

Witness Name: Jim McManus

Statement No.: 2

Exhibits: 9

Dated: 19th August 2025

UK COVID-19 INQUIRY

WITNESS STATEMENT OF PROFESSOR JIM MCMANUS

Introduction

1. I, Jim McManus, WILL SAY AS FOLLOWS: -
2. I am currently the National Director of Health and Wellbeing, Public Health Wales, 2 Capital Quarter, Tyndall Street, Cardiff, Wales. CF10 4BZ.
3. During 1 January 2020 and 28 June 2022 (the Specified Period) I was Director of Public Health at Hertfordshire County Council, a role I took up in July 2012 and left in September 2023.
4. I am a Fellow of the Faculty of Public Health and a registered public health specialist with the United Kingdom Public Health Registrar, having achieved registration in 2008. I was elected to Fellowship of the Faculty of Public Health on achieving specialist registration in 2008. I was elected to Fellowship of the Royal Society of Biology in 2016.
5. I am also a Chartered Psychologist (2006) and Chartered Scientist (2008). I hold a Graduate Conversion Diploma in Psychology (Open University, 2003) a Postgraduate Diploma in Health Psychology and Research Methods (University of Teesside, 1998) a Postgraduate Certificate in Public Health and Research Methods (University of

Lancaster, 2015) a Postgraduate Certificate in Leadership and Quality Improvement (2019, Ashridge Hult) and a Master of Science (Open University, 2023.) In 2022 I was awarded the degree of Doctor of Science (Honoris Causa) by the University of Hertfordshire.

6. I have worked in public health roles since 1990, in Local Government, the Voluntary Sector and the NHS. I have been a Director of Public Health since 2008 and before that an Assistant Director of Public Health since 2005. I was Joint Director of Public Health for Birmingham during the period of the H5N1 Swine influenza pandemic in 2009. During this time, I have also served on advisory boards for the National Institute of Health Research and multiple other scientific boards and committees.
7. I am a Visiting Professor at the University of Hertfordshire and a Visiting Professor in the Centre for Health Economics and Medicines Evaluation at the University of Bangor.
8. Throughout my career in public health, I have worked on health protection, emergency preparedness and health improvement simultaneously, which most public health professionals working in local systems do.
9. During the specified period I was also President of the Association of Directors of Public Health (ADPH), having been interim President since 1st October 2021 and elected to the role formally in November 2021. The ADPH was a Core Participant during Module 1 of the Inquiry and in my capacity as President I provided both a witness statement and gave evidence in person to the Inquiry.
10. My successor as ADPH President, Greg Fell, provided a witness statement to the Inquiry on 30th April 2025 in relation to the engagement and role of ADPH and Directors of Public Health with Test, Trace and Isolate programmes.
11. In my capacity as President, I was also a participant in the Government Scientific Advisory Group on Emergencies (SAGE) and multiple national Covid-19 groups and task forces.
12. I make this Statement following a request for evidence in relation to Module 8 of the UK Covid-19 Inquiry (the Inquiry).

13. The matters I set out within this statement are within my own knowledge save where I state otherwise. Where I refer to facts that are not within my own knowledge, I will give the source of my knowledge of those facts.

Work in relation to schools during the Specified Period.

14. I set out here the work which was undertaken in my role as Director of Public Health by me and colleagues during the Specific Period.

15. Hertfordshire County Council's (the Council's) Public Health team established a dedicated multi-agency Schools' Cell' in January 2021, to address the impacts of Covid-19 on children and young people attending the following settings:

- Early years and childcare,
- Primary schools,
- Secondary schools,
- Colleges and universities.

16. This Schools Cell reported into formal command and control structures via an (Operational) Outbreak Tactical Coordination Group and the Health Protection Board which I chaired at the time. The Health Protection Board was attended by the Council's Head of Health Protection, NHS colleagues, District & Borough Environmental Health Officers, representatives from Adult Care Services, the Council's Communications Team and the UK Health Security Agency.

17. The Operational (Outbreak) Tactical Coordination Group, led by the Council's Head of Emergency Response, was attended by District & Borough Environmental Health Officers, representatives from the Council's Adult Care Services, Hertfordshire Constabulary, the Chair of the Council's Schools Cell, Public Health Consultants and an Evidence & Intelligence Analyst.

18. The (Operational) Outbreak Tactical Coordination Group sought to review current epidemiological data from recent Incident Management Team meetings, held by the UK Health Security Agency for education settings, to support schools with implementing national guidance and undertaking local risk assessments. The Schools

Cell considered local actions to help prevent the spread of Covid-19, ultimately agreeing strategies which enabled children and young people to continue to receive education in their setting safely.

19. The Schools Cell via its chair (which varied between the Council's Head of Health Protection, Head of Standards & Accountability or a nominated deputy) would routinely escalate issues to me as Director of Public Health at the Council at the time.
20. Ventilation in schools was frequently discussed as one of the many control measures available and recommended in both national policy and local risk assessments to help reduce the spread of Covid-19 in schools. Reducing the spread within these environments was a priority as this was impacting on children and young people's ability to receive education, either directly as they were unwell themselves or due to transmission to parents and teaching staff, meaning they could not get to school or there were insufficient staff available to teach them.
21. The ventilation measures available to these settings were predominantly advice to open windows; however, site visits conducted by the Council's health and safety team reported that due to the construction and/or age of many buildings this was not always possible. Public Health advice to open windows was also challenged by some settings as being uncomfortable for pupils in the colder winter months.
22. In August 2021 the Department of Education rolled out the universal provision of 300,000 CO₂ monitors for schools across England. The Department of Education produced guidance at the time which stated that "Good ventilation can help reduce the risk of spreading coronavirus, so a focus on improving general air flow, preferably through fresh air or effective mechanical systems, can help to create a safer environment for staff and students. CO₂ levels as measured by monitors are a proxy for good ventilation. You can use CO₂ monitors to help you". I exhibit to my Statement as "**Exhibit JM/1 - INQ000588077**" a copy of "RP24-How to Use CO₂ monitors in education and childcare settings" in which this guidance is found.
23. In September 2021, Environmental Health officers within Hertfordshire's District Councils raised concerns about inadequate ventilation in schools and the reliance on manual ventilation alone via email to the Head of Health Protection. This was backed up by schools reporting their CO₂ monitors sounding which is indicative of elevated

levels of CO₂ in the classroom i.e. more than 1500ppm (the level specified in ventilation guidance document BB 101 which should not be exceeded for more than 20 consecutive minutes a day where spaces are mechanically ventilated and the daily average limit where spaces are naturally ventilated). I exhibit to my Statement as **"Exhibit JM/2 - INQ000588082"** a copy of "Building Bulletin 101- Guidelines on ventilation, thermal comfort and indoor air quality in schools-Version 1", the ventilation guidance to which I have referred.

24. Advice from the Council's Health and Safety Manager following an email exchange in relation to school CO₂ alarms was if CO₂ levels were elevated i.e. 1500ppm consistently then that was an indicator of poor ventilation (a red light should show at that level with the DfE supplied monitors). The HSE and DfE advice (**Exhibit JM/1 - INQ000588077**) in such cases was "You should take action to improve ventilation where CO₂ readings are consistently higher than 1500ppm".
25. Advice from the Council's Health and Safety Manager at the time varied, as advice was specific to each setting in terms of what could reasonably be done to improve air flow. Sometimes advice was as straightforward as opening windows wider / for longer, equally advice also considered additional vents or an alternate engineered solution.
26. Public Health colleagues within the Council were aware of the Department of Education running a pilot in Bradford with air purifiers in several schools to determine if these reduced the concentration of airborne viruses. It was felt that these units could play a role in improving the ventilation in schools and so the Council sought to find out more and scope the possibility of a Hertfordshire pilot, which involved giving air purifiers and air quality monitoring equipment to various primary schools across Hertfordshire.
27. In October 2021 the UK Health Security Agency sent a brief to me via their cascade system highlighting the impact of high levels of Covid-19 outbreaks in schools. This briefing note included an emphasis on the importance of ventilation. I exhibit to my Statement as **"Exhibit JM/3 - INQ000588080"** a copy of "2021108BN067COVID-19 Schools Outbreak UKHSA guidance V1.0" to which I refer.
28. In November 2021 the emergence of the new Covid-19 variant, Omicron, was considered at the School's Cell and the Health Protection Board to consider the impact

this may have on schools. The School Cell continued to work with parents, teachers and settings to promote vaccinations, test trace and isolate and promote infection prevention control measures. By December 2021 there were cases of Omicron in Hertfordshire and Covid-19 positivity started to increase despite the control measures mentioned.

29. In September 2022 Environmental Health Officers from Hertfordshire District Councils continued to explore research and evidence into additional measures which may help to reduce the spread of the Covid-19 pathogen and raised again the use of High Efficiency Particulate Arresting (HEPA) filters in schools. An email conversation between the Council's Public Health team and the Council's health & safety colleagues discussed a central government pilot into air filters in schools and the subsequent minor changes to the guidance and a procurement offer from the Government via an online marketplace available to education settings, providing air cleaning units at a 'suitable specification and competitive price.
30. Given the emerging evidence and concerns that schools may not be able to afford the purchase of air cleaning units, colleagues in the Council began research and discussions into a local pilot. This pilot was to ensure that the evidence we were hearing in the research realm was transposable to a local setting. On 8th December 2022 a business case was presented at the Council's Health Protection Board requesting funding for a pilot. I exhibit to my Statement as **"Exhibit JM/4 - INQ000588078"** a copy of the business case to which I refer. Once the pilot data was reviewed the team were clear that Hertfordshire schools would likely see a similar impact to those noted in the literature base. This promoted a call to seek further funding to implement the intervention in a range of additional schools.

Ventilation in Schools

31. The inquiry understands that I have a particular interest in the issue of ventilation in schools. This interest has not only arisen through Covid-19. It arose through reflection on epidemiological data on air quality in schools and the developing evidence-base on the importance of air quality for children's health and the role of schools and good ventilation in this. This has come both through reading the evidence in response to queries and concerns raised with me over time by parents, young people's

representative groups, elected members and schools, and through officers in my team working on child health bringing to my attention their concerns through epidemiological review and evidence review.

32. Between December 2022 to July 2023, the Council carried out a pilot study on the use of air purifiers (using HEPA filters with internal UV light as a biocide) in two primary schools to understand the impact on fine particulates which include and may act as a carrier for viral particles.
33. The Evaluation found a notable change in PM2.5 levels with statistical significance. This correlated with external research findings which we were party to prior to publication. I exhibit to my Statement as **“Exhibit JM/5 - INQ000588079”** a copy of “Noakes CJ, Burridge HC, Beggs CB, et al 901 Class-ACT: the UK’s trial on the feasibility and effectiveness of air cleaning technologies in schools Archives of Disease in Childhood 2023;108: A98”, the research to which I refer.
34. Further research from this same study found a reduction in illness absence in schools provided with air purifiers. To my knowledge this work is yet to be published however the value of a 20% reduction in illness absence found in the study has been referenced in several articles including an article in the New Scientist: “HEPA filters cut covid-19 sick days but we’ve been slow proving this”.
35. Further research from this same study found a reduction in illness absence in schools provided with air purifiers. To my knowledge this work is yet to be published however the value of a 20% reduction in illness absence found in the study has been referenced in several articles including an article in the New Scientist: “HEPA filters cut covid-19 sick days but we’ve been slow proving this”.
36. I am not personally aware of the reason for the delay in the publication of the further research and feel that this is best addressed by the authors of the research. I note that one of the authors of the research, Cathy Noakes, has provided evidence to the Inquiry already. To my knowledge this reduction in illness absence study has not been replicated in terms of the specific methodology, scale and scope. There have however been other studies that have considered the impact of providing HEPA filters into the school environment which have found an impact on respiratory infections (e.g.

Banholzer N, Jent P, Bittel P, Zürcher K, Furrer L, Bertschinger S, Weingartner E, Ramette A, Egger M, Hascher T, Fenner L. Air Cleaners and Respiratory Infections in Schools: A Modeling Study Based on Epidemiologic, Environmental, and Molecular Data. *Open Forum Infect Dis*. 2024 Mar 21;11(4):ofae169. doi: 10.1093/ofid/ofae169. PMID: 38665173; PMCID: PMC11045022) and particulate matter exposure even in areas already provided with lower grade air cleaning (e.g. Simona, S.C., Bartell, S.M. & Vieira, V.M. Classroom air quality in a randomized crossover trial with portable HEPA air cleaners. *J Expo Sci Environ Epidemiol* 35, 644–648 (2025). <https://doi.org/10.1038/s41370-025-00743-9>). My understanding of the study was that the demographics of the schools were comparable, and the ventilation rates were similar. The significant difference was the introduction of HEPA filters into the intervention classrooms. However, whether the reduction in illness absence was due to air purification, this question is best addressed by the authors of the research.

37. Following evidence from the Council's pilot study and discussion with the academic team involved with the Bradford study, additional resources were requested to roll out the intervention to an additional 29 schools. Resource was authorised following a business case presented to the Council's Public Health Management Board – which I chaired - on 24th July 2023, a copy of which is exhibited to my Statement as "**Exhibit JM/6 - INQ000588083**". The intervention was undertaken in partnership with the Schools Air Quality Monitoring for Health and Education (SAMHE) network. This partnership enabled the largest known UK study of air quality impact from air filtration in school in the UK at the time of the intervention. The SAMHE team provided monitoring network and evaluation expertise, while the Council provided the air purifiers and mechanism to onboard selected schools. Each classroom within each school was provided with an air purifier and an air quality sensor. Schools received the intervention in early 2024 following a recruitment exercise.
38. Following successful delivery and a price reduction on unit costs, additional schools were onboarded. A further request approved by the Council's Public Health Management Board saw additional funds provided. In total 62 schools received air purifiers in every classroom with delivery completed in July 2024.

39. Schools invited to participate were prioritised by deprivation and outdoor air pollution. Geographic grouping was also considered to consider future health data at an area level.
40. Importantly air purifiers with a specific minimum accredited filter were used (HEPA13). This was to ensure a known filtration rate was employed.
41. Evaluation of summer term 2024 data has been completed by Dr Samuel Woods of Imperial College London. This focused on the evaluation of fine particulate concentrations in classrooms with air purifiers compared to schools engaged in the wider SAMHE project which had no air purifier but crucially provision of an air quality monitor for a classroom. This enabled comparisons to be drawn between schools with and schools without air purification. A 29% reduction was found in classrooms provided with air purifiers. A paper has been submitted for publication to make data available to all. In lieu of publication I exhibit to my Statement as **"Exhibit JM/7 - INQ000588084"** a copy of an article published in the Guardian – "Closing classroom windows does not stop air pollution, study finds | Air pollution". This provides wider detail around school air quality and ventilation and refers to our study. In addition, a scientific poster is linked in the article and provides extracts from the paper awaiting publication. A copy of this poster is exhibited to my Statement as **"Exhibit JM/8 - INQ000588076"** This poster was provided to all delegates electronically at the UKHSA Prevention conference in March 2025.
42. The next step in the evaluation process will be to consider illness absence data. This work is expected to commence in the autumn/winter of 2025 and will be carried out by partners at Imperial College London.
43. Whilst the air purifiers show positive results these should be considered part of a range of measures to help reduce the concentration of pathogens in a classroom or other enclosed space. Natural ventilation remains important; however, air pollution, pollen and cold weather can have a negative impact on this. Other measures considered successful at the time included public health campaigns around the catch it, bin it, kill messaging. Enhanced hand hygiene and environmental cleaning to prevent fomite transfer and where appropriate the use of face coverings.

44. Research brought forward by the Council's air quality team throughout and post Covid-19 show that promoting the use of air purification in classrooms reduces fine particulate air pollution which is known to create impacts across the whole life course. Analysis of illness absence is yet to be collected. Logically a reduction in pathogen loading in the air is expected to reduce infection rates. This has been found out in trials in clinical settings such as demonstrated by "**Exhibit JM/9 - INQ000588081**" to my Statement – "Addenbrooke's Hospital. Air filter significantly reduces presence of airborne SARS-CoV-2 in COVID-19 wards | University of Cambridge".

Considerations for the future

45. The importance of ensuring every child has the best possible health is well established in public health evidence, not least through the work of Professor Sir Michael Marmot and the Institute for Health Equity. In my view and the view of many public health professionals it is crucial to a sustainable and healthy society. This needs to include physical health as well as emotional and mental health and wellbeing. There is ample evidence on the impact of poor health on pupils' attainment and whole life success and health. Preventing children from communicable and non-communicable disease is well-established as an important priority for good health across the life course. The evidence is developing that good air quality is important for healthy child development but also that good air quality can help prevent harmful exposure to infections and the harmful effects of environmental pollutants.
46. Having considered all the evidence above, my view at the time of the work described above was, and remains now, that being in school or education and being protected free from harmful exposure to pathogens are equally important. It is false logic to oppose one to the other. This is especially so given the emerging evidence on the long-term harms of repeated covid-19 infection and the fact that infection and disease in children who are vulnerable for whatever reason can significantly harm their health, their education and their future.
47. In my view it is important that future pandemic preparedness should have an emphasis on keeping children and young people in education and childcare safely, since the impact of closing schools is far reaching well beyond the pandemic and are still being

realised today. The consequences of children experiencing serious consequences of infection which could perhaps have been prevented are also still being realized today. Keeping children and young people in education and childcare needs to be done in a way which, wherever possible, protects people from infections which are harmful. We have known for some time that Covid-19 is not a minor infection for all. The nature of the setting must also be factored into decision-making and policy. This is not least because these settings are generally not conducive to standard Infection Prevention and Control (IPC) measures as they are not purpose built or clinical settings and so cleaning, ventilation, hand hygiene and one-way systems can be challenging. Having said, all staff involved in education and childcare at the time did an incredible job of implementing these measures and keeping our children and young people safe. Preparedness training for these staff will be key, including regular training in infection prevention and control. Investment into this sector is crucial to bringing old buildings up to a specification which supports this.

48. Throughout my career it has become apparent that school environments are typically not optimised to promote the healthiest possible learning environment. Through my team's interventions above and becoming more familiar with the literature around environmental conditions and their impact on cognition, behaviour and concentration the case for ensuring that environmental conditions within classrooms are optimised speaks volumes. At the same time the spread of pathogens in a school environment is a known concern made apparent during the Covid-19 pandemic. It is also apparent that different standards exist for internal environments based on how ventilation is provided to a space and subsequently the environmental quality standards that can be expected. This creates a potential inequality within our schools with those least able to afford to upgrade ventilation systems unable to provide the healthiest learning environment. This is highlighted in the Department for Education document BB 101 (**Exhibit JM/2 - INQ000588082** to my Statement) which notes different target levels for CO2 depending on whether the space is mechanically or naturally ventilated. Our evidence makes it clear that air filtration reduces exposure to pollutants. The literature base suggests an impact on illness absence be this through reduced disease transmission or another mechanism.

49. Given the above I would therefore recommend the provision of mechanical ventilation with filtration in all new build schools as a necessity with design codes updated including BB 101 (**Exhibit JM/2 -INQ000588082** to my Statement) having more information on potential improvements available through filtration of air. The Council's design codes recommend mechanical ventilation with heat recovery to tie in energy savings; however, funds are typically challenged to enable implementation. In addition, creating a programme to retrofit existing naturally ventilated schools would create school environments better equipped to reduce infection risks within schools and negative impacts associated with children not attending educational settings during measures which we saw under Covid-19. The Council's officers are involved in supporting research into air flow in internal spaces and we understand how many variables are involved and how use of those spaces impacts air flows. There seems to be a need for dedicated resources deployed to understand how to create the healthiest, most prepared school environments and updated Department for Education scorecard costs to reflect current market rates which would enable some of the funding to be made available to implement best practise in future.

50. I am aware that costs to retrofit existing school stock will be challenging in the current and foreseeable economic environment. An approach to promote betterments with no known health harms would be a scheme to promote air purification through filtration in existing schools, particularly those with natural ventilation only. The positive benefits may be felt most in more deprived areas which typically suffer from higher ambient air

pollution levels and where residents of these areas have a greater health burden from air pollution exposure. In addition, protecting more vulnerable children by prioritising SEND settings may be appropriate however based on my experience greater consideration of how standalone air purifiers are deployed into these settings may be required e.g. noise and other potential distractions such as air flow and lights on devices).

Statement of Truth

I believe that the facts stated in this witness statement are true. I understand that proceedings may be brought against anyone who makes, or causes to be made, a false statement in a document verified by a statement of truth without an honest belief of its truth.

Signed:

Personal Data

Dated: 19th August 2025