THE LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE

Centre for Economic Performance

Pupil absence and the pandemic

Stephen Gibbons, Sandra McNally and Piero Montebruno

September 2024

Nuffield Foundation

Abstract
This paper investigates lost education time during the COVID-19 pandemic in England. We look at the general factors affecting rates of absence during different stages of the pandemic and the consequences of specific policy guidance. Our evidence shows that pupil absence was strongly linked to socioeconomic factors, with pupils in schools in more economically disadvantaged areas missing out the most. We look at the influence of the guidance given by Local Authorities during a phased reopening of schools at the end of the first wave of the pandemic in June 2020. We find that pupils in Local Authorities that did not advise schools to comply with central government guidance on re-opening lost out through lower school attendance. We also look at the influence of the local Tier system that was implemented in England in the Autumn of 2020 to enforce social and business restrictions of differing degrees of severity. Although schools could all open whatever the Tier status of their area, attendance was sometimes restricted to priority children in the higher Tiers. We find the pupil absence was indeed higher under more restrictive Tiers, particularly the most restrictive, even conditional on local metrics of pandemic severity. Families from poorer backgrounds were more sensitive to the restrictions, suggesting another reason for their vulnerability to education loss from the pandemic.

Keywords: schools, COVID-19, Coronavirus, pupil absence
JEL: H12; I2

This work was funded by the Nuffield Foundation, grant number FR-000022949. We thank the project advisory board for helpful feedback.

Stephen Gibbons, London School of Economics and Centre for Economic Performance at London School of Economics. Sandra McNally, University of Surrey and Centre for Economic Performance at London School of Economics. Piero Montebruno, Centre for Economic Performance at London School of Economics.

Published by
Centre for Economic Performance
London School of Economic and Political Science
Houghton Street
London WC2A 2AE

1. Introduction

The global COVID-19 pandemic led to extensive disruption to schooling across the world. In England, schools experienced periods of closure throughout 2020 and 2021. Even when schools were allowed to open, they experienced high and persistent levels of pupil absence, well in excess of what could be explained by sickness, and attendance rates have not yet recovered to their pre-pandemic level. Missing school has obvious potential ramifications for students in terms of lost education time, lost time in contact with other students and, ultimately, subsequent achievement and life chances. Understanding the factors leading to these high levels of absence is therefore important for understanding and addressing potential disparities in accumulated education time over the pandemic. Our research contributes to this understanding. Coronavirus-related policy guidance potentially played a role, alongside demographic and socioeconomic factors, by influencing families' perceptions of the risks involved in attending school. We look explicitly at two policy events that potentially affected families in this way.

Our study investigates the role of school and local area characteristics, and the influence of COVID-19 policy guidance on pupil absence. We do this for two periods during the pandemic in England when schools were ostensibly allowed to open for students, but policies were in place that led to geographical differences in the incentives for, and constraints on, school attendance.

The first period we study is a period of phased re-opening, after the first national lockdown that started on 23rd March 2020 when schools were closed to most pupils. Central government guidance was for primary schools to reopen for some year groups (grades) from 1st June 2020 and for other year groups to follow. Secondary schools began to open for some year groups from 15th June. However, this guidance was controversial because of worries about safety amongst staff and parents, and because it was only a matter of weeks until the end of the school year. Local Authorities – the administrative bodies that are responsible for a high share of schooling in England – differed in their level of support for this re-opening policy and provided their own guidance on whether schools should re-open.

Our second study period is the period of local Tier restrictions, whereby local areas were placed in different categories according to local levels and growth rates of infections. These Tier categories ranged

from 1-4, with higher Tiers subject to greater restrictions on the business and social activities that were legally permitted. The legislative framework surrounding these Tier restrictions is contained in the Coronavirus: The Health Protection (Coronavius, Restrictions) (All Tiers) (England) Regulations 2020.

This is the first research into the interaction of COVID-19 polices with local area and school characteristics in influencing pupil absence rates in schools in England. We do not investigate the consequences of absence in this report and defer investigation of the impact of absence on student outcomes to a forthcoming companion paper (Gibbons, McNally and Montebruno 2023b). In the following section, we summarise existing evidence covering the causes of pupil absence, and the consequences for subsequent outcomes.

2. Existing evidence

Absenteeism from school is an instinctively important topic, but good evidence on its causes and consequences is surprisingly sparse. While it is self-evident that missing school might lead to worse educational outcomes and correlations between the two are well established, the magnitude of any causal relationship is difficult to determine. Recent literature has, nevertheless, made some progress in disentangling the causal effects of lost education time on achievement from the confounding influence of student and family characteristics on both absence rates and education outcomes. This is typically achieved by comparing absence and achievement for a given pupil, at different times or in different subjects, or by exploiting external shocks such as strikes, snow days or riots that close schools. Examples include Cattan et al. (2021), Liu et al. (2021), Goodman (2014), Aucejo and Romano (2016), Baker (2013), Belot and Webbink (2010), Jaume and Willén, (2019), Johnson (2009, 2011) Montebruno, (2020), Pischke (2007) and Lavy (2015) though the estimated effects vary widely according to the setting. There are theoretical links from missing school to other aspects of behaviour, socialisation and wellbeing, although empirical evidence on these topics is developed.

Much work has considered what happened to students during the COVID-19 pandemic in the UK as well as internationally, e.g. see Farquharson et al. (2022) for a summary in the UK context. As the first period of school closures (from March 2020) took everyone by surprise, these was little guidance and

resources for schools about online delivery. There was wide inequality in the extent of school engagement. For example, among the richest fifth of parents, nearly 60% of those sending their children to state schools reported that their child was providing online classes, falling to 40% among the poorest fifth of parents (Andrew et al. 2020). There were also huge differences among those sending their children to state schools and private schools, with the latter much better resourced (Elliot Major et al. 2020). During the second period of closure (January-March 20201), schools' provision of learning evened out to some extent (Cattan et al. 2021). Throughout the pandemic, there were also socio-economic differences in access to reliable internet and home computers (Sutton Trust, 2021) and in home environment and resources, for example in the extent to which parents had the time and resources to engage with their children's learning.

There is a growing body of evidence on the effects of the COVID-19 pandemic on learning loss and educational achievement, in the UK and internationally. For example, see Patrinos et al. (2022) for a recent survey of evidence, showing very large effects of the pandemic on global learning loss, though there is large variation between countries and between socio-economic groups within country. In the UK, most studies found that the first period of school closures in England cost children 1-2 months of expected progress, with larger impacts in maths (Rose et al. 2021; Renaissance Learning and EPI, 2021). Estimates of the effect of restrictions in 2021 suggest this cost primary school pupils around one month of expected progress (Renaissance Learning and EPI, 2021). Milanovic et al. (2023) find that there are some enduring effects of the pandemic on primary school attainment, particularly for younger students and in some subjects areas (literacy – grammar, punctuation and spelling or GPS). Also, the gap between those classified as disadvantaged (eligible for the pupil premium) and other students has increased each autumn between 2020 and 2022 for primary school (Year 6) English and maths.

Our concerns in this paper are the causes of absenteeism and the influence of policy during the COVID-19 pandemic response in 2020 and early 2021. We look at the consequences of pupil absence in a forthcoming companion paper (Gibbons, McNally and Montebruno 2023b).

3. Methods and Data

3.1 Background information

The analysis in the following sections describes patterns of pupil absence over different stages of the Coronavirus pandemic, during its early phases from March 2020 to July 2021 – spanning the Spring and Summer terms of the 2019/20 academic year, and Autumn and Spring terms of the 2020/21 academic year from September 2020 to May 2021. For reference, Figure 1 presents a calendar of events, to aid understanding of the policy context, follows. The calendar shows the months and weeks of our study period, and the events happening in schools (in blue) and in the wider policy environment (in orange).

Figure 1. Calendar of England's pandemic regulations and school restrictions

March 2020		
02	Warnings	Open
09	Warnings	Open
16	Reduce activities	Open
23	1st National lockdown	Key worker children only
30	1st National lockdown	Key worker children only

April 2020		
06	1st National lockdown	Easter holiday
13	1st National lockdown	Easter holiday
20	1st National lockdown	Key worker children only
27	1st National lockdown	Key worker children only

May 2020		
04	1st National lockdown	Key worker children only
11	1st National lockdown	Key worker children only
18	1st National lockdown	Key worker children only
25	1st National lockdown	Key worker children only

June 2020		
01	Phased re-opening	Phased reopening (prim)
08	Phased re-opening	Phased reopening
15	Phased re-opening	Phased reopening (sec)
22	Phased re-opening	Phased reopening
29	Phased re-opening	Phased reopening

July 2020		
06	Reopening, local lockdowns	Phased school reopening
13	Reopening, local lockdowns	Phased school reopening
20	Reopening, local lockdowns	Phased school reopening
27	Reopening, local lockdowns	Summer holiday

August 2020		
03	Reopening, local lockdowns	Summer holiday
10	Reopening, local lockdowns	Summer holiday
17	Reopening, local lockdowns	Summer holiday
24	Reopening, local lockdowns	Summer holiday
31	Reopening, local lockdowns	Summer holiday

September 2020		
07	Reopening, local lockdowns	Open with restrictions
14	Local lockdowns, rule of 6	Open with restrictions
21	Local lockdowns, wfh	Open with restrictions
28	Local lockdowns, wfh	Open with restrictions

October 2020		
05	Local lockdowns, wfh	Open with restrictions
12	1st Tier regs (3 Tiers)	Open with restrictions
19	1st Tier regs (3 Tiers)	Open with restrictions
26	1st Tier regs (3 Tiers)	Half term

November 2020		
02	2nd National Lockdown 5/11	Open with restrictions
09	2nd National Lockdown	Open with restrictions
16	2nd National Lockdown	Open with restrictions
23	2nd National Lockdown	Open with restrictions
30	Lockdown ends 2/12	Open with restrictions

December 2020		
07	2nd Tier Regs (3 Tiers)	Open with restrictions
14	2nd Tier Regs (3 Tiers)	Open with restrictions
21	2nd Tier Regs (4 Tiers)	Christmas holiday
28	2nd Tier Regs (4 Tiers)	Christmas holiday

January 2021		
04	3rd National Lockdown 6th	Open with restrictions
11	3rd National Lockdown	Key worker children only
18	3rd National Lockdown	Key worker children only
25	3rd National Lockdown	Key worker children only

February 2021		
01	3rd National Lockdown	Key worker children only
08	3rd National Lockdown	Key worker children only
15	3rd National Lockdown	Key worker children only
22	3rd National Lockdown	Key worker children only

March 2021		
01	3rd National Lockdown	Key worker children only
08	Re-opening step 1, stay home	Open with restrictions
15	Re-opening step 1, stay home	Half term
22	Re-opening step 1, stay home	Open with restrictions
29	Re-opening step 1	Open with restrictions

April 2021		
05	Re-opening step 1	Easter holiday
12	Re-opening step 2	Easter holiday
19	Re-opening step 2	Open with restrictions
26	Re-opening step 2	Open with restrictions

May 2021		
03	Re-opening step 2	Open with restrictions
10	Re-opening step 2	Open with restrictions
17	Re-opening step 3	Open with restrictions
24	Re-opening step 3	Open with restrictions
29	Re-opening step 3	Open with restrictions

Calendar shows general restrictions in orange and school restrictions in blue. School holidays are approximate as these vary from school to school.

An important feature to note, is that schools were completely closed for around 17 weeks in this period, to all children other than those of parents designated as 'key workers'. The definition of key workers was wide-ranging definition, but covered health care workers, teachers and others involved in running of crucial services. These closure periods occurred in the first and third national lockdowns. At other times,

schools were ostensibly open to other pupils, although there were various restrictions at different times on the ages that could attend and on the operational processes in teaching schools. As discussed above, there was very little formalised remote learning at this time, although practices varied widely.

3.2 Data sources

Information on attendance at schools during the pandemic comes from the Department for Education's Attendance in Education and Early Years Settings During the Coronavirus Outbreak survey. This survey of attendance was carried out from the start of the pandemic until the end of 2021. The data records daily information on pupil and teacher absence but the content changes over the period according to the needs of the data collectors at the time. We focus on the basic questions on pupils absent, which are recorded consistently throughout the data. The information on absence is not complete for all schools, for all days.

We merge the characteristics of schools, pupils and the local area from a range of data sources:

- COVID-19 Cases by specimen date, NHS Test and Trace, UK Health Security Agency, UKHSA, weekly and at MSOA-level.
- English Indices of Deprivation, Ministry of Housing, Community & Local Government, the release of 2019 and at LSOA-Level.
- Deaths registered in England, Office for National Statistics, monthly and at MSOA-level.
- Edubase now part of Get Information about Schools, GIAS), DfE, release of January 2020 at the school level.
- The "Schools, pupils, and their characteristics" dataset, DfE, release of January 2020, school-level.
- The Office for National Statistics urban-rural status classification of LSOAs.

School level information is linked using the school unique reference number (URN) and local area merged based on school location. When linking geographical data, we use the Middle or Lower Layer Super Output Area (MSOA/LSOA) in which the school is located. We constructed alternative geographical zones based on the neighbouring MSOAs surrounding a school location to better represent

school catchment areas – the nearest 10, 25 or 50 LSOA for example – though in practice we found this refinement made little difference to our results.

We derive data on the changing COVID-19 policy environment from publicly available online sources. Our first focus is on the different local responses to the Government's call to reopen schools after the first wave of the pandemic, in June and July in summer term of 2019/20. As noted in the Introduction, this policy was controversial and Local Authorities differed in the guidance they provided to schools. We derived information on this guidance from LA websites (106 cases), statements on Twitter (2 cases), one case using both LA website and Twitter, or media reports (usually local newspapers, 35 cases). We classified LAs into the four groups using text analysis on this unstructured text. The proportions of LAs in each guidance category are shown in Table 1.

Table 1: LA guidance in the Summer Term of 2019/20

	Freq.	Percent
LA made no public statement, according to our search	8	5.26
LA advised schools not to re-open	33	21.71
LAs let each school to decide on reopening strategy, conditional on safety considerations	76	50.00
LAs advised schools to reopen according to the Government's proposed staged return	35	23.03
Total	152	100.00

Information on the Tier status of the Local Authority in which the school is located, during the Autumn 2020 term, was taken from various web sources. There were restrictions on social gatherings throughout the period. Three phases of additional restrictions were put in place during this term. In September, a small number of local areas (in the Midlands and North of England) were periodically subject to local lockdowns, where business and social activity was highly restricted. In October, a three-tier system was in place, with Tier 1 subject to the least restriction on activity and Tier 3 with the strictest controls. In November, there was a national lockdown for most of the month. In December, a four-tier system was introduced, with a new Tier 4 that was, in effect, equivalent to a local lockdown. To simplify the categorisation in our analysis, we refer to places subject to no restrictions on days in September, as well as those designated as Tier 1 in October and December as being in Tier 1. Places designated as under local lockdown on days in September, and the national lockdown in November are classified as Tier 4. For parts of the analysis, we partition the pandemic study period into the following categories: (1)

Autumn 2019; (2) First national lockdown Mar-Jun 2020; (3) Phased reopening Jun-Jul 2020; (4) First tier regulations Sep-Oct 2020; (5) Second tier regulations Oct-Dec 2020; (6) Third national lockdown Jan-Mar 202; (7) Return to school Apr-Jul 2021.

We combine these various data sources together to create a school-level panel dataset with daily observations, which records information on pupil absence linked to: school characteristics (an indicator of whether school is LA maintained, proportion of pupils eligible for free meals, proportion whose first language is not English, proportions in various ethnic groups); local COVID-19 case and death rates at MSOA level; the local Index of Multiple Deprivation 2019 at LSOA level; indicators of the urban-rural classification of the LSOA (either major conurbation, other urban area, or rural town, village or isolated setting); indicators of the COVID-19 policy status of the Local Authority in which the school is located – i.e. the Local Education Authority policy on re-opening in June 2020, or the Tier designation in the Autumn term of 2020.

3.3 Methods of analysis

There are three parts to our analysis. Firstly, we provide some descriptive figures, maps and charts, illustrating the patterns of absence from school during the pandemic period. The results are presented in Section 4.1.

Next, we investigate the associations between characteristics of schools and the proportions of students absent during different phases of the pandemic, compared to a baseline in the pre-pandemic academic term of Autumn 2019/20. These descriptive regressions are estimated on our school-day level data set separately for seven different periods from Autumn 2019 to December 2020. These results are presented in Section 4.2.

We then move on to an analysis of the influence of central and local government policy decisions on pupil absence, focussing on the period when students returned to school in June 2020, and the period of Tier regulations from September 2020 to December 2020. We explain the interpretation of these regressions in more detail where we present the results in Sections 5.1 and 5.2, but the basic framework is a 'difference-in-difference' regression using our school-day level panel dataset, in which we regress

absence rates for each school day on indicators of the policy status on that particular day. Technically, these regressions have the following form:

$$absence_{st} = \alpha_s + \beta' policy_{st} + \gamma' characteristics_{st} + f_s(t) + \varepsilon_{st}$$

The dependent variable $absence_{st}$ is the proportion of students absent in school *s* on day *t*. The key explanatory variables of interest are the policy indicators ($policy_{st}$), which are either indicators of the LA guidance on re-opening, in the Summer 2020 term, or indicators of the Tier regulations in place at a particular school *s* on day *t* during Autumn 2020. The regressions control for: time-varying COVID-19 case and death rates plus interactions between fixed school/local area characteristics (e.g., the 2019 index of multiple deprivation, and proportions of pupils in different demographic groups) with indicators of whether the period is before or during policy implementation ($characteristics_{st}$); unobserved school characteristics that are constant over time, through school-specific constant terms (fixed effects, α_s); non-linear, school-specific trends in absence over time, through school-specific polynomials ($f_s(t)$). The coefficients β that we report in the results section represent the effect of the implementation of the policy on absence rates, compared to the periods when the policy was not in place, conditional on all the factors described above.

4. Descriptive analysis of absence during different waves of the pandemic

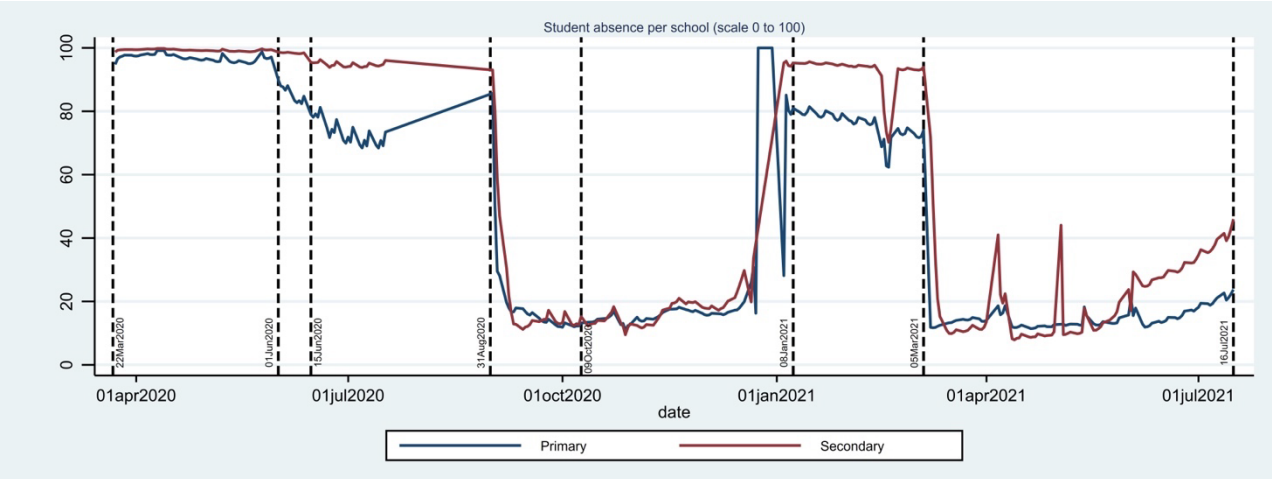
4.1 Graphical analysis

Figure 2 and Table 2 illustrate how absence varied over the study period. The Figure shows the absence rates by day over the April 2020-July 2021 period. Table 2 summarises the mean and standard deviation of daily absence rates by different phases of the pandemic and pandemic policy. Initially, during the first national lockdown, absence rates are near to 100% when schools were only open to key workers. From June 2020 to the end of the school year in July is the period of phased reopening of schools. As can be seen in Figure 2, absence rates decreased gradually as more and more schools opened, for increasing numbers of year groups, after the first wave of the pandemic. This is particularly so for primary schools due to their planned phased reopening. Absence rates were still high at 78% for primary schools and 95%

for secondary schools, on average. The numbers of secondary schools open for any children other than those of key workers remained low and so did secondary pupil attendance.

In September 2020, after the summer break, England was still in period of high infections and social restrictions, with the 'rule of 6' that prevented gatherings of more than 6 people and some local lockdowns in place. Schools re-opened and absence rates were lower than before the summer, though were high compared to the pre-pandemic period and remained so throughout the Autumn term of 2020, the period of the Tier regulations and the second national lockdown. In Autumn 2019 before the pandemic, mean absence was 4.3% in primary schools and 7% in secondary schools, whereas it was nearly 15% for primary schools and nearly 18% for secondary schools during the Autumn Term of 2020. In January 2021, the third national lockdown was in place, and schools were again only open to children of key workers. Consequently, absence rates are around 75% for primary school children, and over 90% for secondary school children. The higher attendance for primary school children presumably reflects the role of schooling in providing childcare for younger children of key workers over this period. After March 2021, schools re-open and we see a big drop in absence rates, though still averaging 13% in primary schools, 21% in secondary schools, and with the trend increasing over the spring and summer terms.

Figure 2: Student absence during pandemic phases 2020-21



Comparison of primary and secondary school's student absence during the pandemic. Absence measured by weekly average of daily number of students absent divided by the total number of pupils at the beginning of the pandemic (from Edubase January 2020), as a percentage. Each line marks the end and the beginning of a different set of source data, corresponding to different phases of pandemic policy.

Table 2: Absence rates during phases of the pandemic

	Primary absence %		Secondary absence %	
	Mean	s.d.	Mean	s.d.
Autumn 2019	4.3	1.2	7.0	4.2
First national lockdown Mar-Jun 2020	96.9	2.1	99.2	0.7
Phased reopening Jun-Jul 2020	77.6	10.8	94.9	2.4
First tier regulations Sep-Oct 2020	14.8	10.4	17.5	12.7
Second tier regulations Oct-Dec 2020	14.8	9.9	17.5	10.2
Third national lockdown Jan-Mar 2021	75.1	10.1	93.9	4.5
Return to school Apr-Jul 2021	12.9	9.0	21.2	10.3

Notes: average absence by school

Analysis of the factors influencing absence requires that there is variation in absence and closure rates across schools. The high standard deviations in absence shown in Table 2 during most phases of the pandemic indicate that there is a lot of disparity between schools, and from week to week in levels of absence. During the periods of phased re-opening of Summer 2020 and the Tier Regulations of Autumn 2020 there was considerable variation between schools in the timing of re-opening and strength of local restrictions, which are likely to have induced this kind of variation. We look deeper into these patterns in which illustrates this variation across schools with the histograms of absence rates for different policy phases of the pandemic, for primary and secondary schools separately. The horizontal axis is the percentage of students absent (on average over the period) and the vertical axis the percentage of schools with this level of absence. As in Figure 2, the patterns accord with what we would expect during each phase, with high rates of absence in the first lockdown (when attendance was restricted to children of key workers), during the phased reopening at the end of the 2019/20 school year, and in the third national lockdown in January-March 2021 (when attendance was again restricted to children of key workers). Absence in other phases is lower but there is clearly a lot of variation across schools.

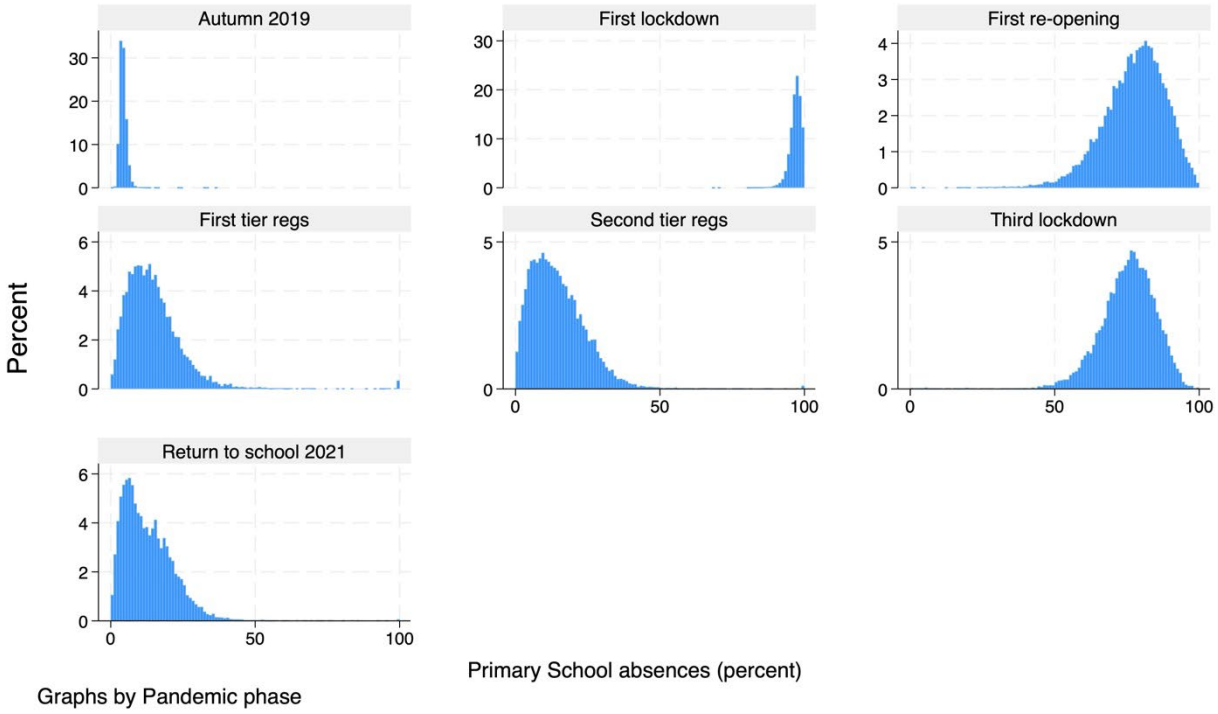
The aim of the analysis in the rest of this section is to understand in what ways the characteristics of schools and their geographical setting are linked to these student absence rates. Attendance is likely affected through four channels, linked to the preferences, expectations and constraints faced by children and their families. Firstly, absence rates will depend directly on levels of infection and illness in the community. The dominant source of viral illness in the population during the pandemic period was obviously COVID-19. It is theoretically unclear to what extent COVID-19 would have directly caused

pupils to stay off school during our study period. Infections in children were often asymptomatic and testing was only available for asymptomatic cases after 2020. It is therefore likely that many children would have attended school when infected. On the other hand, children were likely to have stayed off school when others in their family had COVID-19 symptoms. Secondly, absence rates are, in normal times, affected by parental attitudes to education, norms in the social groups to which families belong, and other personal characteristics of children and their families. Absence rates are usually higher for more children from more deprived backgrounds, such as those from high-deprivation neighbourhoods and from poorer families eligible for free school meals (Department for Education 2011). These factors would likely have continued to influence attendance during the pandemic and the empirical analysis below will investigate to what extent the pandemic shifted the relationships. An additional factor which may have come to play here during the pandemic, is the occupations and industries in which parents were employed. Restrictions on work and business activity will have impacted some families more than others and shifted the constraints families faced in terms of the feasibility of sending children to school versus keeping them at home. Thirdly, we would expect attendance to be linked to perceptions of the risks of infection from sending children to school. Government policy potentially had a role to play here, in terms of signalling levels of risk in the community. Lastly, direct restrictions on school opening will have played a part. These are discussed in more detail in the relevant sections below.

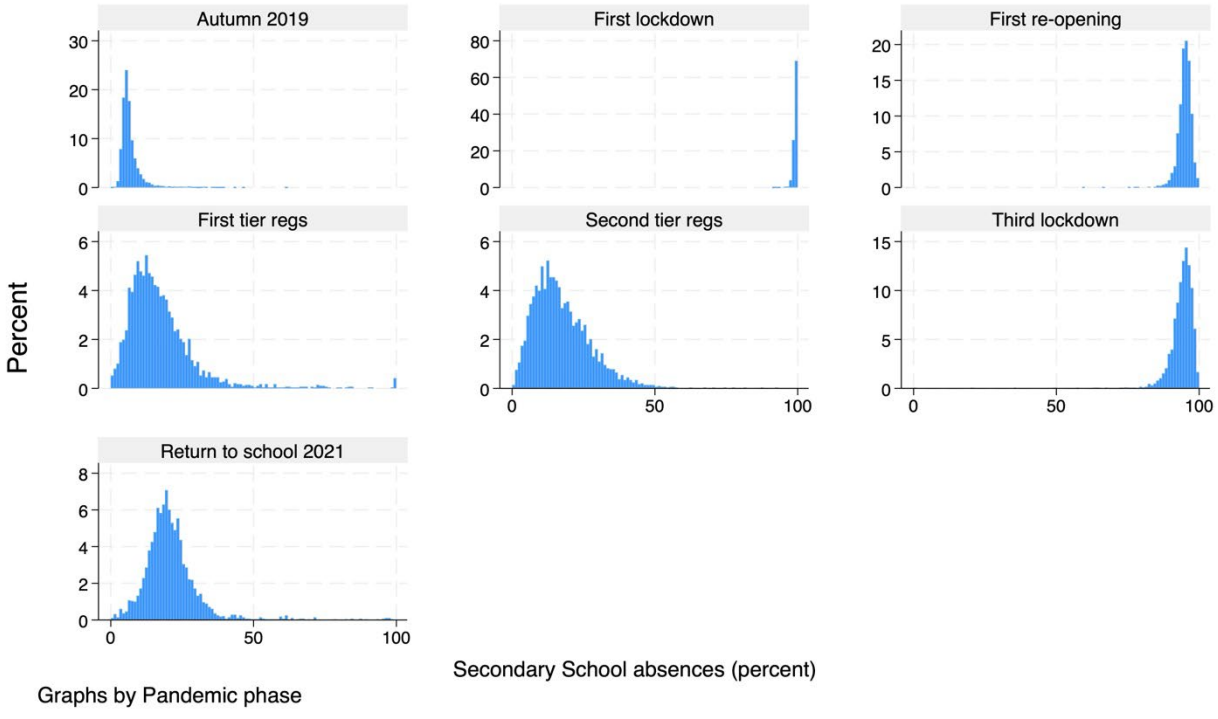
In Figure 4 and Figure 5, we map the geographical distribution of attendance by different phases of the pandemic, separately for primary and secondary schools. Each image is based on a two-week snapshot during each phase. There are evident disparities between LAs (except in the first phase when attendance is universally low). For primary schools there is some evidence of a north-south divide in terms of attendance during the 2020-21 school year, with higher rates of attendance in LAs in the south than in the north. For secondary schools, patterns of attendance look more geographically dispersed.

Figure 3: Distribution of absence across schools during pandemic phases 2020-21

Primary

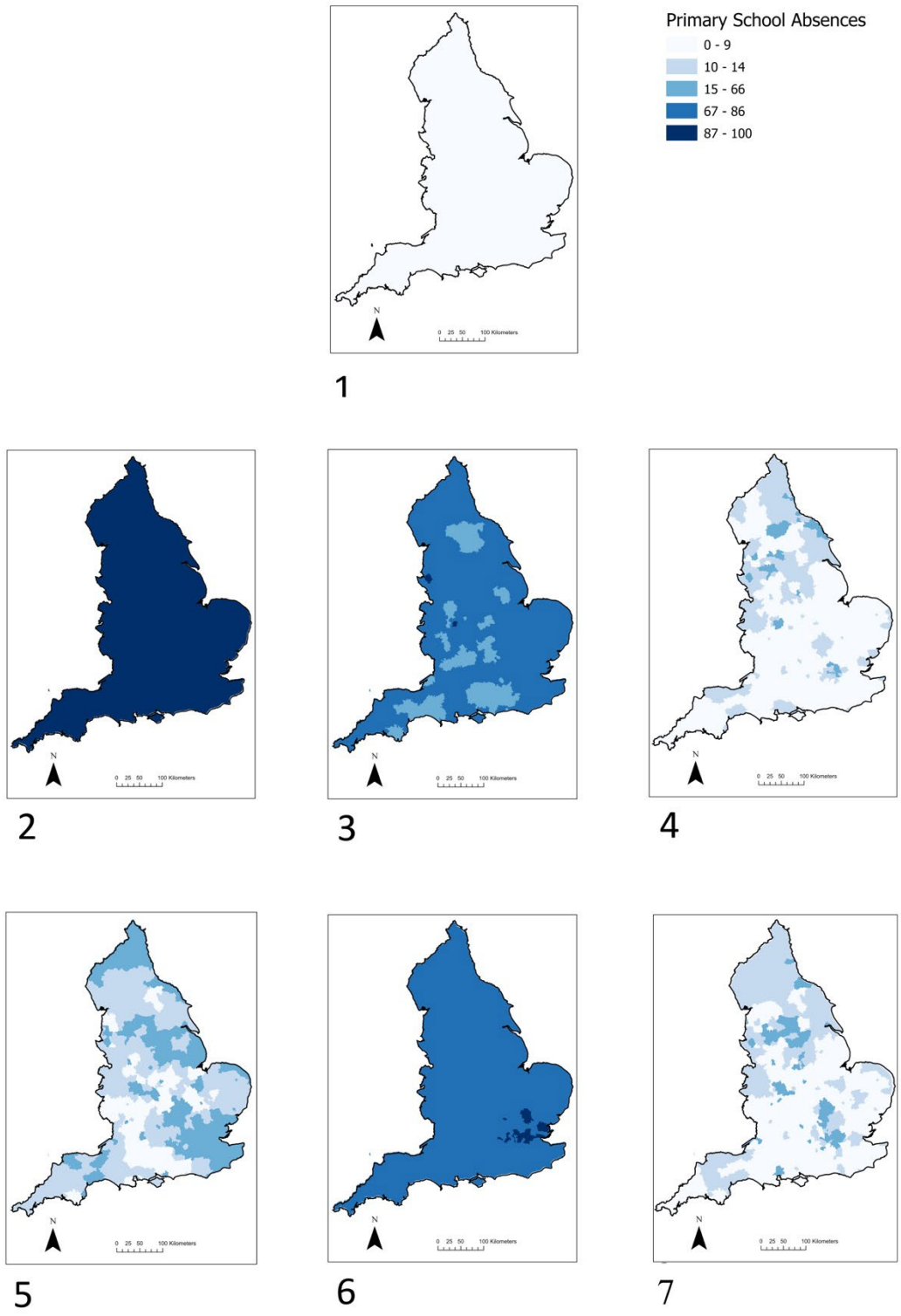


Secondary



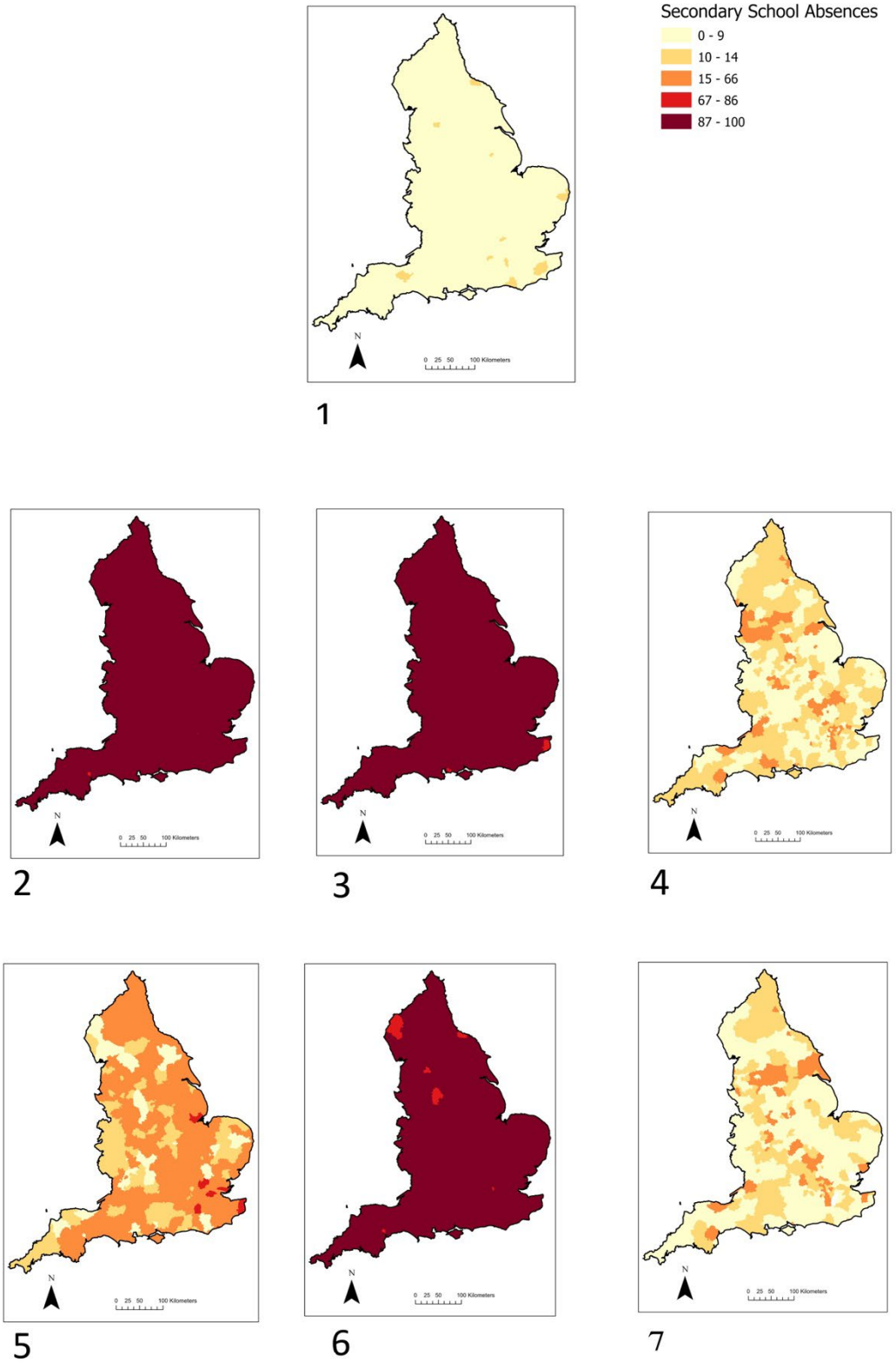
Distribution percentage students absent across schools (as a percentage of school census headcount in 2019/20).

Figure 4: Primary school student absence (%) by phase of the pandemic.



Each map corresponds to the phases of the pandemic: (1) Autumn 2019; (2) First national lockdown Mar-Jun 2020; (3) Phased reopening Jun-Jul 2020; (4) First tier regulations Sep-Oct 2020; (5) Second tier regulations Oct-Dec 2020; (6) Third national lockdown Jan-Mar 202; (7) Return to school Apr-Jul 2021

Figure 5: Secondary school student absence (%) by phase of the pandemic.



Each map corresponds to the phases of the pandemic: (1) Autumn 2019; (2) First national lockdown Mar-Jun 2020; (3) Phased reopening Jun-Jul 2020; (4) First tier regulations Sep-Oct 2020; (5) Second tier regulations Oct-Dec 2020; (6) Third national lockdown Jan-Mar 202; (7) Return to school Apr-Jul 2021

4.2 Descriptive regression analysis

Table 3 and Table 4 extend this descriptive analysis to look in more detail at the local area and school characteristics associated with pupil absence. The tables show results from regressions of pupil absence rates on school and local area characteristics. The columns correspond to different phases of the pandemic, as for the graphical analysis above, with the addition of a column corresponding to the Autumn term of 2019 to allow comparison with a non-pandemic period. The local area characteristics we consider are the IMD for 2019, indicators of the size of the urban area, and variables measuring local area COVID-19 case and death rates. These data are at the MSOA level and correspond to the MSOA in which a school is located. The school-level variables represent the socioeconomic background of the students – proportion entitled to free school meals, proportion whose first language is not English, and proportion by ethnic group – plus an indicator of whether the school is LA maintained, that is whether it is directly funded by the LA (e.g. community, voluntary, foundation) or is funded directly from central government (e.g. academies, Free Schools). The regressions control for day-specific fixed effects, so show the cross-sectional (between-school) association between these school and local area characteristics and the absence rates.

From the top row of Table 3, we can see that higher deprivation is associated with higher levels of absence, in periods outside of lockdown. Deprivation here is indexed by the 2019 index of multiple deprivation from the English Indices of Deprivation 2019 (MHCLG 2019). This provides a ranking of areas by socio-economic status in the period before the pandemic. We define neighbourhoods here as the Middle Layer Super Output Areas (MSOAs) in which each school is located.[1] A decile move up the IMD distribution is associated with an increase in absence rates of around 0.2 percentage points during 2020/21 and around 0.4 percentage points when absence rates were very high at the end of the 2019/20 academic year. Based on Column (1), the direction of relationship outside of the lockdown periods is in line with what would be expected in normal years, with higher levels of absence in poorer more deprived areas. However, the effects of deprivation on absence are greatly amplified during the pandemic because

[1] MSOAs comprise between 2,000 and 6,000 households and have a usually resident population between 5,000 and 15,000 persons. MSOAs fit within local authorities.

absence rates were more than double the usual rate, on average, and showed much higher variation than usual between schools. The mean absence rate in the Autumn 2019 time was 5.74% (s.d. 1.68%) whereas during the Autumn 2020/21 term it was 12% (s.d. 14%). During the lockdown periods, this relationship between deprivation and absence vanishes or changes direction. A likely reason for this is that schools were only open for key workers, and low-income families from more deprived areas are likely to be over-represented in this group. A similar pattern is seen for the association between the proportion of pupils eligible for free school meals and absence in the first lockdown period, compared to the rest.

The patterns for ethnicity show no systematic patterns in these cross-sectional regressions, varying in sign and significance from one period to the next. These patterns could be driven by a range of factors, such as the occupations of different ethnic groups, their representation in roles that were given key worker status and changing perceptions of risk as the pandemic evolved. Schools in larger urban areas generally experienced higher rates of absence than those in rural areas during the pandemic, in contrast to what was happening prior to the start. An exception is during the second national lockdown in 2021, where, as for IMD, the direction of the relationship is reversed. Explanations for these differences across urban-rural areas must remain speculative but may relate to factors such as differences in the occupational structure, whether parents were able to work from home, and differences in the perceptions of risk in dense versus less dense areas. Unsurprisingly, higher local COVID-19 prevalence – measured by death and case rates – are positively associated with pupil absence rates, presumably because children in these areas would be more likely to be infected or self-isolating and unable to attend school.

Table 4 repeats this descriptive analysis for secondary schools. The patterns are much less systematic for secondary schools. There is a similar pattern in association between local area deprivation, urban location and absence, but the magnitudes are much smaller.

Adding regional dummies to the specifications in Table 3 and Table 4 makes no substantive difference to the patterns of coefficients on local area and school characteristics. The implied regional disparities in absence rates are quite large, though vary from period to period (see the Appendix tables, Table 9 and Table 10). There appear to be no persistent regional gaps in absence rates over the pandemic period (conditional on the range of variables in Table 3 and Table 4). We also looked at the contribution of the

various sub-domains of the Index of Multiple Deprivation (barriers to housing, crime, education and skills, employment, health, income and living environment) but found evidence that any specific aspects of deprivation were linked to higher absence rates over all periods of the pandemic.

To help visualise the main patterns in Table 3 (for primary schools) we present the coefficients on three key variables – IMD, FSM and location in a conurbation – for each stage of the pandemic, on a timeline in Figure 6.

This shows that throughout most of the pandemic (except for periods of national lockdown), the correlation between deprivation and absences was greatly accentuated relative to the situation before the pandemic. The same is true of population density and absences.

So far, our analysis has described the general associations between school/local area characteristics over the different phases of the pandemic through the end of the 2019/20 and the 2020/21 academic years. In the next section, we focus on the influence of specific aspects of central and local government pandemic policy – the phased re-opening of schools in June/July 2020, and the period of Tier restrictions and local lockdowns in the Autumn of 2020.

Table 3: Association of local and school characteristics and absence, primary schools

	(1) Pre-pandemic Autumn 2019	(2) First lockdown Mar-Jun 2020	(3) Summer reopening Jun-Jul 2020	(4) Tier system Sep-Oct 2020	(5) Tier system, lockdown Oct-Dec 2020	(6) National lockdown Jan-Mar 2021	(7) Return to school Mar-Jul 2021
	Absence %	Absence %	Absence %	Absence %	Absence %	Absence %	Absence %
IMD percentiles							
IMD (inverted)	0.0048***	-0.0013	0.043***	0.017***	0.029***	-0.0080**	0.032***
	(0.00051)	(0.00082)	(0.0037)	(0.0040)	(0.0038)	(0.0035)	(0.0040)
School characteristic							
Non-LA maint.	-0.0053	0.038	-0.57***	-0.35**	-0.15	0.12	-0.34**
	(0.018)	(0.036)	(0.16)	(0.17)	(0.16)	(0.15)	(0.17)
% English NFL	0.0023***	0.017***	0.038***	0.12***	0.058***	0.12***	0.060***
	(0.00073)	(0.0012)	(0.0057)	(0.0072)	(0.0069)	(0.0055)	(0.0069)
% FSM	0.046***	-0.0053**	0.15***	0.16***	0.17***	0.087***	0.15***
	(0.0016)	(0.0021)	(0.0088)	(0.010)	(0.010)	(0.0085)	(0.011)
% Bangladeshi	-0.0086***	0.0090***	0.060***	0.019	0.014	0.077***	-0.054**
	(0.0015)	(0.0027)	(0.011)	(0.018)	(0.018)	(0.011)	(0.027)
% Caribbean	-0.018***	-0.033***	-0.069*	0.042	0.00044	0.15***	-0.12*
	(0.0046)	(0.011)	(0.039)	(0.049)	(0.051)	(0.048)	(0.064)
% Pakistani	-0.00015	0.015***	0.12***	0.018	0.033**	0.021**	0.027***
	(0.0011)	(0.0018)	(0.0078)	(0.013)	(0.013)	(0.0091)	(0.010)
% African	-0.027***	0.0074**	0.041***	-0.029*	-0.040**	0.031**	-0.00099
	(0.0017)	(0.0035)	(0.013)	(0.016)	(0.016)	(0.015)	(0.018)
% Chinese	-0.077***	0.025	0.045	0.015	0.029	0.24***	-0.14
	(0.010)	(0.019)	(0.099)	(0.094)	(0.092)	(0.085)	(0.092)
Geography							
Conurbation	-0.18***	0.49***	5.71***	2.27***	2.60***	-0.56**	2.87***
	(0.030)	(0.055)	(0.24)	(0.25)	(0.28)	(0.23)	(0.25)
Other urban	-0.14***	0.11**	3.22***	0.63***	0.73***	-1.05***	1.17***
	(0.025)	(0.049)	(0.21)	(0.21)	(0.21)	(0.19)	(0.21)
Covid variables							
COVID-19 death rate (mnth)	-	0.00062**	0.030***	-0.00022	0.0067***	0.021***	-
		(0.00030)	(0.0044)	(0.0079)	(0.0022)	(0.0013)	
COVID-19 case rate (day)	-	-0.00027	0.018***	0.0050***	0.014***	0.0032***	0.018***
		(0.00023)	(0.0025)	(0.00093)	(0.00040)	(0.00030)	(0.00042)
Day fixed effects	-	Yes	Yes	Yes	Yes	Yes	Yes
Observations	16,093	531,331	438,725	245,211	653,287	404,397	908,071
R-squared	0.236	0.102	0.362	0.291	0.150	0.335	0.680

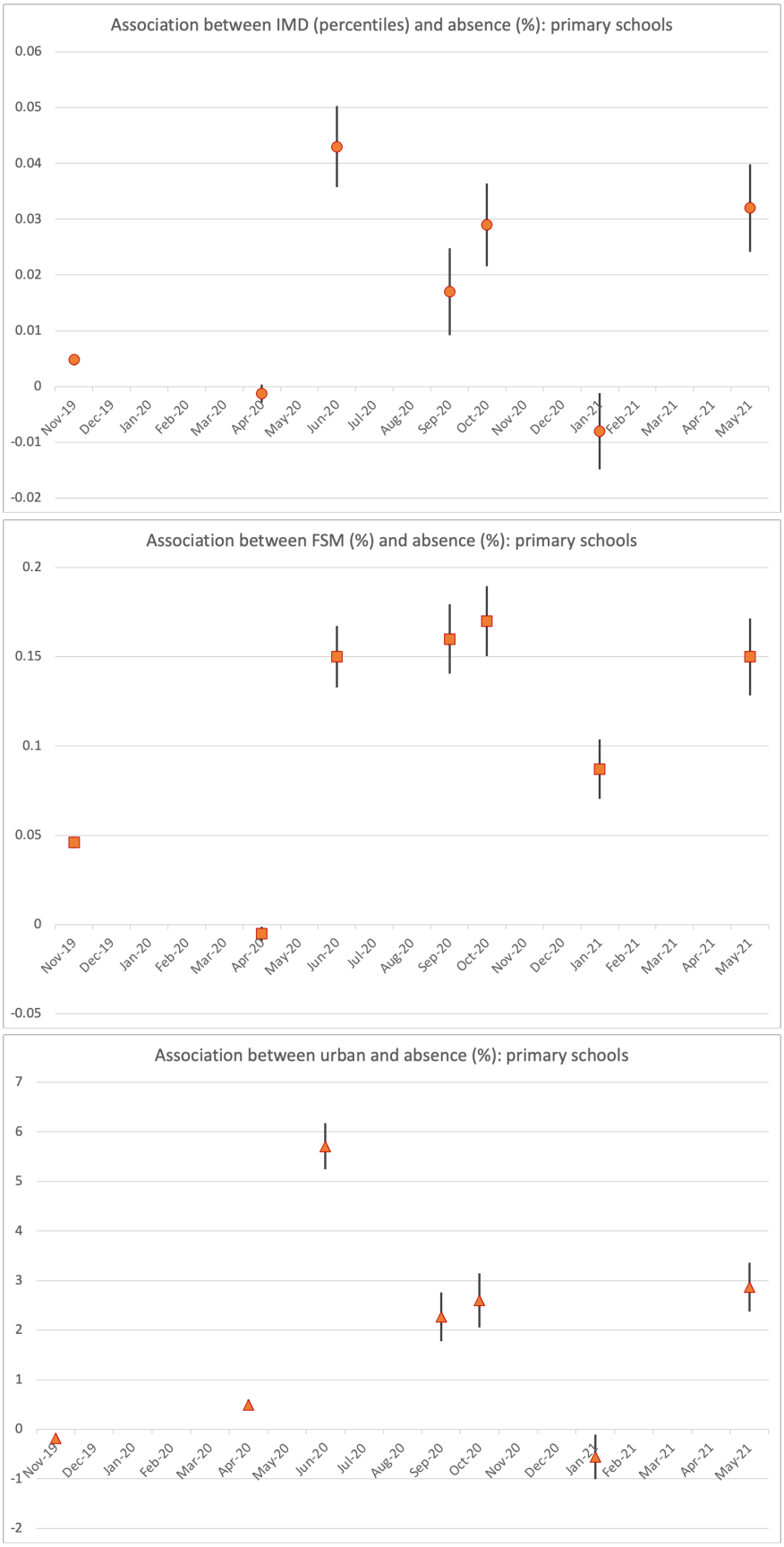
Robust standard errors clustered at school level, in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Standard errors clustered at LA level are similar

Table 4: Association of local and school characteristics with absence, secondary schools

	Pre-pandemic Autumn 2019	(1) First lockdown, Mar-Jun 2020	(2) Summer reopening, Jun-Jul 2020	(3) Tier system Sep-Oct 2020	(4) Tier system, lockdown Oct-Dec 2020	(5) Lockdown, Jan-Mar 2021	(6) Return to school Mar-Jul 2021
	Absence %	Absence %	Absence %	Absence %	Absence %	Absence %	Absence %
IMD percentiles							
IMD (inverted)	0.0011	-0.00013	0.0037*	0.0083	0.0053	-0.010***	0.0073
	(0.0012)	(0.00045)	(0.0020)	(0.0091)	(0.0091)	(0.0038)	(0.0090)
School characteristic							
Non-LA maint.	-0.0071	0.090***	-0.075	-1.99***	-1.66***	0.34**	-1.05***
	(0.050)	(0.027)	(0.10)	(0.45)	(0.41)	(0.14)	(0.36)
% English NFL	-0.012***	0.0020**	0.015***	0.036*	-0.045**	0.022***	-0.046***
	(0.0022)	(0.00096)	(0.0041)	(0.019)	(0.018)	(0.0044)	(0.018)
% FSM	0.096***	-0.011***	0.010	0.16***	0.11***	-0.078***	0.0084
	(0.0050)	(0.0015)	(0.011)	(0.030)	(0.028)	(0.012)	(0.028)
% Bangladeshi	-0.033***	0.0072***	-0.0017	0.0043	0.039	0.048***	-0.00026
	(0.0049)	(0.0016)	(0.0083)	(0.041)	(0.028)	(0.0081)	(0.029)
% Caribbean	-0.012	-0.011*	-0.049	-0.028	0.17	0.031	0.11
	(0.016)	(0.0064)	(0.030)	(0.16)	(0.12)	(0.027)	(0.15)
% Pakistani	-0.016***	0.0061***	0.010	0.031	0.035	0.016**	0.0027
	(0.0035)	(0.0012)	(0.0068)	(0.033)	(0.030)	(0.0081)	(0.031)
% African	-0.041***	0.0065**	-0.0032	0.0034	0.027	0.047***	0.045
	(0.0058)	(0.0027)	(0.010)	(0.066)	(0.052)	(0.012)	(0.050)
% Chinese	-0.35***	0.056***	0.14*	-0.56*	-0.77***	0.47***	0.13
	(0.034)	(0.017)	(0.075)	(0.31)	(0.29)	(0.094)	(0.28)
Geography							
Conurbation	-0.31***	0.18***	0.17	0.92	0.95	0.81***	2.29***
	(0.079)	(0.043)	(0.16)	(0.77)	(0.67)	(0.27)	(0.69)
Other urban	-0.13**	0.0023	-0.26*	-0.17	1.66***	0.31*	1.63***
	(0.063)	(0.037)	(0.14)	(0.56)	(0.49)	(0.17)	(0.54)
Covid variables							
COVID-19 death rate (mnth)	-	0.00012	0.0081***	-0.024	0.015**	0.0051***	-
		(0.00020)	(0.0027)	(0.026)	(0.0066)	(0.0011)	
COVID-19 case rate (day)	-	0.00027*	0.0071***	0.012***	0.025***	0.0010***	0.020***
		(0.00014)	(0.0015)	(0.0035)	(0.0014)	(0.00026)	(0.00097)
Day fixed effects	-	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,996	125,745	60,640	45,031	118,328	76,405	165,883
,R-squared	0.377	0.121	0.053	0.372	0.152	0.132	0.72

Robust standard errors clustered at school level, in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Standard errors clustered at LA level are substantively similar

Figure 6: Association between IMD, FSM, conurbation and absence in primary schools over time



The figure plots relevant coefficients from the regression of Table 3.

5. Analysis of effects of local policies

5.1 Reopening after the first wave, Spring and Summer 2020

In this section, we look at the factors associated with pupil absence when schools began to reopen in June 2020, after the first wave of the pandemic. As discussed in detail above, all schools were closed to most pupils between March and June 2020, though remained open for children of key workers. From June 2020 central government initiated a phased re-opening, from 1st June for primary schools and 15th June for secondary schools. Primary schools began to open for children in Nursery, Reception, Year 1 and Year 6. Secondary schools began to open for Years 10 and 12. Throughout the period schools remained open for key worker children in all year groups. In the results below, we define differentiate between the effects in the pre-June and post-June periods.

The incidence of this re-opening locally, and pupil absence in turn, was affected by Local Authority guidance. As discussed in Section 1, some Local Authorities advised schools to follow central government guidance and re-open for selected year groups. Others advised schools not to follow central government guidance and to stay closed, some let schools make their own decision and some gave no guidance on the issue. Figure 7 maps how LAs guided schools as to whether to follow Government guidance or not (simplifying this into two groups: LAs that advised schools to follow central government and LAs that did not). Although there are no immediately obvious geographical patterns, it is clear that many metropolitan urban areas (the clusters of smaller LAs zones on the map) advised against or issued no specific guidance to follow the Government plans. In part this may be because LAs felt there was a higher risk to staff and students in urban areas. In part it may be because the urban LAs are typically controlled by Labour, so may have taken a more oppositional stance to the Conservative central Government policy agenda.

Figure 7: Local Authority guidance on school reopening, June 2020

Notes: Categories of guidance derived from scraping of LA websites.

Whatever the reasons for these differences, the guidance provided influenced levels of absence. This is shown in Figure 8 which plots the distribution of pupil absence rates (% of normal enrolment), split by the pre-June and post-June periods, and by whether the school's LA advised its schools to follow central government policy on re-opening or not. Note, these percentages are for shares of normal enrolment, not the pupils eligible to attend.

A key feature of Figure 8 for primary schools is the expected drop in absence rates after the Government prescribed re-opening date of June 1st, from a mean of over 95% during the period of enforced closure to below 80% after. The dashed vertical lines show the means, with the colour corresponding to the colour used for the distribution, as shown in the key. This high absence rate potentially reflects a combination of factors: schools were open only for all pupils in four, out of eight, year groups; not all schools followed the Government guidance to reopen; and absence rates remained high in year groups even in schools that were open for them. LA guidance potentially played a part. There is a 5-percentage point gap in mean absences between schools in LAs that advised schools to follow the government guidance and those that did not. But even in schools that were advised to open, there is a lot of variation in mean absences, ranging from 0-100% and with standard deviation of 13% across schools. A likely explanation is that parents were reluctant to allow their children back to school after the trauma of the pandemic, and with only 7 weeks left in the school year. We look at the local and school-level factors related to this variation in absence rates in the regression estimates in Section 4.2 below.

Figure 9 shows the distributions of pupil absence for secondary schools. The recovery in pupil attendance is less marked in secondary schools, which is unsurprising given that there were only 5 weeks (25 days) left of the school year and only two-year groups were initially invited back. Absence rates were still at 96% after schools were due to open, down from 99% during the closure period, though again there is variation across schools. There was evidently a reluctance to return amongst pupils at secondary schools, too. The differences between LAs that advised schools to follow the Government guidance and those that didn't or advised against it are much less marked – the gap is less than 0.5 percentage points.

Figure 8: Distribution of absence rates in primary schools, before and after 01/06/2020, split according to LA guidance

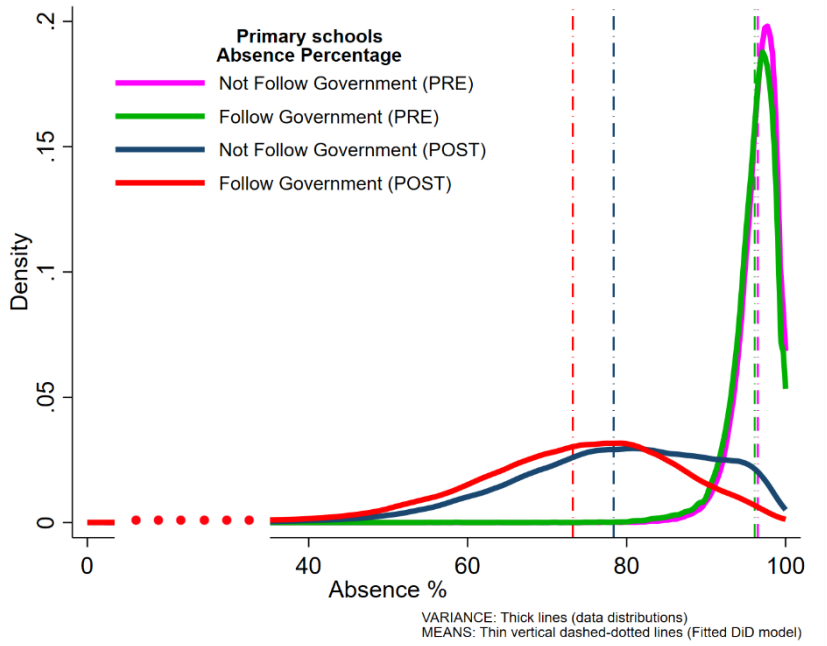


Figure 9: Distribution of absence rates in secondary schools, before and after 15/06/2020, split according to LA guidance

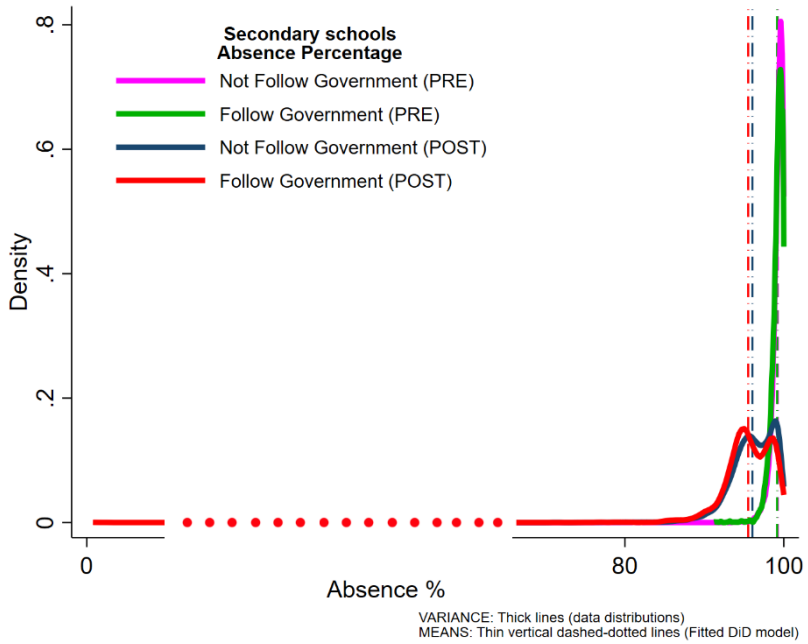


Table 5: Effect of LA guidance, local and school characteristics on primary school pupil absence, March-July 2020

	(1) Guidance, covariates	(2) Guidance, IMD, covariates	(3) Guidance, IMD school, covariates	(4) Guidance, IMD school, covariates, urban
	Absence %	Absence %	Absence %	Absence %
Post June 1st x LA Guidance				
School decision	2.43***	1.95***	1.58***	1.31***
	(0.18)	(0.18)	(0.18)	(0.19)
No statement	4.55***	3.60***	3.91***	3.51***
	(0.45)	(0.44)	(0.44)	(0.43)
Don't reopen	9.93***	8.95***	8.47***	8.11***
	(0.19)	(0.20)	(0.20)	(0.21)
Post x IMD/component percentiles				
IMD (inverted)		0.076***	0.041***	0.040***
		(0.0025)	(0.0036)	(0.0036)
Post x School characteristics				
Non-LA maintained			-0.49***	-0.39**
			(0.16)	(0.16)
% English NFL			0.0015	-0.0061
			(0.0054)	(0.0054)
% FSM			0.11***	0.10***
			(0.0082)	(0.0083)
% Bangladeshi ethnic			0.081***	0.076***
			(0.0096)	(0.0097)
% Caribbean ethnic			0.11***	0.056
			(0.034)	(0.034)
% Pakistani ethnic			0.064***	0.058***
			(0.0078)	(0.0078)
% African ethnic			-0.0066	-0.016
			(0.013)	(0.013)
% Chinese ethnic			0.083	-0.046
			(0.093)	(0.096)
Post x Geography				
Major conurbation				1.86***
				(0.24)
Other urban				0.49**
				(0.21)
Time variant (MSOA)				
COVID-19 monthly death rate	-0.00084***	-0.00090***	-0.00097***	-0.0010***
	(0.00031)	(0.00030)	(0.00030)	(0.00030)
COVID-19 daily case rate	-0.0044***	-0.0042***	-0.0043***	-0.0044***
	(0.00027)	(0.00026)	(0.00027)	(0.00027)
School fixed effects & trends	Yes	Yes	Yes	Yes
Post	-9.97***	-13.3***	-13.1***	-13.3***
	(0.14)	(0.18)	(0.19)	(0.22)
Observations	1,001,006	1,001,006	969,986	969,986
R-squared	0.858	0.859	0.858	0.858

Robust standard errors clustered at school level, in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Standard errors clustered at LA level are substantively similar

Table 6: Effect of LA guidance, local and school characteristics on secondary school pupil absence, March-July 2020

	(1) Guidance, covariates	(2) Guidance, IMD, covariates	(3) Guidance, IMD school, covariates	(4) Guidance, IMD school, covariates, urban
	Absence %	Absence %	Absence %	Absence %
Post June 1st x LA Guidance				
School decision	0.29***	0.24**	0.19*	0.22*
	(0.11)	(0.11)	(0.11)	(0.11)
No statement	0.65***	0.56***	0.65***	0.68***
	(0.21)	(0.21)	(0.21)	(0.21)
Don't reopen	0.71***	0.59***	0.43***	0.47***
	(0.13)	(0.14)	(0.14)	(0.15)
Post x IMD/component percentiles				
IMD (inverted)		0.0076***	0.0027	0.0028
		(0.0016)	(0.0019)	(0.0018)
Post x School characteristics				
Non-LA maintained			-0.35***	-0.36***
			(0.099)	(0.098)
% English NFL			0.0027	0.0039
			(0.0046)	(0.0046)
% FSM			0.031***	0.033***
			(0.0063)	(0.0064)
% Bangladeshi ethnic			-0.0066	-0.0066
			(0.0075)	(0.0076)
% Caribbean ethnic			-0.023	-0.018
			(0.026)	(0.027)
% Pakistani ethnic			0.012**	0.012**
			(0.0051)	(0.0051)
% African ethnic			-0.025**	-0.023**
			(0.011)	(0.011)
% Chinese ethnic			0.056	0.088
			(0.085)	(0.088)
Post x Geography				
Major conurbation				-0.34**
				(0.16)
Other urban				-0.22*
				(0.13)
Time variant (MSOA)				
COVID-19 monthly death rate	0.0028***	0.0028***	0.0027***	0.0027***
	(0.00015)	(0.00015)	(0.00015)	(0.00015)
COVID-19 daily case rate	0.00013	0.00013	0.000069	0.000077
	(0.00014)	(0.00014)	(0.00014)	(0.00014)
School fixed effects & trends	Yes	Yes	Yes	Yes
Post	-3.50***	-3.81***	-3.72***	-3.58***
	(0.089)	(0.11)	(0.15)	(0.18)
Observations	192,163	192,163	186,360	186,360
R-squared	0.707	0.707	0.707	0.707

Robust standard errors clustered at school level, in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Standard errors clustered at LA level are substantively similar

We explore the factors affecting pupil absence rates in greater detail in Table 5 and Table 6. The tables focus on the role of the LA guidance given during June 2020, the socioeconomic conditions of the school MSOA as described by the English Indices of Deprivation 2019, characteristics of schools and their student body, plus the urban environment. The coefficients and standard errors are from a regression of daily pupil absence rates on a set of variables categorising LA policy in the phased re-opening period, alongside controls for the MSOA index of multiple deprivation, school demographic variables, urban indicators and COVID-19 infection/death rates. The regression specification includes school fixed effects and school-specific cubic time trends, to control for pre-existing differences and trends across schools. Variables that do not vary over time during the period (school demographics, IMD, urban indicators) are interacted with a post-lockdown dummy variable – i.e. an indicator for days after 1st June for primary schools and 15th June for secondary schools. Their coefficients give the effect of these variables on the change in absence rates that occurred between the period before and after the June opening date (the panels labelled "*Post* x …").

The top panel of Table 5 reports the effect of the different categories of LA guidance, like those shown in Figure 8, but splitting the 'Not Follow Government' group into its constituent subgroups: LAs that stated that schools should make the decision, LAs that made no public statement at all and LAs that explicitly advised schools not to re-open. The baseline category is LAs that asked schools to follow Government guidance and re-open.

All specifications control for some time varying covariates: the daily MSOA level COVID-19 case rate and the monthly COVID-19 death rate (both per 100,000 people). Note, the COVID-19 case rate at this time was inaccurate due to limited testing. The coefficients on these time varying variables cannot be easily interpreted, given the specifications already control flexibly for school-specific time trends.

Column (1) shows the effects of the LA guidance categories, with no additional control variables. Column (2) controls for the MSOA Index of Multiple Deprivation (IMD), scaled between 0 for the least deprived and 100 for the most deprived school MSOA. Column (3) includes both IMD and school characteristics, Column (4) adds in indicators of whether the school is in a metropolitan, urban or rural postcode. All these variables are interacted with the *Post* dummy variable.

In line with Figure 8, the coefficients reported in the top three rows of Table 5 indicate that schools in LAs that gave advice counter to official government policy (i.e. to re-open; which is the baseline) had significantly higher absence rates on average (i.e. the coefficients on the guidance categories are all positive relative to the baseline 'follow government guidance'). For example, in Column (1), row 3, the coefficient of 9.93 indicates that schools in LAs that explicitly advised schools not to re-open for most pupils had absence rates almost 10 percentage points higher than schools in LAs that advised schools to follow government guidance. Where LA advice was more ambiguous, in that they left it for schools to decide or provided no public guidance, the effects are smaller – 4.6 and 2.4 percentage points respectively. The magnitude of the effects of LA guidance on absence changes slightly depending on the control variables included across Columns (1)-(4). But even with a rich set of controls for IMD, school characteristics and urban indicators in Column (4) the gap between schools that were advised to remain open and others is between 1.3 and 8.1 percentage points, and statistically significant.

Part of this observed difference in absence rates between schools in LAs with different guidance is no doubt directly due to school decisions over whether children, other those of key workers who had been allowed to attend throughout, were permitted to return to school. Schools would have made different decisions over who to bring back in response to LA guidance. But families in LAs that were not explicitly supportive of the Government re-opening policy may also have felt less confident about returning to school, even when they were invited to do so.

The association of absence rates with the indices of deprivation and other socioeconomic characteristics are informative. The results show that schools in more deprived areas had higher absence rates than those in less deprived areas during the re-opening period. In Column (2), a 10 percentile (one decile) increase in the multiple deprivation index is linked to a 0.8 percentage point higher rate of absence, so moving from the least to the most deprived MSOAs would increase absence rates by 8 percentage points. Column (3) shows the association of absence rates with school-level attributes (conditional on MSOA overall deprivation). Schools out of direct LA control (i.e. Voluntary schools, foundation schools, free schools and academies) had slightly lower rates of absence in the re-opening phase. Characteristics of the pupils enrolled in the school have a similar effect to the MSOA deprivation indices. Characteristics

linked to local area deprivation – the percentage of pupils whose first language is not English, eligible for free school meals and in minority ethnic groups – are associated with higher absence rates. The geographical factors are also interesting, indicating that absence rates were increasing with city size, being around 2 percentage points higher in major conurbations, and 0.5 percentage points higher in other urban areas, than in non-urban and rural settings.

In summary, the picture here is one in which primary school pupils in more deprived settings, urban areas, in LA maintained schools, and in LAs which did not explicitly tell schools to re-open, were likely to have lost more educational time than pupils in other settings.

The effects on absence rates shown in Table 5 could come about through two mechanisms. At the intensive margin, even if schools were open, socioeconomic and policy factors may have affected households' decisions over whether to return to school. At the extensive margin, the same factors may have influenced schools' decisions over whether or not to re-open. The association between the absence rates and school/local demographics suggests that the high absence rates in the re-opening period were not just due to school closure, but to the choices and constraints faced by the school population. Indeed, most of what is seen in Table 5 comes about through the intensive margin – the decision of households not to send their children to school when the schools were ostensibly open. If we repeat the analysis using only those schools that were formally open after the June re-opening date, the results change very little. In practice, around 85% of schools were formally open. Conversely, if we change the regression to model school closure (using a dummy 0-1 variable for closure as the dependent variable) few of the variables have large or statistically significant impacts (though, unsurprisingly, schools were less likely to open if told not to by their LA).

We turn now to secondary schools. Table 6 repeats the analysis of Table 5 for secondary schools in England. The results are broadly similar to those for primary schools – higher absence was linked to lack of LA guidance to follow central government policy, higher deprivation and LA maintained schools, but the magnitudes are far smaller and sometimes statistically insignificant. This is because the absence rates were on average much higher and there was much less variation across schools – see Figure 9. There is, again, some evidence of a link between city size and absence, with schools in small towns experiencing

less absence than major conurbations, though also less than rural areas. Additional analysis shows that, as for primary schools, the difference in absence rates between schools is due to variation in absence across open schools, rather than variation in rates of closure. The results are largely unchanged if we estimate the regressions on the sample of schools that were formally open and there are almost no statistically significant effects on closure from any of the variables analysed here.

We estimated regressions that extend those of Table 5 and Table 6, splitting out the IMD index into its constituent domains (specific to education, income, crime etc.) but found no clear systematic patterns. We also looked at regional differences, finding that absence rates were generally higher in regions outside London, the South East and South West.

On a technical note, the standard errors in the regressions above are clustered at school level, so they are robust to heteroscedasticity at school level and correlation in unobservable factors affecting absence within schools, over time. We also re-estimated with standard errors clustered at LA level, to allow for general autocorrelation patterns across schools, within LAs, but the results were not substantively different. We looked at alternative definitions of the relevant geographical scale at which to consider the influence of area level deprivation and the time varying covariates. To do this, we assigned each school to its nearest neighbouring 10 MSOAs and aggregated the variables over these nearest MSOAs. We found little difference in comparison with the specifications assigning each school to just its own MSOA so do not report these more aggregated neighbourhood estimates.

5.2 Reopening in the second wave, Autumn 2020

Primary and secondary schools opened as usual in September 2020 and remained open throughout the Autumn term. However, this was at the start of a second large wave of COVID-19 cases and deaths. England was subject to a variety of local and national restrictions over the whole term. This regime was piecemeal and included Local Lockdowns (in our sample, Local Lockdowns span from 1st September 2020 to 14th October 2020); the First Tier Regulations (from the 14th October 2020 to 5th November 20020), which had three tiers; the Second National Lockdown (from 5th November to 2nd December 2020); and the initial part of the All Tiers Regulations (in our sample, it spans from 2nd December to

18th December or the last term day). All these regulations were enacted in Statutory Instruments and were valid only for England. Importantly, schooling was not included in these Tier regulations. In other words, students were supposed to attend school throughout the whole of this period including the Second National Lockdown. Figure 10 maps how these different restrictions evolved over the weeks throughout the Autumn term of 2020.

We analyse the impact of these restrictions and their interaction with local and school characteristics using school-by-day level panel data for the whole of the Autumn term. The coefficients and standard errors from the regressions are presented in Table 7 and Table 8 for primary and secondary schools respectively. Column (1) presents results for the effects on absence rates of moving into different Tier categories (the baseline tier being Tier 1/no specific restrictions). Column (2) includes the interaction of different tiers with the local MSOA 2019 IMD percentile (relative to Tier 1). Column (3) augments the specification with interactions between Tiers and school characteristics. Column (4) adds in interactions with urban size indicators. All regressions control for school fixed effects interacted with flexible time trends (cubic polynomials), so the estimates come from variation within schools over time, netting out any effects that vary smoothly over time. This allows us to more reliably isolate the role of the changing Tier designations. All regressions also control for COVID case and death rates (per 100,000). This is a 'regression discontinuity design', where identification of the Tier effects comes from the discontinuous switching between Tiers.

Column (1) of Table 7 suggests that the Tier restrictions had an impact on absence, despite the fact that schools were open and children were expected to attend. The coefficients imply that moving from Tier 1 to Tier 2 or 3 increased absences in primary schools by 2-3 percentage points. Moving to Tier 4 increased absences by nearly 5.5 percentage points. Of course, an obvious explanation would be that children were sicker and less likely to attend school when the Tier restrictions were higher. However, we are controlling here for local (MSOA) case rates and death rates and for school-specific nonlinear time trends that should largely take out smoothly time-varying factors like COVID-19 infection rates. The implication is that something specific about the Tier designations led to higher absences.

Column (2) suggests that the effects of the Tier restrictions on pupil absence varied according to local area deprivation. The top three sets of coefficients now give the effects of the Tiers at the lowest levels of deprivation (corresponding to the bottom of the IMD distribution), ranging from around 1-1.5 percentage points in Tiers 2 and 3 to 4 percentage points in Tier 4. The next three sets of coefficients (Tier x IMD) show how the effects of the Tiers increase with increasing deprivation (or equivalently how the effect of deprivation varies with the Tier level). At the top end of the IMD distribution (IMD = 100), there would be an additional 3 percentage points absence in each of the Tier levels (i.e. 0.03*100), taking the impact of the Tier 4 designation in the most deprived areas to over 7 percentage points, and the impact of Tier 2 and 3 designations to over 4 percentage points.

The association of local area deprivation with absence can be completely explained by the characteristics of the school population. When we interact school characteristics with the Tier designations in Column (3), the IMD x Tier interactions become small and statistically insignificant, while there are many large and significant effects associated with student demographics. There is little difference between the effects of the Tiers in more autonomous, non-LA maintained schools (e.g. foundation schools, free schools, voluntary schools and academies in England's nomenclature) and LA-maintained schools during this period, the effects being small – less than one percentage point – varied and generally insignificant. The implied effects of ethnicity and family income are more important. Schools with twice the average proportion eligible for free school meals (i.e. with FSM = 45%) would have expected over 2 percentage points higher absence than those with the lowest FSM proportions as they moved into higher Tiers (i.e. multiplying the coefficients of around 0.05, by 45). The patterns for ethnicity stand out for some groups. Schools with a high proportion of Caribbean and Chinese ethnic groups (relative to White students) seemed particularly sensitive to the Tier designations. But the picture is diverse, and high proportions of African and Bangladeshi students seems to be associated with lower rates of absence in higher Tiers. In general, higher proportions of students whose first language was not English are associated with higher absences rates in the higher Tiers. An increase in the proportion whose first language is not English from zero to twice the average (a gap of about 40%) would mean an increase in expected absence rates of 1.8% in Tier 4 relative to Tier 1 (i.e. 0.046*40).

Adding in controls for urban size in Column (4) suggests that most, if not all, of the association between the Tier restrictions and student demographics is related to the urban setting. Tier 2-4 restrictions in major conurbations increased absence rates by over 4% relative to rural settings. The effect in smaller urban areas is more modest at between 1 and 1.5 percentage points. These effects need to be added to the main effects of the Tiers (the top three sets of coefficients in the table) to see the overall impact of the Tiers. For example, the impact of the Tier 4 restrictions in major conurbations was to increase absence rates by nearly 6.6 percentage points relative to the baseline Tier 1 in non-urban areas (i.e. 2.53+4.08). It is also noticeable that the Tier 2-3 restrictions had no effect relative to Tier 1 on absences in non-urban areas; the coefficients on Tier 2-3 at the top of the table are small and statistically insignificant.

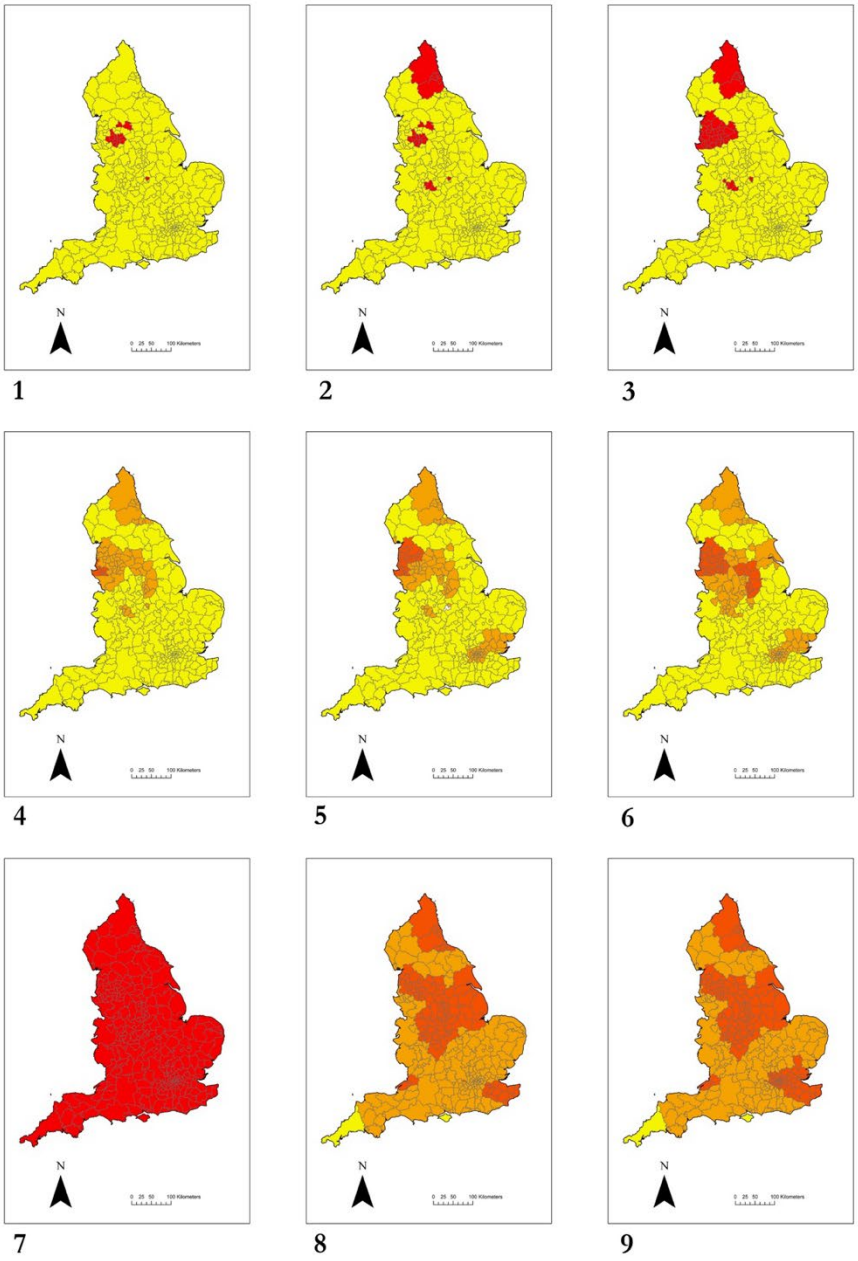
Turning now to secondary schools, Table 8 repeats the above analysis. The main effects of the Tiers in Column (1) are broadly similar to those for primary schools – higher Tiers are associated with higher absences. Similarly, there are interactions with IMD, with stronger effects where deprivation is higher (Column 2). In column (3), we can see that lower income in the school population is the main factor driving this, with much stronger effects of the higher Tiers in schools with high proportions of students eligible to receive free school meals. The ethnic group effects are less marked, though absence is increasing quite strongly with the number of students of Chinese ethnic origin. The urban setting is again important in increasing absence rates in response to the Tier designations.

To help visualise the main patterns in Table 7 and Table 8, we present the key coefficients for Tier 2, Tier 3 and Tier 4/Lockdown in Figure 11. The figure shows the effects of each tier designation on absence, relative to the lowest tier (Tier 1).

What can we conclude from this set of results? One clear-cut finding is that the higher Tier designations led to higher levels of absence in both primary and secondary schools, even though schools were open and students expected to attend. These effects from the higher Tier designations are stronger in more deprived areas. The role of demographic characteristics in the school and the urban context is more nuanced and differs between the primary and secondary phases (although the effect of socio-economic background is consistent across both). While the empirical analysis does not allow us to isolate

the mechanisms by which the Tier designations influenced absence, a potential explanation is that the higher-level local Tier restrictions signalled higher degrees of risk from COVID-19 associated with school attendance and encouraged families to keep their children at home. The culture of staying at home and working from home that had developed during the early stages of the pandemic may also have led parents who were unable to work due to the restrictions to keep their children at home. These explanations also fit in with the results from the reopening in the Summer of 2020 in Section 5.1 when LA support for central government policy on re-opening had a significant impact on absence rates.

Figure 10: Geographical distribution of lockdowns and Tier regulations in England, September to December 2020.



Notes: Panels 1-3, Local Lockdowns 1st September 2020 to 14th October; Panels 4-6 the First Tier regulations (from the 14th October 2020 to 5h November 20020); Panel 7 Second National Lockdown (from 5th November to 2nd December 2020; Panel 8 and 9, initial part of the All Tiers regulations (in our sample, it spans from 2nd December to 18th December or the last term day). We categorise Local Lockdowns as Tier 4 and periods without restrictions or with Tier 1 restrictions as Tier 1.
Key: Red - Tier 4 or lockdown; Dark Orange – Tier 3; Light Orange – Tier 2; Yellow – Tier 1/no restrictions

Table 7: Effect of Tiers, local and school characteristics on primary school pupil absence, September-December 2020

VARIABLES	(1) Tiers, covariates Absence %	(2) Tiers, IMD, covariates Absence %	(3) Tiers, IMD, school, covariates Absence %	(4) Tiers, IMD, school, urban covariates Absence %
Tiers				
Tier2	3.02***	1.44***	0.92***	-0.15
	(0.11)	(0.23)	(0.25)	(0.30)
Tier3	2.23***	0.95***	0.63*	-0.26
	(0.17)	(0.34)	(0.37)	(0.45)
Tier4	5.43***	3.97***	3.36***	2.53***
	(0.098)	(0.19)	(0.21)	(0.22)
Tier x IMD percentiles				
Tier2 x IMD		0.030***	0.0083	0.0070
		(0.0039)	(0.0055)	(0.0055)
Tier3 x IMD		0.027***	0.0083	0.0067
		(0.0056)	(0.0080)	(0.0080)
Tier4 x IMD		0.030***	0.0067	0.0069
		(0.0036)	(0.0047)	(0.0047)
Tier x School characteristics				
Tier2 x Non-LA maintained			-0.11	0.23
			(0.23)	(0.23)
Tier3 x Non-LA maintained			-1.02***	-0.62*
			(0.36)	(0.36)
Tier4 x Non-LA maintained			-0.0084	0.25
			(0.20)	(0.20)
Tier2 x % English NFL			0.037***	0.017**
			(0.0077)	(0.0079)
Tier3 x % English NFL			0.025*	0.0021
			(0.013)	(0.013)
Tier4 x % English NFL			0.046***	0.023**
			(0.0085)	(0.0089)
Tier2 x % FSM			0.048***	0.029**
			(0.013)	(0.013)
Tier3 x % FSM			0.042**	0.018
			(0.018)	(0.019)
Tier4 x % FSM			0.050***	0.026**
			(0.012)	(0.012)
Tier2 x % Bangladeshi ethnic			-0.014	-0.021
			(0.022)	(0.022)
Tier3 x % Bangladeshi ethnic			-0.063*	-0.072**
			(0.035)	(0.036)
Tier4 x % Bangladeshi ethnic			-0.012	-0.018
			(0.024)	(0.024)
Tier2 x % Caribbean ethnic			0.16***	0.060
			(0.052)	(0.050)
Tier3 x % Caribbean ethnic			0.30***	0.19**

			(0.093)	(0.092)
Tier4 x % Caribbean ethnic			0.21***	0.11*
			(0.058)	(0.058)
Tier2 x % Pakistani ethnic			-0.0098	-0.018
			(0.015)	(0.015)
Tier3 x % Pakistani ethnic			0.030	0.029
			(0.024)	(0.025)
Tier4 x % Pakistani ethnic			0.020	0.016
			(0.019)	(0.019)
Tier2 x % African ethnic			-0.030	-0.047**
			(0.022)	(0.023)
Tier3 x % African ethnic			-0.0043	-0.027
			(0.039)	(0.039)
Tier4 x % African ethnic			-0.061**	-0.080***
			(0.025)	(0.025)
Tier2 x % Chinese ethnic			0.62***	0.30**
			(0.13)	(0.13)
Tier3 x % Chinese ethnic			0.75***	0.38**
			(0.17)	(0.17)
Tier4 x % Chinese ethnic			0.69***	0.37***
			(0.13)	(0.13)
Tier x Geography				
Tier2 x Major conurbation				4.12***
				(0.37)
Tier3 x Major conurbation				4.41***
				(0.55)
Tier4 x Major conurbation				4.08***
				(0.35)
Tier2 x Other urban				1.16***
				(0.31)
Tier3 x Other urban				1.19**
				(0.49)
Tier4 x Other urban				1.37***
				(0.23)
Time variant (MSOA)				
COVID-19 monthly death rate	-0.0037*	-0.0041*	-0.0041*	-0.0044*
	(0.0023)	(0.0023)	(0.0023)	(0.0023)
COVID-19 daily case rate	0.0082***	0.0081***	0.0083***	0.0083***
	(0.00041)	(0.00040)	(0.00041)	(0.00041)
Observations	928,639	928,639	898,372	898,372
R-squared	0.593	0.593	0.562	0.562

Robust standard errors clustered at school level, in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Standard errors clustered at LA level are substantively similar

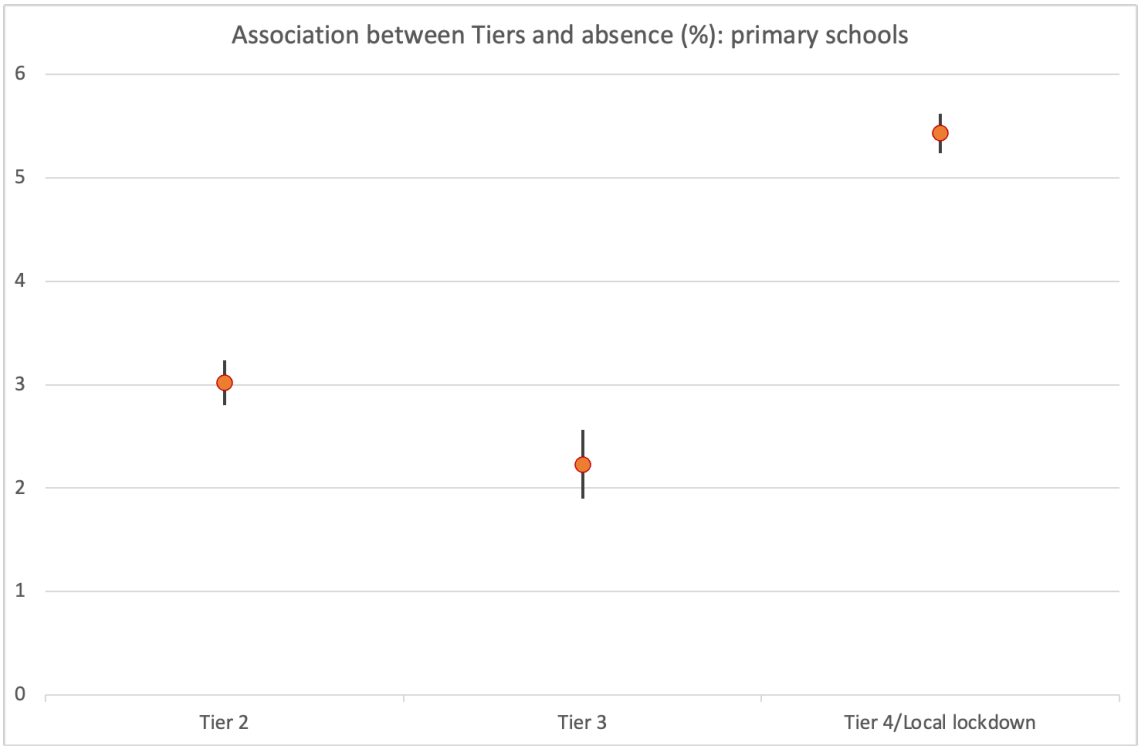
Table 8: Effect of Tiers, local and school characteristics on secondary school pupil absence, September-December 2020

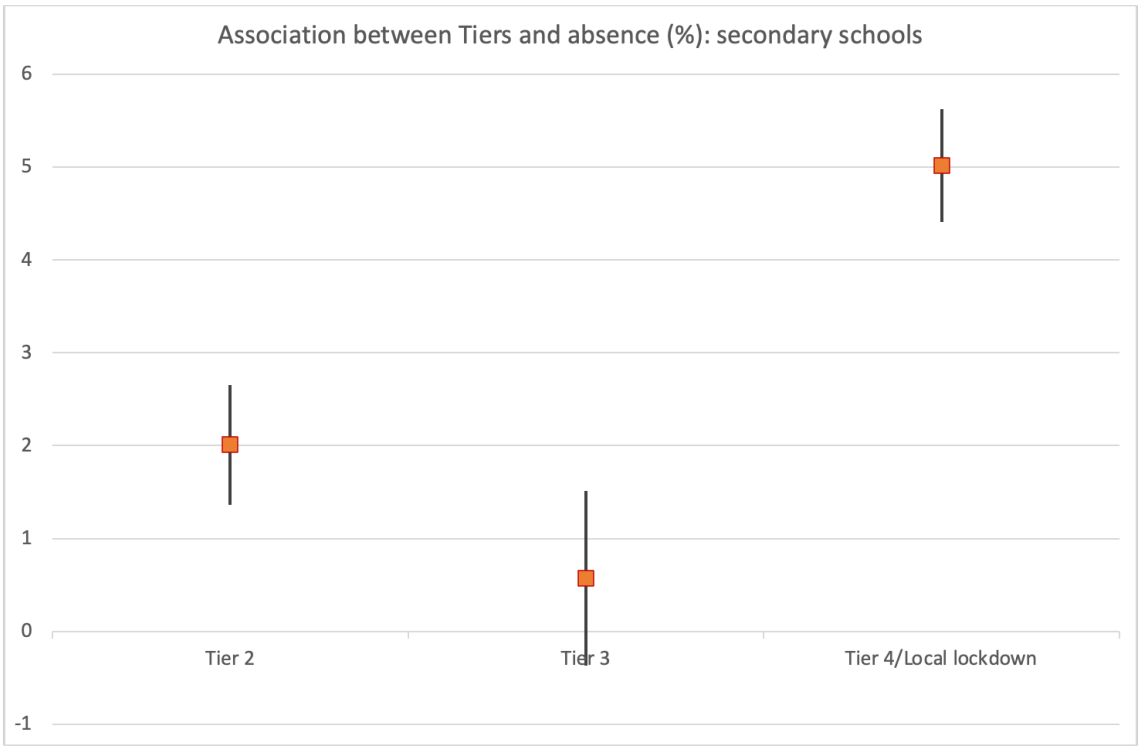
VARIABLES	(1) Tiers, covariates Absence %	(2) Tiers, IMD, covariates Absence %	(3) Tiers, IMD, school, covariates Absence %	(4) Tiers, IMD, school, urban covariates Absence %
Tiers				
Tier2	2.01***	-0.099	-1.81*	-3.53***
	(0.33)	(0.63)	(0.93)	(1.15)
Tier3	0.57	-0.30	-0.50	-1.95
	(0.48)	(0.98)	(1.49)	(1.81)
Tier4	5.02***	3.38***	2.13**	1.90*
	(0.31)	(0.57)	(0.90)	(1.00)
Tier x IMD percentiles				
Tier2 x IMD		0.042***	0.00094	-0.0012
		(0.012)	(0.013)	(0.013)
Tier3 x IMD		0.020	-0.010	-0.013
		(0.017)	(0.019)	(0.019)
Tier4 x IMD		0.034***	-0.0022	-0.0025
		(0.011)	(0.013)	(0.013)
Tier x School characteristics				
Tier2 x Non-LA maintained			-0.28	-0.16
			(0.73)	(0.73)
Tier3 x Non-LA maintained			-2.04*	-1.92*
			(1.09)	(1.10)
Tier4 x Non-LA maintained			-0.045	-0.022
			(0.75)	(0.75)
Tier2 x % English NFL			-0.016	-0.024
			(0.030)	(0.030)
Tier3 x % English NFL			0.026	0.028
			(0.042)	(0.042)
Tier4 x % English NFL			0.0012	0.0034
			(0.031)	(0.032)
Tier2 x % FSM			0.23***	0.21***
			(0.042)	(0.043)
Tier3 x % FSM			0.15**	0.14**
			(0.065)	(0.066)
Tier4 x % FSM			0.22***	0.22***
			(0.047)	(0.048)
Tier2 x % Bangladeshi ethnic			-0.047	-0.054
			(0.064)	(0.064)
Tier3 x % Bangladeshi ethnic			0.021	0.012
			(0.087)	(0.087)
Tier4 x % Bangladeshi ethnic			-0.057	-0.062
			(0.063)	(0.063)
Tier2 x % Caribbean ethnic			0.13	0.054
			(0.16)	(0.16)
Tier3 x % Caribbean ethnic			0.066	-0.0015

			(0.27)	(0.28)
Tier4 x % Caribbean ethnic			0.013	-0.0091
			(0.19)	(0.19)
Tier2 x % Pakistani ethnic			0.025	0.016
			(0.052)	(0.052)
Tier3 x % Pakistani ethnic			-0.045	-0.051
			(0.059)	(0.059)
Tier4 x % Pakistani ethnic			0.019	0.017
			(0.050)	(0.050)
Tier2 x % African ethnic			0.0038	-0.011
			(0.076)	(0.077)
Tier3 x % African ethnic			0.11	0.099
			(0.12)	(0.12)
Tier4 x % African ethnic			-0.096	-0.097
			(0.084)	(0.085)
Tier2 x % Chinese ethnic			0.79*	0.51
			(0.42)	(0.43)
Tier3 x % Chinese ethnic			1.19**	1.00*
			(0.59)	(0.59)
Tier4 x % Chinese ethnic			0.098	0.066
			(0.47)	(0.48)
Tier x Geography				
Tier2 x Major conurbation				3.55***
				(1.14)
Tier3 x Major conurbation				2.57
				(1.75)
Tier4 x Major conurbation				0.40
				(1.11)
Tier2 x Other urban				1.51
				(0.96)
Tier3 x Other urban				1.37
				(1.58)
Tier4 x Other urban				-0.034
				(0.76)
Time variant (MSOA)				
COVID-19 monthly death rate	-0.0088	-0.0092	-0.012*	-0.011
	(0.0066)	(0.0067)	(0.0069)	(0.0069)
COVID-19 daily case rate	0.013***	0.013***	0.013***	0.013***
	(0.0011)	(0.0011)	(0.0011)	(0.0011)
Observations	168,694	168,694	163,341	163,341
R-squared	0.722	0.722	0.509	0.510

Robust standard errors clustered at school level, in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Standard errors clustered at LA level are substantively similar

Figure 11: Associations between Tier designations pupil absence, September 2020-January 2021





Figures reports regression coefficients and 95% confidence intervals. The coefficient represents the average effect of being in a given Tier on daily absence rates, relative to Tier 1

6. Conclusion

COVID-19 had an effect on educational loss in many different dimensions, which is still being felt. One of these dimensions is through attendance at school, which has been shown in studies to have a causal effect on educational achievement – though the extent of this varies by context. In this report, we investigate how attendance changed over the main period of the pandemic in England and the role of local, school and pupil characteristics in influencing the disparities in pupil absence across schools. We show the strong influence of national and local government guidance for influencing pupil attendance, even outside times of compulsory lockdown (and when schools were open). A striking finding is that it is lower socio-economic groups that are most impacted by this. Where LAs did not explicitly encourage school attendance (after the period of the first national lockdown) or where they were in a higher tier (September – December 2020), those students in disadvantaged areas and/or eligible for free school meals lost out more in terms of school attendance, especially those in primary school. This is one mechanism for the widening socio-economic gap in educational achievement during and after the pandemic (though certainly not the only one). As persistently poor attendance rates are still an issue, even sometime after the pandemic, the potential for different patterns of behaviour developed during the pandemic is a likely explanation. This analysis show that as in many other respects, the pandemic did more damage to those already facing hardships due to socio-economic deprivation. Our analysis also shows that local policies exacerbated levels of absence and amplified the effects of socioeconomic disadvantage on levels of absence. In a companion report, we analyse the effect that the absence induced by pandemic policy had on subsequent pupil absence and educational achievement.

7. References

Andrew, A., Cattan, S., Costa Dias, M., Farquharson, C., Kraftman, L., Krutikova, S., Phimister, A., and Sevilla, A. (2020a), 'Family Time Use and Home Learning during the COVID-19 Lockdown', Institute for Fiscal Studies (IFS), Report 178.

Baker, J. Drange, N., Griefen, H.M., (2022). 'An Evaluation of a National Program to Reduce Student Absenteeism in High School'. NBER Working Paper 20194.

Baker, M. (2013). 'Industrial Actions in Schools: Strikes and Student Achievement'. Canadian Journal of Economics, 46(3), 1014–1036.

Belot, M., and Webbink, D. (2010). 'Do Teacher Strikes Harm Educational Attainment of Students?' Labour, 24(4), 391–406.

Blainey, K., and Hannay, T. (2021), 'The Effects of Educational Disruption on Primary School Attainment in Summer 2021', RS Assessment from Hodder Education.

Cattan, S., Kamhofer, D.A., Karlsson, M. and T Nisson (2021a). 'The Short- and the Long-term Effects of Student Absence: Evidence from Sweden' IFS Working Paper 21/06

Cattan, S., Farquharson, C., Krutikova, S., Phimister, A., Salisbury, A., and Sevilla, A. (2021b), 'Home Learning Experiences through the COVID-19 Pandemic', Institute for Fiscal Studies (IFS), Report 195.

Department for Education (2011) 'A Profile of Pupil Absence in England', Department for Education Research Report DFE-RR171

Elliot Major, L., Eyles, A., and Machin, S. (2020), 'Generation COVID: Emerging Work and Education Inequalities', Centre for Economic Performance (CEP), COVID-19 Analysis, Paper 011.

Farquharson, C., McNally, S., and Tahir, I. (2022). Education Inequalities. IFS Deaton Review of Inequalities. Institute for Fiscal Studies. London.

Gibbons, McNally and Montebruno (2023b). 'Absence and Attainment: Evidence from Pandemic Policy', working paper, London School of Economics

Goodman, J. (2014). "Flaking out: Student Absences and Snow Days as Disruptions of Instruction Time". NBER Working Paper, 20221.

Jaume, D. and Willén A. (2019). 'The Long-Run Effects of Teacher Strikes: Evidence from Argentina'. Journal of Labor Economics 37(4), 1097-1139

Johnson, D. (2009). 'Collateral Damage: The Impact of Work Stoppages on Student Performance in Ontario (e-brief 74). C.D. Howe Institute.

Retrieved from http://search.proquest.com/docview/1698040518/

Johnson, D. R. (2011). 'Do Strikes and Work-to-Rule Campaigns Change Elementary School Assessment Results?' Canadian Public Policy / Analyse de Politiques, 37(4), 479–494.

Liu, J., Lee M. and S. Gershenson (2021). 'The short- and long-run impacts of secondary school Absences' Journal of Public Economics, 199 104441

Lavy, V. (2015). 'Do Differences in School's Instruction Time Explain International Achievement Gaps? Evidence from Developed and Developing Countries'. Economic Journal, 125(88), 397-424.

MCHLG (2019) English Indices of Deprivation 2019, Ministry of Housing Communities and Local Government, London

Milanovic, K., Blainey, K., Hannay, T., and Wood, C., (2023). 'The Longer-term Impact of COVID-19 on Pupil Attainment and Wellbeing'. https://www.nuffieldfoundation.org/wp-content/uploads/2022/02/The-longer-term-impact-of-COVID-19-on-pupil-attainment-and-well-being.pdf

Montebruno, P. (2020). 'Disrupted Schooling: Impacts on Achievement from the Chilean School Occupations'. CEP Discussion Paper No 1696, Centre for Economic Performance, London School of Economics and Political Science.

Patrinos, H., Vegas, E., and Carter-Rau, R. (2022). An Analysis of COVID-19 Student Learning Loss. Policy Research Working Paper 10033. World Bank Group

https://documents1.worldbank.org/curated/en/099720405042223104/pdf/IDU00f3f0ca808cde0497e0b88c01fa07f15bef0.pdf

Pischke, J-S (2007). 'The Impact of Length of the School Year on Student Performance and Earnings: Evidence from the German Short School Years'. Economic Journal, 117, 1216-1242

Renaissance Learning & Education Policy Institute (2021), 'Understanding Progress in the 2020/21 Academic Year: Findings from the Summer Term and Summary of All Previous Findings'.

Rose, S., Twist, L., Lord, P., Rutt, S., Badr, K., Hope, C., and Styles, B. (2021), 'Impact of School Closures and Subsequent Support Strategies on Attainment and Socio-Emotional Wellbeing in Key Stage 1', National Foundation for Educational Research, Interim Paper 1.

Sutton Trust (2021), 'Remote Learning: The Digital Divide'.

8. Appendix Tables

Table 9: Regional disparities in absence rates in secondary schools.

	(1) First lockdown, Mar-Jun 2020	(2) Summer reopening, Jun-Jul 2020	(3) Tier system Sep-Oct 2020	(4) Tier system, lockdown Oct-Dec 2020	(5) Lockdown, Jan-Mar 2021	(6) Return to school Mar-Jul 2021
	Absence %	Absence %	Absence %	Absence %	Absence %	Absence %
East Midlands	-0.20***	-1.06***	-2.83***	-1.86***	0.62*	-2.62***
	(0.075)	(0.34)	(0.35)	(0.34)	(0.33)	(0.35)
East of England	0.45***	-0.45	-0.072	-2.04***	6.08***	-2.04***
	(0.068)	(0.32)	(0.34)	(0.34)	(0.31)	(0.37)
London	0.15*	-1.44***	-0.16	-0.80*	7.60***	-0.80**
	(0.083)	(0.40)	(0.45)	(0.42)	(0.32)	(0.36)
North East	0.34***	2.49***	-2.80***	-0.66	1.21***	0.18
	(0.080)	(0.38)	(0.47)	(0.42)	(0.37)	(0.45)
North West	-0.36***	2.44***	-3.17***	-1.93***	0.32	-1.20***
	(0.065)	(0.27)	(0.31)	(0.30)	(0.29)	(0.28)
South East	-0.11*	-4.52***	-0.89***	-2.40***	3.31***	-3.37***
	(0.067)	(0.32)	(0.32)	(0.31)	(0.29)	(0.32)
South West	-0.39***	-3.47***	-0.23	-1.98***	1.08***	-2.38***
	(0.076)	(0.34)	(0.33)	(0.33)	(0.30)	(0.32)
West Midlands	0.046	-1.21***	-3.07***	-1.94***	2.48***	-2.32***
	(0.067)	(0.32)	(0.33)	(0.32)	(0.29)	(0.31)
Yorkshire and Humber	-	-	-	-	-	-

Robust standard errors clustered at school level, in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Regional coefficients from regressions similar to Table 3, with additional regional dummies

Table 10: Regional disparities in absence rates in secondary schools.

	(1) First lockdown, Mar-Jun 2020	(2) Summer reopening, Jun-Jul 2020	(3) Tier system Sep-Oct 2020	(4) Tier system, lockdown Oct-Dec 2020	(5) Lockdown, Jan-Mar 2021	(6) Return to school Mar-Jul 2021
	Absence %	Absence %	Absence %	Absence %	Absence %	Absence %
East Midlands	0.0042	0.11	-4.23***	-0.92	0.20	-2.70**
	(0.052)	(0.21)	(1.03)	(0.89)	(0.29)	(1.05)
East of England	0.071	-0.21	-1.35	0.31	1.34***	-0.51
	(0.049)	(0.22)	(0.98)	(0.84)	(0.27)	(0.75)
London	-0.087	-0.66**	-4.83***	-2.23*	1.20***	-1.94**
	(0.063)	(0.28)	(1.29)	(1.20)	(0.30)	(0.90)
North East	0.28***	0.52**	-3.84***	-0.048	1.27***	0.46
	(0.053)	(0.25)	(1.08)	(0.95)	(0.30)	(0.81)
North West	0.028	0.17	-2.94***	-1.29*	0.044	-0.96
	(0.046)	(0.20)	(0.98)	(0.77)	(0.29)	(0.73)
South East	-0.091**	-0.59***	-2.37***	0.87	0.47*	-1.66**
	(0.046)	(0.21)	(0.92)	(0.78)	(0.26)	(0.75)
South West	-0.13**	-0.82**	-0.56	0.47	-0.53*	0.93
	(0.060)	(0.41)	(1.00)	(0.91)	(0.28)	(0.77)
West Midlands	0.067	-0.16	-3.70***	0.51	0.99***	0.94
	(0.046)	(0.20)	(0.93)	(0.77)	(0.25)	(0.71)
Yorkshire and Humber	-	-	-	-	-	-

Robust standard errors clustered at school level, in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Regional coefficients from regressions similar to Table 3, with additional regional dummies