino/a/x Enrollment Share	-0.112 (0.104)	-0.101 (0.094)	-0.101 (0.094)	-0.059 (0.091)	-0.089 (0.094)	-0.079 (0.094)
Other Enrollment Share	0.151* (0.070)	0.093 (0.062)	0.090 (0.062)	0.106+ (0.055)	0.156* (0.064)	0.156* (0.062)
Economically Disadvantaged Enrollment Share	-0.087+ (0.052)	-0.087+ (0.047)	-0.087+ (0.047)	-0.130** (0.045)	-0.122* (0.047)	-0.128** (0.047)
Percent of Households w/ Broadband	-0.191* (0.086)	-0.151* (0.076)	-0.152* (0.075)	-0.073 (0.073)	-0.094 (0.077)	-0.079 (0.077)
Urban	-2.099 (3.898)	-5.493 (3.374)	-5.494 (3.376)	-4.825 (3.227)	-5.065 (3.193)	-5.148 (3.222)
Rural	5.374*** (1.600)	2.753+ (1.500)	2.752+ (1.505)	1.602 (1.457)	1.790 (1.464)	1.726 (1.471)
Hybrid Offer		-13.615*** (1.692)	-13.614*** (1.692)	-12.382*** (1.652)	-12.501*** (1.650)	-12.620*** (1.646)
Remote Offer		-22.090*** (1.928)	-22.061*** (1.935)	-23.739*** (2.011)	-23.883*** (2.007)	-25.022*** (2.523)
Lagged COVID-19 Cases per 100k			-0.002 (0.025)	-0.036 (0.024)	-0.055* (0.022)	-0.054* (0.022)
Lagged COVID-19 Deaths per 100k			0.003 (0.036)	-0.024 (0.037)	-0.006 (0.035)	-0.007 (0.035)
Vaccines Administered per 100k			0.000 (0.000)	0.000* (0.000)	0.000** (0.000)	0.000** (0.000)
Trump Vote Share 2016				0.459*** (0.076)	0.491*** (0.084)	0.504*** (0.083)
Unemployment Rate, 2019					-1.345* (0.605)	-1.424* (0.590)
Individual Poverty Rate					0.125 (0.176)	0.136 (0.173)
Electronic Devices						6.032+ (3.303)
Wi-Fi						-2.101 (1.446)
Broadband						0.412 (2.096)
Facility Assistance						-0.685 (1.361)
Facility Technology						0.605 (1.530)
Observations	**4540**	**4540**	**4540**	**4540**	**4540**	**4540**
Adjusted R^2	**0.300**	**0.409**	**0.409**	**0.435**	**0.436**	**0.441**

Notes: Robust standard errors, clustered at the district level, are in parentheses. All models include month fixed effects. "Other Student Share" includes students who identify as American Indian or Alaska Native, Native Hawaiian or Other Pacific Islander, or two or more races. $^{+}$ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 6. Remote Uptake Given the Offer of Other Modalities						
	(1)	(2)	(3)	(4)	(5)	(6)
Asian Enrollment Share	0.751*** (0.077)	0.475*** (0.059)	0.475*** (0.059)	0.329*** (0.059)	0.325*** (0.061)	0.325*** (0.061)
Black Enrollment Share	0.434*** (0.038)	0.227*** (0.031)	0.228*** (0.031)	0.131*** (0.030)	0.116*** (0.030)	0.115*** (0.031)
Latino/a/x Enrollment Share	0.130 (0.087)	0.094 (0.066)	0.096 (0.066)	0.033 (0.060)	0.012 (0.062)	0.008 (0.062)
Other Enrollment Share	0.104 (0.098)	0.021 (0.064)	0.021 (0.064)	0.025 (0.059)	0.027 (0.060)	0.031 (0.061)
Economically Disadvantaged Enrollment Share	0.202*** (0.049)	0.174*** (0.038)	0.174*** (0.038)	0.213*** (0.035)	0.238*** (0.035)	0.241*** (0.036)
Percent of Households w/ Broadband	0.257*** (0.068)	0.175** (0.055)	0.176** (0.055)	0.141** (0.053)	0.102+ (0.056)	0.100+ (0.056)
Urban	10.007*** (2.318)	5.601** (1.731)	5.616** (1.729)	4.796** (1.613)	4.546** (1.608)	4.550** (1.629)
Rural	-5.756*** (1.694)	-4.773** (1.501)	-4.779** (1.501)	-3.069* (1.485)	-3.042* (1.485)	-3.046* (1.486)
In-Person Offer		-35.769*** (1.534)	-35.507*** (1.554)	-33.435*** (1.576)	-33.333*** (1.574)	-33.291*** (1.565)
Hybrid Offer		-17.888*** (1.385)	-17.762*** (1.384)	-18.405*** (1.341)	-18.321*** (1.337)	-18.398*** (1.330)
Lagged COVID-19 Cases per 100k			-0.033 (0.028)	0.023 (0.028)	0.038 (0.025)	0.039 (0.025)
Lagged COVID-19 Deaths per 100k			-0.024 (0.052)	0.016 (0.050)	0.032 (0.047)	0.033 (0.047)
Vaccines Administered per 100k			-0.000 (0.000)	-0.000** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Trump Vote Share 2016				-0.448*** (0.058)	-0.546*** (0.073)	-0.549*** (0.074)
Unemployment Rate, 2019					0.267 (0.674)	0.308 (0.668)
Individual Poverty Rate					-0.384* (0.165)	-0.388* (0.165)
Electronic Devices						-3.057 (2.527)
Wi-Fi						0.581 (1.296)
Broadband						0.756 (1.723)
Facility Assistance						0.949 (1.187)
Facility Technology						-0.200 (1.366)
Observations	**6801**	**6801**	**6801**	**6801**	**6801**	**6801**
Adjusted R2	**0.435**	**0.623**	**0.624**	**0.638**	**0.643**	**0.643**

Notes: Robust standard errors, clustered at the district level, are in parentheses. All models include month fixed effects. "Other Student Share" includes students who identify as American Indian or Alaska Native, Native Hawaiian or Other Pacific Islander, or two or more races. $^{+}$ *p < 0.10,* * *p < 0.05,* ** *p < 0.01,* *** *p < 0.001*

APPENDIX

Table A1. Distribution of Districts and Students by Planned Instructional Modality and Month									
Instructional Modality	**Sept**	**Oct**	**Nov**	**Dec**	**Jan**	**Feb**	**Mar**	**Apr**	**May**
Districts									
Fully In-Person Only	3%	3%	3%	1%	2%	3%	4%	4%	4%
Fully In-Person Option	55%	60%	61%	41%	50%	62%	67%	70%	70%
Hybrid Only	1%	2%	2%	1%	1%	2%	3%	3%	3%
Hybrid Option	16%	18%	18%	7%	11%	16%	18%	16%	16%
Fully Remote Only	23%	16%	16%	48%	35%	16%	7%	6%	5%
No Modality Data	1%	1%	1%	1%	1%	1%	1%	1%	1%
No Plan Submitted	0%	0%	0%	0%	0%	0%	0%	0%	1%
Students									
Fully In-Person Only	0%	0%	0%	0%	1%	2%	2%	1%	3%
Fully In-Person Option	47%	56%	55%	33%	44%	54%	65%	70%	70%
Hybrid Only	0%	2%	2%	0%	1%	2%	6%	5%	5%
Hybrid Option	17%	23%	24%	10%	18%	27%	23%	18%	18%
Fully Remote Only	35%	18%	18%	55%	35%	16%	4%	4%	3%
No Modality Data	1%	1%	1%	1%	1%	1%	1%	1%	0%
No Plan Submitted	0%	0%	0%	0%	0%	0%	0%	0%	0%

Notes: Columns may not sum to 100% due to rounding. Data reflect plans submitted by 11:59 pm on 5/10/2021. The "No Modality Data" category includes districts that submitted plans but did not provide information about their planned instructional modality for general education students. The "No Plan Submitted" category includes districts that did not submit any information in the MDE/CEPI data collection instrument for the month. Source: Data collected from school districts' monthly reconfirmation of ECOL plans through a collaboration between the Michigan Department of Education, the Center for Educational Performance and Information, and the Education Policy Innovation Collaborative.

Table A2. Estimated Percentage of Students by Planned Instructional Modality and Latino Student Population																		
	Low Latino Student Population									High Latino Student Population								
	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
FULLY IN-PERSON																		
Only Option	0%	0%	0%	0%	0%	0%	0%	1%	1%	0%	0%	0%	0%	0%	2%	2%	1%	2%
Offered	26%	27%	26%	17%	23%	27%	28%	28%	28%	18%	22%	23%	12%	19%	28%	30%	31%	32%
Min Receipt	36%	38%	37%	24%	32%	38%	40%	41%	41%	29%	36%	37%	17%	28%	40%	46%	48%	48%
Max Receipt	43%	47%	47%	28%	38%	46%	52%	55%	56%	46%	59%	56%	22%	37%	49%	68%	68%	70%
Ave. Uptake	72%	69%	67%	73%	72%	71%	65%	62%	61%	51%	49%	54%	66%	64%	68%	55%	57%	56%
HYBRID																		
Only Option	1%	1%	1%	0%	0%	0%	14%	14%	14%	0%	1%	1%	0%	0%	0%	0%	0%	0%
Offered	5%	5%	5%	1%	2%	5%	20%	20%	21%	7%	8%	9%	5%	9%	12%	13%	14%	14%
Min Receipt	12%	13%	14%	3%	5%	13%	28%	29%	29%	14%	15%	16%	8%	15%	20%	22%	26%	25%
Max Receipt	28%	30%	32%	8%	11%	34%	45%	49%	51%	18%	21%	24%	12%	22%	32%	37%	47%	45%
Ave. Uptake	28%	28%	27%	25%	32%	26%	32%	30%	30%	58%	53%	50%	54%	55%	50%	47%	43%	43%
FULLY REMOTE																		
Only Option	40%	27%	26%	70%	59%	30%	13%	9%	7%	31%	20%	24%	64%	44%	27%	8%	7%	7%
Offered	60%	56%	53%	76%	66%	43%	33%	32%	30%	58%	51%	51%	77%	63%	49%	39%	37%	35%
Min Receipt	71%	70%	70%	82%	75%	59%	50%	50%	49%	74%	69%	69%	84%	75%	64%	59%	58%	55%
Max Receipt	98%	98%	98%	99%	99%	99%	85%	84%	84%	99%	98%	98%	98%	99%	97%	95%	99%	96%
Ave. Uptake	44%	51%	49%	31%	29%	30%	40%	43%	42%	51%	51%	49%	49%	45%	42%	47%	44%	43%

Notes: There are 206 districts in the "Low" group (≤2% Latino/a/x students), 397 in "Middle" (2-9% Latino/a/x students), and 208 in the "High" group (>9% Latino/a/x students). Data reflect plans submitted by 11:59 pm on 5/10/2021. Source: Data collected from school districts' monthly reconfirmation of Extended COVID-19 Learning Plans through a collaboration between MDE, CEPI, and EPIC; enrollment data from the Center for Educational Performance and Information, Student Count Report (2020-21, Statewide, accessed April 1, 2021).

Table A3. Estimated Percentage of Students by Planned Instructional Modality and Asian Student Population

	Low Asian Student Population									High Asian Student Population								
	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
FULLY IN-PERSON																		
Only Option	1%	1%	1%	0%	1%	1%	1%	1%	1%	0%	0%	0%	0%	0%	1%	1%	1%	1%
Offered	30%	32%	32%	23%	27%	32%	33%	32%	32%	17%	20%	21%	12%	19%	24%	29%	35%	35%
Min Receipt	43%	45%	45%	32%	38%	44%	48%	46%	47%	27%	34%	35%	20%	30%	37%	45%	52%	52%
Max Receipt	54%	57%	57%	40%	43%	54%	63%	60%	62%	36%	48%	49%	24%	37%	46%	61%	69%	70%
Ave. Uptake	67%	67%	67%	69%	75%	70%	64%	64%	63%	61%	56%	57%	67%	66%	66%	60%	63%	62%
HYBRID																		
Only Option	2%	2%	2%	0%	1%	4%	3%	2%	2%	0%	2%	2%	0%	0%	1%	9%	9%	9%
Offered	7%	8%	9%	4%	6%	12%	13%	13%	13%	10%	15%	18%	6%	15%	22%	26%	23%	23%
Min Receipt	12%	13%	14%	7%	9%	17%	20%	20%	21%	20%	27%	30%	12%	25%	35%	37%	33%	33%
Max Receipt	20%	23%	25%	11%	14%	26%	33%	35%	35%	29%	46%	48%	21%	37%	52%	52%	51%	50%
Ave. Uptake	42%	40%	41%	50%	50%	48%	45%	44%	45%	52%	43%	48%	43%	54%	54%	52%	45%	46%
FULLY REMOTE																		
Only Option	33%	27%	27%	53%	47%	28%	13%	14%	11%	32%	12%	13%	57%	36%	16%	3%	3%	3%
Offered	48%	44%	45%	64%	56%	43%	35%	36%	35%	60%	47%	43%	74%	54%	36%	28%	24%	24%
Min Receipt	63%	60%	61%	74%	68%	58%	55%	55%	54%	75%	66%	62%	83%	68%	54%	47%	44%	44%
Max Receipt	97%	97%	97%	99%	99%	94%	95%	95%	95%	100%	97%	97%	99%	98%	97%	88%	89%	89%
Ave. Uptake	35%	36%	37%	35%	29%	34%	39%	39%	40%	52%	52%	47%	51%	40%	36%	41%	36%	36%

Notes: There are 240 districts in the "Low" group (≤1% Asian students), 350 in "Middle" (2-24% Asian students), and 224 in the "High" group (>24% Asian students). Data reflect plans submitted by 11:59 pm on 5/10/2021. Source: Data collected from school districts' monthly reconfirmation of Extended COVID-19 Learning Plans through a collaboration between MDE, CEPI, and EPIC; enrollment data from the Center for Educational Performance and Information, Student Count Report (2020-21, Statewide, accessed April 1, 2021).

Table A4. Estimated Percentage of Students by Planned Instructional Modality and Total Enrollment

	Small Total Enrollment									Large Total Enrollment								
	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
FULLY IN-PERSON																		
Only Option	6%	6%	6%	3%	4%	5%	6%	6%	5%	0%	0%	0%	0%	0%	2%	2%	1%	3%
Offered	40%	41%	40%	29%	32%	38%	40%	40%	40%	21%	24%	24%	15%	21%	28%	34%	38%	38%
Min Receipt	54%	54%	54%	40%	43%	52%	54%	54%	54%	33%	39%	39%	23%	33%	42%	50%	55%	55%
Max Receipt	63%	63%	63%	49%	52%	62%	64%	65%	64%	42%	53%	51%	29%	42%	50%	64%	69%	71%
Ave. Uptake	72%	73%	72%	68%	70%	70%	71%	69%	71%	64%	59%	62%	66%	64%	69%	65%	67%	64%
HYBRID																		
Only Option	2%	2%	2%	1%	0%	2%	5%	4%	5%	0%	2%	2%	0%	0%	2%	7%	6%	6%
Offered	9%	9%	9%	4%	6%	9%	13%	13%	15%	11%	15%	17%	6%	15%	22%	24%	20%	20%
Min Receipt	15%	15%	15%	8%	10%	14%	20%	21%	22%	20%	26%	29%	12%	25%	35%	35%	30%	30%
Max Receipt	26%	26%	26%	15%	17%	23%	32%	33%	35%	29%	43%	45%	21%	38%	51%	51%	48%	48%
Ave. Uptake	42%	42%	42%	36%	47%	45%	43%	45%	45%	53%	45%	49%	43%	53%	54%	51%	45%	45%
FULLY REMOTE																		
Only Option	21%	20%	19%	45%	40%	27%	15%	12%	10%	30%	14%	15%	53%	31%	13%	3%	3%	2%
Offered	35%	34%	33%	54%	50%	40%	31%	28%	27%	54%	43%	40%	70%	50%	31%	25%	23%	22%
Min Receipt	51%	51%	50%	66%	62%	55%	48%	46%	45%	70%	62%	59%	80%	64%	50%	45%	43%	42%
Max Receipt	90%	91%	90%	94%	93%	90%	88%	88%	87%	100%	98%	98%	99%	98%	96%	90%	92%	90%
Ave. Uptake	32%	32%	32%	31%	30%	33%	34%	33%	34%	46%	46%	42%	48%	39%	33%	37%	34%	34%

Notes: There are 195 districts in the "Small" group (≤337 students), 406 in "Midsize" (337-1824 students), and 213 in the "Large" group (>1824 students). Data reflect plans submitted by 11:59 pm on 5/10/2021. Source: Data collected from school districts' monthly reconfirmation of Extended COVID-19 Learning Plans through a collaboration between MDE, CEPI, and EPIC; enrollment data from the Center for Educational Performance and Information, Student Count Report (2020-21, Statewide, accessed April 1, 2021).

Table A5. Estimated Percentage of Students by Planned Instructional Modality and Broadband Internet Access

	Low Broadband Internet Access									High Broadband Internet Access								
	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May
FULLY IN-PERSON																		
Only Option	1%	1%	1%	1%	1%	1%	1%	2%	2%	0%	0%	0%	0%	0%	1%	1%	1%	2%
Offered	23%	23%	23%	16%	20%	22%	25%	25%	26%	22%	26%	26%	16%	22%	30%	36%	44%	44%
Min Receipt	38%	38%	38%	23%	29%	32%	41%	42%	44%	34%	41%	42%	26%	35%	45%	53%	62%	62%
Max Receipt	65%	66%	67%	27%	35%	39%	72%	73%	76%	39%	52%	51%	30%	44%	55%	64%	73%	75%
Ave. Uptake	46%	45%	45%	71%	69%	68%	45%	44%	45%	72%	64%	67%	70%	65%	68%	69%	72%	70%
HYBRID																		
Only Option	1%	1%	1%	0%	0%	2%	2%	2%	2%	0%	3%	3%	0%	0%	2%	6%	6%	6%
Offered	5%	6%	7%	4%	6%	11%	12%	11%	12%	13%	19%	23%	7%	19%	26%	25%	20%	20%
Min Receipt	10%	11%	13%	7%	11%	18%	21%	25%	26%	23%	31%	35%	14%	30%	40%	37%	29%	29%
Max Receipt	18%	22%	25%	12%	18%	30%	36%	59%	60%	31%	51%	53%	25%	45%	58%	55%	42%	43%
Ave. Uptake	38%	36%	38%	46%	47%	45%	43%	28%	29%	58%	46%	52%	42%	54%	55%	51%	51%	50%
FULLY REMOTE																		
Only Option	23%	19%	17%	66%	55%	44%	6%	5%	4%	30%	9%	10%	49%	25%	7%	1%	1%	0%
Offered	54%	53%	52%	72%	63%	55%	42%	42%	41%	52%	37%	32%	68%	44%	25%	21%	17%	17%
Min Receipt	72%	71%	71%	80%	73%	68%	63%	64%	63%	68%	57%	52%	79%	61%	46%	41%	37%	38%
Max Receipt	98%	98%	98%	98%	96%	97%	97%	96%	96%	99%	96%	95%	98%	98%	96%	90%	92%	92%
Ave. Uptake	53%	54%	55%	31%	32%	33%	51%	53%	52%	43%	44%	38%	50%	38%	32%	34%	29%	30%

Notes: There are 191 districts in the "Low" grouping (≤68% of households), 407 in "Middle" (68%-83% of households) and 208 in the "High" grouping (>83% of households). Data reflect plans submitted by 11:59 pm on 5/10/2021. Source: Data collected from school districts' monthly reconfirmation of Extended COVID-19 Learning Plans through a collaboration between MDE, CEPI, and EPIC; household broadband access data from the American Community Survey (ACS) obtained from IPUMS NHGIS, University of Minnesota, www.nhgis.org.

Table A6. Hybrid Uptake Given the Offer of Other Modalities						
	(1)	(2)	(3)	(4)	(5)	(6)
Asian Enrollment Share	-0.271* (0.130)	-0.536*** (0.090)	-0.536*** (0.090)	-0.459*** (0.090)	-0.445*** (0.092)	-0.475*** (0.088)
Black Enrollment Share	0.032 (0.068)	-0.153** (0.049)	-0.152** (0.049)	-0.092+ (0.053)	-0.095+ (0.055)	-0.104* (0.053)
Latino/a/x Enrollment Share	0.186 (0.159)	0.116 (0.128)	0.118 (0.127)	0.145 (0.125)	0.122 (0.129)	0.105 (0.124)
Other Enrollment Share	-0.046 (0.308)	0.028 (0.227)	0.037 (0.227)	0.018 (0.226)	0.013 (0.232)	-0.015 (0.233)
Economically Disadvantaged Enrollment Share	-0.103 (0.089)	-0.125* (0.060)	-0.129* (0.060)	-0.151* (0.061)	-0.140* (0.064)	-0.138* (0.064)
Percent of Households w/ Broadband	0.126 (0.148)	0.012 (0.099)	0.015 (0.099)	0.051 (0.096)	0.021 (0.101)	-0.003 (0.100)
Urban	-3.215 (3.466)	-7.796** (2.863)	-7.768** (2.859)	-7.418** (2.752)	-7.616** (2.738)	-6.871* (2.738)
Rural	1.774 (3.778)	-0.617 (2.552)	-0.584 (2.555)	-1.866 (2.607)	-1.694 (2.591)	-1.804 (2.581)
In-Person Offer		-31.939*** (2.151)	-32.019*** (2.152)	-32.778*** (2.132)	-32.711*** (2.143)	-32.123*** (2.122)
Remote Offer		-42.213*** (2.934)	-42.243*** (2.942)	-42.585*** (2.942)	-42.532*** (2.976)	-43.115*** (3.033)
Lagged COVID-19 Cases per 100k			0.040 (0.054)	0.017 (0.054)	0.006 (0.050)	-0.009 (0.050)
Lagged COVID-19 Deaths per 100k			0.098 (0.142)	0.060 (0.143)	0.101 (0.141)	0.098 (0.136)
Vaccines Administered per 100k			-0.000 (0.000)	0.000 (0.000)	0.000 (0.000)	0.000 (0.000)
Trump Vote Share 2016				0.269** (0.099)	0.278* (0.140)	0.244+ (0.139)
Unemployment Rate, 2019					-1.472 (1.628)	-1.167 (1.654)
Individual Poverty Rate					0.075 (0.380)	-0.010 (0.381)
Electronic Devices						0.394 (5.256)
Wi-Fi						4.221 (2.722)
Broadband						-7.240** (2.458)
Facility Assistance						-0.720 (2.117)
Facility Technology						-0.295 (2.447)
Observations	2358	2358	2358	2358	2358	2358
R2	0.012	0.451	0.451	0.458	0.458	0.466

*Notes: Robust standard errors, clustered at the district level, are in parentheses. All models include month fixed effects. "Other Student Share" includes students who identify as American Indian or Alaska Native, Native Hawaiian or Other Pacific Islander, or two or more races. + p < 0.10, * p < 0.05, ** p < 0.01, *** p < 0.001*