SPECIAL REPORT PART 1

# THE LESSONS OF THE LUCY LETBY CASE

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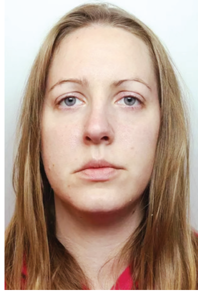
**ON MEDICAL EXPERTS AND A FAIR TRIAL**

**After Lucy Letby was convicted in August 2023 of murdering seven babies, a number of experts contacted *Private Eye* columnist MD because they "believe the science and statistics presented at the trial were incomplete and flawed and that the case against Letby was not proven beyond reasonable doubt". Reporting restrictions because of a retrial of Letby over one count of attempted murder meant MD was unable to write about this until *Eye* 1628, published in mid-July 2024.**

# THE LESSONS OF THE LUCY LETBY CASE

## MD ON MEDICAL EXPERTS AND A FAIR TRIAL PART 1

### Grounds for doubt



MD's initial view of the trial of Lucy Letby was to accept the verdict in August last year and criticise hospital managers for not investigating the concerns of the whistleblowing paediatricians sooner ("Letby Lessons", p7, Eye 1605). Post publication, I was then contacted by a number of experts who believe the science and statistics presented at the trial were incomplete and flawed and that the case against Letby was not proven beyond reasonable doubt.

The *Eye* was set to publish these views last September but was prevented from doing so by a court order, which we unsuccessfully challenged. Free from such reporting restrictions, the *New Yorker* published lengthy concerns about the scientific validity of the trial (13 May 2024) and – following the lifting of the restrictions – the *Guardian* (9 July), *Telegraph* (9 July), *Independent* (13 July 13) and *Mail* (13 July) followed suit. Why do so many experts doubt the fairness of the trial?

### Proving cause of death

BABIES ill enough to be on neonatal intensive care units are, not surprisingly, at risk of death. But ascertaining a precise cause is very difficult. Post-mortem findings will often cite congenital abnormalities, other serious diseases, birth trauma and infections. Low birth weight, prematurity and substandard care can be contributory factors; but sometimes we simply don't know. A study of 1,000 infant deaths in south-east London found the cause of mortality was unexplained for about half the newborns who had died unexpectedly, even after post-mortem examinations.

Proving deliberate harm is extraordinarily difficult as it is very rare and very hard to detect unless someone is caught in the act or uses a consistent, obvious or researched method of harm. Or if the perpetrator admits guilt. None of the above applied to Letby, so proving guilt beyond reasonable doubt relies on post-mortem findings.

### Post-mortem findings

SIX of the seven babies who Letby was convicted of murdering had a post-mortem examination conducted at the regional centre of excellence – Alder Hey Children's Hospital – by one of three experienced, paediatric / perinatal pathologists. In five, the pathologist certified one or more "natural" causes of death and in one the cause was certified as "unascertained" but was not categorised as "unnatural".

For example, Baby C lived just four days. He was born at 30 weeks weighing less than 2lbs because of placental insufficiency. One nurse described him as "the smallest baby I have ever seen". He also had pneumonia and breathing distress, and an X-ray taken the day before his death showed air in his stomach, which is common in babies who have needed help with breathing by a bag and mask placed over the mouth and nose.

After his death, the post-mortem concluded the death was natural, exacerbated by the lack of blood flow in the womb. A coroner supported this finding. However, the prosecution later argued his death was caused by Letby deliberately pumping air into his stomach to put pressure on the lungs. Other alleged methods of harm included injecting air into blood vessels to cause embolism, deliberately dislodging breathing tubes, overfeeding with milk and injecting insulin. But none of these actions was observed or picked up at post-mortem. In an extensive search of Letby's internet history, there was no evidence she'd researched any of these methods. So what was the case against her?

### Suspicious cluster

CENTRAL to the prosecution case was that in 2015-2016 at the Countess of Chester (CoC) hospital unit there was a statistically unlikely rise in fatal and near-fatal events in babies that were stable and not expected to deteriorate, and that Letby was always on duty when these events happened. A roster data table was drawn up as the key piece of evidence showing Letby was the only staff member who was always on duty when 25 serious untoward events occurred, including an alleged poisoning of two babies with insulin. Equally damming, the deaths and harms reduced to expected levels when Letby was removed from the unit.

### Alternative hypotheses

● **NATIONAL TREND** In 2015, when the excess deaths started at Chester, the infant-mortality rate in England and Wales rose for the first time in a century. A survey found two-thirds of the country's neonatal units did not have enough medical and nursing staff.

● **RANDOM CHANCE** Unexpected clusters of deaths and harms can happen by random chance alone. *Suspected serial killers and unsuspected statistical blunders*, a 2024 paper by UCL statistics Professor John O'Quigley, details why. In July 2016, Dr John Gibbs, a senior consultant paediatrician at the Countess of Chester, wrote to his fellow clinicians: "The increase in neonatal mortality that we have experienced over the last 18 months might be within 'expected' statistical variance."

● **SICK BABIES** In 2015, the CoC unit treated more babies than it had in previous years, and they had, on average, lower birth weights and more complex medical needs**.** This alone could lead to more deaths. The prosecution argued that the babies Letby was accused of murdering were well and stable before collapse but all but one of the babies were premature; three of them weighed less than three pounds.

Mike Hall, a retired neonatologist and visiting professor in neonatology at the University of Southampton, was Letby's (unused) expert witness for the initial trial. He studied all the cases in great detail and takes a different view: "It is my opinion that the prosecution expert witnesses misrepresented the degree of 'wellness', prior to their final collapses, of most, if not all, of those who died – leading the jury to believe that the babies were well when they were not. Given this, there could be differing views as to whether the deaths were all 'sudden, unexpected and unexplained'. The three pathologists who conducted the original post-mortem examinations do not seem to have been in accord with this analysis." The *Telegraph* goes into detail about how sick each baby was prior to death.

● **INADEQUATE CARE** This is a far more likely cause of avoidable harm in the NHS than murder. The Chester unit, built in 1974, is outdated and cramped. In 2012, the head of the unit Dr Stephen Brearey observed: "The risks of infection for the babies is greater the closer they are to each other." Problems with the drainage system led to blocked pipes and sewage occasionally backed up into the toilets and sinks.

There were seven consultant paediatricians but only one was a neonatal specialist. There simply may not have been enough specialist input for so many sick babies.

In 2014, an inquest found a baby had died because a doctor had inserted a breathing tube into the baby's oesophagus rather than his trachea, ignoring several indications that the tube was misplaced. The boy's mother observed that "staff shortages meant blood tests and X-rays were not assessed for seven hours and there was one doctor on duty who was splitting his time between the neonatal ward and the children's ward."

In late 2015, one of the senior paediatricians emailed the hospital's chief executive, Tony Chambers, to report that staff on the unit were "chronically overworked" and "no one is listening". "Over the past few weeks, I have seen several medical and nursing colleagues in tears". Doctors were working shifts of more than 20 hours and the unit was so busy that "at several points we ran out of vital equipment such as incubators. This is now our normal working pattern and it is not safe. Things are stretched thinner and thinner and are at breaking point. When things snap, the casualties will either be children's lives or the mental and physical health of our staff."

A review team from the Royal College of Paediatrics and Child Health was invited to analyse the cluster of excess deaths in 2016 and found junior staff had "insufficient senior cover" and exhibited "a reluctance to seek advice". In addition: "Direct visibility from one area to another is poor, and infants are moved regularly to accommodate acuity [ie sicker infants] – an extra risk in the system."

In February 2016, the Care Quality Commission (CQC) found the neonatal unit was understaffed and "lacked storage space and resources for the care of patients who required strict infection control". Across the NHS, the combination of short staffing and lack of experienced staff is the commonest factor in avoidable deaths. Sudden deteriorations in already sick patients are not picked up in time. Human errors are common. Murder isn't.

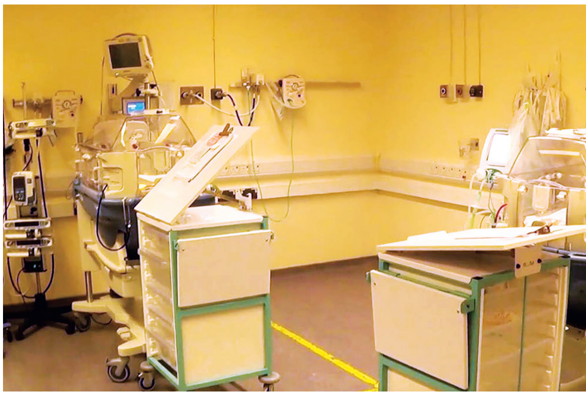
● **DOWNGRADED UNIT** The excess deaths and harms did indeed return to expected levels when Letby was removed from the unit, but this also coincided with the unit being downgraded, so it was only allowed to deal with babies who did not need intensive care, and mostly those born after 32 weeks' gestation. This alone could account for the reduction in harm.

### Causal challenges

THE *Guardian* interviewed Dr Svilena Dimitrova, an NHS consultant neonatologist, who is part of the government-appointed Ockenden review investigating failures in maternity care leading to dozens of avoidable deaths at Nottingham University NHS hospital trust. "The theories proposed in court were not plausible and the prosecution was full of medical inaccuracies. I wasn't there, so I can't say Letby was innocent… but the information presented to court was flawed and not proof of guilt beyond doubt."

MD's senior neonatology source – who did not want to be named – concurs that more natural occurrences are far more plausible than those proposed by the prosecution:

"Episodes of apnoea and bradycardia are very frequent in preterm babies. If a baby fails to self-correct from an apnoeic episode and needs resuscitation, the first thing that's done is to ventilate using a bag and mask. As the mask covers the mouth and nose, the stomach is inevitably distended. This is the likeliest cause for the repeated mentions of gaseous distension of the stomach… In my opinion, the cases all have much more plausible alternative explanations than those alleged. For example,



research has found that air embolism is a not infrequent occurrence after cardiopulmonary resuscitation, to which of course these infants were substantially subjected… On the basis of what I've seen, this conviction is wholly unsafe."

## Insulin challenge

LETBY was convicted of attempted murder giving two babies synthetic insulin, presumably via their liquid nutrition bags. This wasn't suspected at the time; she wasn't caught doing it; and there was no direct evidence the bags had been tampered with. But the prosecution later deduced this must have happened from the clinical picture of two babies suddenly deteriorating with low blood sugar requiring high doses of dextrose and glucagon to correct.

Blood samples could have proved this. One of the samples was actually taken 10 hours after Letby left the hospital, leading to the hypothesis that she not only injected insulin into nutrition bags at the bedside, but did it to some of those in storage in the hope that another nurse would select the bag she had tampered with.

Other publications have gone into the expert detail about the unreliability of the particular antibody tests performed and how corroborating tests were needed to prove exogenous insulin was administered. These were never done. For Letby's appeal, a detailed submission from a group of experts pointing out errors in interpretation of the insulin results was deemed inadmissible because it was not new evidence, but a challenge to existing evidence.

## Missing Shoo

FOR her appeal, Letby's defence called expert witness and neonatologist Dr Shoo Lee, from Toronto, the co-author of a 1989 paper about air embolism causing skin changes in neonates that the prosecution had argued proved Letby had injected air into blood vessels. Shoo argued that only one very specific skin discoloration was diagnostic of air embolism, and none of the babies in the case had displayed this. This was also dismissed as evidence that was not new. The skin changes may simply have been the consequence of large amounts of adrenaline administered during prolonged resuscitation.

## Statistical challenge

MANY statisticians have pointed out errors in the prosecution's "killer" staff roster. It showed Letby was present at 25 serious untoward events; but it contained errors. One of the three attempted murder charges in relation to Baby G is not included but there is an additional event pertaining to Baby J that was not on the list of charges. Most worrying, there were (at least) 35 deaths or non-fatal collapses during the period in question that should have been included in the table for it to be considered statistically robust. Why did babies collapse when Letby was not on duty? She was convicted of seven murders but there were ten other deaths that she wasn't on duty for. As O'Quigley observes: "All the roster proves is that Letby was on duty when she was on duty."

In September 2022, the Royal Statistical Society published a document entitled *Healthcare Serial Killer or Coincidence?*, which considered the miscarriage of justice for a Dutch paediatric nurse convicted of murder, Lucia de Berk, and argued that statistical expertise was essential to the fairness of such trials.

Miscarriages of justice are often attributed to "tunnel vision" and "confirmation bias" – processes that may lead investigators to "focus on a particular conclusion and then filter all evidence in a case through the lens provided by that conclusion". Whether this happened in the Letby case is unknown, because no statistical expert gave evidence. Another highly-regarded statistician told MD: "There needed to be an expert statistical debate about whether the spreadsheet of shifts compiled by the prosecution showing concordance between Letby being on duty and deaths occurring was valid, and whether other plausible events, or combinations of events, had been fairly taken into consideration as causes of death." But there was none.

## Change is needed

ONE hallmark of the justice system is that you don't have to offer any defence – expert or otherwise – and it is entirely down to the prosecution to prove guilt beyond reasonable doubt. Letby and her barrister Ben Myers KC did not call their single expert witness to give evidence, secure in the knowledge that the evidence against her was largely circumstantial, and perhaps mindful that the prosecution had six expert witnesses and seven consultant paediatricians who were united in believing her to be guilty because it seemed the most plausible explanation for the spate of sudden and unexplained collapses.

Myers did a very competent job challenging the prosecution witnesses. But the glaring weakness in the process was that the jury only heard expert evidence from one side.

MD can make no judgement either way as to the guilt or innocence of Lucy Letby, but the way expert witnesses are used – or not used – in criminal trials with complex and uncertain science is simply not fit for purpose and risks miscarriages of justice. It should be mandatory for the jury to hear expert witnesses from both sides or – better still – it should be a duty of, say, the Royal Colleges and Royal Statistical Society to provide a team of the best, current expert witnesses on behalf of the court, not paid or employed by one side or the other. This is vital for justice to be done and to be seen being done.

In the current system, the jury may only hear a highly selective and curated version of the science from a single side, and experts will later disclose evidence they believe should have been heard in the court hearings after the verdict, which must be extremely distressing for the parents of the children who died, the friends and relatives of Lucy Letby and members of the jury who would have wanted the complete scientific picture. There should also be mandatory statistical input to ensure both sides use data fairly. Shabana Mahmood, the new justice secretary, should look at this as a matter of urgency. Meanwhile, the Thirlwall public inquiry may inadvertently be derailed by experts who say under oath that Letby wasn't stopped sooner because there were far more plausible reasons for the deaths than murder. And hospital managers threatened with a corporate manslaughter charge can argue the same, with plenty of expert support. Meanwhile, only Letby can decide if she wants to take it to the Criminal Cases Review Commission. Perhaps winning on appeal was her legal team's tactic all along.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