



BMJ Open Parents' and teachers' attitudes to and experiences of the implementation of COVID-19 preventive measures in primary and secondary schools following reopening of schools in autumn 2020: a descriptive cross-sectional survey

Zahin Amin-Chowdhury ¹, Marta Bertran,¹ Meaghan Kall,² Georgina Ireland,¹ Felicity Aiano,¹ Annabel Powell,¹ Samuel E Jones,¹ Andrew J Brent,^{3,4} Bernadette E Brent,⁴ Frances Baawuah,¹ Ifeanyichukwu Okike,⁵ Joanne Beckmann,⁶ Joanna Garstang,^{7,8} Shazaad Ahmad ⁹, Neisha Sundaram,¹⁰ Chris Bonell ¹¹, Sinéad M Langan ¹², James Hargreaves,¹¹ Shamez N Ladhani^{1,13}

To cite: Amin-Chowdhury Z, Bertran M, Kall M, *et al*. Parents' and teachers' attitudes to and experiences of the implementation of COVID-19 preventive measures in primary and secondary schools following reopening of schools in autumn 2020: a descriptive cross-sectional survey. *BMJ Open* 2022;**12**:e052171. doi:10.1136/bmjopen-2021-052171

► Prepublication history and additional supplemental material for this paper are available online. To view these files, please visit the journal online (<http://dx.doi.org/10.1136/bmjopen-2021-052171>).

Received 21 April 2021
Accepted 13 April 2022



© Author(s) (or their employer(s)) 2022. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ.

For numbered affiliations see end of article.

Correspondence to

Zahin Amin-Chowdhury;
zahin.amin@ukhsa.gov.uk

ABSTRACT

Objective To assess implementation and ease of implementation of control measures in schools as reported by staff and parents.

Design A descriptive cross-sectional survey.

Setting Staff and parents/guardians of the 132 primary schools and 19 secondary schools participating in COVID-19 surveillance in school kids (SKIDs and SKIDsPLUS Studies).

Main outcome measure Prevalence of control measures implemented in schools in autumn 2020, parental and staff perception of ease of implementation.

Results In total, 56 of 151 (37%) schools participated in this study, with 1953 parents and 986 staff members completing the questionnaire. Most common measures implemented by schools included regular hand cleaning for students (52 of 56, 93%) and staff (70 of 73, 96%), as reported by parents and staff, respectively, and was among the easiest to implement at all times for students (57%) and even more so, for staff (78%). Maintaining 2-metre distancing was less commonly reported for students (24%–51%) as it was for staff (81%–84%), but was one of the most difficult to follow at all times for students (25%) and staff (16%) alike. Some measures were more commonly reported by primary school compared to secondary school parents, including keeping students within the same small groups (28 of 41, 68% vs 8 of 15, 53%), ensuring the same teacher for classes (29 of 41, 71% vs 6 of 15, 40%). On the other hand, wearing a face covering while at school was reported by three-quarters of secondary school parents compared with only parents of 4 of 41 (10%) primary schools. Other measures such as student temperature checks (5%–13%) and advising staff work from home if otherwise healthy (7%–15%) were rarely reported.

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ This study is one of the few to investigate school staff and parents' perceptions of the implementation of control measures following the reopening of schools in England.
- ⇒ The early establishment of COVID-19 surveillance in primary and secondary schools in the summer term 2020 provided a cohort to rapidly evaluate the experiences of parents and school staff during the autumn term before schools were required to close for the subsequent national lockdown.
- ⇒ As the questionnaire and information provided were available in English only, there is likely to be an under-representation of families for whom English was not their main language.
- ⇒ Some school responses were only provided by one participant so may not necessarily be representative of the whole school.
- ⇒ Although the surveillance included schools recruited nationally, a convenience sample was used and as such may not be representative of all primary and secondary schools in England.

Conclusions Variable implementation of infection control measures was reported, with some easier to implement (hand hygiene) than others (physical distancing).

BACKGROUND

Early in the pandemic, the role of children in transmission of SARS-CoV-2 was still unclear and many countries implemented national



lockdowns which included school closures.¹ As the pandemic progressed, studies showed that children were comparatively less affected by COVID-19, representing only 1%–3% of confirmed COVID-19 cases, with fewer hospital admissions and deaths compared with adults.^{2–4} On the other hand, the negative impact of the pandemic on the physical, social and mental well-being of children and adolescents has been widely reported; school closures and home quarantine have been associated with increased anxiety and depressive symptoms, reduced physical activity, as well as worsened integration and social competence in school children.^{5–9}

In the UK, children of key workers and vulnerable children continued to attend school throughout the first lockdown. Subsequently, from 01 June 2020, some school years (nursery, reception, year 1 and year 6) returned to school, followed by some secondary school years (years 10 and 12) from 15 June 2020, although school attendance was not mandatory.¹⁰ The second half of the summer term continued until 18 July 2020 before summer holidays began. During this period, strict physical distancing and infection control measures were implemented in schools, including limiting class sizes to small numbers, which remained in strict social bubbles that did not interact physically or socially with other bubbles in school.¹¹ The success of the summer term (where few cases and outbreaks of COVID-19 were reported) contributed to the wider reopening of all schools with full attendance in the autumn term, which started in September 2020.¹²

The large number of students attending primary and secondary schools during the autumn term of 2020/2021 was likely to raise significant challenges for implementing and reinforcing physical distancing and infection control measures. In addition to the challenges of maintaining infection control measures in educational settings, community SARS-CoV-2 infection rates were higher at the start of the autumn term compared with the previous summer term.¹³ This in turn raised concerns about increased risk of SARS-CoV-2 introduction into education settings, via outbreaks that result in isolation of large class bubbles or potential closures if infection could not be controlled through current national guidelines and recommendations.¹⁴

To enhance understanding of the impact of SARS-CoV-2 in educational settings, UK Health Security Agency (UKHSA, formerly Public Health England (PHE)) has been conducting SARS-CoV-2 surveillance since the start of the pandemic in England which has included swabbing and serological sampling in selected primary and secondary schools.¹² As part of this surveillance, we assessed the experiences and challenges of returning to school during the autumn 2020/2021 term by inviting the schools taking part in UKHSA's school studies to participate in an online survey aimed at staff and parents 2 months after the students returned to school in September 2020.

METHODS

School surveillance

As part of national surveillance, UKHSA initiated enhanced surveillance in 132 primary schools which were selected as previously described¹⁵ in five sites across England (East London, North and West London, Derby, Oxford and Manchester), during the second half of the summer term, where staff and students were tested for SARS-CoV-2 infection through weekly swabbing or blood sampling for SARS-CoV-2 antibodies at the beginning and end of the second half of the summer term (sKIDS Study). From September 2020, surveillance was extended to include 19 secondary schools (sKIDSPLUS Study) who agreed to participate.^{16 17}

Study design

A descriptive cross-sectional survey was conducted among staff—including teachers, teaching assistants and senior leadership teams—and parents/guardians in the 132 primary schools and 19 secondary schools participating in sKIDS and sKIDSPLUS surveillance.

UKHSA's studies

These schools were invited to take part in the online survey during the first week of November 2020, when schools returned from the half-term holidays. Schools expressing an interest in taking part were provided with an online link to forward to the teaching staff and all the parents in that school, irrespective of whether they were taking part in the sKIDS surveillance. The surveys were disseminated on 10 November 2020 and up to five email reminders were sent to encourage participants to complete the questionnaire until the last day of the survey on 28 December 2020. In total, 151 schools participating in sKIDS and sKIDSPLUS across England were contacted, of which 56 (37%) participated in the survey.

Questionnaire design

Staff and parent questionnaires were adapted from those used during summer 2020 in a survey for headteachers which was informed by government guidelines on the reopening of schools.¹⁸ The questionnaires were designed using the Snap Professional V.11 (Snap Surveys, New Hampshire, USA) survey platform to be disseminated online. Participants were provided with a list of preventive measures and were asked whether any of the measures were being implemented at their school as far as they were aware. Interventions were grouped into those related to students, staff or the classroom and school environment. Parents were asked to rate to what extent their child was able to follow certain preventive measures from a scale of always follows/follows most times/follows sometimes/never follows/not applicable. Similarly, staff were asked to rate the ease of implementation of the control measures from a scale of easy to implement/some challenges/very challenging.

Data analysis

Questionnaire responses from SnapSurvey were imported into Stata V.15.1 (StataCorp, Texas, USA). Data were cleaned and a descriptive analysis performed, stratified by parent/staff category and primary/secondary school. School profiles obtained from the Department for Education data were used to compare school demographic characteristics including type of school, school size, percentage of students on free school meals and percentage of persistent absence in responding schools and non-responding schools.¹⁹ To report questions related to control measures at a school level, responses were weighted such that for schools with multiple responses, the contribution of each response summed to 1 in the weighting to compensate for over-representation of schools with more responses than others. Categorical variables are presented as proportions and compared using χ^2 or Fisher's exact tests, where appropriate. Data that did not follow a normal distribution are described as median with IQRs and compared using the Mann-Whitney U test.

RESULTS

Characteristics of schools, parents and staff respondents

In total, there were 1953 parent and 986 staff respondents by 28 December 2020. Parents from 41 of 132 (31%) primary schools with a mean response of 83 (range 1–109) and from 15 of 19 (75%) secondary schools (mean response: 64; range (2–173)) responded to the parent/guardian survey. Staff from 56 of 132 (42%) primary schools (mean response: 8; range (1–59)) and 17

of 19 (90%) secondary schools (mean response: 30; range (10–66)) responded to the staff survey. Response rates were higher in secondary schools which were larger but otherwise characteristics were broadly similar between responding and non-responding schools (online supplemental table 1).

Of those parents/guardians who responded, 999 (51%) reported that their child attended primary school and 954 (49%) attended secondary school. A higher proportion of primary school parents (345 of 999, 35%; 95% CI 32% to 38%) reported their child was eligible to receive free school meals, compared with only 13% (120 of 954; 95% CI 11% to 15%) of secondary school parents (online supplemental table 2). Over half the primary school respondents were teachers (268, 57%) compared with 341 (66%) of secondary school respondents. Senior leadership team respondents including headteachers, deputy and assistant headteachers comprised 56 (12%) primary and 51 (10%) secondary staff respondents (online supplemental table 2).

Implementation of preventive measures at school

Student measures according to parents

Parents from 93% (52 of 56) of schools reported that regular hand cleaning for students was the most frequently reported measure (70, 94%) and more frequently reported in primary schools (39 of 41, 95%), compared with secondary schools (13 of 15, 87%) (table 1). Other student measures that more frequently reported by primary than secondary school parents included respiratory hygiene (30 of 41, 73% vs 9 of 15, 60%), keeping students within the same small groups at all times (28 of

Table 1 Student measures implemented as reported by parent/staff, respectively

	Parent		Staff	
	Primary school n (%) N=41	Secondary school n (%) N=15	Primary school n (%) N=56	Secondary school n (%) N=17
Requiring maintenance of 2 m distance from others for students	12 (29.2)	8 (53.3)	13 (23.2)	6 (35.3)
Requiring regular hand cleaning for students	39 (95.1)	13 (86.7)	55 (98.2)	15 (88.2)
Ensuring students catch cough or sneezes with tissue or arm	30 (73.2)	9 (60.0)	52 (92.9)	11 (64.7)
Keeping students with the same small groups at all times each day	28 (68.3)	8 (55.0)	43 (76.8)	9 (52.9)
Ensuring that the same teacher(s) and other staff members are assigned to each student group	29 (70.7)	6 (40.0)	37 (66.1)	3 (17.6)
Students attending school on a daily or weekly rota	11 (26.8)	6 (40.0)	8 (14.3)	3 (17.6)
Students required to wear face masks or face coverings while at school	4 (9.8)	12 (80.0)	2 (3.6)	16 (94.1)
Daily temperature checks for students	2 (4.8)	2 (13.3)	4 (7.1)	1 (5.9)
Ensuring students who have coronavirus symptoms, or have someone at home who does, stay home	–	–	54 (96.4)	16 (94.1)

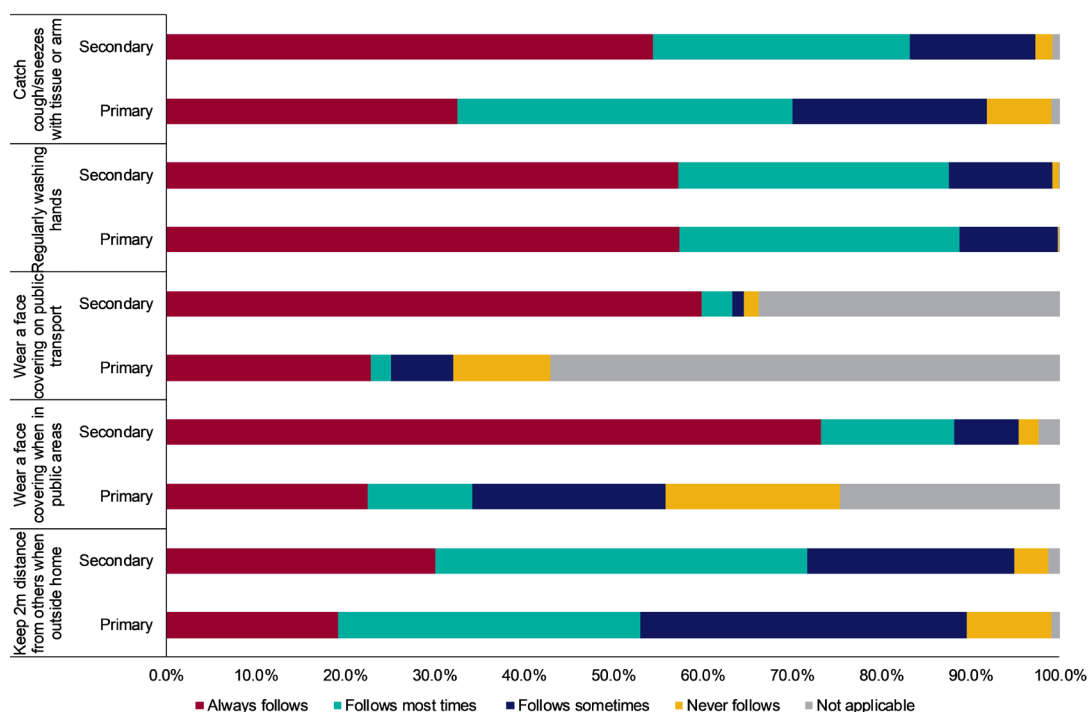


Figure 1 Child's compliance of preventive measures as reported by parents.

41, 68% vs 8 of 15, 55%) and ensuring the same teacher/staff member was assigned to each student group (29 of 41, 71% vs 6 of 15, 40%). Measures less commonly implemented in primary and secondary schools included daily/weekly rota for attending school (11 of 41, 27% and 6 of 15, 40%, respectively) and daily temperature checks (2 of 41, 5% and 2 of 15, 13%, respectively). In line with guidance, over three-quarters (12 of 15, 80%) of secondary parents reported that their child was required to wear a face covering while at school, compared with only 4 of 41 (10%) in primary (table 1).

Parents' perception of their child's compliance of preventive measures

Among parents of primary schoolchildren, regular hand washing (24 of 41, 59%) and respiratory hygiene (13 of 41, 32%) were reported to be easiest to follow all the time (figure 1). While wearing a face mask was not recommended in the guidelines for children under the age of 11 years, 24% (10 of 41) of parents reported their child wore one on public transport always or most of the time. Compared with primary schools, parents of secondary schoolchildren reported higher compliance of all preventive measures in their children. Among parents of secondary schoolchildren, most reported that their child always wore a face mask/covering in public areas (10 of 15, 67%) or when on public transport (9 of 15, 60%). The most difficult measure to follow all the time among children of both primary and secondary schools was keeping a 2-metre distance from others when outside of the home, although most parents of primary (22 of 41; 54%) and secondary schoolchildren (11 of 15, 73%) reported that

their child kept a 2-metre distance at least most of the time (figure 1).

Student measures according to staff

Almost all staff members in primary (54 of 56, 96%) and secondary schools (16 of 17, 94%) reported that the school ensured students with COVID-19 symptoms would be required to stay at home (table 1). Similarly, regular hand washing was also reported to be widely implemented (55 of 56, 98% and 15 of 17, 88%, respectively). Some measures were rarely reported to be implemented, such as students attending school on daily/weekly rota (8 of 56, 14% and 3 of 17, 18%, respectively) and daily temperature checks for students (4 of 56, 7% and 1 of 17, 6%, respectively). Other measures reported at very different frequencies in primary and secondary schools included wearing face masks/coverings by students (16 of 17, 94% and 2 of 56, 4%, respectively) as per national guidance, and ensuring the same staff are assigned to each student group (37 of 56, 66% and 3 of 17, 18%, respectively).

Staff perception of students' compliance of preventive measures

When asked how challenging staff found the implementation of student measures, the most challenging measure was requiring students to maintain 2-metre distancing in both primary (37%) and secondary (58%) schools. Where implemented, the easiest measures reported by staff were daily temperature checks for students (71% and 88%, respectively) and students attending school on a weekly/daily rota (70% and 52%, respectively). Regular hand cleaning was reported by staff to be easier to implement

Table 2 Preventive measures implemented at school for staff

	Staff	
	Primary school n (%) N=56	Secondary school n (%) N=17
Staff advised not to attend work or work from home if clinically vulnerable	22 (39.3)	7 (41.2)
Staff advised to work from home if they live in a household with someone who is extremely clinically vulnerable	7 (12.5)	3 (17.6)
Staff advised to work from home if their job can be done from home	4 (7.1)	2 (11.8)
Staff asked to wear face masks or face coverings while at school	22 (39.3)	16 (94.1)
Stopping in-person staff meetings	29 (51.8)	8 (47.1)
Requiring maintenance of 2 m distance from others for staff	45 (80.4)	14 (82.4)
Requiring regular hand cleaning for staff	55 (98.2)	16 (94.1)

in primary (45%) than in secondary (34%) schools (data not presented).

Preventive measures for staff

The vast majority of primary schools (54 of 56, 96%) and secondary schools (15 of 17, 88%) as reported by staff had received guidance by the school on what to do if a student or staff member has COVID-19 symptoms. The majority of staff reported that their school required regular hand cleaning for staff (97% in primary/secondary) and requiring a 2-metre distance from others (83%) (table 2). Approximately half of primary (29 of 56, 52%) and secondary (8 of 17, 47%) schools reported that they had stopped all in-person staff meetings. Face masks/coverings for staff members were reported to be implemented in 94% (16 of 17) secondary schools and 39% (22 of 56) primary schools. Other measures not commonly implemented by either primary or secondary schools included staff being advised to work from home if their job could be done from home (7%–13%) or if they lived in a household with an extremely clinically vulnerable individual (13%–15%). Less than half the primary (22 of 56, 39%) and secondary (7 of 17, 41%) school staff reported that the school advised not to attend work or to work from home if they themselves were clinically vulnerable (table 2).

Most (16 of 17, 94%) of secondary schools reported that they were advised to wear face masks/coverings outside classrooms, of which, 17% reported that they were required to wear them all the time. In comparison, 33% primary school staff reported being required to wear face masks/coverings outside classrooms and only 6% reported to being required to wear them all the time. Of the remaining, 25% reported that they were given the option to wear a face mask/covering or not.

When asked how challenging it was to implement preventive measures for staff, the 2-metre distancing was the most challenging, with 27% of primary and 36% of secondary school staff reporting that it was 'very challenging' (figure 2). In contrast, regular hand cleaning

was the easiest to implement (79% and 77%, respectively). Most primary and secondary school staff reported that there were 'some challenges' to staff working from home if clinically vulnerable (49%), if they were living with someone clinically vulnerable (55% vs 58%) or if their work could be done from home (49% vs 61%).

School and the environment measures

Staff reporting of preventive measures in the school and classroom

Fitting hand sanitisers at the school entrance, stopping large gatherings and staggering break times for different classes were among the most commonly reported measures by staff of both primary and secondary schools (>85%). Some measures were more commonly reported to be more challenging by primary than secondary school staff, such as requiring 2-metre distancing for parents dropping off or picking up children (87% vs 29%, respectively) and staggering drop-off or collection times (92% vs 72%, respectively). Other measures were not as commonly reported by staff, such as removing/disabling air flow hand driers from toilets (27%–33%) (table 3).

The majority of staff in primary and secondary schools reported that hand sanitisers were fitted in their classroom (40 of 56, 71% and 13 of 17, 76%, respectively) and that touch surfaces were frequently cleaned (50 of 56, 89% and 15 of 17, 88%, respectively) (table 3). Other measures were more frequently reported by primary school staff than secondary school staff, such as removing soft furnishing and toys that are hard to clean (39 of 56, 70% vs 4 of 17, 24%, respectively), ensuring students were in the same classroom all day (49 of 56, 88% vs 7 of 17, 41%, respectively) and scheduling more lessons and activities outdoors (14 of 56, 25% vs 1 of 17, 6%, respectively) (table 3).

Fitting hand sanitisers in the classrooms, removing/disabling air flow hand driers from toilets and removing soft furnishing/toys that are hard to clean were some of the easiest measures to implement in both primary and secondary schools (>70%). Maintaining space between seats and desks was reported by more than half the

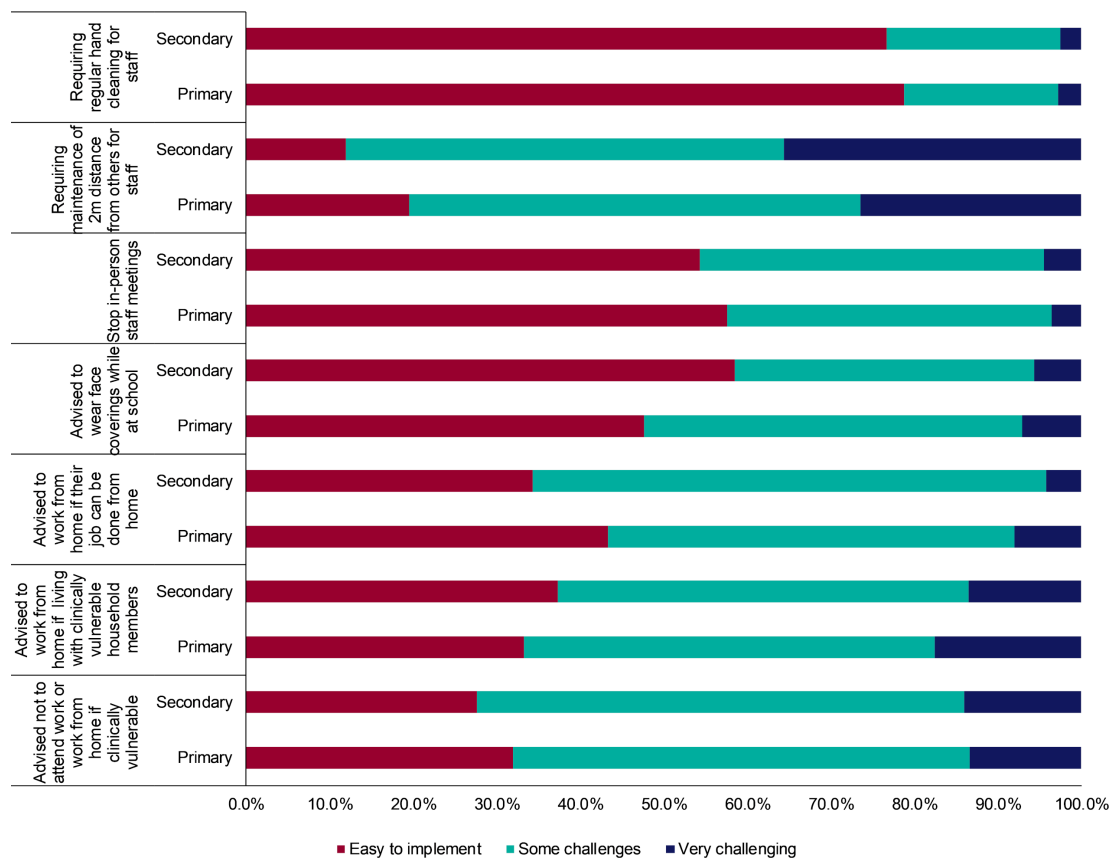


Figure 2 Perceived ease of implementation of staff measures, by staff.

primary (52%) and secondary school staff (60%) to have ‘some challenges’. Among primary school staff, the 2-metre distancing at drop-off/collection was reported to be the most challenging with the majority reporting that this measure had ‘challenges’ (52%) or was ‘very challenging’ (31%). Among secondary school staff, introducing a one-way system in corridors and staggering break times were reported to be most challenging with more than half reporting ‘some challenges’ (55%) (data not presented).

Perception of risk

While more than half of the parents were positive about their children returning to school, roughly one-third reported being a little anxious. Ninety per cent and 82% of primary and secondary school parents were either completely or partly reassured by the preventive measures implemented in their schools (data not presented).

DISCUSSION

Summary of key findings

More than 150 schools taking part in sKIDs across England were invited to take part in the questionnaire survey and 56 agreed to forward the online questionnaire links to their staff and parents of students attending their schools. In general, when asked about preventive measures implemented in their schools, parents reported variable rates of implementation for

their schools. In primary schools, staggering drop-off and collection times and stopping large gatherings of students such as assemblies were the only preventive measures reported by more than 75% of parents, and the latter was the only measure reaching this frequency in secondary schools. Overall, however, 90% and 82% of primary and secondary school parents were either completely or partly reassured by the preventive measures implemented in their schools. Further to this, reassuringly, more than half of parents were positive about their children returning to school, similar to findings of a similar US survey of parents.²⁰ However, around one-third of parents reported being a little anxious, while 13% and 16% of primary and secondary school parents, respectively, reported being extremely anxious about their children returning to school.

Among staff, a significant finding of this survey was that 80% of primary staff and 87% of secondary school staff felt that they were at higher risk of COVID-19 because of their profession. Indeed, only 52% of primary school staff and 38% of secondary school staff felt safe at school despite the implementation of a wide range of social distancing and infection control measures. According to the teaching staff, preventive measures for staff were variably implemented, apart from regularly hand cleaning, maintaining a 2-metre distance between staff members and, for secondary school staff, wearing face masks or face coverings

Table 3 Preventive measures implemented at child's school (classroom and school environment)

	Parent		Staff	
	Primary school n (%) N=41	Secondary school n (%) N=15	Primary school n (%) N=56	Secondary school n (%) N=17
Classroom measures				
Fitting hand sanitisers in classrooms	19 (46.3)	9 (60.0)	40 (71.4)	13 (76.5)
Maintaining space between seats and desks	22 (53.7)	7 (46.7)	28 (50.0)	7 (41.2)
Removing non-essential objects from classrooms	–	–	35 (62.5)	7 (41.2)
Removing soft furnishing and toys that are hard to clean	–	–	39 (69.6)	4 (23.5)
Cleaning frequently touched surfaces	–	–	50 (89.3)	15 (88.2)
Scheduling more lessons and activities outdoors	13 (31.7)	2 (13.3)	14 (25.0)	1 (5.9)
Ensuring students use the same classroom throughout the day	–	–	49 (87.5)	7 (41.2)
Ensuring students do not share equipment/learning materials in classrooms	–	–	36 (64.3)	12 (70.6)
Ensuring students do not carry equipment/learning materials between home and school	19 (46.3)	3 (20.0)	33 (58.9)	2 (11.8)
School and the environment measures				
Introducing one-way systems in school corridors	19 (46.3)	9 (60.1)	31 (55.4)	11 (64.7)
Fitting hand sanitisers at the school entrance	17 (41.5)	8 (53.3)	50 (89.3)	15 (88.2)
Removing/disabling air flow hand driers from toilets	–	–	20 (35.7)	4 (23.4)
Staggering drop-off and collection times	31 (74.7)	9 (60.0)	50 (89.3)	12 (70.6)
Staggering break times for different classes	–	–	51 (91.1)	14 (82.4)
Stopping large gatherings of students, for example, assemblies	31 (75.6)	10 (66.7)	53 (94.6)	15 (88.2)
Stopping team sports	14 (34.1)	6 (40.0)	30 (53.6)	8 (47.1)
Requiring 2 m distancing for parents dropping off or picking up children	28 (68.3)	4 (26.7)	49 (87.5)	4 (23.5)
Allowing only one parent to accompany child to school	22 (53.7)	3 (20.0)	–	–
Encouraging parents and children to not travel to school using public transport	9 (22.0)	5 (33.3)	–	–

while at school. In particular, most staff members did not feel like they were given the option to work from home if possible, even if there was a clinical reason to do so. According to the teaching staff, most preventive measures were well implemented apart from requiring 2-metre distancing between staff.

For preventive measures involving students, too, maintaining the 2-metre distance was found to be particularly difficult to implement for both primary and secondary schools, while secondary schools also struggled to maintain small groups at all times or ensuring that the same staff members were assigned to each student group—a problem also commonly reported by parents. This was also reflected in teaching staff experiencing difficulties with maintaining space between seats and desks in both primary and secondary schools. Another problem faced particularly by secondary schoolteachers was ensuring that the students used the

same classroom throughout the day and ensuring that the students do not carry materials between home and school. Other measures were implemented to a variable extent, except for parents dropping off or picking up secondary school students, which may be because most secondary school students are not picked up by their parents.

Comparison with published literature

In England, the experiences of the 2020/2021 autumn term when all the students returned to school were very different to the previous summer term, when only some primary and secondary school years returned to school and with small class bubble sizes. At that time, detailed interviews with headteachers of the sKIDs schools identified different challenges in implementing infection control measures, including difficulties in prioritising teaching because of the additional requirement and



practices, physical space constraints, staffing issues, finances, lack of adequate protective equipment and parent.²¹ Our survey from the autumn term showed that many of these challenges still remained, but were also further complicated by the return to near-normal class sizes. The inability to maintain the 2-metre distance between the students and between students and staff, especially in primary schools, has been a consistent finding and not only challenging to implement with 51% of headteachers reporting ‘major challenges’ but is also considered incompatible with good teaching, especially in early years classrooms.^{22 23}

One cross-sectional survey study in England, using a convenience sample of 442 participants, measured parental perceptions of control measures implemented in their child’s school in June. Their findings suggested that suboptimal practices were widespread, with only half of parents reporting hand washing or hand gel dispensing facilities at school entrances and in classrooms and almost 40% reporting class sizes being larger than the recommended 15.²⁴ This compared with over three-quarters of staff reported use of hand gel dispensers in classrooms and at entrances, and only 40%–60% of parents reporting this in our study. A qualitative study conducted among primary school staff in Wales reported challenges in monitoring good hygiene practices, particularly with a ‘class of 30’.²⁵

Parents interviewed in another England study found that the most common reason for parents not sending their children to school when their child was eligible was that ‘it was too risky’, reported by 52% of 423 parents who did not send their child to school.²⁶ Another qualitative study conducted in another region of England did report that while parents and staff were concerned about the increased risk of COVID-19 transmission in schools—they did feel on balance the benefits outweighed the risks and there was good acceptability of COVID-19 infection control measures implemented in schools.²⁷

Studies outside the UK on this topic are limited; furthermore, varying community SARS-CoV-2 infection rates and implementation of local infection control measures to mitigate the risk of infection in their settings make it difficult to compare the experience of educational staff and parents of primary and secondary school students during autumn 2020/2021 with other countries.

Strengths and limitations of this study

This is to our knowledge one of the largest surveys conducted among parents and school staff in England on the implementation of preventative measures during the COVID-19 pandemic in primary and secondary schools. One key strength of this survey was the establishment of close relationships with schools taking part in school surveillance studies which enabled a good response, with parents from 56 schools and staff from 73 schools completing nearly 3000 questionnaires

within 3 weeks, before schools were required to close for the subsequent national lockdown. We also used a standardised questionnaire, which contrasts with other studies which mainly involved detailed interviews, often with a small number of staff and parents.

However, there are some limitations. We did not assess responses by demographics, such as ethnicity or socioeconomic status, which are very likely to influence questionnaire responses among staff and students, as has been reported elsewhere.²⁰ Instead, we provided a summary of the demographics and results for all participants combined to ensure that the key messages reflect the group as a whole. Of those who took part, it is likely that there was an under-representation of families for whom English was not their main language as well as those with limited access to digital platforms and the internet.

Not all schools agreed to forward the questionnaire to their staff and parents, mainly because they were too busy and this may have also introduced selection bias if those who felt less prepared were less willing to participate in the questionnaire survey, perhaps anxious about what this might reveal. Additionally, responses may be affected by desirability bias as participants may not have wished to reflect poorly on their schools, their actions or of their children in selecting less favourable responses. Another limitation was that for some schools, responses were only provided by one participant so may not necessarily be representative of the whole school. While participating primary schools had a broad geographical spread across England, they are not representative of all primary and secondary schools in England. Primary schools participating in SKIDs were selected because they reopened with at least 30 students in attendance during the summer term. Similarly, secondary schools were identified for SKIDsPLUS because they were located in five regions where paediatric teams were available for taking blood samples for antibody testing from staff and students.

Implications of findings

The findings of this survey provide educationalists and policymakers with real-world data to help make more informed decisions to ensure that educational settings remain open throughout the pandemic. Education staff, including teachers, are working hard to follow national recommendations which are continually being updated, to help keep schools safely open during the COVID-19 pandemic, despite most of them considering themselves to be at increased risk of COVID-19 because of their profession and being concerned for their own health. Parents too expressed concern about schools reopening and, while most were not worried about the health of their children, they were worried about their children transmitting the virus to others, including vulnerable household members.

While most recommendations in the national guidance have been implemented to some extent in most

schools, consistent concerns include difficulties in maintaining physical distancing within the school environment.²² This, along with difficulties of maintaining small bubble sizes following full reopening of schools, raises the question whether all staff and students should wear face masks/coverings in school,²⁸ as has been implemented in other countries.²⁹ Indeed, most parents appear to be supportive of children wearing masks in school.²⁰ More generally, more studies are needed to assess the relative benefits of current infection control measures, including, but not restricted to, face masks/coverings, so that future guidelines are more evidence based.^{29 30}

In particular, smaller class sizes, through blended in-school and home learning, for example, would enable more effective implementation of the recommended infection control measures and provide additional reassurance for staff, parents and students.³¹ This would, however, only be possible if schools are provided with the appropriate computer hardware, internet support and technical support to allow the students to attend their classes online.³² We also identified a need to improve communication between policymakers and education staff in schools.²⁹ Many staff members commented on some unrealistic recommendations in the national guidance, such as maintaining physical distancing and seating arrangements within the class, while attempting to bring all the children back to school in the current autumn term. Previous findings from research in the summer term had also highlighted teachers' concerns that physical distancing requirements had negatively impacted effective teaching practices which would normally include group activity and practical work.²³ Providing individualised and pragmatic support for schools that are unable to implement some specific measures, including financial support where needed, would help improve relationships and ensure optimal prevention practices in educational settings.³³ By the same token, improved communication with parents, either directly by policymakers or through schools, would provide additional reassurance about the safety of their children attending school. Consistent messaging and using social media to reach younger people would also help communicate public health messages to promote behaviours that reduce COVID-19 transmission.^{34 35}

The return to full school attendance exacerbated the challenges of maintaining physical distancing and infection control measures. At the same time, community infection rates were much higher between September and December 2020 than they were in June 2020, with increased numbers of cases in school-aged children,³⁶ and outbreaks in primary and secondary schools.³⁷ This had a large impact on the number of staff and student contacts required to self-isolate as part of the contact bubbles. Often whole classes and year groups had to self-isolate following a single confirmed case, and many staff and students had to

self-isolate multiple times because they were contacts of different cases in their bubble. This was disruptive not only for the self-isolating students but also the remaining students because of the inconsistencies in school attendance and teaching staff.²³

Overall, there is growing evidence the risk of infections and outbreaks in educational settings correlate strongly with community SARS-CoV-2 infections rates in adults.^{36 38 39} Interventions to reduce local community infection rates, including local and national lockdowns without school closures as was recently implemented in England, not only reduced SARS-CoV-2 infections in adults but also in school-aged children. Ongoing surveillance in educational settings, as well as review of school guidance, however, remains critical due to/as a result of the changing landscape of the pandemic, even more so with the emergence of new variants.⁴⁰

CONCLUSION

Implementation of infection control measures was variable; although hand and respiratory hygiene measures were well implemented and easy to follow, other measures such as maintaining physical distancing were difficult to implement. Some parents and staff were concerned about returning to school and the risk that posed to children, staff and household members; however, majority were not worried about returning to school. Continued monitoring of SARS-CoV-2 in schools, including the concerns for staff and parents, is required, as the pandemic shifts into new phases and the risks within schools alter.

Author affiliations

¹Immunisation and Vaccine Preventable Diseases Division, UK Health Security Agency, London, UK

²COVID-19 National Epidemiology Cell, UK Health Security Agency, London, UK

³Nuffield Department of Medicine, University of Oxford, Oxford, UK

⁴John Radcliffe Hospital, Oxford University Hospitals NHS Foundation Trust, Oxford, UK

⁵Derbyshire Children's Hospital, University Hospitals of Derby and Burton NHS Foundation Trust, Derby, UK

⁶Specialist Children & Young People's Services, East London NHS Foundation Trust, London, UK

⁷College of Medical and Dental Sciences, University of Birmingham, Birmingham, UK

⁸Allens Croft Children's Centre, Birmingham Community Healthcare NHS Trust, Birmingham, UK

⁹Department of Virology, Manchester University NHS Foundation Trust, Manchester, UK

¹⁰Department of Global Health and Development, London School of Hygiene & Tropical Medicine, London, UK

¹¹Department of Public Health, Environments and Society, London School of Hygiene & Tropical Medicine, London, UK

¹²Department of Non-communicable Disease Epidemiology, London School of Hygiene & Tropical Medicine, London, UK

¹³Paediatric Infectious Diseases Research Group, St George's University of London, London, UK

Twitter Zahin Amin-Chowdhury @acciochoc

Acknowledgements We would like to thank all the staff members and parents who participated in the survey.

Contributors SNL, FB, JB, IO, SA, JG, AB, BB, NS, CB, SL and JH were responsible for conceptualisation, study design and methodology. ZA-C, SNL, MB, MK, GI, FA, AP, SEJ, AB, BB, FB, IO, JB, JG and SA contributed to project administration. ZA-C and SNL contributed to the original draft of the report, did the formal analysis and were responsible for data validation and verification. SNL acted as the guarantor. All authors contributed to reviewing and editing of the manuscripts.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient and public involvement Patients and/or the public were not involved in the design, or conduct, or reporting, or dissemination plans of this research.

Patient consent for publication Not required.

Ethics approval This study involves human participants. The sKIDs and sKIDsPLUS Studies received approval from the UKHSA Research and Ethics Committee (reference ID: NR0209) as part of UKHSA's responsibility to investigate risk and transmission of SARS-CoV-2 among children in educational settings. As part of this, parent and staff experiences of the COVID-19 pandemic, returning to schools and implementation of COVID-19 measures were sought through an online questionnaire. Participants were informed that the survey was anonymised and voluntary; completion and return of questionnaire were taken as implied consent.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement No data are available.

Supplemental material This content has been supplied by the author(s). It has not been vetted by BMJ Publishing Group Limited (BMJ) and may not have been peer-reviewed. Any opinions or recommendations discussed are solely those of the author(s) and are not endorsed by BMJ. BMJ disclaims all liability and responsibility arising from any reliance placed on the content. Where the content includes any translated material, BMJ does not warrant the accuracy and reliability of the translations (including but not limited to local regulations, clinical guidelines, terminology, drug names and drug dosages), and is not responsible for any error and/or omissions arising from translation and adaptation or otherwise.

Open access This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

ORCID iDs

Zahin Amin-Chowdhury <http://orcid.org/0000-0002-3106-992X>

Shazaad Ahmad <http://orcid.org/0000-0002-0400-8937>

Chris Bonell <http://orcid.org/0000-0002-6253-6498>

Sinéad M Langan <http://orcid.org/0000-0002-7022-7441>

REFERENCES

- Li X, Xu W, Dozier M, *et al*. The role of children in transmission of SARS-CoV-2: a rapid review. *J Glob Health* 2020;10:011101.
- Zhu N, Zhang D, Wang W, *et al*. A novel coronavirus from patients with pneumonia in China, 2019. *N Engl J Med* 2020;382:727–33.
- Swann OV, Holden KA, Turtle L, *et al*. Clinical characteristics of children and young people admitted to hospital with covid-19 in United Kingdom: prospective multicentre observational cohort study. *BMJ* 2020;370:m3249.
- Ladhani SN, Amin-Chowdhury Z, Davies HG, *et al*. COVID-19 in children: analysis of the first pandemic peak in England. *Arch Dis Child* 2020;105:1180–5.
- Pizarro-Ruiz JP, Ordóñez-Cambor N. Effects of Covid-19 confinement on the mental health of children and adolescents in Spain. *Sci Rep* 2021;11:11713.
- Xie X, Xue Q, Zhou Y, *et al*. Mental health status among children in home confinement during the coronavirus disease 2019 outbreak in Hubei Province, China. *JAMA Pediatr* 2020;174:898–900.
- Jiao WY, Wang LN, Liu J, *et al*. Behavioral and emotional disorders in children during the COVID-19 epidemic. *J Pediatr* 2020;221:264–6.
- Clarke J, Kipping R, Chambers S, *et al*. Impact of COVID-19 restrictions on preschool children's eating, activity and sleep behaviours: a qualitative study. *BMJ Open* 2021;11:e051497.
- Mansfield KL, Newby D, Sonesson E, *et al*. COVID-19 partial school closures and mental health problems: a cross-sectional survey of 11,000 adolescents to determine those most at risk. *JCPP Adv* 2021;1:e12021.
- Education Do. *Actions for schools during the coronavirus outbreak*, 2020.
- Department for education. coronavirus (COVID-19): implementing protective measures in education and childcare settings, 2020. Available: <https://www.gov.uk/government/publications/coronavirus-covid-19-implementing-protective-measures-in-education-and-childcare-settings/coronavirus-covid-19-implementing-protective-measures-in-education-and-childcare-settings> [Accessed January 2021].
- Ladhani S. Prospective active national surveillance of preschools and primary schools for SARS-CoV-2 infection and transmission in England, June 2020 2020.
- Mensah AA, Sinnathamby M, Zaidi A, *et al*. SARS-CoV-2 infections in children following the full re-opening of schools and the impact of national lockdown: prospective, National observational cohort surveillance, July–December 2020, England. *J Infect* 2021;82:67–74:67–74.
- SAGE. *Children's Task and Finish Group: Update on children, schools and transmission - 4 November 2020*, 2020.
- Sea L. Prospective active national surveillance of Preschools and primary schools for SARS-CoV-2 infection and transmission in England, June 2020. In: *Lancet Regional Health - Europe*, 2021.
- Public health England. COVID-19: paediatric surveillance, 2021. Available: <https://www.gov.uk/guidance/covid-19-paediatric-surveillance# covid-19-surveillance-in-schools-in-england>
- Ladhani SN, Ireland G, Baawuah F. SARS-CoV-2 infection, antibody positivity and seroconversion rates in staff and students following full reopening of secondary schools in England: a prospective cohort study SARS-CoV-2 infection, antibody positivity and seroconversion rates in staff and students following full reopening of secondary schools in England: a prospective cohort study, September–December 2020. *eClinicalMedicine* 2021:37.
- Sundaram N, Bonell C, Ladhani S, *et al*. Implementation of preventive measures to prevent COVID-19: a national study of English primary schools in summer 2020. *Health Educ Res* 2021;36:272–85 <https://academic.oup.com/her>
- Department for education (2020). school admissions and transport to school: find and compare schools in England 2019/20. <https://www.compare-school-performance.service.gov.uk/download-data> (January 2021).
- Gilbert LK, Strine TW, Szucs LE, *et al*. Racial and Ethnic Differences in Parental Attitudes and Concerns About School Reopening During the COVID-19 Pandemic - United States, July 2020. *MMWR Morb Mortal Wkly Rep* 2020;69:1848–52.
- Sundaram N, Bonell C, Ladhani S, *et al*. Implementation of preventive measures to prevent COVID-19: a national study of English primary schools in summer 2020. *Health Educ Res* 2021;36:272–85.
- Education Do. *Guidance for schools: coronavirus (COVID-19)*, 2020.
- Caroline Sharp JN, Lucas M, Julius J, National Foundation for Educational Research. *Schools' responses to Covid-19 the challenges facing schools and pupils in September 2020*, 2020. ISBN: 978-1-912596-10-2.
- Smith LE, Woodland L, Amlôt R, *et al*. A cross-sectional survey of parental perceptions of COVID-19 related hygiene measures within schools and adherence to social distancing in journeys to and from school. *BMJ Paediatr Open* 2020;4:e000825.
- Marchant E, Todd C, James M, *et al*. Primary school staff perspectives of school closures due to COVID-19, experiences of schools reopening and recommendations for the future: a qualitative survey in Wales. *PLoS One* 2021;16:e0260396.
- Woodland L, Smith LE, Webster RK, *et al*. Why did some parents not send their children back to school following school closures during the COVID-19 pandemic: a cross-sectional survey. *BMJ Paediatr Open* 2021;5:e001014.
- Lorenc A, Kesten JM, Kidger J, *et al*. Reducing COVID-19 risk in schools: a qualitative examination of secondary school staff and family views and concerns in the South West of England. *BMJ Paediatr Open* 2021;5:e000987.
- Spitzer M. Masked education? the benefits and burdens of wearing face masks in schools during the current corona pandemic. *Trends Neurosci Educ* 2020;20:100138.
- Esposito S, Cotugno N, Principi N. Comprehensive and safe school strategy during COVID-19 pandemic. *Ital J Pediatr* 2021;47:6.
- Patel S, Epalza Ibarondo C, Toubiana J, *et al*. Urgent need to develop evidence-based COVID-19 recommendations for primary schools. *Arch Dis Child* 2021;106:1039–1040.
- Gandolfi A. Planning of school teaching during Covid-19. *Physica D* 2021;415:132753.

- 32 Kroshus E, Hawrilenko M, Tandon PS, *et al.* Plans of US parents regarding school attendance for their children in the fall of 2020: a national survey. *JAMA Pediatr* 2020;174:1093–10.
- 33 Carretero Gomez S, Napierala J, Bessios A. *What did we learn from schooling practices during the COVID-19 lockdown*, Eur 30559 en, publications office. Luxembourg: of the European Union, 2021.
- 34 Benham JL, Lang R, Kovacs Burns K, *et al.* Attitudes, current behaviours and barriers to public health measures that reduce COVID-19 transmission: a qualitative study to inform public health messaging. *PLoS One* 2021;16:e0246941.
- 35 Branquinho C, Kelly C, Arevalo LC, *et al.* "Hey, we also have something to say": A qualitative study of Portuguese adolescents' and young people's experiences under COVID-19. *J Community Psychol* 2020;48:2740–52.
- 36 Mensah AA, Sinnathamby M, Zaidi A, *et al.* SARS-CoV-2 infections in children following the full re-opening of schools and the impact of national lockdown: prospective, National observational cohort surveillance, July–December 2020, England. *J Infect* 2021;82:67–74.
- 37 Aiano F, Mensah AA, McOwat K, *et al.* COVID-19 outbreaks following full reopening of primary and secondary schools in England: cross-sectional national surveillance, November 2020. *The Lancet Regional Health - Europe* 2021;6:100120.
- 38 Aspinall WP, Sparks RSJ, Cooke RM. Quantifying threat from COVID-19 infection hazard in primary schools in England. *medRxiv* 2020.
- 39 Ismail SA, Saliba V, Lopez Bernal J, *et al.* SARS-CoV-2 infection and transmission in educational settings: a prospective, cross-sectional analysis of infection clusters and outbreaks in England. *Lancet Infect Dis* 2021;21:344–53.
- 40 Fontanet A, Autran B, Lina B, *et al.* SARS-CoV-2 variants and ending the COVID-19 pandemic. *Lancet* 2021;397:952–4.