Clean air isn't optional ...
it's essential.

Clean air guide

For early childhood settings & schools

LONG COVID KIDS

THE VOICE OF EARLY CHILDHOOD

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Finally, we are grateful to our sponsors and to The Voice of Early Childhood for their support in bringing this guide to life.

About us

Long Covid Kids is a UK charity which represents and supports families, children, and young people living with Long Covid and related conditions.

Through awareness campaigns, research advocacy, and expert-by- experience guidance, the charity works to increase understanding, aid early diagnosis, and improve intervention responses. The volunteer team provides support, guidance, and signposting for affected families navigating the many challenges of paediatric Long Covid. To find out more visit: www.longcovidkids.org & www.longcovidkids.org/clean-air

The Voice of Early Childhood (TVOEC) is a reflective platform amplifying diverse voices across the early childhood profession.

Through thoughtful articles, podcast episodes, and an annual conference, TVOEC fosters inclusive dialogue and reflection to challenge dominant narratives and promote equity, understanding, and wellbeing for all children, families, and educators. To find out more: www.thevoiceofearlychildhood.com

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All children deserve to breathe clean air in their learning environments.

Welcome

A big welcome and thank you from Long Covid Kids and The Voice of Early Childhood. Thank you for making the time and effort to download and read this guide. We know how vital clean air is for our youngest children, which is why we have put together this informative guide for you to delve into, with practical takeaways and actionable points you can take straight into your settings and classrooms.

Clean air is as essential for learning as safe drinking water and nutritious food. Yet most educators rarely think about the air children breathe. We resign ourselves to educational settings being "germ factories" and that everyone will be coughing by October, but there's something we can do about it.

By taking simple, evidence-based steps to improve indoor air quality, educators can dramatically reduce illness and boost learning outcomes. This isn't about expensive renovations, it's about understanding three key principles: monitor, filter, and ventilate.

Children breathe approximately 11,000 litres of air daily, but as physicist André Henriques from CERN pointed out, if you asked a room full of adults what children need, clean air wouldn't make the list, yet it's fundamental to their health and development. Children face increased risks from poor air quality; their airways are small and still developing, they breathe more rapidly and inhale more air relative to their size than adults do. We expect clean water and healthy food, so why are we neglecting air quality? **The answer is that air pollution is invisible, making it easy to ignore.**

The stakes are high. In 2023/24, according to the DfE, illness absence was still 40% higher than pre-pandemic rates for children. Furthermore, Long Covid cases in children nearly doubled between March 2023-2024, reaching over 111,000 in England and Scotland alone (ONS, 2024).

But, much of the illness that spreads unchecked in our nurseries and schools is preventable. Many diseases that disrupt education: Covid-19, flu, RSV, whooping cough, measles, norovirus are spread through the air (Gralton et al., 2011; Leung, 2021). Improving indoor air quality will reduce transmission of ALL of these illnesses simultaneously.

We wouldn't let children drink dirty water, so why are we letting them breathe dirty air?
The time for action is NOW.

On behalf of the team at Long Covid Kids Charity and The Voice of Early Childhood, we invite you to explore this guide with curiosity and purpose. Whether you're new to the topic or already advocating for cleaner air, every small change you make matters. Together, we can create learning environments where all children can thrive — spaces that support their health, wellbeing and potential. Thank you for being part of this vital conversation and for taking steps towards a cleaner, safer future for every child.

Anne Marie McConway
Early Years Advisor
Long Covid Kids Charity

Angelica Celinska
Founder
The Voice of Early Childhood

We wouldn't let children drink dirty water, so why are we letting them breathe dirty air?

Why indoor air quality matters in early childhood settings & schools

Children are uniquely vulnerable to poor indoor air quality. Their developing immune and respiratory systems are more easily damaged by pollutants and infections (Brady, 2005; Nesti & Goldbaum, 2007).

Indoor air quality refers to the condition of the air inside buildings and its impact on occupant health. Unlike outdoor air, indoor air becomes polluted by gases, harmful particles and airborne diseases (Daisey et al., 2003; Sundell, 2004). Importantly, indoor air can be up to five times more polluted than outdoor air.

Educational settings are facing unique challenges:

- Higher occupancy rates - often with four times more people per square metre than offices
- Children playing at close quarters, sharing resources
- Activities like shouting and singing which increase aerosol emissions
- Many educational settings are in older buildings with poor ventilation

Research consistently shows the link between air quality and learning. Studies demonstrate that improved air quality enhances cognitive performance and reduces asthma and respiratory symptoms (Allen et al., 2016; Allen et al., 2020). When air quality is poor, children experience reduced concentration and impaired decision-making.

Poor air quality is also an **equity issue**. Clinically vulnerable children and staff are disproportionately affected by poor air quality. Those who have asthma, cancer, are immunocompromised or have long covid for example, risk exclusion from education due to the effects of unsafe indoor air. Children from disadvantaged backgrounds are also more likely to attend schools in older buildings with inadequate ventilation, located near busy roads with higher levels of air pollution.

Links to early childhood pioneers

Contemporary air quality advocacy continues the rich educational traditions rooted in understanding that healthy environments are fundamental to children's development. This principle was first articulated by Florence Nightingale in 1859, who emphasised the importance of good ventilation, by stating: "The first rule of nursing is to keep the indoor air as pure as the air without", (Nightingale, 1859, pg. 6).

Before medical advancements like vaccinations and antibiotics, we relied on non-pharmaceutical interventions to safeguard public health and curb disease spread. **It seems we've forgotten many fundamental practices that once guided illness prevention.**

The McMillan sisters established open-air nurseries in early 20th century London, recognising how overcrowded, poorly ventilated spaces contributed to ill-health and educational disadvantage. Their approach was revolutionary, creating environments where children could breathe fresh air throughout the day and they found that this vastly reduced the amount of illness the children experienced (Helyar, 2018).

Emmi Pikler emphasised creating environments which support physical health and emotional security. Clean, well-ventilated spaces were fundamental to the respectful, autonomous development she promoted (Sanchez et al., 2020).

Forest Schools demonstrate outdoor learning benefits, including reduced infection transmission in fresh air environments. While not all lessons can be outdoors, forest school principles remind us that maximising fresh air should guide educational practice (Bento & Dias, 2023).

These pioneers and approaches understood that the environment shapes learning as powerfully as the curriculum or teaching methods. Modern filters and CO_2 monitors are simple, low cost tools we can use to achieve their goal: ensuring children breathe clean, healthy air.

Impact of Long Covid on children

We all know that Covid-19 infections can cause acute illness. Unfortunately, it has become clear in the last five years that there are also long-term health implications which can result from repeated Covid-19 infections. This is being largely overlooked.

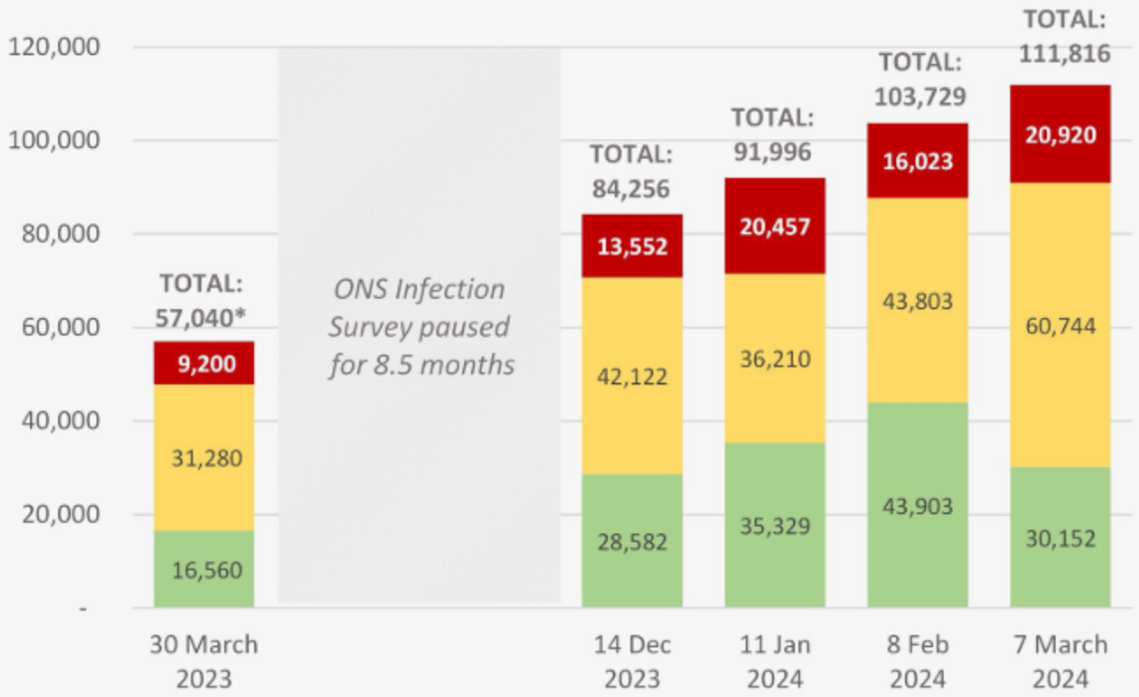
This graph represents the most recent ONS data about how many children were suffering with Long Covid in England and Scotland in March 2024, the number of children reporting long term health issues doubled from March 2023 - March 2024:

CHILDREN AGED 3-17 YEARS:

111,816 children (aged 3-17 years) were estimated to be suffering from Long Covid during the 4 week period ending 7 March 2024 (England & Scotland).

Over 20,000 of these children with Long Covid (19%) reported that their ability to undertake day-to-day activities had been limited A LOT.

Source: ONS Covid Infection Surveys

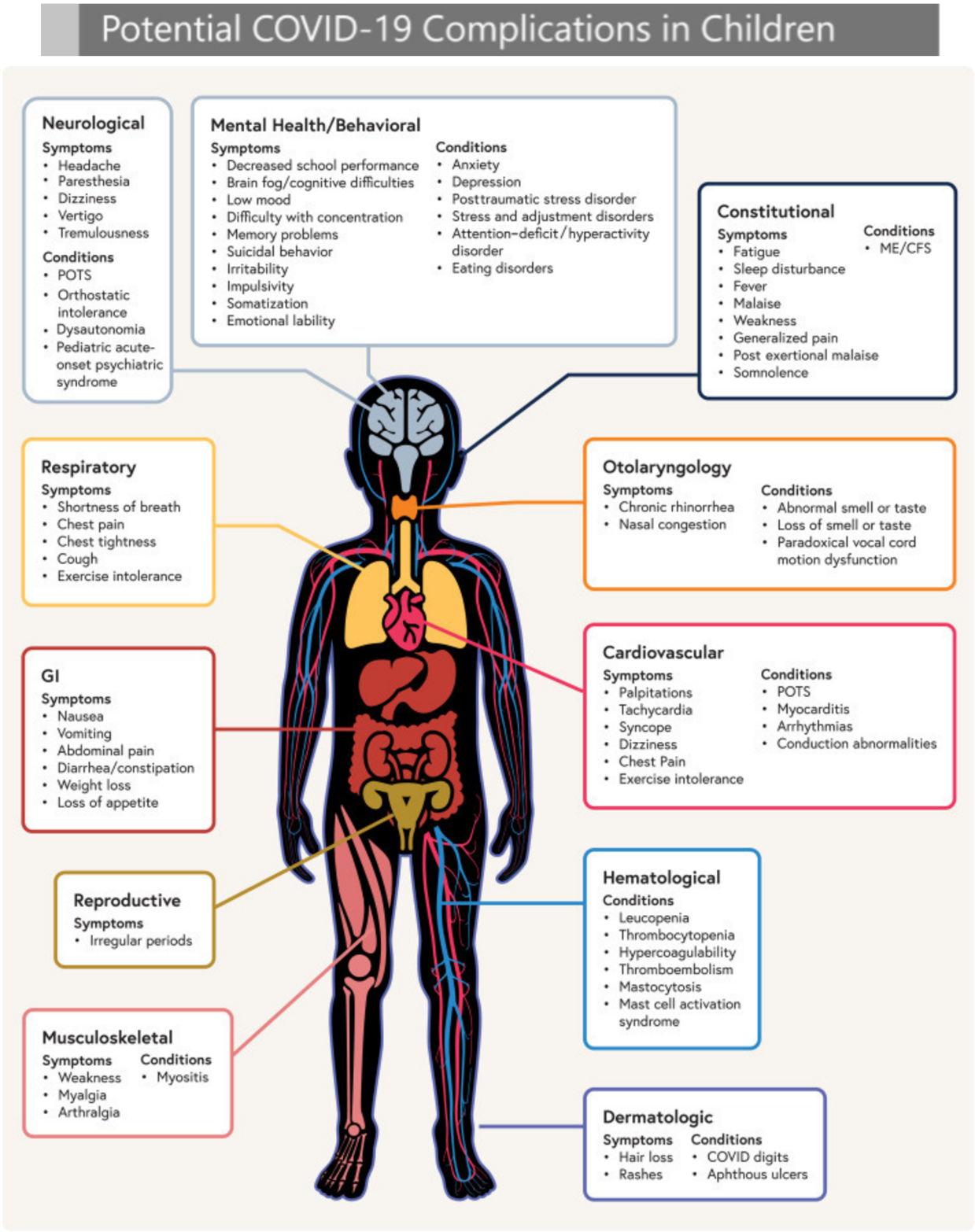


Extent to which Long Covid reduces ability to undertake day-to-day activities:

Not limited at all | Limited a little | Limited A LOT

** The ONS survey data from March 2023 was UK-wide data whereas the latest ONS survey data is for England & Scotland only. In order to present the data on a like-for-like basis, I have extrapolated 92% of the UK-wide figures from March 2023 since England & Scotland represent 92% of the UK population.*

Long Covid is an umbrella term used to describe the chronic health problems which are caused or triggered by a Covid-19 infection. Long Covid in children can present as cardiovascular, neurological, mental health, respiratory, and gastrointestinal symptoms (Rao et al., 2024), with symptoms varying by age (Gross et al., 2024). A recent study in America has suggested that Long Covid may be emerging as the most prevalent chronic health condition in children. This is potentially affecting 6 million American children and surpassing even asthma in prevalence (JAMA Pediatrics, 2025).



from 'Postacute Sequelae of SARS-CoV-2 in Children' by Rao *et al* (7 Feb 2024 © American Academy of Pediatrics)

Covid-19 infections continue to impact babies severely; they remain the only age group where hospital admissions haven't decreased over time. **Between September 2023 and April 2024, 1% of all babies under six months required hospital stays due to Covid-19**, with 6,300 babies under one year admitted, 5% needing intensive care, and tragically, eight babies dying (Wilde et al., 2024). **This gives babies under six months a higher hospitalisation rate than adults over 90.**

Furthermore, the number of children being diagnosed with diabetes has been rising in the UK since 2020 (D'Souza et al., 2023). A recent report from Sweden states that they have also seen **a 62% increase in diagnoses of type 1 diabetes among children under five between 2018 and 2022**, the researchers have identified Covid-19's disruptive impact on the immune system as a factor (Barndiabetesfonden, 2024).

This aligns with other research which has shown that the virus can dysregulate the immune system, leaving people more susceptible to other illnesses (Ruf, 2024). A recent article in the British Medical Journal (BMJ) calls into question the 'immunity debt' theory which has been used to explain the global surge in non-covid infections seen since pandemic protections were lifted. The evidence now points to **Covid infections causing immune damage leaving us all more susceptible to other pathogens and to the reactivation of dormant viruses**, such as Epstein-Barr virus (EBV) and varicella zoster virus (VZV) (Tsergas, 2025).

Contrary to popular belief, **frequent infections and illnesses in childhood are NOT beneficial and do not 'build immunity'**. A recent longitudinal cohort study found that a high infection burden (from all pathogens) in early life is in fact associated with increased risks of moderate to severe infections and antibiotic treatments later in childhood (Brustad et al., 2025).

Moreover, a recent study (Zhang et al., 2025) found that **the risk of Long Covid in children and adolescents doubled with a second infection**. The researchers analysed 465,000 medical records and identified myocarditis – inflammation of the heart muscle – as the most common complication observed after infection, with risk tripling after a second bout of Covid-19. Blood clots were found to be twice as likely after a second infection. Other complications occurring at higher rates after reinfection included kidney damage, irregular heartbeat, severe fatigue, mental health issues, skin conditions, and cognitive impairment. **This evidence underscores the urgent need to reduce reinfections in children.**

Educators are also suffering. It was found that **those working in education are disproportionately affected by Long Covid** due to increased exposure (Kromydas et al., 2023). Long Covid in the general population is estimated to affect 4.6%, equating to 3.1 million adults (NHS England GP Patient Survey, 2024).

It is therefore clear that we are all at risk, and implementing simple protective measures such as improving ventilation and adding air filtration would be a proportionate and logical response to this ongoing threat to health.

Has the pandemic changed infection control practices?

Unfortunately not. The Covid-19 pandemic HAS fundamentally changed our understanding of disease transmission. In 2020, the WHO advised that 'droplets' were the primary transmission route, leading to an increase in surface cleaning and handwashing. However, the WHO then acknowledged in 2021 that airborne aerosols, smaller particles which hang suspended in the air like smoke for up to two hours, are a significant transmission route for Covid-19 (Greenhalgh et al., 2021; Morawska & Milton, 2020).

This change to WHO guidance means that our traditional infection control measures, like increased handwashing and surface cleaning, are actually ineffective at reducing airborne spread. Instead, removing the floating aerosols using air filters and improving ventilation are the most effective tools we have at our disposal to reduce airborne disease transmission Lindsley et al., 2021; Curtius et al., 2021).

No amount of handwashing will stop someone breathing in viral particles.

In light of this new understanding, we can now take action to ensure that tackling airborne transmission forms part of our Infection Prevention and Control (IPC) practices on a day to day basis.

This IS happening in some areas; there are innovative campaigns and clean air pilot studies dotted around the country. For example; the Clean Air for Kids initiative is seeing success in Bristol schools, Hertfordshire County Council funded air filters for some of their schools and most recently Sadiq Kahn commissioned a 'clean air' pilot in London giving 200 schools air filters. Around the country, it is unknown exactly how many schools and nurseries have air filters which have either been donated by concerned parents, crowdfunded by the local community or funded directly by nurseries/schools. But, as awareness of the benefits increases, this number will continue to grow. Of course, this postcode lottery is highly inequitable. All children Deserve to breathe clean air in their learning environments.

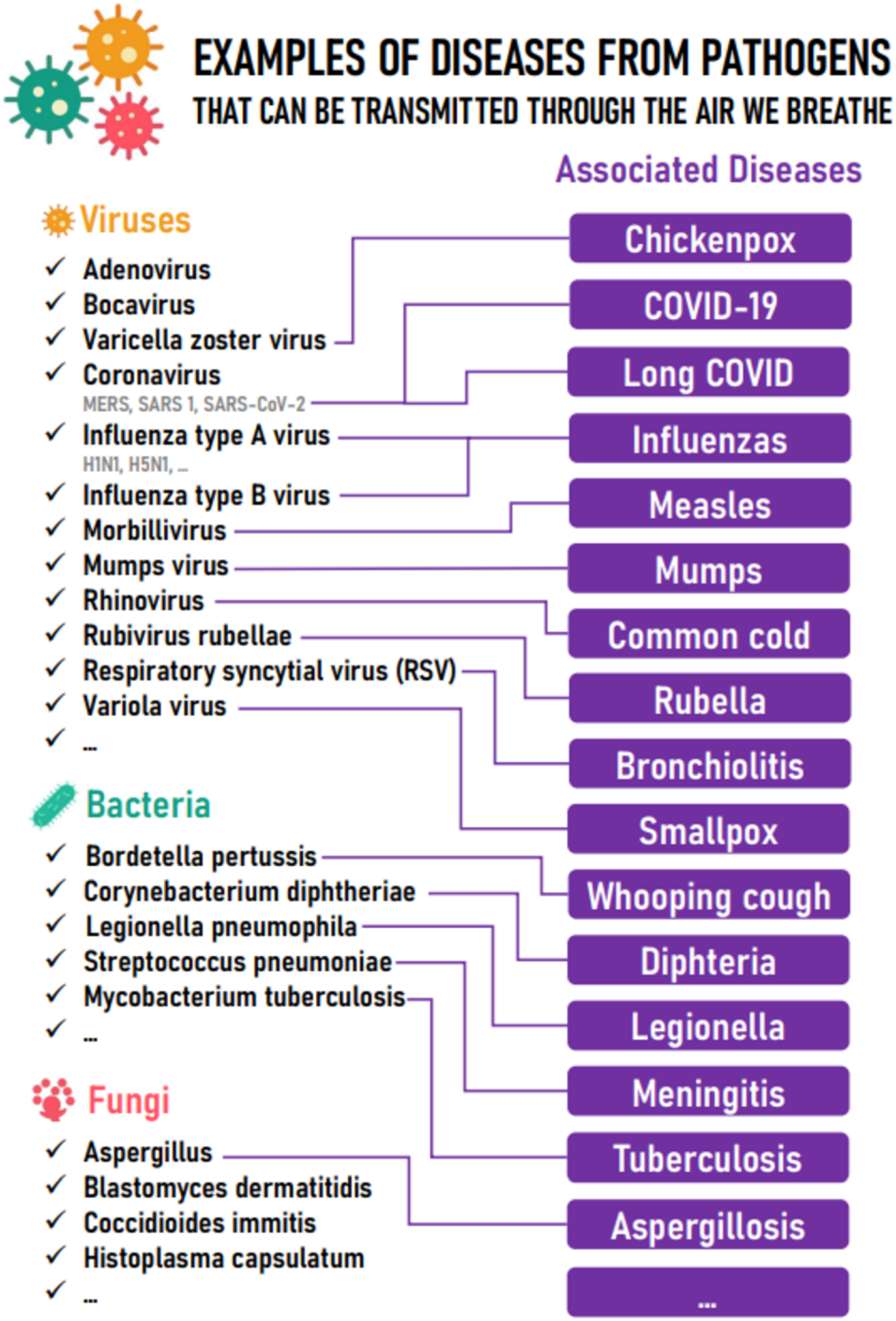
All children deserve to breathe clean air in their learning environments.

Which diseases are airborne?

Many of the common childhood illnesses that disrupt education are spread through aerosols. Understanding this fact is crucial because improving air quality will provide protection against multiple diseases.

Common airborne diseases include Covid-19, Influenza, Whooping Cough, RSV, Chickenpox, Measles, Mumps, TB, Meningitis and Norovirus. Therefore, the most effective way to reduce the spread of disease is to clean the air.

This image shows how many pathogens are airborne and the diseases they cause:



letsair.org *Morenton, P. (n.d.)*

What do the current guidelines say?

The Infection Prevention and Control (IPC) guidelines (Department of Health and Social Care, 2022) explicitly state that institutions should monitor and improve indoor air quality, recommending the use of Co2 monitors and advising action be taken if readings exceed 800 ppm (parts per million). However despite these clear guidelines, such measures are not being widely implemented.

At present, the UK only offers guidelines, not regulations on indoor air quality. This means that action relies on individual settings, leadership and budgets rather than legally binding policy. Following government infection control guidance should not be optional. **As a matter of urgency, we need the government to introduce regulations, not guidelines, and improved standards for indoor air quality.**

Professional bodies have been calling for policy updates. A report from the Royal Academy of Engineering and CIBSE, made the case for a major upgrade of ventilation and air filtration systems, particularly in community buildings like schools and hospitals where the benefits of reducing disease transmission far outweighed the costs of installation, operation and maintenance. The cost of inaction is estimated to be up to £1.3 trillion (Royal Academy of Engineering & National Engineering Policy Centre, 2022).

The SAMHE air quality monitoring project recommends that UK governments commit to meeting WHO Air Quality Guidelines, update school guidance to focus on good ventilation and fund interventions (SAMHE, 2022).

Prior to the most recent General Election, the current Labour government were themselves very critical of the inaction on this issue. Wes Streeting MP, Stephen Morgan MP, Bridget Phillipson MP and Prime Minister Keir Starmer all spoke about the how vital it is to ensure that ventilation and air quality is urgently addressed. Let us hope that they have not forgotten.

The case for policy change

The pandemic has revealed a 'blind spot' in our IPC policy and practice. The Department for Education, when questioned, have said that they expect individual settings to ensure that air quality meets the expected standards. But settings are often not aware that these standards even exist! This apparent abdication of responsibility by the DfE leaves nurseries and schools without any clear direction or support. Meanwhile, staff and children's health continues to suffer unnecessarily.

We don't expect educators to clean their own drinking water or remove asbestos from buildings, these are recognised as systemic responsibilities requiring proper standards and support. Yet currently, educators in the UK are being left to manage indoor air quality without adequate guidance, funding, or training. This approach is both unfair and ineffective. We need government policy to:

- Commit to current WHO Air Quality Guidelines
- Update IPC advice to reflect the new scientific understanding of airborne transmission
- Ensure that education leaders, staff, and unions are supported to take consistent action to improve indoor air quality

Internationally, other countries have much higher expectations in relation to indoor air quality. France, for example, recently passed legislation lowering acceptable CO_2 levels in classrooms to 800 ppm with enforcement mechanisms in place (French Ministry of Health, 2023).

CO_2 LEVELS	REGULATIONS		GUIDELINES		
1500 ppm DAILY AVERAGE					
1250 ppm DAILY AVERAGE					
1200 ppm CEILING			(*)		
1000 ppm CEILING					
900 ppm CEILING					
800 ppm CEILING					

* 1200 ppm for schools built before 2012, 950 ppm for the schools built after 2012

As this image demonstrates, the UK guidelines set the bar very low for our children. A key question is; why DO we have such low expectations for the quality of the air our children are breathing?

While we wait for the government to act, those working in the sector can take the lead. Invest in CO_2 monitors and air filters and educate the educators about the importance of good indoor air quality (McConway, 2025).

The long term goal is government legislation which guarantees every child's right to clean air, backed by adequate funding and enforcement.

Greens against Covid

"Greens Against Covid" is a Campaign Working Group of the Green Party of England & Wales. We advocate for proportionate public health measures to protect us all from the harm caused by repeated Covid infections. This includes air quality improvements in all public indoor spaces, with this being particularly urgent in healthcare and educational settings.

Protecting our children

1.Prevention over reaction: We believe in stopping infections before they cause harm, rather than dealing with the consequences. This means championing clean indoor air in shared indoor spaces, such as schools and nurseries, through improved ventilation and air filtration.

2.Evidence-based policy: We're working to ensure that government infection prevention and control guidance reflects the latest research, including the overwhelming evidence showing that Covid-19 is an airborne disease and repeated infections are causing serious long-term harm to population health.

3.Ethical approach to attendance: We are challenging the harmful DfE guidance which encourages symptomatic children and staff to attend school or nursery. We advocate instead for policy and practice which protects the whole school community whilst genuinely supporting attendance through illness prevention.

We're not just campaigning for change, we're connecting policymakers with leading experts, gathering evidence, and offering simple, practical solutions.

We believe that children have a right to breathe clean air.
https://linktr.ee/greensagainstcovid

Use this QR code to watch a short video which explains the Green Party Covid, Long Covid and Clean Air policy:

The cost of doing nothing

Ignoring indoor air quality is creating unsustainable financial and educational burdens. Air quality has long been a serious, but neglected, threat to public health. Before the pandemic, Public Health England highlighted that "poor air quality is the largest environmental risk to public health in the UK, as long-term exposure to air pollution can lead to chronic conditions such as cardiovascular and respiratory diseases, as well as lung cancer, ultimately reducing life expectancy" (PHE, 2018).

Current DfE data shows that childhood illness is the leading cause of school absenteeism, with pupil absence due to illness remaining 40% higher than pre-pandemic rates. Likewise, staff absence due to illness has also increased and remained high, which resulted in supply teacher costs soaring 40% in 2023/24 to £222 per pupil (DfE, 2024).

The financial implications for the education sector of these increased levels of illness are substantial; the cascading costs include supply cover, staff needing to reduce working hours or leave the profession due to long-term ill health or opting for early retirement.

The wider economic impact is substantial. Research from the London School of Economics estimates that tackling indoor air pollution could also save the UK up to £40 billion annually (Grantham Research Institute on Climate Change and the Environment, 2023). This includes reduced healthcare costs, increased productivity, and better educational outcomes.

The hidden costs include productivity lost when staff work whilst unwell, constant teaching and learning disruption and impacts on children's mental health and social development from repeated bouts of illness. Furthermore, this disproportionately affects vulnerable and disadvantaged children. They will be bearing disproportionate burdens than their peers.

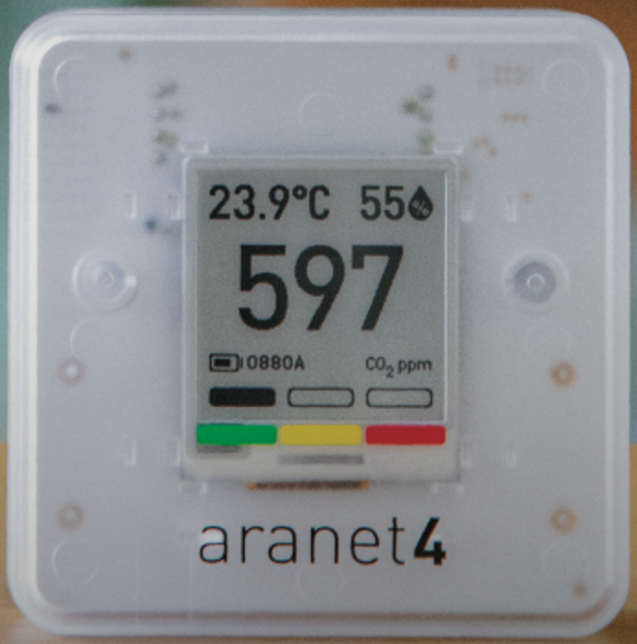
All of these costs are avoidable. Air quality improvements represent investments that will pay dividends in health, education and financial terms.

Breathe Better.
Learn Better.
Live Better.

Clean air is not optional. It's essential for healthy children, staff, and residents. The Aranet4 CO_2 monitor helps you see the invisible giving real-time insights into indoor air quality so you can act before problems arise.

- Easy-to-use, portable, and wireless
- Clear traffic-light display for quick decisions
- Trusted by schools, care homes, professionals worldwide

Buy from the Authorized UK Distributor



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Clean air supports learning and wellbeing

Air quality directly impacts learning outcomes far beyond just preventing illness. Research demonstrates clear connections between improved air quality and enhanced cognitive performance, with studies showing associations between cognitive function scores and carbon dioxide, ventilation, and volatile organic compound exposures (Allen et al., 2016).

Harvard research found that improving indoor air quality improves student performance (Allen et al., 2020).
When air quality is enhanced, children experience better concentration, improved problem-solving abilities, and higher academic achievement.

Key benefits include:

- **Cognitive performance:** Better ventilation and lower CO_2 levels improve concentration and decision-making
- **Respiratory health:** Air filters significantly reduce asthma symptoms and breathing difficulties
- **Attendance:** Cleaning the indoor air reduces transmission of illness which improves attendance
- **Inclusion:** Clinically vulnerable staff and children can attend safely and consistently. Although, everyone is vulnerable to long term harm from Covid-19 infections and requires a safe environment
- **Staff wellbeing:** Teachers report less fatigue, fewer respiratory infections, and improved working conditions

Improved air quality leads to more stable learning environments, supporting better outcomes for all children.
It is one of the most cost-effective educational interventions available.

Do air cleaners work?

Yes! The science is clear. Air filters have been shown to effectively remove airborne pathogens and pollutants (Shaughnessy & Sextro, 2006).

How do air filters work?

- They use in-built fans.
- The air circulating in the room is pulled in and then pushed through the high-grade filters inside.
- This traps 99.97% of the airborne contaminants that are present.
- The filtered, cleaner air then blows out of the fan back into the indoor space.

International research confirms that portable air cleaners significantly reduce indoor exposure to simulated exhaled Covid-19 aerosols (Lindsley et al., 2021), while classroom testing demonstrates reduced airborne transmission risk (Curtius et al., 2021).

There are many case studies which have found air cleaners to be effective, here are a few examples:

- A Swiss study demonstrated that air filters providing five air changes per hour in a standard classroom cut the cumulative viral dose absorbed by occupants fivefold (Villers et al., 2022).
- A Cambridge University study showed the remarkable potential of air filtration, with almost all traces of Covid-19 removed from the air in hospital wards (University of Cambridge, 2021).
- A recent Finnish study found that two daycares equipped with air filters reported significant drops in staff and child illness, with absences falling by 30% (Vartiainen et al., 2024).
- The Austrian ImpAQS study conducted a longitudinal analysis of ventilation and indoor air quality in classrooms, finding that simply monitoring indoor air quality alone was beneficial in improving classroom environments. This project successfully promoted 'classroom CO2 champions' (students alerting teachers to ventilate on a regular basis) who participated in improving ventilation (McLeod & Hopfe, 2025).
- The Class Act study in Bradford found that Covid-related illness absence in schools fell by more than 20% when air filters were used in classrooms, underlining their direct impact on children's education.

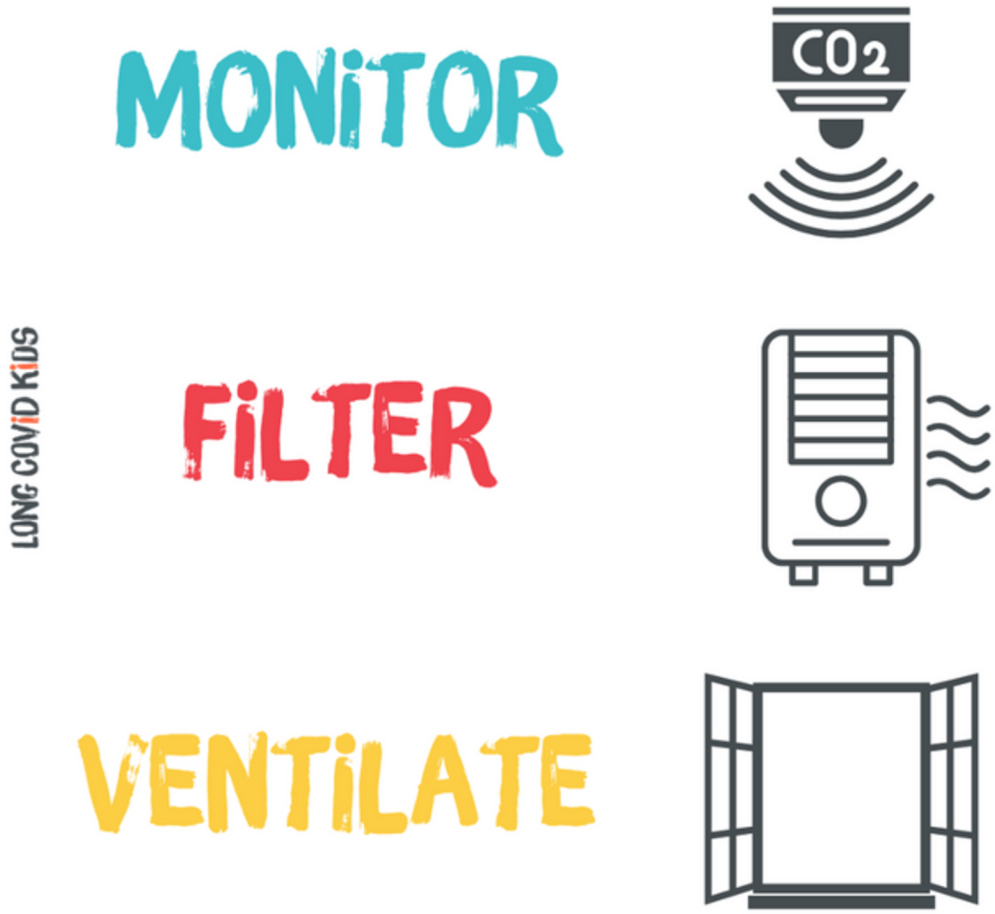
The Class Act study also revealed that effective deployment of air quality measures relies on staff motivation as much as on technology. **Teachers often failed to switch on air filters, showing that staff training and support are essential alongside investment in the technology (Noakes et al., 2023).**

It is also important to note here that air filters complement good ventilation, but they don't replace it. They will remove unwanted particles but only ventilation can reduce CO_2 levels. **The most effective clean air approaches integrate all three steps: monitoring, filtration, and ventilation.**

The three essential steps: Monitor, filter, ventilate

1. **Monitor:** Make air quality visible using carbon dioxide monitors, aim to maintain levels at or around 800 ppm. Elevated CO_2 levels indicate that you are breathing in other people's exhaled air, which increases disease transmission risk. Position the monitors at child height, away from windows and doors.
2. **Filter:** Remove harmful particles: Invest in quality air filters to remove harmful particles from the air. Choose a size appropriate for the room and run continuously during occupancy (not on auto setting).
3. **Ventilate:** Bring in fresh air: while air filters are effective, they cannot lower CO_2 levels alone, so ensure windows and doors are also open, or opened regularly, to introduce external air and maintain good ventilation. Even brief airing periods can rapidly reduce CO_2 levels.

'We can easily improve indoor air quality by regularly monitoring carbon dioxide levels in rooms, filtering the air and improving ventilation,' (Noakes et al., 2023).

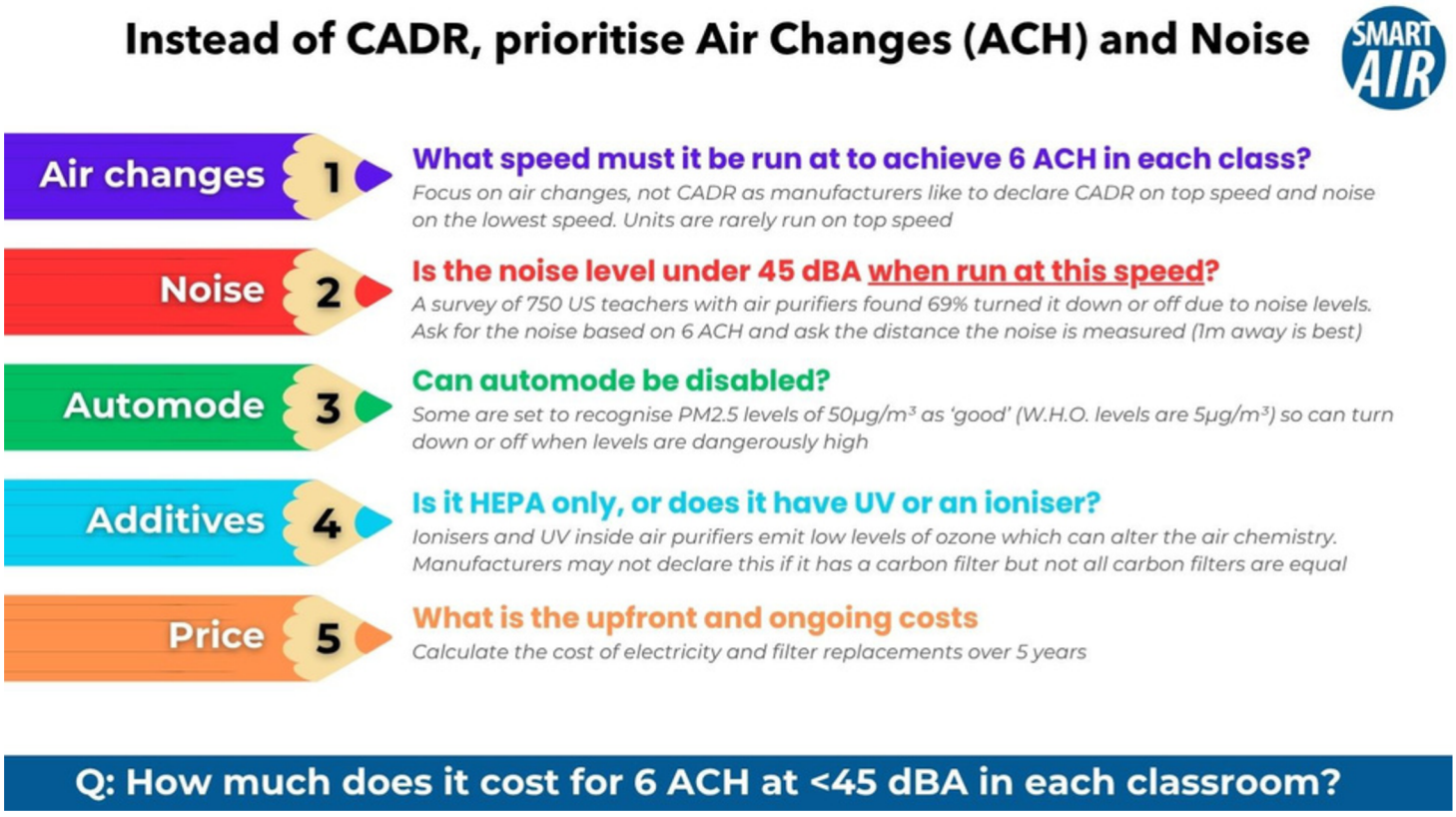


How to choose the right air filter

Key requirements for effectiveness:
- Appropriate size air filter for the size of the room
- Quiet operation; under 45 dBA when running at the correct speed
- Central positioning (ideally), placed away from obstructions
- Continuous operation during occupancy
- Regular maintenance and filter replacement

Implementation considerations:
- Provide staff training on proper use and maintenance
- Build filter replacement into routine maintenance schedule

SmartAir UK have provided some useful top tips for choosing the right air filters, they recommend looking beyond the CADR (Clean Air Delivery Rate) and to think instead about ACH (Air Changes per Hour). The National Education Union (NEU) recommends 6 ACH in classrooms. See this article for further advice https://smartairfilters.com/uk/en/ach-vs-cadr/



Why clean air in schools is a necessity

Step into a classroom and you can see the desks, the students, the whiteboard. What you cannot see is the air, and that is where one of the biggest risks to student health and learning hides.

The numbers are startling. In a single school day, a child breathes around 2,880 litres of air, the equivalent of 1,440 two litre water bottles (Isaac-Upton, 2025). Multiply that by thirty pupils and you get nearly 90,000 litres of shared air moving through young lungs in just six hours. Children also breathe more air relative to their body weight than adults, so they take in more of whatever is in that air.

Pollution is not just an outdoor problem. With windows often closed for warmth or to reduce traffic noise, indoor classrooms trap outdoor pollution along with viruses, dust and allergens. Research shows that 87 percent of UK schools are located in areas that breach World Health Organisation pollution limits (Health Equals, 2025). That means the very places children go to learn are often filled with air that undermines their health.

What poor air means for schools

• Health risks: One in eleven children in the UK has asthma (NHS England), and polluted air is a common trigger. Respiratory issues remain a leading cause of school absence.
• Lost learning: Pupils miss over 6 % of possible school sessions each term because of absence, with illness making up the biggest share (GOV.UK, 2025). Poor indoor air adds to this toll.
• Cognitive effects: Studies link high levels of indoor pollutants with lower attention, memory and overall academic performance.
• Financial costs: Absences, supply cover and disrupted lessons all carry a cost, both financially and educationally.

The air pupils breathe has a direct impact on their wellbeing and education.

The challenge of noise

Over the last few years, many schools have invested in air purifiers. The intention is right. But too often, devices end up turned down or turned off because of one overlooked factor: noise.

In November 2021, GPS commissioned a National Teachers Survey (GPS, 2021) of 750 US teachers with air purifiers in their classes found that 70% of teachers lower or switch off purifiers because of how loud they are.

The result is that classrooms remain under-protected, even when the equipment is technically in place. Clean air solutions that are not designed for real teaching environments fail where they matter most.

What schools should look for

For education professionals, the challenge is not simply finding a filter that works in theory, but one that is effective in practice:

• True HEPA filtration to capture the smallest and most harmful particles.

• Enough airflow to provide the recommended six air changes per hour in classrooms.

• Low noise at functional speeds, so purifiers can stay on during lessons without becoming disruptive.

When these three elements come together, schools can protect health without creating new problems.

The Blast & Blast Mini air purifiers with timer switches lined up in a UK school corridor

Practical solutions in action

The Smart Air Blast and Blast Mini (HouseFresh, 2025) have been independently tested and ranked among the top air purifiers for UK classrooms by HouseFresh and Safe Air Schools UK (Safe Air Schools UK). For schools seeking to improve classroom air quality, practical solutions exist that allow them to equip multiple rooms without disruption.For example, a typical package for a 15-classroom school provides 10 Blasts and 5

Blast Minis (Smart Air UK, 2025), covering both large and smaller rooms. When scaled across pupils, this can cost as little as £0.70 per pupil, offering a manageable and effective way to maintain healthy, quiet classrooms.

The Blast air purifier at Lessness Heath Primary School in the UK

The way forward

Education leaders, governors and facilities teams have an opportunity to make a generational difference. By taking air quality seriously and choosing solutions that are both effective and unobtrusive, schools can create the environment children need to thrive.

We would never give pupils polluted water to drink. It is time to stop asking them to breathe polluted air. Clean air in schools is not an optional extra. It is a foundation for health, attendance and performance. The technology to achieve it quietly and effectively already exists. What is needed now is commitment.

CLEANER AIR FOR EVERY CLASSROOM

Commercial air purifiers designed for schools and nurseries, available to **BUY** or **LEASE**

Powerful yet quiet - designed for schools

- Noise: 43-49dBA on top speed *(won't disrupt class)*
- HEPA only *(no ozone from UV or ionisers)*
- Energy efficient with long-lasting filters *(upto 5 years)*
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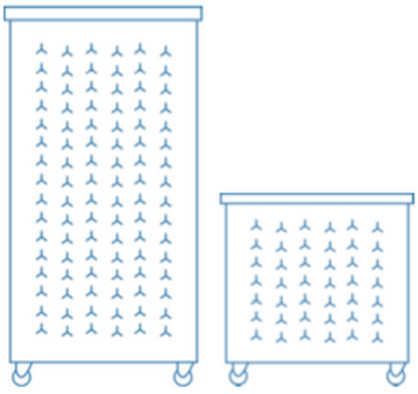
No ozone simply hepa



10 Blast air purifiers

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PRICING EXAMPLE

Primary school with 15 classrooms

Own it £6,750 ex VAT ➡ £13.50 per pupil

Lease it £350/month ex VAT* ➡ £0.70 per pupil per month

* 3 year contract, then yearly rollover (filter replaced every 3 years) or purchase for £1.00

Learn more

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Choose clean air for your school, get in touch with us today!

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Measuring CO_2 levels

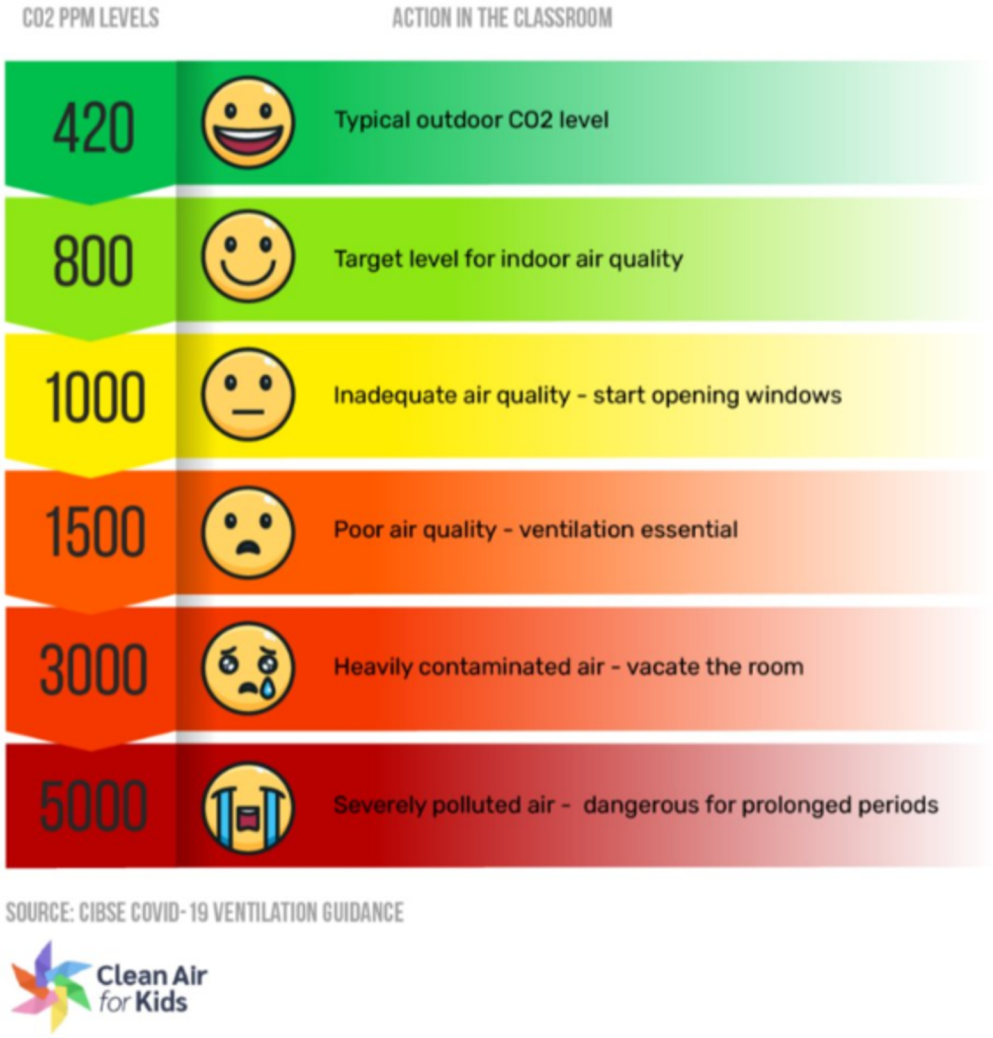
CO_2 monitoring provides practical, immediate feedback on air quality. The current IPC guidelines recommend using CO_2 monitors to check levels regularly, with action recommended if readings exceed 800 ppm (Department of Health and Social Care, 2022).

Effective monitoring requires:

- Correct placement at child height
- Consistent, regular tracking throughout the day
- Staff training on interpreting readings and taking action
- Integration into daily routines, the children can help!

Some settings use a traffic light system, like the one below, making data easy for staff and pupils to understand. Involving children in monitoring and improving indoor air quality also creates learning opportunities while building awareness of air quality importance.

Understanding CO_2 thresholds:



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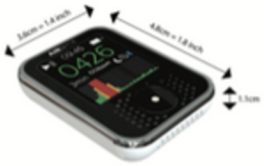
AIRSPOT



Discover Healthy Air with the **worlds smallest** fresh air CO_2 monitor!

AirSpot uses the latest sensor technology to provide accurate, real-time CO_2 readings.

Redefines portability

AirSpot is designed to slip effortlessly into the daily routine - whether clipped to a bag, worn on the wrist or attached to a smartphone, empowering people to monitor air quality anywhere!

Easily BlueTooth connect to the free AirSpot App

The AirSpot App is available on Android and iPhone. It allows users to easily track their data continuously, set alerts, geolocate indoor air quality and share these insights with their community.

Simple to understand

The user interface makes measuring and acting on air quality data as simple as possible. Providing readily actionable solutions - healthy air can be as easy as opening a window.

AirSpot is offering a
25% discount
for readers of The Voice of Early Childhood's Clean Air Guide.
Scan QR code below. Valid until end of 2025.

AIRSPOT

EarlyChildhood25

Benefits to educational settings

Health benefits:

- Significant illness reduction
- Reduced respiratory symptoms and asthma attacks
- Reduced symptoms to airborne allergens (e.g. pollen and dust)
- Reduced exposure to Covid and lower risk of developing Long Covid symptoms
- Protection for all clinically vulnerable children and staff

Educational benefits:

- Enhanced cognitive performance
- Better attendance and learning continuity
- More inclusive environments for all children
- Safer conditions for clinically vulnerable individuals

Financial benefits:

- Reduced supply teacher costs
- Lower staff turnover and recruitment expenses
- More families choosing to send their children to the setting/school

Operational benefits:

- Improved staff wellbeing and retention
- Enhanced reputation and parental confidence
- Competitive edge, particularly in the Early Childhood PVI sector
- Better prepared for future disease outbreaks

Protecting the smallest ones: How adults can help shield children under 3 from infection

For educators and caregivers working with babies and toddlers (aged 0–3 years), there is nothing more important than protecting the health and safety of these young children. At this age, children are especially vulnerable to respiratory infections because their immune systems are still developing, and they rely almost entirely on the adults around them for protection.

In nurseries, childcare settings, and at home, the reality is that young children are often exposed to viruses through those who care for them most: their educators, family members, and other close contacts. Reducing this risk starts with the adults.

A layered approach to protection

One of the most effective ways to keep babies and toddlers safe is to reduce the chance of viruses entering their environment in the first place. While vaccinations, good hygiene, and proper ventilation remain essential, there are additional measures adults can adopt to create a stronger protective barrier against harmful airborne particles.

This is where NoriZite® Nasal Spray can play an important role as part of a layered prevention strategy.

What makes NoriZite different?

NoriZite is not a medicine; it is a drug-free, hormone-free nasal spray that works as a physical barrier inside the nose. It helps to trap and block inhaled virus particles before they can attach to nasal cells and multiply.

Its unique formulation combines two plant-based biopolymers – carrageenan and gellan gum – which form a soft gel coating on the nasal lining. This coating helps to:

- Trap and neutralise airborne viruses and allergens before they can infect the body.
- Provide long-lasting protection (up to 6 hours) with just one spray in each nostril.
- Moisturise and soothe the nasal passages, which is especially helpful during dry indoor conditions.

Because NoriZite works mechanically rather than chemically, it is safe for daily use and suitable for adults and children over 12 years old (always follow usage instructions).

Why adult protection matters

In early years settings, babies and toddlers are constantly in close contact with adults – through play, feeding, cuddles, and daily routines. If educators or family members are exposed to viruses outside the setting – on public transport, at work, or in crowded indoor spaces – they may inadvertently bring those viruses into the nursery or home environment.

For children under three, infections can often be more severe. Their smaller airways, developing immune systems, and ineligibility for certain vaccines make them particularly at risk. Even minor infections can cause significant discomfort, and more serious ones may lead to hospital visits. By reducing their own risk of catching viruses, adults can directly lower the risk to the children in their care.

How NoriZite can support educators and families

NoriZite can be a valuable addition to daily routines, especially for those who work in close proximity to very young children:

- Use it before entering crowded or high-risk indoor environments.
- Combine it with good hygiene habits, such as washing hands frequently and changing clothes after work or travel.
- Pair it with other preventive measures, including proper ventilation and regular cleaning in childcare settings.

Peace of mind for the whole community

While there is no single solution that can guarantee full protection, combining multiple layers of defence can significantly reduce the risk of infection.

NoriZite offers peace of mind because it is:

- Backed by science – Developed in collaboration with leading biomedical researchers.
- Convenient and easy to use – A quick spray fits effortlessly into daily routines.
- Non-invasive and gentle – Suitable for everyday use and compatible with other preventive strategies.

By using NoriZite regularly, adults can help reduce the chance of carrying viruses into the environments where children under three spend their time. This simple step can create a safer space for the youngest and most vulnerable members of our community.

Taking the first step

Babies and toddlers rely entirely on the adults around them for protection. Whether you are an educator, family member, or carer, looking after your own health and reducing your exposure to viruses is one of the most effective ways to safeguard the children in your care.

NoriZite's unique barrier technology can support this goal, providing an extra layer of defence each day. Prevention is always better than cure, and with a thoughtful approach, we can all help keep children safer and healthier – so they can thrive in the early years of life.

Key takeaways:
What actions can you take right now?

We don't have to accept the 'inevitable' bouts of illnesses when working in education. Instead, we can take proactive steps based on the evidence.

Immediate Actions (today):
- Invest in appropriate CO_2 monitors and air cleaners
- Open windows strategically before sessions, during breaks, between activities
- Use CO_2 monitors consistently, aiming for readings at or around 800 ppm
- Ensure air cleaners run continuously and aren't obstructed
- Involve children in daily indoor air quality monitoring routines

Short-term Actions (this term):
- Consistently implement the three essential steps: Monitor, Filter, Ventilate
- Train all staff on equipment use and data interpretation
- Engage with families about air quality initiatives and associated health benefits
- Document the patterns and improvements you see as a result of cleaning the air

Medium-term Goals (this year):
- Develop comprehensive indoor air quality policies and procedures
- Include indoor air quality considerations in planning and risk assessments
- Connect with research projects like SAMHE for support and data contribution

Long-term Advocacy:
- Support campaigns for policy change and improved indoor air quality standards
- Share evidence with local authorities and politicians
- Advocate for IPC regulation as opposed to guidelines

Key principles:
- Monitor CO_2 levels- aim for around 800 ppm
- Filter the air
- Ventilate regularly to introduce fresh air
- Train staff for consistent implementation and understanding

The cost of continuing to do nothing is high. We are five years into this pandemic. Since 2020, pupil and staff absence due to illness has not declined, long term sickness figures have reached record highs and we are still at the mercy of every new wave of infection. Something needs to change.

Armed with accurate information about how you can protect children and staff from repeated illness, you can now take action to protect children, staff and the wider community. This will improve both short and long term health outcomes and protect against future pandemics.

We wouldn't want our children to drink dirty water,
so why are we letting them breathe dirty air?

Listen to the podcast episode

A breath of fresh air:
Reducing illness in early years settings
by improving indoor air quality

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LONG COVID KIDS

Listen on The Voice of Early Childhood Podcast

A breath of fresh air: Reducing illness in early years settings by improving indoor air quality

Indoor air quality (IAQ) directly impacts child and staff health in early years settings and schools. This article explores why clean air matters, what we've learned from COVID-19, and three essential actions to reduce airborne disease transmission: monitor, filter, and ventilate.

Listen & read here

www.thevoiceofearlychildhood.com/a-breath-of-fresh-air/

References

Al-Aly, Z., Davis, H., McCorkell, L., et al. (2024). Long COVID science, research, and policy. Nature Medicine, 30, 2148–2164. https://tinyurl.com/55e6en86

Allen, J. G., Ibrahim, A. M., Kiomourtzoglou, M. A., Jacobson, M., & Spengler, J. D. (2020). Improving indoor air quality improves student performance. Harvard T.H. Chan School of Public Health. https://tinyurl.com/3mx96trz

Allen, J. G., MacNaughton, P., Cedeno-Laurent, J. G., Spengler, J. D., Vallarino, J., & Bernstein, A. (2016). Associations of cognitive function scores with carbon dioxide, ventilation, and volatile organic compound exposures in office workers: A controlled exposure study of green and conventional office environments. Environmental Health Perspectives, 124(6), 805–812. https://tinyurl.com/mry5mw9b

Barndiabetesfonden. (2024, June 18). Rekordstor ökning av antalet små barn som insjuknar i typ 1-diabetes – ökning med 62 procent på fem år [Record large increase in the number of small children who contract type 1 diabetes – a 62 percent increase in five years]. Barndiabetesfonden. https://www.barndiabetesfonden.se/nyheter/rekordstor-okning-av-antalet-sma-barn-som-insjuknar-i-typ1diabetes/

Bento, G., & Dias, G. (2023). Psychological benefits of attending forest school for preschool children: A systematic review. Educational Psychology Review, 35*(1), 1-28. xxxxx
Brady, M. T. (2005). Infectious disease in pediatric out-of-home child care. Pediatrics, 115(4), 1008–1011. https://tinyurl.com/y7u7mvme

Brustad, N., Wolsk, H. M., Greve, T., Vissing, N. H., Stokholm, J., & Bisgaard, H. (2025). Early-life infections and later childhood health outcomes: A longitudinal cohort study. Journal of Pediatrics, 234, 56–64. https://tinyurl.com/mts2uaub

Camporesi, A., Morelli, S., Giuliani, M., & Lodi, L. (2024). Long COVID in children: A systematic review of symptoms and long-term effects. Pediatric Research. https://tinyurl.com/yh8fekev

Clean Air for Kids. (n.d.). Home [Homepage]. https://www.cleanairforkids.co.uk/

Curtius, J., Granzin, M., & Schrod, J. (2021). Testing mobile air purifiers in a school classroom: Reducing the airborne transmission risk for SARS-CoV-2. Aerosol Science and Technology, 55(5), 586–599. https://tinyurl.com/4384rp7z

D'Souza, D., Empringham, J., Pechlivanoglou, P., Uleryk, E. M., Cohen, E., & Shulman, R. (2023). Incidence of Diabetes in Children and Adolescents During the COVID-19 Pandemic: A Systematic Review and Meta-Analysis. JAMA Network Open, 6(6), e2321281. https://doi.org/10.1001/jamanetworkopen.2023.21281

Daisey, J. M., Angell, W. J., & Apte, M. G. (2003). Indoor air quality, ventilation, and health symptoms in schools: An analysis of existing information. Indoor Air, 13(1), 53–64. https://tinyurl.com/32jtyfb8

Department for Education. (2024). Pupil attendance in schools: Week 29 (2024). Explore Education Statistics. https://tinyurl.com/bdh6sz2m

References

Department of Health and Social Care. (2022, May 10). Preventing and controlling infections in schools and other childcare facilities. GOV.UK. https://tinyurl.com/2jpa8cbc

French Ministry of Health. (2023). New indoor air quality regulations for schools. Ministère de la Santé et de la Prévention. https://sante.gouv.fr

GOV.UK (2025) Pupil absence in schools in England, Autumn term 2024/25, GOV.UK. Available at: https://explore-education-statistics.service.gov.uk/find-statistics/pupil-absence-in-schools-in-england/2024-25-autumn-term (Accessed: 15 September 2025).

GPS (2021) GPS Air: Teachers concerned about IAQ press release, GPS Air | Teachers Concerned About IAQ Press Release. Available at: https://gpsair.com/resources/press-room/teachers-concerned-about-iaq (Accessed: 15 September 2025).

Gralton, J., Tovey, E., McLaws, M. L., & Rawlinson, W. D. (2011). The role of particle size in aerosolized pathogen transmission: A review. Journal of Infection, 62(1), 1–13. https://tinyurl.com/56mrhk72

Grantham Research Institute on Climate Change and the Environment. (2023, February 7). Tackling indoor air pollution could save UK up to £40 billion a year. London School of Economics and Political Science. https://tinyurl.com/47y87rpt

Greenhalgh, T., Jimenez, J. L., Prather, K. A., Tufekci, Z., Fisman, D., & Schooley, R. (2021). Ten scientific reasons in support of airborne transmission of SARS-CoV-2. The Lancet, 397(10285), 1603–1605. https://tinyurl.com/ytap8uw8

Gross, A. M., Weber, J., Wachs, J. E., & Patel, N. (2024). Age-related differences in Long COVID symptoms among children and adolescents. JAMA Pediatrics. https://tinyurl.com/3n9d2wp4

Health Equals (2025) 87% of Britain's schools in toxic air neighbourhoods, with 12 million children at risk, Health Equals. Available at: https://healthequals.org.uk/data_insights/uk-schools-toxic-air/ (Accessed: 15 September 2025).

Helyar, F. (2018). The McMillan sisters, the roots of the open-nursery, and breaking the cycle of poverty. Social and Education History, 7(1), 54-76. https://doi.org/10.17583/hse.2018.2925

HouseFresh (2025) Latest data on air purifiers for UK classrooms with Safe Air School UK, X (formerly Twitter). Available at: https://x.com/ThisHouseFresh/status/1968260723064402290 (Accessed: 17 September 2025).

Isaac-Upton, S. (2025) 1,440 bottles of air - why children can 'choke' on classroom pollution, Smart Air UK. Available at: https://smartairfilters.com/uk/en/classroom-pollution/ (Accessed: 15 September 2025).

References

JAMA Pediatrics. (2025). Long COVID in young children, school-aged children, and teens. JAMA Pediatrics Patient Page. https://jamanetwork.com/journals/jamapediatrics/fullarticle/2834486

Katz, A., Li, T., Osei-Twum, J. A., James, L., Leung, V., Bozek, P., Persaud, N., O'Campo, P., & Siegel, J. A. (2025). Science tells us that portable air filters reduce infection risk: It's time for public health authorities to make this clear. Journal of Infection and Public Health. https://tinyurl.com/tp-AirFilters

Kromydas, T., Demou, E., Edge, R., Gittins, M., Katikireddi, S. V., Pearce, N., van Tongeren, M., Wilkinson, J., & Rhodes, S. (2023). Occupational differences in the prevalence and severity of long-COVID: Analysis of the ONS Coronavirus (COVID-19) Infection Survey. medRxiv. https://tinyurl.com/59a3nra4

Leung, N. H. L. (2021). Transmissibility and transmission of respiratory viruses. Nature Reviews Microbiology, 19(8), 528–545. https://tinyurl.com/2bsesyf8

Lindsley, W. G., Derk, R. C., Coyle, J. P., Blachere, F. M., & Beezhold, D. H. (2021). Efficacy of portable air cleaners and masking for reducing indoor exposure to simulated exhaled SARS-CoV-2 aerosols—United States, 2021. MMWR Morbidity and Mortality Weekly Report, 70(27), 972–976. https://tinyurl.com/52cevwft

McConway, A. M. (2025). Improving indoor air quality: Reducing disease transmission in settings. Early Years Educator Supplement, March 2025.

Mendell, M. J., Eliseeva, E. A., Davies, M. M., Spears, M., Lobscheid, A., Fisk, W. J., & Apte, M. G. (2013). Association of classroom ventilation with reduced illness absence: A prospective study in California elementary schools. Indoor Air, 23(6), 515–528. https://tinyurl.com/mry94u3k

Morawska, L., & Milton, D. K. (2020). It is time to address airborne transmission of COVID-19. Environment International, 139, 105730. https://tinyurl.com/yck6m2ye

Morenton, P. (n.d.). Let's air. https://letsair.org/

Nesti, M. M., & Goldbaum, M. (2007). Infectious diseases and daycare and preschool education. Journal de Pediatria, 83(4), 299–312. https://tinyurl.com/y99yu46f

NHS England (no date) Childhood asthma, NHS England. Available at: https://www.england.nhs.uk/childhood-asthma/ (Accessed: 15 September 2025).

NHS England. (n.d.). GP patient survey. https://tinyurl.com/yxhb2374

Nightingale, F., 1859. Notes on nursing: what it is, and what it is not. London: Harrison

Noakes, C. J., Burridge, H. C., Beggs, C. B., et al. (2023). Class-ACT: The UK's trial on the feasibility and effectiveness of air cleaning technologies in schools. Archives of Disease in Childhood, 108, A98.

References

Office for National Statistics. (2024). Prevalence of Long COVID symptoms in children and young people in the UK. ONS Publications. https://tinyurl.com/56h4kx67

Public Health England. (2018). Health matters: Air pollution. GOV.UK. https://tinyurl.com/346zcwjc

Rao, S., Tiwari, P., & Patel, R. (2024). Long COVID in children: Clinical features, risk factors, and long-term outcomes. The Pediatric Infectious Disease Journal, 43(2), 91–98. https://tinyurl.com/5etr9s3j

Royal Academy of Engineering, National Engineering Policy Centre. (2022, June). Infection resilient environments: Time for a major upgrade. https://raeng.org.uk/media/dmkplpl0/infection-resilient-environments-time-for-a-major-upgrade.pdf

Ruf, W. (2024). Immune damage in long COVID. Science, 383(6561), 262–263. https://tinyurl.com/mavmdhxx
Safe Air Schools UK (no date) Safe Air Schools UK Toolkit, Resources, guidance and templates I safe air schools. Available at: https://www.safeairschools.org/toolkit/ (Accessed: 17 September 2025).

Safer Air Project. (n.d.). Safer shared air. Safer Air Project. https://tinyurl.com/5n95v49a

Sanchez, J., Herrán, E., & Anguera, M. T. (2020). A systematic observation of early childhood educators accompanying young children's free play at Emmi Pikler Nursery School: Instrumental behaviors and their relational value. Frontiers in Psychology, 11, Article 1790. https://doi.org/10.3389/fpsyg.2020.01790

Schools Air Quality Monitoring for Health and Education (SAMHE). (2022). Evidence-based recommendations. https://tinyurl.com/yk6spa8u

Shaughnessy, R. J., & Sextro, R. G. (2006). What is an effective portable air cleaning device? A review. Journal of Occupational and Environmental Hygiene, 3(4), 169–181. https://tinyurl.com/bdm7fptn

Smart Air UK (2025) Back to school, Smart Air UK. Available at: https://smartairfilters.com/uk/en/back-to-school/ (Accessed: 17 September 2025).

Smart Air UK. (2025, August 29). Do we need to shift the focus away from CADR for schools? Smart Air UK. https://smartairfilters.com/uk/en/ach-vs-cadr/

Sundell, J. (2004). On the history of indoor air quality and health. Indoor Air, 14(7), 51–58. https://tinyurl.com/2n7tp2sh

Tsergas, N. (2025). Why scientists are rethinking the immune effects of SARS-CoV-2. BMJ, 390, Article r1733. https://doi.org/10.1136/bmj.r1733

University of Cambridge. (2021, November 16). Air filter significantly reduces presence of airborne SARS-CoV-2 in COVID-19 wards. https://www.cam.ac.uk/research/news/air-filter-significantly-reduces-presence-of-airborne-sars-cov-2-in-covid-19-wards

References

Vartiainen, V. A., Hela, J., Luoto, A., Nikuri, P., Sanmark, E., Taipale, A., Ehder-Gahm, I., Lastovets, N., Sormunen, P., Kulmala, I., & Säämänen, A. (2024). The effect of room air cleaners on infection control in day care centres. Indoor Environments, 1(1), Article 100007. https://doi.org/10.1016/j.indenv.2024.100007
Villers, J., et al. (2022). SARS-CoV-2 aerosol transmission in schools. Swiss Medical Weekly. https://smw.ch/index.php/smw/article/view/3201/5368

Wilde, H., Harrison, A., et al. (2024). Trends in pediatric hospital admissions caused or contributed by SARS-CoV-2 infection in England. The Journal of Pediatrics, 276, 114370.

World Health Organization. (2023, February 7). Post COVID-19 condition (long COVID). World Health Organization. https://tinyurl.com/bdmpeprz

Zhang, B., Wu, Q., Jhaveri, R., Zhou, T., Becich, M. J., Bisyuk, Y., et al. (2025). Long COVID associated with SARS-CoV-2 reinfection among children and adolescents in the omicron era (RECOVER-EHR): A retrospective cohort study. The Lancet Infectious Diseases. Advance online publication. https://doi.org/10.1016/S1473-3099(25)00476-1

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