

**Witness: Prof. Jonathan Marcus Grigg**  
**Statement: Second**  
**Date: 7<sup>th</sup> October 2020**

**IN THE SOUTHWARK CORONER'S COURT**  
**BEFORE ASSISTANT CORONER Dr PHILIP BARLOW**

**INQUEST TOUCHING UPON THE DEATH OF ELLA ADOO-KISSI-DEBRAH**  
**OF 64, WELLMEADOW ROAD, LEWISHAM, LONDON, SE6 1HL**

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**SECOND EXPERT REPORT OF**  
**PROFESSOR JONATHAN MARCUS GRIGG**

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I, **JONATHAN MARCUS GRIGG**, of Queen Mary University of London, Mile End Road, Bethnal Green, London E1 4NS, **WILL SAY AS FOLLOWS:**

**QUALIFICATIONS AND EXPERIENCE**

1. I am Professor of Paediatric Respiratory and Environmental Medicine at Queen Mary University of London. I am also an honorary paediatric respiratory consultant at Barts Health NHS Trust, where I am responsible for running a difficult asthma clinic.
2. I qualified as a medical practitioner in 1982, and subsequently trained in neonatology and paediatric respiratory medicine and have certification for subspecialist in both areas. I obtained membership of the Royal College of Physicians (MRCP) in 1986, and fellowship of the Royal College of Paediatrics and Child Health (FRCPH) in 1999 and a MD from the University of London in 1994. In 2018, I was made an honorary fellow of the Faculty of Public Health (FFPH) in recognition of my work in air pollution. My academic career has focussed on both paediatric asthma and the health effects of air pollution in children, with many publications and invited lectures in both areas.
3. I was vice chair of the Royal College of Physicians' working party on air pollution, and currently am a member of the UK Committee on the Medical Effects of Air Pollution (COMEAP), and Chair of the Royal College of Paediatrics and Child Health's Working Party on the effects of indoor air pollution on children's health. Recently I have advocated for reduced traffic emissions as a founding member of "Doctors against Diesel".

## **INSTRUCTIONS**

4. Hodge, Jones & Allen Solicitors (“HJA”), acting on behalf of Ella’s mother Rosamund Adoo-Kissi-Debrah, have instructed me to provide a second expert report in these proceedings.
5. HJA has provided me with, and I have read, copies of the following documents:
  - 5.1. Part 35 of the Civil Procedure Rules;
  - 5.2. The Practice Direction with supplements Part 35 of the Civil Procedure Rules;
  - 5.3. The General Medical Council’s Guidance on “*Acting as a witness in legal proceedings*” (2013);
  - 5.4. The British Medical Association’s “*Expert witness guidance*” (2007); and
  - 5.5. The Civil Justice Council Guidance for the instruction of experts in civil claims in 2014.
6. It was explained to me at the outset by HJA that, in fulfilling my role as an expert witness, my overriding duty is to the Court and not to any party to these proceedings. I confirm that I have complied and will continue to comply with that duty.
7. I have been provided with an expert report by Professor Stephen T. Holgate dated 20 April 2020 and a report of Dr Greg Warner dated 1 October 2020. I have also perused the witness statements served on behalf of the government authorities in these proceedings. I have also had sight of the witness statement of Rosamund Kissi-Debrah dated 31 January 2018.
8. In addition, I have relied upon the published literature to provide evidence to support my conclusions as well as drawing on my own research and clinical experience in paediatric respiratory medicine.
9. In this second report I am asked to consider the following questions:
  - (i) Whether the paediatricians treating Ella would have been expected to have known of the risks that air pollution posed to her health?
  - (ii) Whether there was a failure to provide such clinicians with the necessary tools to advise patients about the risks of air pollution and how would this have impacted on Ella’s treatment?
  - (iii) From the perspective of a paediatrician, what lessons can be learnt from Ella’s death?

**QUESTION 1 - Whether the paediatricians treating Ella would have been expected to have known of the risks that air pollution posed to her health?**

10. It appears from the evidence that none of the many treating clinicians who reviewed Ella over the years of repeated hospital admission considered the role that air pollution might have on her condition, and none provided her mother and/or GP with advice on how to manage risk.
11. I am not surprised by this omission. Notwithstanding the state of scientific knowledge of the potential risks of air pollution, through the date of Ella's death and beyond, there had been a failure to ensure that this knowledge was cascaded down by Government agencies to medical personnel responsible for the treatment of patients with severe respiratory disease.
12. The 'knowledge' basis available to clinicians / paediatricians working in the field of respiratory disease was at this time incomplete. In some cases, this led to the failure to give air pollution the appropriate emphasis, and therefore not reinforced by clinical protocol or advice.
13. The British Thoracic Society (BTS) Asthma Guideline was published in 2008 and a revised version was published in January 2012. To discuss air pollution, clinicians would have been informed by the British Thoracic Society (BTS) Guidelines on Asthma.
14. The 2012 BTS Asthma Guideline in section 3.3.2 states that "[t]ime-series studies suggest that air pollution may provoke acute asthma attacks or aggravate existing chronic asthma although the effects **are very much less** than in those with infection or allergen exposure" (emphasis added). In my view, "very much less" may have been interpreted as meaning that the risks of air pollution for children with severe asthma are minor compared with other triggers. Furthermore, a reference in the text is relevant only to ozone<sup>1</sup>. There is reference to a 1995 publication by UK's Committee on the Medical Effects of Air Pollutants (available at <https://webarchive.nationalarchives.gov.uk/20140505110006/http://www.comeap.org.uk/documents/reports>). But this 1995 report in fact highlights the risks of air pollution since it concludes "patients with severe asthma may be more affected because of their lower reserve of lung function", and that "a small proportion of patients may experience **clinically significant effects** which may require an increase in medication or attention by a doctor".
15. The 2012 BTS Asthma Guideline also states that "[w]hile it might seem likely that moving from a highly polluted environment might help, in the UK, **asthma is more prevalent in 12-14 year olds in non-metropolitan rather than metropolitan areas.**" (emphasis added). This statement may erroneously be interpreted as meaning that moving home from a highly polluted area has little effect on asthma control. But

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<sup>1</sup> Molfino NA, Wright SC, Katz I, Tarlo S, Silverman F, McClean PA, Slutsky AS, Zamel N, Szalai JP, Raizenne M. Effect of low concentrations of ozone on inhaled allergen responses in asthmatic subjects. *Lancet* 1991;338:199–203.

“asthma prevalence” (i.e. asthma diagnosis yes/no) is not the same issue as “asthma control” (i.e. asthma symptoms in children with a diagnosis of asthma).

16. In my view, in 2010-2013, the National Asthma Guidelines did not provide clinicians with the tools to discuss mitigation strategies either for exposure to short term high pollution spikes or exposure to day-to-day traffic-derived air pollution with parents, and children and young people with asthma.
17. Many clinicians would have interpreted the 2012 BTS Asthma Guideline as indicating air pollution was relatively less important than other asthma triggers. This would, in my opinion, have dissuaded clinicians from discussing air pollution mitigation strategies with asthmatic patients.
18. Thus, my view is that it was highly unlikely that discussions about air pollution were part of paediatric asthma consultations in 2013. This was, in part, due to the absence of air pollution advice about the effects of day to day exposure to traffic related pollution and potential mitigation strategies from Government agencies.
19. My own experience of managing difficult asthma since 1995, is that air pollution advice both for short-term high-pollution days, and long-term day to day exposure was not routinely discussed by NHS paediatricians, either general paediatricians or specialist “tertiary” paediatric respiratory consultants.

**QUESTION 2 – Whether there was a failure to provide such clinicians with the necessary tools to advise patients about the risks of air pollution and how would this have impacted on Ella’s treatment?**

20. By 2010-2013, there were a substantial number of academic papers reporting an association between air pollution, especially for the association between traffic-derived air pollution and poorer asthma outcomes. A selection of some of these papers published in just 2012 are given in **Appendix 1**.
21. An important question is thus why there was such a disconnect between the significant number of papers reporting adverse effects of air pollution in children with asthma, and the capacity of clinicians to discuss air pollution with parents of children with asthma. One reason, in my view, was the absence of authoritative information on air pollution and asthma from Government Agencies.
22. Given the knowledge about air pollution and asthma in 2010 – 2013, it is not unreasonable to expect Government agencies at the time to have summarised this evidence and highlighted that, for some children with asthma, air pollution is a trigger of attacks. This evidence should have been cascaded to clinicians. If Government had synthesised the evidence for the adverse effects of air pollution on asthma, this evidence would have been given significant weight by the Committee developing the national BTS Asthma Guidelines in 2008 and in 2012.

23. Since general practitioners, general paediatricians and specialist paediatricians place great weight on the BTS Asthma Guidelines, it is reasonable that clinicians in 2010-2013 did not routinely discuss air pollution issues with parents of children with asthma, and young people with asthma.
24. By contrast, an example where Government agencies did synthesise evidence and issued authoritative advice up to 2013 include in relation to the risks of second-hand smoke on children with asthma:
  - 24.1. In 2003, the Department of Health launched a mass media campaign to raise awareness about the hazards of second-hand smoke exposure and to reduce the number of people smoking around children. Similar mass media campaigns were launched in March 2012 and June 2013 (<https://ash.org.uk/wp-content/uploads/2018/12/ASH-Report-The-Impact-of-Secondhand-Smoke-and-Children.pdf>).
  - 24.2. The 2012 BTS Asthma Guideline provides clear guidance on second-hand smoke; “Parents with asthma should be advised about the danger to themselves and to their children with asthma, of smoking, and be offered appropriate support to stop smoking.”
25. By 2016, there is evidence that Government regarded air pollution as a “public health emergency”. For example, Dame Sally Davies, then Chief Medical Officer for England, writing in the forward section of the Royal College of Physicians’ report, said “[i]ndividuals can take steps to reduce their exposure to air pollution and reduce their impact on air quality and the environment, for example by considering the transport they use and the routes they travel. This type of action alone is not sufficient to help those living in the most deprived areas, where levels of air pollution may be greater and where the death rates from cancer and cardiovascular diseases can be higher. If we are to make significant progress, collective action at population level is needed. Such action will not just reduce air pollution, but can also help to address other important public health and environmental issues such as health inequalities, physical activity levels and climate change mitigation”. Dame Sally focussed her 2017 Annual report on the “Health Impacts of Air Pollution” ([https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/690846/CMO Annual Report 2017 Health Impacts of All Pollution what do we know.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/690846/CMO_Annual_Report_2017_Health_Impacts_of_All_Pollution_what_do_we_know.pdf) ). In her foreword she wrote “I believe it is time for policy makers to take seriously the threat to health posed by pollution”<sup>2</sup>.
26. Of note is that by 2010-2013 Government had the evidence from publications and monitoring data that air pollution was a “public health emergency” in the UK and should have acted by that point.

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<sup>2</sup> Impacts H, Pollution A. Annual Report of the Chief Medical Officer 2017 Health Impacts of All Pollution – what do we know ? 2017;

27. By 2010-2013, little or no progress had been made in either communication of the risks of air pollution from the Government to clinicians, or in the likelihood of clinicians discussing air pollution with their patients.
28. In 2016, clinicians still did not have the tools to discuss air pollution with parents of children with asthma, so to address this, I convened a European Respiratory Society workshop on “How do you explain the risk of air pollution to your patients?”<sup>3</sup> The workshop participants considered that the gaps included the need to understand which actions an individual can make to reduce exposure, whilst ensuring healthy activities are still maintained and having no negative impact on activities of daily life; and the need for healthcare providers to have the tools to advise patients about air pollution and how to change their treatment plans or activities on high pollution days, and how to reduce long-term exposure. The workshop developed a factsheet for Health Care Professionals to enable them to better explain the risk of air pollution to patients. The factsheet aimed to put risk of air pollution into a more meaningful format for individuals, and particularly those living with chronic lung conditions. A series of infographics were also developed, including one about the risks of living on a heavily used road (**Appendix 2**).
29. In my opinion, there was an unacceptable failure to have ensured that the potential risks of air pollution to vulnerable patients such as Ella were cascaded down by Government agencies so as to ensure her treating clinicians were better able to manage her condition.
30. It was not acceptable to have waited until the knowledge of risk reached the point of ‘scientific certainty’. To the contrary, the ‘precautionary principle’ should have applied, not least in respect of highly vulnerable children such as Ella.
31. The clinicians who treated Ella on her multiple admissions to hospital should have been equipped to (i) recognise the potential link between her presentation and air pollution (ii) advised her mother and her GP of these links and (iii) given advice to reduce risk. The failure to take these steps was not the fault of these doctors rather the failure was to ensure that they were equipped with the requisite knowledge.
32. Had this requisite knowledge been provided the evidence for an association between air pollution and asthma would have been discussed, and the possibility of moving away from the road would have been sensitively explored, being careful not to make parents feel that the asthma symptoms of Ella were their fault.
33. The nature of the steps that should have been taken in the period 2010 to 2013 mirror those that should apply today. There are two major areas of advice on air pollution that can be given by paediatricians to parents or guardians of a child with severe asthma:
  - a. First, advice on what to do on days of high pollution days, where air pollutants are expected to temporarily high across a large urban area such as London, usually as a result of meteorological factors.

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<sup>3</sup> Powell P, Brunekreef B, Grigg J. How do you explain the risk of air pollution to your patients? *Breathe* 2016

- b. Second, advice on what to do to mitigate against day to day exposure to traffic-derived air pollutants from living, walking to school, and being schooled near heavily used roads.
34. In relation to preventing short-term exposure from spikes in air pollution, the clinicians treating Ella should have discussed relevant factors with her and her family and given advice, such as:
- When there is a short-term increase in air pollution levels across the city, there is an increased risk of more asthma symptoms. So when levels are high, the government will issue an air pollution alert or you may see reports included as part of the weather forecast.
  - These short-term increase (spikes) in air pollution will increase your exposure, no matter where you are. It is therefore sensible to take extra precautions when there is a high pollution day.
  - This includes reducing or avoiding strenuous, outdoor exercise. Since exercise has many benefits, if possible, keep doing your exercise indoors in a well-ventilated room or gym.
  - Stay away from pollution hotspots such as main roads and busy road junctions.
  - Try to get to school a little earlier before rush hour has begun and levels of pollution have built up.
  - Walk to school or the shops on the inside of the pavement – the further you are from the traffic the lower the pollution levels are.
  - Make sure you carry your reliever inhaler. Consider taking your reliever before entering a pollution hotspot.
  - Make extra sure that you use your regular preventer inhaler as prescribed.
  - Make sure you carry with you and know your asthma plan.
35. In relation to preventing long-term, day to day, exposure to air pollution from local traffic, the clinicians should have discussed relevant factors with Ella and her family and given advice such as:
- The possibility of the family moving away from the main road should have been considered and if the family were in social housing a letter supporting such a move could have been provided. Since a large proportion of Ella's time was spent in her home, and outdoor air pollution enters homes, moving home to a less polluted area would have reduced Ella's long-term exposure.
  - On days when there are no air pollution warnings in place for London, which is the majority of days of the year, do not stop going to school or taking part in games.
  - But even on days where there is no air pollution alert in place, take steps to minimise exposure, for example by avoiding polluted routes to school, walking on the inside of the pavement and avoiding spending long periods of time in places where pollution levels build up.
  - However, it's important to remember that exercise is important for good health and walking regularly, and/or using public transport is a good idea.

36. As I set out in my first report, the failure to ensure that these measures were in place by 2013 may well have had a profound impact on Ella's outcome.

**QUESTION 3 - From the perspective of a Paediatrician, what lessons can be learnt from Ella's death?**

37. Progress is now being made in developing guidance such as provided by the British Lung Foundation (<https://www.blf.org.uk/support-for-you/air-pollution/tips>). The Government should take a leading role in coordinating these efforts to ensure that clinicians have the necessary tools to advise their patients on air pollution, however this is not yet happening.
38. The most recent BTS Asthma Guideline (2019) contains more information on air pollution, stating that “[c]hallenge studies demonstrate that various pollutants can enhance the response to allergen inhalation in patients with asthma” and “[i]ncreased asthma symptoms in young children (mean age ≤9) have been linked, in observational studies, to exposure to air pollutants, including particulates, nitrogen dioxide, sulphur dioxide and ozone”. Finally, it states that “[i]nformation on current levels of air pollution, recommended actions and health advice is available from The Daily Air Quality Index ([www.uk-air.defra.gov.uk](http://www.uk-air.defra.gov.uk))”
39. However, this statement on air pollution effects remains in the document; “Time-series and other observational studies suggest that air pollution may provoke acute asthma attacks although the effects **are very much less than in those with infection or allergen exposure**” (emphasis added).
40. The most recent 2019 BTS Asthma Guideline still contains no practical guidance on how children and young people can mitigate against short term air pollution spikes, and contains no guidance on mitigation against long-term exposure to traffic-related air pollutants.
41. The Government must take steps to educate health professionals, policymakers and the public about the serious harm that air pollution causes, and there should be a duty on health professionals to inform their patients of these risks. Steps should include:
- The adverse effects of air pollution on health should be included in the medical curriculum;
  - There should be a network of clinicians with expertise in air pollution and air pollution monitoring that clinicians can use for advice;
  - Parents of children with severe asthma should have access to equipment to monitor air pollution levels outside their home;
  - National Asthma Guidelines Committees should include air pollution experts;

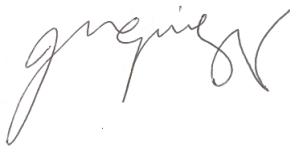


- National Asthma Guidelines should include personal mitigation strategies for both long-term day to day exposure and short-term spikes in air pollution;
- Research should be commissioned on the effect of mitigation strategies on long- and short-term personal exposure of children; and
- Continuous professional development for general paediatricians, respiratory paediatricians, and general practitioners should include updates on published air pollution evidence.

42. Much remains to be done to protect children from air pollution. Indeed, the way that Government protects children from second-hand smoke serves as an exemplar. In my view, sufficient action has yet to be taken.

### **STATEMENT OF TRUTH**

I confirm that I have made clear which facts and matters referred to in this report are within my own knowledge and which are not. Those that are within my own knowledge I confirm to be true. The opinions I have expressed represent my true and complete professional opinions on the matters to which they refer.



Jonathan Marcus Grigg, **BSc, MB BS, MRCP (UK), MD, FRCPCH, FFPH**  
**7<sup>th</sup> October 2020**

## Appendix 1. Examples of asthma and air pollution papers published in 2012

Residential proximity to a major roadway is associated with features of asthma control in children.

Brown MS, Sarnat SE, DeMuth KA, Brown LA, Whitlock DR, Brown SW, Tolbert PE, Fitzpatrick AM.

PLoS One. 2012;7(5):e37044. doi: 10.1371/journal.pone.0037044. Epub 2012 May 17.

Childhood exposure to fine particulate matter and black carbon and the development of new wheeze between ages 5 and 7 in an urban prospective cohort.

Jung KH, Hsu SI, Yan B, Moors K, Chillrud SN, Ross J, Wang S, Perzanowski MS, Kinney PL, Whyatt RM, Perera FP, Miller RL.

Environ Int. 2012 Sep 15;45:44-50. doi: 10.1016/j.envint.2012.03.012. Epub 2012 May 8.

Satellite-based estimates of ambient air pollution and global variations in childhood asthma prevalence.

Anderson HR, Butland BK, van Donkelaar A, Brauer M, Strachan DP, Clayton T, van Dingenen R, Amann M, Brunekreef B, Cohen A, Dentener F, Lai C, Lamsal LN, Martin RV, One IP.

Environ Health Perspect. 2012 Sep;120(9):1333-9. doi: 10.1289/ehp.1104724. Epub 2012 May 1.

An analysis of asthma hospitalizations, air pollution, and weather conditions in Los Angeles County, California.

Delamater PL, Finley AO, Banerjee S.

Sci Total Environ. 2012 May 15;425:110-8. doi: 10.1016/j.scitotenv.2012.02.015. Epub 2012 Apr 2.

The association of ambient air pollution with airway inflammation in schoolchildren.

Chen BY, Chan CC, Lee CT, Cheng TJ, Huang WC, Jhou JC, Han YY, Chen CC, Guo YL.

Am J Epidemiol. 2012 Apr 15;175(8):764-74. doi: 10.1093/aje/kwr380. Epub 2012 Mar 9.

Air pollution and emergency department visits for asthma in Windsor, Canada.

Lavigne E, Villeneuve PJ, Cakmak S.

Can J Public Health. 2012 Jan-Feb;103(1):4-8. doi: 10.1007/BF03404060.

Traffic-related pollutants and wheezing in children.

Bernstein DI.

J Asthma. 2012 Feb;49(1):5-7. doi: 10.3109/02770903.2011.641049. Epub 2012 Jan 3.

Coarse and fine particles but not ultrafine particles in urban air trigger hospital admission for asthma in children.

Iskandar A, Andersen ZJ, Bønnelykke K, Ellermann T, Andersen KK, Bisgaard H.

Thorax. 2012 Mar;67(3):252-7. doi: 10.1136/thoraxjnl-2011-200324. Epub 2011 Dec 9.

## Appendix 2 Infographic on Air Pollution Risks (Breathe 2016)

