1. I would first state that Professor Lucas is not known to me to be a practicing paediatric pathologist. To the best of my knowledge, he has never held a substantive post as a paediatric or perinatal pathologist. I do not believe he holds any specialist qualification in paediatric pathology. I therefore do not consider that he can be properly regarded as an expert in paediatric pathology.

This case concerns general pathology, not specifically paediatric. And I have long experience of dealing with deaths in children.

2. Professor Lucas has clearly stated (page 252-003-006) that he has not seen the histological sections of the tissues sampled from Lucy Crawford. However, despite NOT seeing the sections, he still feels able to draw a conclusion about the pathological findings present. As a practicing paediatric pathologist, I believe that not only I but many of my colleagues in this specialty would regard this as amounting to unprofessional behaviour and to such an extent as to invalidate his conclusions. Professor Lucas has stated that Dr O'Hara's report is 'imprecise', 'basic', and 'includes non-specific pathology'. If he is so critical about the quality of the reporting, why then is he using the written description of the case to base his conclusions on? The presence of bronchopneumonia was commented on by Dr O'Hara, and was confirmed by me when I examined the sections prior to attending the inquest.

The histology of the lungs is described as bilateral bronchopneumonia, present for 24 hours or more. I would not expect to find differently. I am commenting on its interpretation in the context of the case .

3. Dr O'Hara was an experienced perinatal and paediatric pathologist, and was involved in a considerable body of research looking at lung disease in infants (for example, he was the guarantor of a paper published in the journal Paediatric Pathology, reference: 1994 Nov-Dec;14(6):945-53, entitled Surfactant replacement therapy in preterm neonates: a comparison of postmortem pulmonary histology in treated and untreated infants'). This means he would have been fully cognisant with the range of ventilator associated lung changes that can occur, and he would have reasonably been expected to use this term to describe the changes seen in the lungs had this been what he thought it was: the fact that he used the term bronchopneumonia indicates that this was his preferred diagnosis. I am of the opinion that for Professor Lucas to make a diagnosis of ventilatory changes based solely on a brief written description without actually seeing the sections for himself could be considered, at best, unwise and, at worst, unprofessional.

The lung pathology is not in dispute, and one cannot distinguish VAP from non-VAP on histology; it requires the chronology of the case and the care given.

4. I accept that the clinicians didn't consider bronchopneumonia as a diagnosis but it is not uncommon for a small infant to present with non specific symptoms. Every year in Northern Ireland, we have approximately 20 'cot deaths'. In 2-3 of these deaths, babies who were apparently reasonably well with only very minimal symptoms such as not feeding too well, die unexpectedly, and at autopsy these turn out to have bronchopneumonia. The lack of symptoms does not necessarily correlate with the lack of disease. Dr O'Hara would have known this, and that is why he was considering the lung pathology as important. I believe that Professor Lucas is dismissing the presence of bronchopneumonia, as did Dr Sumner before him, because this does not fit with his preconceived idea of the cause of death of this infant. My understanding from Dr O'Hara's report is that he was genuinely in doubt as to the extent of the contribution of dilutional hyponatraemia in the causation of cerebral oedema, and that the hypoxia occasioned by the child's bronchopneumonia could also have been a contributory factor.

Of course everything is easier in retrospect. The point is that in 2000, at the time of first preparing the pathological cause of death, the cerebral damage is attributed solely to the lung infection. However, bronchopneumonia does not produce cerebral oedema in the cadence presented clinically here. That, plus the known hyponatraemia could and should have prompted consideration of another cause of the cerebral oedema.

5. In histopathology practice, personal confirmation of the histological diagnosis is extremely important. For example, for patients who are sent to Belfast for their cancer treatment, all of their cancer diagnoses are reviewed by the pathologists in Belfast: if you are a pathologist being asked to comment on a tissue diagnosis, confirming the diagnosis by looking at the sections is essential. To refute a diagnosis when you haven't even seen the sections is reprehensible. *This case does not depend on the type of detail that cancer diagnoses correctly require; it concerns the interpretation of accepted general histopathological features into a clinical case chronology.*

6. The only way a fair, unbiased and independent opinion could be obtained about the standard of the autopsy and the interpretation of the sections would be to approach a paediatric pathologist and provide them with just the information that Dr O'Hara had at the time of the autopsy, and a copy of his autopsy findings but redacting his commentary and conclusions to allow them to reach their own conclusion. I doubt that any paediatric pathologist would reach a firm conclusion that the cerebral oedema was wholly due only to the presence of hyponatraemia and I would think that they would be as circumspect as Dr O'Hara was in the formulation of his conclusions. *I disagree in part, and this is the nub of the case. Many of us have had hyponatraemia-cerebral oedema fatal cases where we have worked through the pathology and the differential diagnoses to achieve the appropriate correct answer. This involves reading around the issues, and usually discussing the case with clinical colleagues, so that all agree with the conclusion.*

7. On page 252-003-006 Professor Lucas makes a personally disparaging comment about Dr O'Hara 'not liking difficult brain histology'. This is a comment which I believe is uncalled for and unprofessional: as above, Dr O'Hara was an experienced paediatric and perinatal pathologist and Professor Lucas should confine himself to the facts, not suppositions. *I meant here the lack of consideration of alternative causes of cerebral oedema, until after the presentation of Dr Sumner's report.*

8. On page 252-003-007, Professor Lucas comments that I was incorrect to come to the same conclusion that Dr O'Hara had. May I point out that at the time I was asked to present myself to the Inquest, HM Coroner did not see fit to give me any of the background of the case: I was unaware of the reason why the case had been retrospectively turned into a coronial investigation. The Coroner did not share with me any of his correspondence with Dr O'Hara, or any expert report he had commissioned. I was not informed that this was now considered one case in a series of similar cases and that there were concerns about the clinical management because of this. The only documentation available to me was the copy of Dr O'Hara's original report, and his subsequent commentary for the Coroner. As I was not called to give evidence at the Inquest, to the best of my knowledge the pathological findings in this case have never been discussed. *There is still the issue of acknowledged hyponatraemia and cerebral oedema.*

9. Professor Lucas has stated 'there is some confusion as to whether she was merely asked to familiarise herself with the report, so as to read it out to the Court; or she was to reexamine the original histology material and the report'. Again, this raises the serious concern that Professor Lucas appears to think it is acceptable to discuss histopathological findings without actually seeing the histological sections. I would never, in any situation, profess an opinion on a case when I haven't seen the histology sections myself. To do so would be anathema to me: this is unprofessional and frankly dangerous. *I disagree, as pointed in my report, section J. Comment.*

10. In section O (page 252-003-010), Professor Lucas states assertively that the HM Coroner has only two options when a case is referred to him: he can take the case on, or he can tell the clinicians to complete a natural cause of death certificate.

11. This statement is incorrect and reflects Professor Lucas' ignorance of the system in Northern Ireland. In Northern Ireland we have a third way: the coroner can direct the doctor to complete a 'proforma letter'. This tends to be used where the doctor thinks the death is probably natural, but that they aren't sure of the exact sequence of events or the contribution from different disease processes in the causation of death. The proforma letter is a statement that the clinician makes outlining the circumstances of death and then the coroner makes a decision on how to certify the death without going as far as an autopsy examination. Professor Lucas appears to be unfamiliar with this. This is an option which was available to the coroner at the time of Lucy Crawford's death but he chose not to exercise this option. *It would appear that the proforma letter is but another way of conveying information to a coroner, to enable him to make the critical decision: investigate the case or not.*

12. On page 252-003-011 to 012, Professor Lucas makes a serious allegation which I believe he should withdraw forthwith. He appears to be accusing Dr O'Hara (and the clinicians) of collusion in a conspiracy to cover up the cause of death, and he seems to have reached this conclusion because of the way in which the medical certificate of the cause of death (MCCD) was completed after the autopsy. *I am making the general point concerning the sequence of 'death – certification & registration OR referral to a coroner – consented autopsy', which I had assumed was general across the UK. I am not accusing any of the doctors concerned in this case of collusion; only highlighting the potential for it if consented autopsies take place to provide clinico-pathological information for primary death certification purposes. Adding information from autopsy after certification is a standard, if underutilised, process in the UK.*

13. In this case, the doctors apparently had the option to certify death as due to gastroenteritis (as suggested by the coroner at the time and the forensic pathologist), but it appears that they wanted to know more about the cerebral oedema. On the MCCD, there is a 'tick box' on the back of the form to indicate that more information may be forthcoming about the cause of death at a later date. If there had been a long delay between the death and the autopsy, the death could have been certified as gastroenteritis, and this box ticked. However, in Northern Ireland, the autopsy is carried out within a short time after death, and so I submit that it may not be unreasonable to delay completing the MCCD for a few hours until the autopsy is completed and more information may be available to be added to the MCCD. The MCCD could have been completed prior to the autopsy being carried out, but to delay it very slightly to see if more detailed information could be added is not unreasonable in my opinion. The cause of death is not been 'covered up'. I think to call this a perversion and suggest that there is a conspiracy to hide the cause of death this way is unfair and uncalled for: in my opinion, delaying the completion of the MCCD until after the PM is more likely to have been a genuine attempt to complete the MCCD with as much information as possible. Certainly, if there was going to be several days delay between death and completion of the autopsy, the MCCD should have been completed shortly after death to allow for registration of the death, but in Northern Ireland, with an autopsy being completed so quickly, there is minimal delay. *See previous comment. I will indicate in my oral evidence that the practice above is not standard in mainland UK, from my quizzing bereavement officers.*

14. Page 252-003-012: Professor Lucas asserts that it is usual UK practice for the relevant doctors to see the autopsy and discuss the findings: I agree with this statement and in my experience, most clinicians are very keen to attend the autopsy and do so. However, I would suggest that in this case, as the autopsy was carried out so very quickly after death, it may have been too short notice for the clinicians to rearrange clinical commitments. *Fair point.*

15. He also states that clinico-pathological correlation is essential and should be carried out in all cases: this is another statement with which I agree. As a trainee in this hospital in 19931998 I

recall attending morbidity and mortality meetings in Royal Belfast Hospital for Sick Children to discuss cases, so this forum did exist. *Good.*

16. In his appendix (252-003-016), Professor Lucas seems to find something sinister in the fact that the autopsy was carried out very quickly after death, stating that only homicides would be carried out as quickly as this. This is frankly bizarre wording, and appears to insinuate that this was a potential homicide that was being covered up. Again, this reflects a deep ignorance about the system in Northern Ireland. In this region, we have a cultural tradition of being buried very quickly after death, usually within 2 or 3 days. As a result, any autopsies are carried out as quickly as possible. My paediatric pathologist colleague and I are essentially on stand-by: if a case is transferred to us from the more distant hospitals such as Erne or Altnagelvin, we will ask the funeral director bringing the body to us to wait for a couple of hours while the autopsy takes place so that he can return the baby to the family as quickly as possible. In the rest of the country, there is often a considerable delay between death and the autopsy, and between the autopsy and the funeral. This doesn't generally happen in Northern Ireland. The fact that the autopsy on Lucy was carried out so quickly does not suggest that anything untoward was occurring; it merely reflects cultural practice in attempting to return the child to her family as quickly as possible so as not to delay the funeral. *Nothing sinister, just puzzled over the confusing dates and times in the records, and from the premise – in my part of the UK – that it is rare for autopsies to proceed so fast (unless there are religious demands). I think it is good practice to do autopsies asap, so that the pathology is optimal for observation and drawing conclusions.*

17. Dr O'Hara was a pathologist who worked to the highest standards, and was internationally recognised as a paediatric and perinatal pathologist: my personal opinion is that he behaved professionally and ethically at all times, and I believe that if he had any concerns about the care of an infant he would have reported these as necessary. I think for Professor Lucas to insinuate that Dr O'Hara was involved in a conspiracy is offensive, uncalled for and unprofessional. *The practical point is that, until prompted later, he did not consider alternative possible scenarios to explain the child's death (ie hyponatraemic cerebral oedema). I am tasked by the IHRD to address their questions, and that necessarily, if unfortunately, involves criticism of some individuals over some (not all) of their work; that is how inquiries pursue their objectives.*

18. We occasionally have cases where a consented autopsy has been carried out, and we discover that the death was due to a complication of medical or surgical treatment which had not been diagnosed at the time of death (e.g. perforation of the small bowel due to a feeding tube insertion), and these cases are reported to the coroner retrospectively for investigation. I have had two cases like this in the last 10 years, and in each case, the clinician has reported the death to the coroner after the consented autopsy has been carried out, and I then send the report to the coroner. This is the system that was taught to me by Dr O'Hara as a trainee pathologist, and I have no doubt that he worked this way himself. *I agree, but it requires, first, identification of the problem, ie the complication of medical treatment.*

19. The impression I get is that Professor Lucas has been asked to review all of the deaths. When he was appointed to provide an opinion, he was presumably given the whole background to each case, including the fact that these were deaths in which there was a considerable degree of public interest, and with the whole background of this being one of a series of similar cases. Essentially, he was told 'this child died of hyponatraemia' and considered the autopsy report with this in mind. *That is correct, I have reviewed many of the deaths (this is the third report I have produced).*

20. In pathology, we have to be extremely cautious of bias. If I have a complex case, for example, a difficult tumour, and I ask my colleague for her opinion on it, I would give it to her with the history with which I was provided. So, I would say, for example, 'This is a tumour from a 2 year old child's kidney.' If I give it to her with 'This is a tumour from a 2 year old child's kidney and I think it is an X tumour', she is far more likely to agree with me, as I would with her. Bias is inevitable, and so we try and approach cases like this 'blind' i.e. without being coloured by someone else's opinion. *Yes.*

21. My impression from Professor Lucas's report is that he approached the case with a mindset of 'this baby died of hyponatraemia: how did the pathologist miss that diagnosis?' rather than a mindset of 'with the amount of information available to the pathologist at the time of the PM, and no knowledge of the surrounding events, what diagnosis would I have reached on this case? ' *Not so much 'how did that pathologist miss that diagnosis' but how come his mind was not open to alternative diagnoses, given the clinical and other information provided at the time.*

22. I think it is evident that Professor Lucas is reviewing the case with the benefit of hindsight and is not considering what the general awareness of hyponatraemia was at that time. *That is what this inquiry is about. But – speaking personally – I was aware of the syndrome before 2000. More importantly, it is about thinking beyond one's immediate knowledge when difficult clinico-pathological cases are not resolved satisfactorily, consulting with colleagues, and nagging away at the problem until it is resolved.*

23. There is a prevailing attitude among some pathologists that the autopsy is the be-all and end-all, and that it is the so-called ‘gold standard’. It is not: it is a clinical tool for the investigation of disease processes and needs to be considered within the whole gamut of clinical investigations. It is an important investigation certainly, but it is not the responsibility of the pathologist to determine the cause of death on his or her own, without considering clinical input. I would suggest that Dr O’Hara’s ‘failure’ to consider hyponatraemia as the cause of the cerebral oedema is indicative of his genuine uncertainty as to the role of hyponatraemia in the causation of this, and that his report instead defers to the clinicians in the final determination of the cause of death. This is not a failing on his part and should not be regarded as such. *I agree without reservation that the autopsy per se is not necessarily the gold standard. Complex cases often or usually require other inputs – clinical information, laboratory data, imaging etc. But I think it IS the responsibility of the pathologist to lead and coordinate the subsequent correlation of the clinical and pathological features to achieve the best possible diagnosis.*

24. The care of a living patient is very much a team approach: if the case is complex, the consultant clinician will obtain the opinion and advice of other specialists as needed, for example, other doctors, nurses and associated personnel, each with their own area of expertise. Why then, after the death of a patient, is the pathologist expected to reach an opinion entirely on their own with no input from any other specialist? As paediatric pathologists, we discuss cases with others who may have had a role in caring for the mother and baby such as midwifery staff, obstetricians and neonatologists in order to formulate an overall impression as to the mechanism and cause of death. We do not operate in the manner of 'I am the pathologist; this is the cause of death'. This is a behaviour perpetuated by the media such that the pathologist can say with absolute certainty that the death was caused by X, and the patient died at such and such a time. This is far from the truth: the autopsy findings may be equivocal and non-diagnostic, and it is then up to the pathologist and the clinicians to work together to see what diagnosis best fits the clinical presentation and the autopsy findings. I think Dr O'Hara's report was more diffident or empirical rather than dogmatic and reflected his thought processes accurately about the causation of cerebral oedema. *I agree. But as the IHRD has identified in previous deaths, there was no follow up consultation to determine what actually happened in the case. I have no problem with any pathologist not knowing everything – no one does. But we have an obligation to think about cases and consider whether they are, or are not, satisfactorily resolved by autopsy investigation. As the 2002 RCPath Guidelines on Autopsy Practice state: a purpose of the autopsy is to address the questions and issues raised by a death.*