



> COVID-19: Time for a fresh air approach

Research into ventilation
in primary and secondary
schools in the UK

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> An expert view: Professor Paul Linden, University of Cambridge.



Professor Paul Linden, is an expert on the role of ventilation in the airborne transmission of COVID-19, and is based at the University of Cambridge.

We know COVID is spreading in schools and we know poor ventilation increases the risk of infection. In addition to close contact, COVID is spread through airborne particles that are carried around by air currents in a room and they can be filtered from the air and removed by introducing more fresh air.

We have to accept that opening windows, while important, is only a first step. Opening windows will ventilate rooms but can also make everyone cold, or significantly increase energy costs, and may bring in traffic noise and pollution. We also need to ask ourselves; how much responsibility is it fair that we put on teachers? How much do we open windows and for how long? Every classroom is different, and ventilation is complicated – we can't expect teachers to be ventilation experts.

The best answer has to be a combination of solutions that suits each individual classroom because every school and classroom is different. There is technology available to support schools and teachers.

For example, measurements of carbon dioxide, a gas that we exhale, are effective in indicating the levels of ventilation and any airborne infection risks. To complement this, air filtration systems can work in combination with a plan to periodically open windows, for instance to ventilate at break times. A combination of solutions is needed to minimise the risk of COVID spreading in indoor environments.

“

We need to do more to keep our schools open and our children and teachers safe and well.

> **phs** school air quality

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> Executive summary

This report delves into the latest air quality research by **phs** Group and looks at the challenges schools across the UK face to keep the air in their classrooms clean and healthy, to protect teachers and children from the ill effects of COVID-19 and prevent further spread of the disease.

It shines a light on the perceived impracticality and ineffectiveness of the Government's Open Window Guidance to tackle air quality through ventilation, among both education staff and parents, and calls for better measures to make classrooms safe, reduce coronavirus contagion, and combat disrupted learning.



> The COVID-19 classroom challenge

Before COVID-19, teachers and parents could breathe easy knowing that the predictable onslaught of winter bugs doing the rounds in school would eventually pass with only fleeting harm to health and normality resume once more.

However, the pandemic has highlighted – like – no other virus before it in living memory that the air quality in schools is crucial, not only to protect the personal health and wellbeing of both children and staff, but to avoid relentless disruption to learning and prevent further spread of illness both inside and beyond classroom walls.

The greatest risk of COVID-19 transmission occurs in indoor environments, particularly in places where ventilation is poor. A hotbed of germs at the best of times, schools need efficient air systems to reduce airborne viruses. But the critical

question is how this is achieved, especially during the cold winter months when opening a window for prolonged periods of ventilation brings its own set of challenges.

This latest air quality research by **phs**, taking in the views of education staff and parents of children at primary and secondary schools across the UK*, worryingly reveals that more teachers are seemingly off work now than ever before. Furthermore, it shows that the Government's 'open window' guidance on ventilation is unclear, impractical and failing.

We need to clear the air; the UK's schools urgently need better air purification systems to keep classrooms clean, healthy and safe, to tackle the disrupted learning caused by teacher and pupil absences, and to avoid the daunting possibility of a return to more restrictive COVID-19 measures.

*Based on research conducted in November 2021 of 500 administrators, head teachers, teachers, teaching assistants, deputy head teachers and other school staff plus 1,000 parents of children under 16 at primary and secondary schools in the UK.





> Windows: An open and shut case

Our research reveals that:

More than half (52%) of education staff in primary and secondary schools in the UK feel that more teachers are off work now than ever before with absences caused by a combination of factors, such as COVID-19 infection, winter viruses, and the stress and exhaustion covering for sick colleagues.

52%

of education staff are off work now than ever before



While just over a third (35%) say they fully understand the Government's open window guidance – which highlights the importance of simple ventilation techniques to reduce the risks of catching coronavirus – two-thirds of staff (65%) either only understand the official advice to an extent, do not comprehend it at all, or are unfamiliar with it

35%

say they fully understand the Government's open window guidance

65%

only understand the official advice to an extent



One in 10 staff (10%) admit rarely implementing the guidance, which came into effect in 2020, while 5% had never opened a school window and a quarter (24%) only did it sometimes.



10%

staff say they rarely implement the guidance which came to effect in 2020

5%

had never opened a window

Under a third (31%) often aired a classroom, but only just over a quarter (less than 27%) always did.



31%

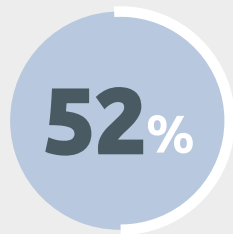
often aired the classroom

27%

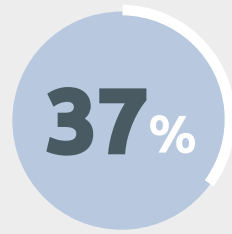
opened their doors for the start of the new academic year

> Key figures

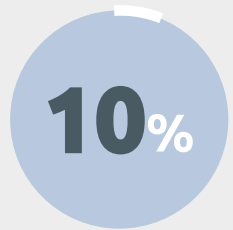
Thinking of staffing levels at your school, do you feel there are more or less teachers off work now than ever before?



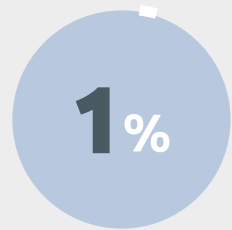
More teachers off



Less teachers off

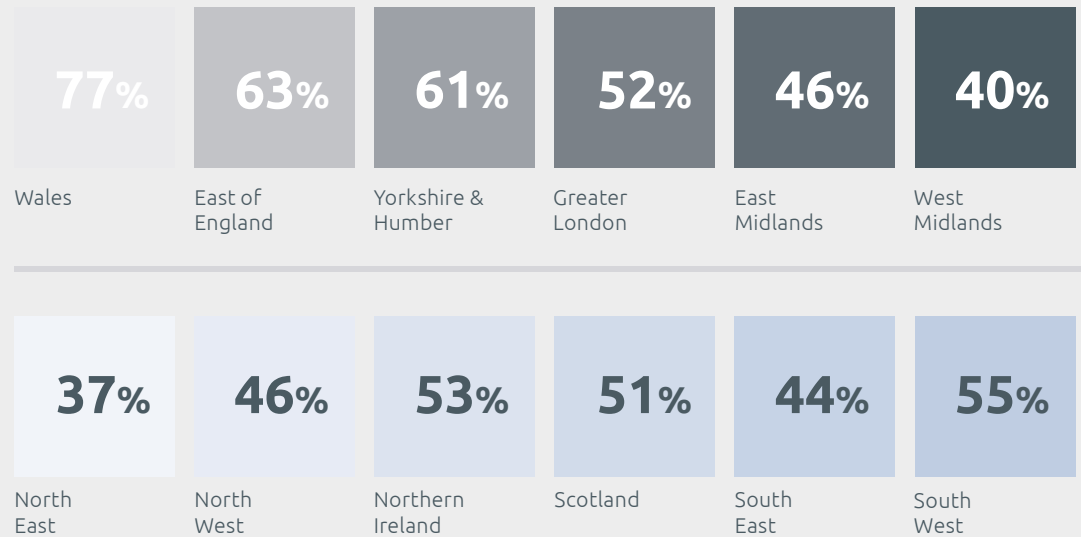


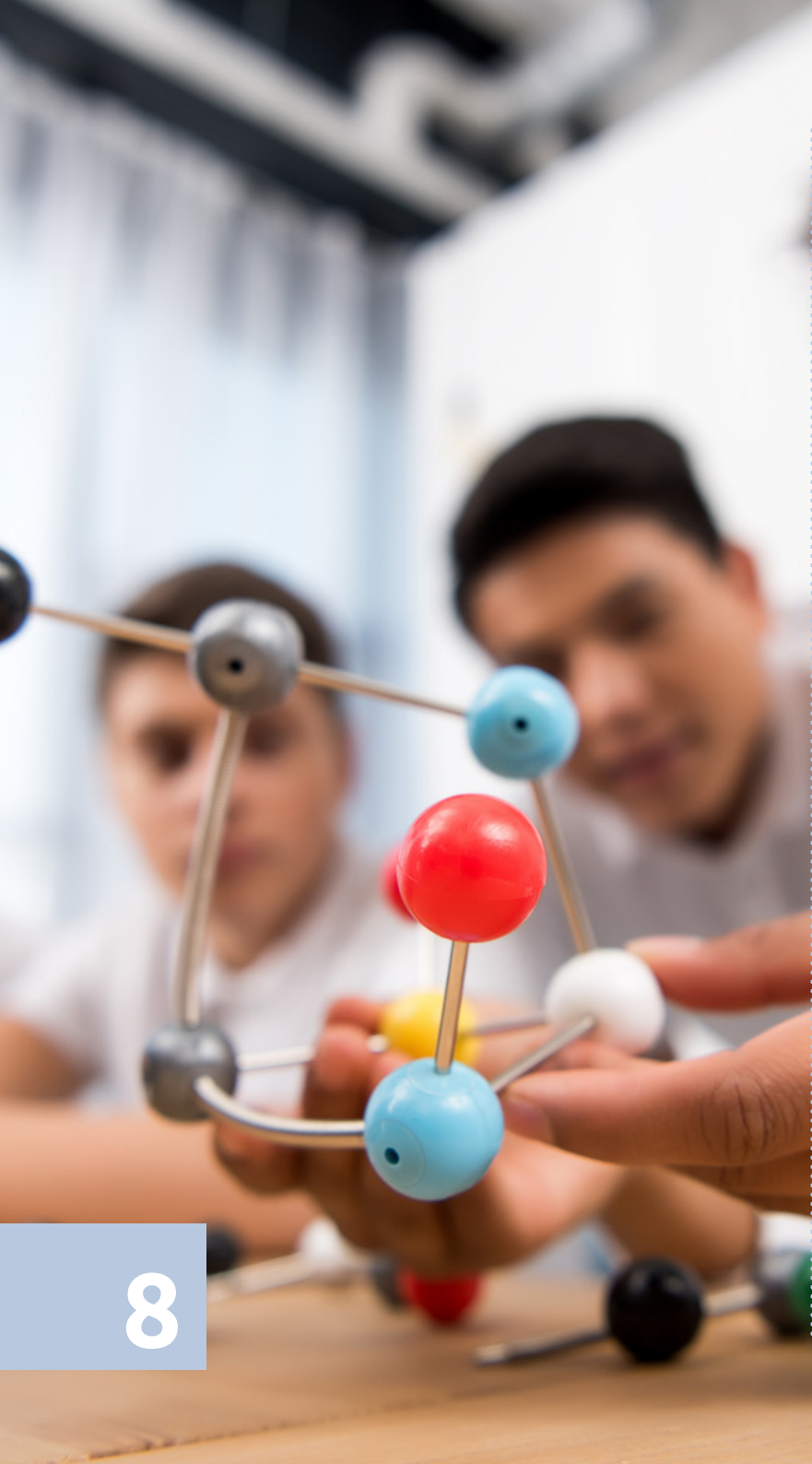
No change



Don't know

Regional split (more teachers off):





> Key figures

Consider the Government's Open Window Guidance.
Which of these statements applies to you?

I fully understand it	I understand it to an extent	I don't understand it	I've heard of it, but I am not very familiar with it
35%	44%	17%	4%

How often, if at all, do you implement the Open Window Guidance since it came into force in 2020?

Always	27%
Often	31%
Sometimes	24%
Rarely	10%
Never	6%
During warmer months only	1%
N/A – Don't have windows in my classroom	1%

➤ The winter chill factor

When asked about following the advice during the colder months, only 5% of staff had opened a window more than five times on average since the clocks went back in October – the highest proportion (33%) said they had ventilated an area on about three occasions.

But just 1 in 10 respondents feel that the government's guidance is a 'good idea', with more than a quarter (29%) saying children are unable to concentrate in class because it is too cold.

A similar number (26%) feel that following the guidance would make it impossible

to teach effectively over the course of the winter, while 24% of staff believe it causes more viruses due to students and teachers' immune systems being compromised by chilly classrooms. Almost 1 in 5 (21%) say it is likely to cause further absenteeism and is also impractical.

And, worryingly, more than a quarter (27%) of school staff polled report that they are unable to open the windows in their classroom even if they want to, with half (50%) revealing there are between 5-10 windows in their school that cannot be opened.

➤ Key figures

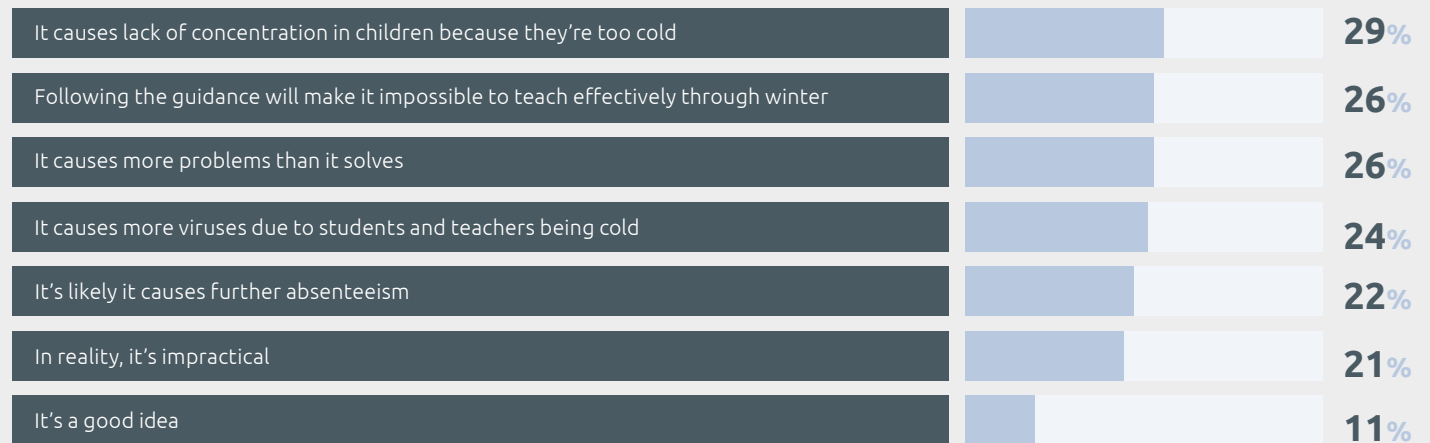
Thinking about the colder months and the clock going back, how many times, on average, have you implemented the open window guidance?

0	1	2	3	4	5+	Mean (in a number of times)
3%	13%	27%	33%	19%	5%	2.67%

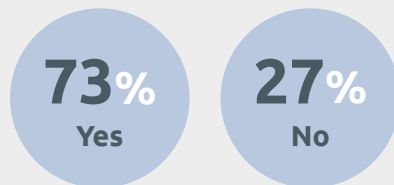


> Key figures

How do you feel about the Government's open window / ventilation guidance?



Are you able to open windows in your classroom?



How many rooms at your school have windows that cannot be opened?

None	1-4	5-10	Over 10	Don't know	Mean (number of windows)
7%	39%	50%	1%	3%	5%



> A call for better measures

When asked if they were concerned about being put at risk of COVID-19 infection or reinfection, almost half of staff (48%) feel somewhat worried while 1 in 5 (21%) are very worried.

48%

staff feel somewhat worried about the COVID-19 infection

21%

staff feel very worried about the COVID-19 infection



A quarter (25%) believe controlling COVID-19 in classrooms from December to March will be 'not very manageable' or 'not manageable at all', and most (58%) think there will be a return to previous, more restrictive COVID-19 measures if better ventilation systems are not put in place.

25%

believe controlling COVID-19 in classrooms will not be very manageable

58%

think if ventilation systems are not put into place, COVID-19 measures will return to previous



Overwhelmingly, 7 in 10 of those questioned (almost 72%) are either strongly or somewhat disappointed in both central and local government for failing to find a better solution for air purification.

A similar proportion (70%) strongly or somewhat agree that schools need to do more regarding better ventilation while 72% are very worried or somewhat worried that a lack of ventilation in winter could lead to more staff and pupil illness.

The vast majority (almost 79%) want the Government to install air purifiers and better ventilation systems to tackle COVID-19 and other illnesses.

72%

are disappointed in the local government for failing to provide a better air purification solution

70%

strongly feel that schools need to do more regarding better ventilation

72%

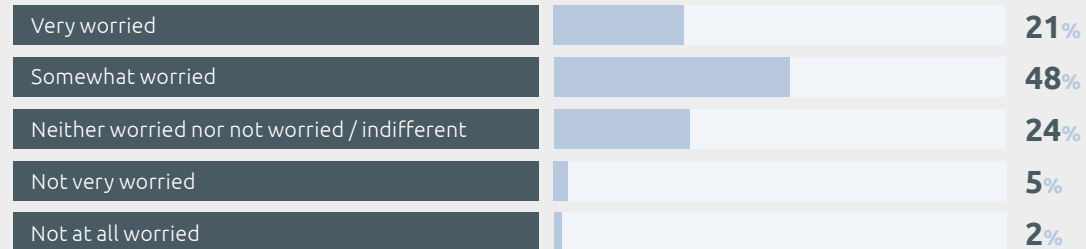
are worried that a lack of ventilation in winter would lead to more ill staff and pupils

79%

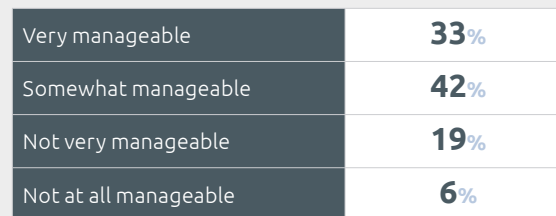
want the Government to install air purifiers and better ventilation systems

> Key figures

How worried are you, if at all, about being put at risk of COVID-19 infection/reinfection?



Thinking of the winter months, how manageable, if at all, do you think regulating COVID-19 in classrooms will be if better ventilation measures aren't implemented?



Do you think there will need to be a return to former COVID-19 measures if better ventilation systems aren't put in place?





> Summary

Education staff are reporting that there is an unprecedented level of teacher absence at a time when schools are only beginning to make up for missed caused by lockdown closures throughout the pandemic.

Continuity of education is crucial to pupils' school progress and academic achievement, and if record levels of teachers are not well enough to be in their classes – aside from the poor health and wellbeing of staff themselves being of concern – there is the significant detrimental impact on children's day-to-day learning to consider, particularly when absences cannot be covered adequately.

It is felt by many that the Government's open window guidance is neither clear enough nor practical to implement during the winter, and compromises both children's ability to concentrate on lessons and the immune systems of both teachers and pupils.

And that's in the classrooms where windows open; a significant proportion of school staff report not being able to ventilate areas even if they are minded to which presents a serious health safety concern.

Staff are worried about their own health and that of their pupils due to the ever-present risk of catching COVID-19, and fear having to reintroduce tougher measures to control the virus if better, more efficient measures are not introduced.

A significant majority are disappointed that the Government and local authorities have not found a better air purification solution and want action now.

> Parental perspective

This survey by **phs** also covered the concerns of parents and reveals that:

31%

As many as a third of parents (31%) had chosen not to make their child do a PCR test on at least one or two occasions even though they had cause to, mainly because they did not believe the symptoms warranted it (30%) or, similarly, because their child hates being tested. One in 5 parents (22%) wanted to avoid the disruption of school absence in the event of a positive result.

24%

When asked if they would move their child to a different school if they knew it had better ventilation systems in place, such as air purifiers, almost a quarter of parents (24%) would switch.

24%

Fewer than 1 in 4 fully understand the Government's ventilation guidance (24%) while almost two thirds (62%) have never checked whether their child's school follows the official ventilation recommendations.

21%

Parents surveyed were split about whether the guidance would work over the course of the winter, with 21% favouring its suspension on the coldest days, while a similar proportion say the advice should be adhered to regardless.

70%

The vast majority of respondents (nearly 70%) said they had recently given more consideration to the air their children are breathing in while learning and that schools should be given ways to make air cleaner.

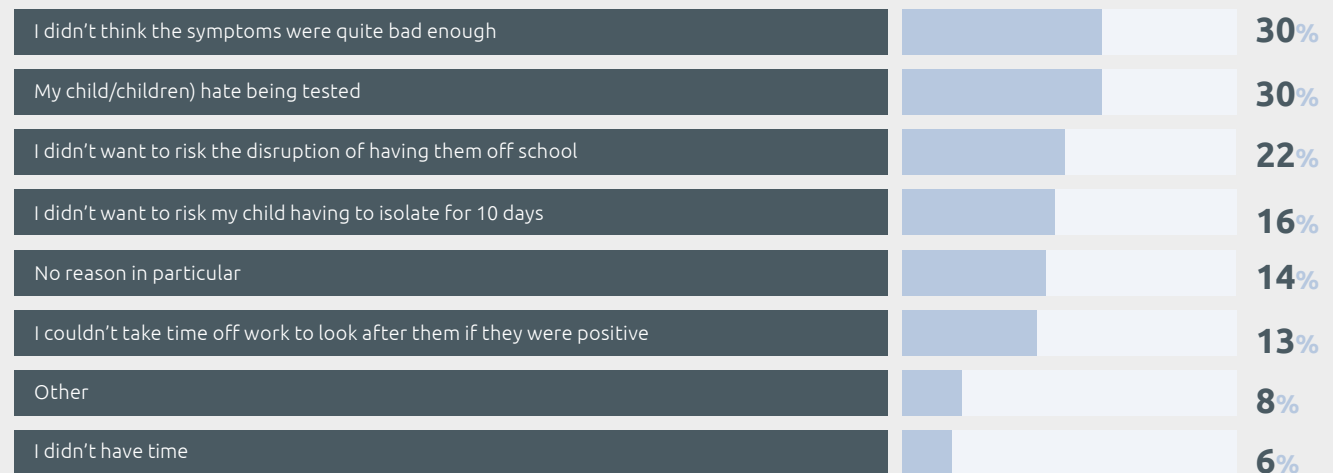


> Key figures

How many times, if any, have you not had your child PCR tested even though there might have been cause for you to?

0	1-2	3-4	5-6	7-8	9-10	Prefer not to say
44%	31%	14%	5%	1%	2%	2%

If one or more times, why did you do this?



Would you move your child to a different school if you knew there were better ventilation systems, for example, air purifiers, in another school?



> Key figures

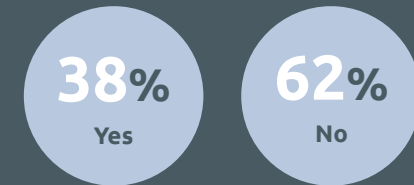
What do you know of the Governments open window guidance in schools?

I understand it to an extent	I've heard something but I am not very familiar with it	I fully understand the guidance	I have never heard of it	I don't understand it
28%	26%	24%	16%	6%

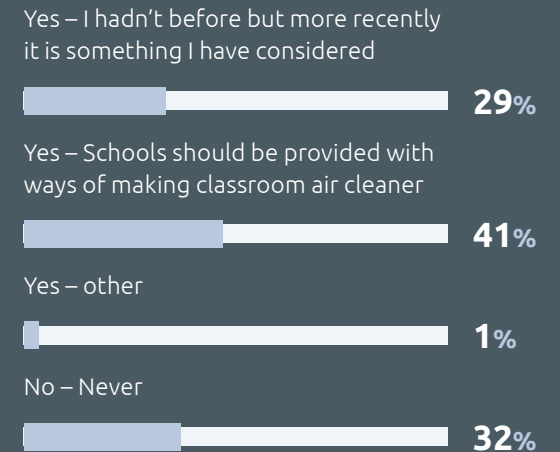
How do you feel the open window guidance would work in the winter months?

It should be suspended on the coldest days	21%
It is important to follow the guidance even if the children and teachers are cold	21%
It is impractical	21%
Don't think the open window guidance would work in the winter months	19%
Children wouldn't be able to learn in the cold	16%
Other	1%

Have you ever checked with your child's school if they follow the open window guidance?



Have you ever given any thought to the air your child breathes in the classroom?



> Summary

As with education staff, there is confusion among parents about the Government's open window guidance and reservations about it being implemented on cold days due to the adverse effects on their children in class.

Moreover, a significant number of families are also ignoring Government legislation to make their children take a PCR test when they show possible COVID-19 symptoms because they do not want to follow through with isolating them for 10 days.

As many as a quarter would consider taking the drastic action of moving their child to a school with better air ventilation systems, which demonstrates the importance parents place on their children breathing in healthy air. Clearly, it's time for a fresh approach.



> The phs solution air cleaning

At **phs**, we have been steadfast in our commitment to finding the most optimum ways of creating a cleaner and safer environment in schools and anywhere indoors.

Recent independent laboratory research has provided the strongest evidence yet that our range of **AERAMAX® PROFESSIONAL AM3** and **AM4** air purifiers and **BIOZONE** and **MINI POWERZONE** air care units have been proven to be effective against COVID-19.

phs' Fellowes **AERAMAX® PROFESSIONAL 3 & 4** has been proven to be effective in eliminating aerosolised concentration of SARS-CoV-2 (COVID-19) by 99.9999% through a single air pass test of the purifier. Whilst our **BIOZONE** and **MINI POWERZONE** units, are proven for effectiveness against SARS-CoV-2 by an independent third-party lab when tested against the approved surrogate Human Coronavirus (OC43). The results found that the UV light technology which treats airborne contaminants passing through the units, which possibly contain COVID-19 material, saw a 99.1% inactivation of the SARS-CoV-2 virus, the virus that causes COVID-19, in as little as 0.25 seconds of exposure. Furthermore, a similar test on the effectiveness of the Photo Plasma technology adopted by **BIOZONE**, saw a 99.3% reduction of the surrogate Human Coronavirus (OC43) on surfaces in under 30 minutes.

While hygiene measures, such as extra hand washing and mask wearing, have been introduced in schools to date over the course of the pandemic, nothing has been done to truly tackle the threat of smaller, infected airborne droplets and particles. Known as aerosols, these enter the air simply by being breathed out and are not contained by masks.

Growing evidence indicates infected aerosols can linger in the air for up to hours at a time and provide a viable

route for COVID-19 transmission. There is even a risk that, depending on the ventilation system, these aerosols may be spread around a school exposing more people to coronavirus and increasing the risk of staff and children being infected.

AERAMAX® PROFESSIONAL air purifiers are also proven to be effective against a range of infectious diseases, germs and viruses that spread easily in schools, including colds, flu, norovirus, chickenpox, measles and mumps, as well as TB, SARS and whooping cough.

Whilst our **BIOZONE** and **MINI POWERZONE** units are also proven to destroy viruses including Human Flu and H5N1 Avian Flu (Bird Flu) as well as surface bacteria such as E. coli, Salmonella and Streptococcus.

Notably, in **AERAMAX** trials in nursery settings, air quality was found to be as much as seven times cleaner with anecdotal reports of a reduction in illness and sick days. Furthermore, they reduce allergens such as dust, pollen and VOCs as well as odours, and tackle the rising problem of indoor air pollution.

Used as part of a package of hygiene measures including hand washing, sanitisation and cleaning, air purifiers create a safer, cleaner environment for schools and future-proof against day-to-day illnesses and the risk of future outbreaks.

An almighty challenge requires an all-encompassing solution – not just for winter, but all-year round. One that is ready for rollout across all schools nationwide today to protect the health of both staff and the children in their care. It's time to stop relying on opening windows and start opening new doors to proven air quality systems backed up by scientific research.

