

Dramatische gerechtelijke dwalingen

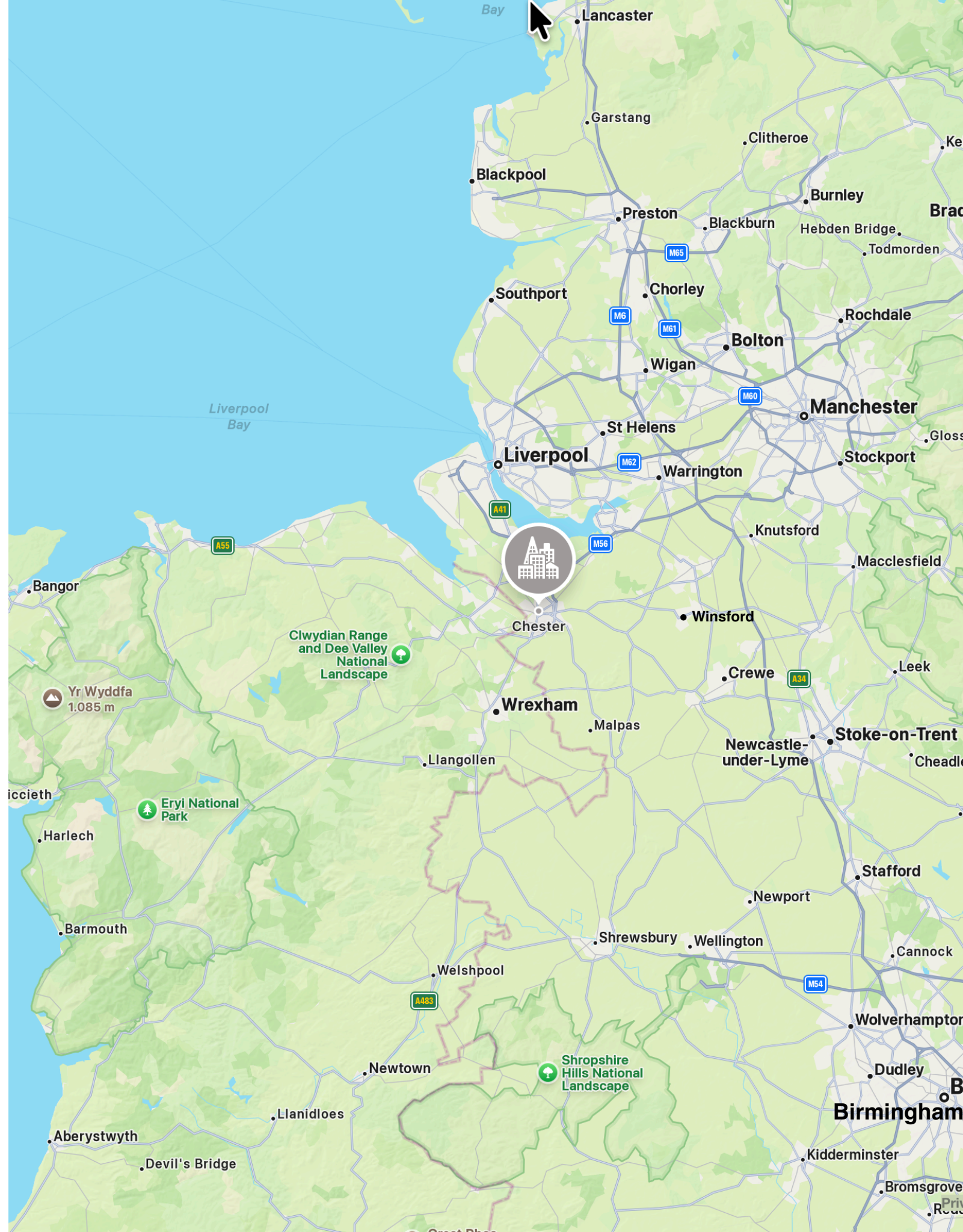
**Wat is de kans op toeval?
Forensische statistiek, deel 2**

Richard Gill, 15 October 2026, OKW Apeldoorn

Chester

Bewaker van de grens tussen Engeland en Wales

Chester is a cathedral city and the county town of Cheshire, England, on the River Dee, close to the England-Wales border. With a built-up area population of 92,760 in 2021, it is the most populous settlement of *Cheshire West and Chester*. It is also the historic county town of Cheshire and the second-largest settlement in Cheshire after Warrington. Chester was founded in 79 AD as a "castrum" or Roman fort with the name Deva Victrix during the reign of Emperor Vespasian.



The Countess of Chester Hospital

and its Maternity Unit

Right: five years ago; left: one year ago



The Countess of Chester Hospital

The Maternity and Children Units as they are today



The four ingredients

Cf. Lucia de Berk

- A spike in deaths
- Association between bad events & presence of a notable nurse
- Something bad was going on from June 2015 – June 2016
- Consultants associated this with Lucy from the beginning
- July 2016: unit demoted to Level 1
- Lucy placed on administrative duties
- The deaths stopped
- Disturbing forensic evidence
- Weird writings seen as a confession

Lucy Letby: the spike

Early neonatal deaths
2013 + 2014
versus 2015

> 1 - pbinom(7, 14, 1 / 3)
[1] 0.0576163

Trust or Health Board/unit	Period	Late fetal loss	Stillbirth	Early neonatal deaths	Late neonatal deaths	Post neonatal deaths	All deaths
Countess of Chester Hospital NHS Foundation Trust summary by year	2013 reported deaths	4	8	3	1	2	18
	2014 reported deaths	2	9	3	1	0	15
	2015 reported deaths	4	12	8	1	0	25
	2016 reported deaths	1	2	7	1	0	11
	2017 reported deaths	0	11	2	2	0	15
	2018 reported deaths	0	6	2	0	0	8

Early neonatal deaths
2013 + 2014
versus 2015 + half 2016

> pbinom(8 + 5 - eps, 6 + 8 + 5, 1.5 / 3.5, lower.tail = FALSE)
[1] 0.02205686

3, 3, 8, 7, 2, 2

Lucy Letby: the roster chart

Operation Hummingbird				Exhibit Ref: CEH/16																				Staff Presence Report																				
Chart 1: Nurses present on clinical and administrative duties Summary																																												
				Nursing Staff on Clinical and Administrative Duties																																								
Event	Baby	Date Shift Started	Shift Type	Ailsa SIMPSON		Angela McSHANE	Ashleigh HUDSON	Belinda SIMCOCK	Bernadette BUTTERWORTH	Caroline BENNION		Caroline OAKLEY	Cheryl CUTHBERTSON-TAYLOR	Christopher BOOTH	Eirian POWELL	Elizabeth MARSHALL		Janet COX	Jean PEERS	Jennifer JONES-KEY	Joanne WILLIAMS	Kathryn WARD		Laura EAGLES	Lisa WALKER	Lucy LETBY	Mary GRIFFITH	Melanie TAYLOR	Minna LAPPALAINEN	Nicola DENNISON	Patricia STEELE	Rebecca MORGAN	Samantha O'BRIEN	Shelley TOMLINS	Sophie ELLIS		Valerie PARKES	Valerie THOMAS	Vicky BLAMIRE	Yvonne FARMER	Yvonne GRIFFITHS	Total		
1	Child A + G	08/06/2015	NIGHT							X						X									X	X	X	X								X							7	
2	Child B G	09/06/2015	NIGHT										X									X			X	X	X									X							6	
3	Child C + G	13/06/2015	NIGHT													X	X									X		X			X													6
4	Child D + G	21/06/2015	NIGHT								X	X					X					X					X																	5
5	Child E + G	03/08/2015	NIGHT					X				X													X	X														X				5
6	Child F G	04/08/2015	NIGHT					X					X													X	X									X	X			X				6
7	Child G G	06/09/2015	NIGHT	X										X										X	X	X																		5
8	Child G G	21/09/2015	DAY							X		X			X		X	X								X				X							X			X	X			11
9	Child H NG	25/09/2015	NIGHT													X										X										X			X			X		5
10	Child H + -	26/09/2015	NIGHT											X		X	X									X	X								X									5
11	Child I	30/09/2015	DAY				X		X						X		X		X						X	X		X				X						X			X			11
12	Child I	12/10/2015	NIGHT				X					X						X							X	X																		5
13	Child I	13/10/2015	NIGHT									X						X			X				X	X									X						X			7
14	Child I + G	22/10/2015	NIGHT				X							X												X		X												X				5
15	Child J -	26/11/2015	NIGHT									X													X	X	X				X										X			6
16	Child J -	17/12/2015	DAY												X				X		X				X	X				X		X									X		X	9
17	Child K -	16/02/2016	NIGHT									X									X					X										X				X				5
18	Child M	09/04/2016	DAY			X	X	X									X									X	X																	6
19	Child L G	09/04/2016	DAY			X	X	X									X									X	X				X													7
20	Child N -	02/06/2016	NIGHT											X												X		X								X			X					5
21	Child N -	14/06/2016	NIGHT					X	X											X		X	X		X	X																		7
22	Child O + G	23/06/2016	DAY							X			X					X							X		X			X	X	X					X				X	X		11
23	Child P	23/06/2016	DAY							X			X					X							X		X			X	X	X						X			X	X		11
24	Child P + G	24/06/2016	DAY		X								X					X							X	X						X						X			X			8
25	Child Q -	25/06/2016	DAY														X									X	X		X	X														5
Total				1	1	2	5	5	2	2	3	7	2	7	3	5	7	6	2	1	3	3	2	4	6	25	7	7	2	3	6	3	2	3	4	4	5	6	2	6	5			

*(‘X’ indicates ‘on duty’ presence on the shift, where a suspicious event has been identified)

*(‘X’ indicates ‘on duty’ presence on the shift, where a suspicious event has been identified)

Deaths in NICU: 7 G + 1 “-” on chart; 5 not on chart. 4 deaths very soon after transfer

The insulin poisonings

Babies F and L



Sign in



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Lucy Letby trial: Astonishing level of insulin found in baby, jury told

🕒 30 November 2022

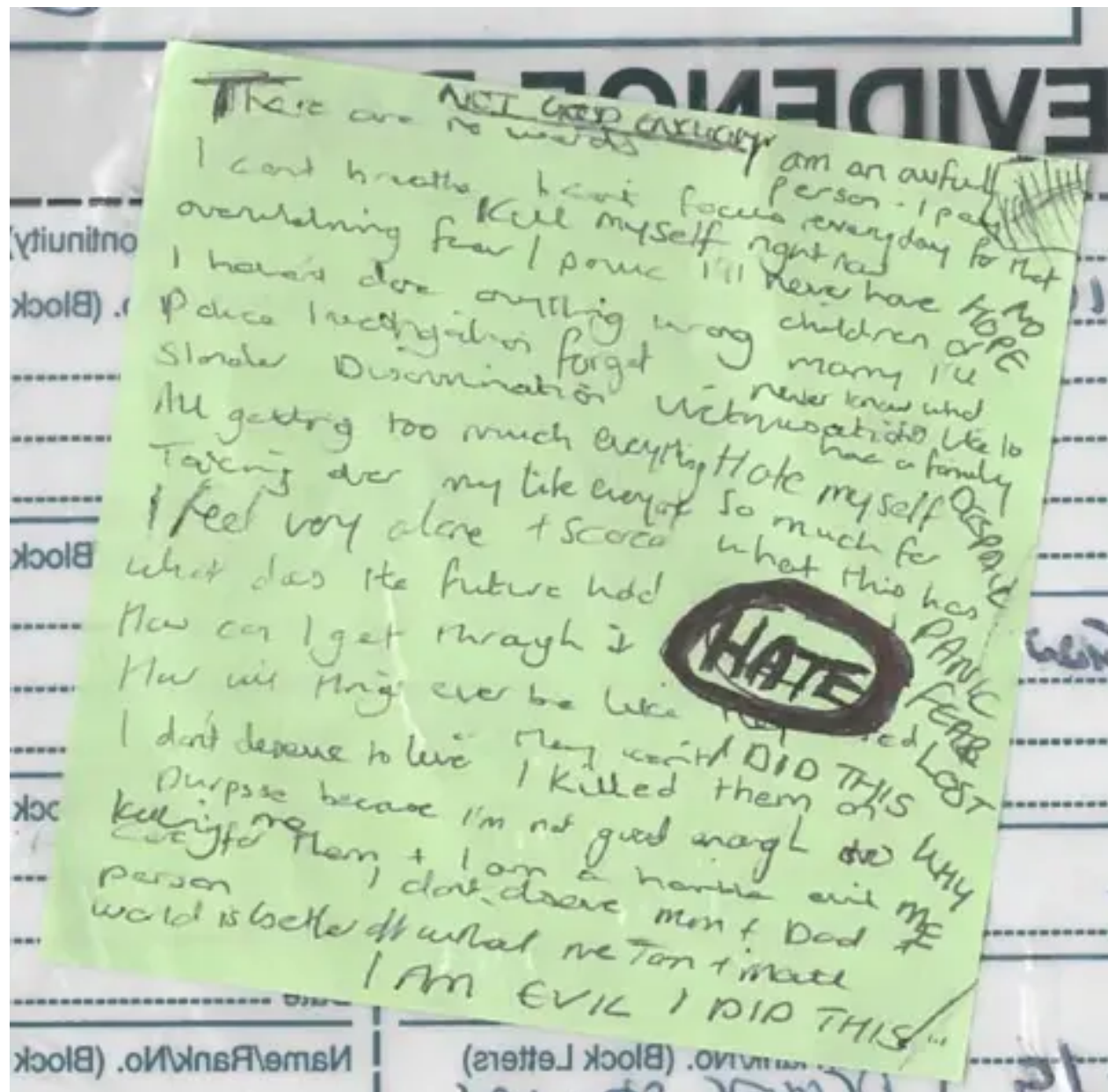


SWNS

Lucy Letby is accused of murdering seven babies and trying to kill 10 others

<https://www.bbc.co.uk/news/uk-england-merseyside-63808514>

The confession



NOT GOOD ENOUGH
 There are no words
 I cant breathe I cant focus
 overwhelming fear i panic
 I haven't done anything wrong
 Police Investigation
 Slander Discrimination Victimisation
 All getting too much everything
 Taking over my life every day
 I feel very alone and scared
 What does the future hold
 How can I get through it
 How did things ever be like
 I don't deserve to live
 purpose because I'm not good enough to
 killing me
 person
 world is better off without me tom + matt
 I AM EVIL I DID THIS

I am an awful
 person - I pay
 everyday for that
 I'll never have
 children or
 never know what
 like to
 have a family
 Hate myself
 so much for
 what this has
 done
 HATE
 they accused
 they went
 I killed them on
 purpose because I'm not good enough to
 care for them + I am a horrible evil
 person
 I don't deserve mum + dad +
 world is better off without me tom + matt
 I AM EVIL I DID THIS

NO
 HOPE
 DESPAIR
 PANIC
 FEAR
 LOST
 WHY
 ME

THIS IS THE BREAKDOWN OF THE INFAMOUS "GREEN CONFESSION"
 IT IS QUITE CLEARLY NOTHING OF THE SORT.

I HAVE BROKEN DOWN EVERY WORD (EXCEPT THAT ARE INDECIPHERABLE)
 THE ORDER IN WHICH TO READ THE NOTE IS BY COLOUR.

FIRST TO READ IS IN REDACTED

THEN THE TEXT IN REDACTED

THEN REDACTED

FOLLOWED BY REDACTED

FINALLY THE TEXT IN REDACTED

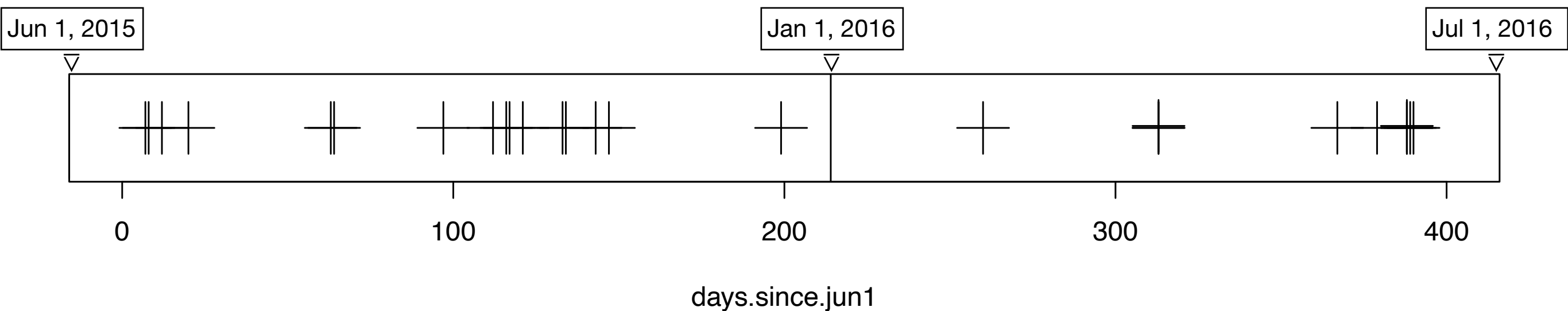
Insulin immunoassay warning

Please note that the insulin assay performed at RLUH is not suitable for the investigation of factitious hypoglycaemia. If exogenous insulin administration is suspected as the cause of hypoglycaemia, please inform the laboratory so that the sample can be referred externally for analysis.

Insulin	
Description	A peptide hormone secreted physiologically by the β cells of the islets of Langerhans in the pancreas.
Indication	Investigation of the cause of hypoglycaemia.
Additional Info	Proteolytic cleavage of 86 amino acid proinsulin polypeptide prior to secretion produces mature insulin molecule (51 amino acids) and equimolar quantity of c-peptide. Insulin is secreted in response to activation of sulphonylurea-sensitive K^+ channel in response to hyperglycaemia and other secretagogues. Insulin is the dominant hormone regulating blood glucose concentration and has numerous modes of action that reduce circulating glucose levels. Insulin action is impaired in diabetes mellitus through either absolute deficiency (type 1) or relative tissue resistance (type 2). Tumoural secretion of insulin (insulinoma) is a rare cause of hypoglycaemia. Very rarely, tumours may cause hypoglycaemia through secretion of proinsulin or IGF-2. Please note that the insulin assay performed at RLUH is not suitable for the investigation of factitious hypoglycaemia. If exogenous insulin administration is suspected as the cause of hypoglycaemia, please inform the laboratory so that the sample can be referred externally for analysis.
Concurrent Tests	Plasma glucose to confirm hypoglycaemia. Serum c-peptide and serum ketones where appropriate.
Dietary Requirements	Fasting sample required
Interpretation	Insulin must be interpreted in the context of the prevailing glucose level, ideally when the patient is demonstrably hypoglycaemic (plasma glucose ≤ 2.5 mmol/L in adults). Normal insulin/glucose ratio: < 5.0 mU/mmol. (See also entry on c-peptide/insulin ratio: http://rlbuhtnet/jps/c_peptide_insulin_ratio.pdf)
Collection Conditions	Fasting sample (where appropriate) or sample collected during hypoglycaemic attack. <u>Inpatients</u>: Sample must be received in laboratory within 30 minutes of venepuncture. <u>External hospitals</u>: Separate serum within 30 minutes of collection and freeze immediately. Send samples frozen.
Frequency of testing	As required, contact lab for urgent analysis.

Timeline of 25 indictment events

Lucy Letby: fully qualified and full time on unit, January 2015–June 2016



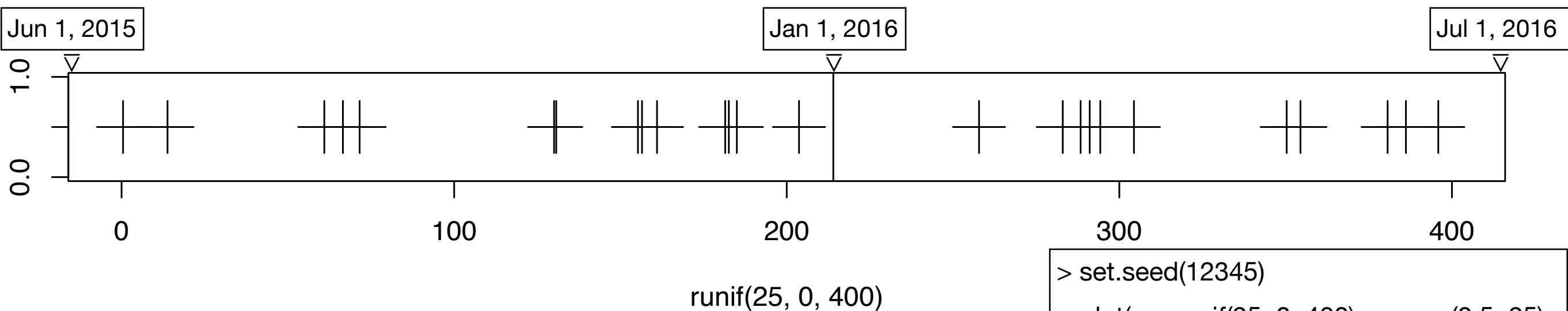
First event: June 8, 2015

Last event: June 27, 2016

Note the tight clustering

Timeline of 25 random events

Does this look random? Or do you see gaps and clusters?



First event: June 1, 2015

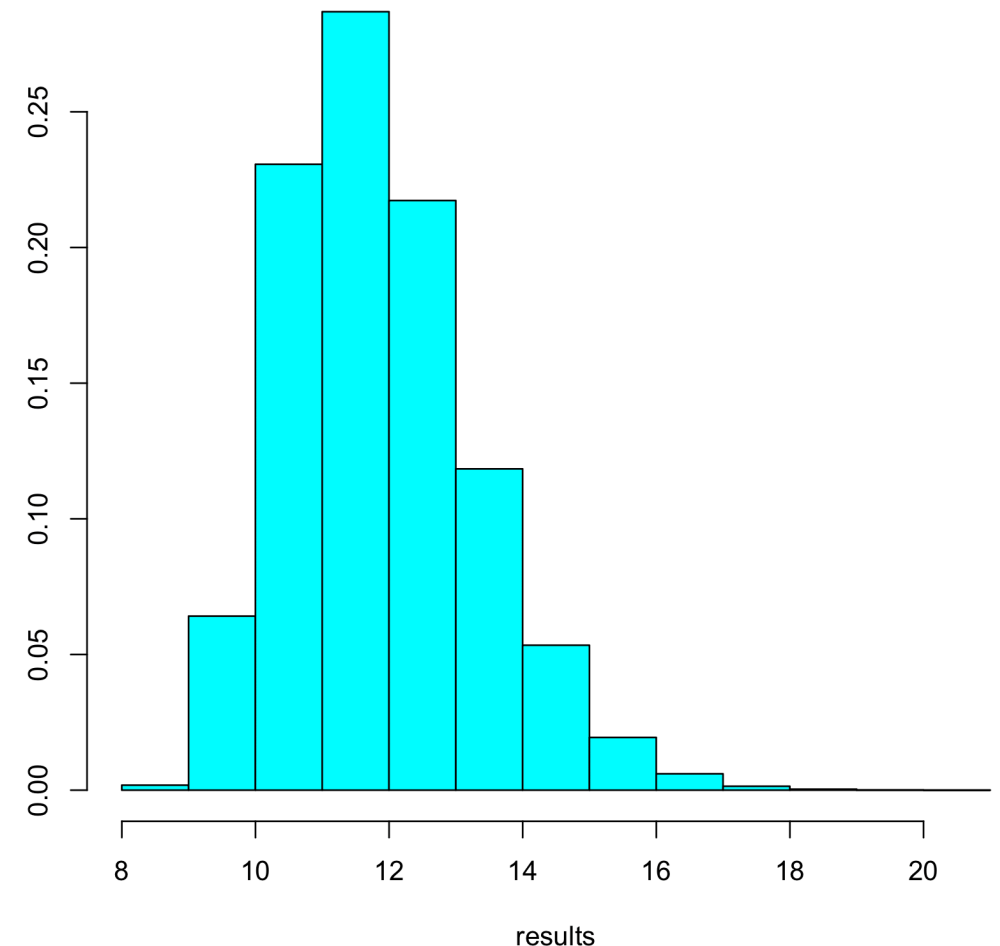
Last event: June 26, 2016

```
> set.seed(12345)
> plot(x = runif(25, 0, 400), y = rep(0.5, 25),
+      xlim = c(0, 400), ylim = c(0, 1),
+      type = "p", pch = 3, lab = c(5, 3, 7),
+      ylab = "", cex = 3)
```

Note the not quite as tight clustering, similar gaps

Lucy Letby: the spike

```
> simulate_max_fixed_n <- function(n, window_w, total_T, n_reps = 1000) {  
+   max_counts <- replicate(n_reps, {  
+     # 1. Generate n events from a Uniform distribution  
+     arrivals <- sort(runif(n, min = 0, max = total_T))  
+  
+     # 2. Sliding window count  
+     # For each arrival, count how many others fall within [t, t + w]  
+     window_counts <- sapply(arrivals, function(t) {  
+       sum(arrivals >= t & arrivals <= (t + window_w))  
+     })  
+  
+     max(window_counts)  
+   })  
+   return(max_counts)  
+ }  
>  
> results <- simulate_max_fixed_n(n = 24, window_w = 13/12,  
+   total_T = 3.5, n_reps = 10^6)  
>  
> truehist(results, h = 1)  
>  
> sum(results > 11) / 10^6  
[1] 0.418451
```



- The probability of a spike under the null hypothesis of complete randomness is 42%
- Statistically speaking, there was no spike!

Dramatis personae (1/4)

<https://www.blueprintforfreespeech.net/en/prize/recipient/2023/jayaram-brearey-gibbs>

Dr Ravi Jayaram, Dr Steve Brearey, Dr John
Gibbs and the other paediatric consultants at
the Countess of Chester NHS Trust

2023 BLUEPRINT UK

WHISTLEBLOWING PRIZE



Dramatis personae (2/4)

https://en.wikipedia.org/wiki/James_Goss_%28judge%29



James Richard William Goss was born on 12 May 1953 to judge William Alan Belcher Goss and his wife Yvonne. He was educated at [Charterhouse School](#), an independent [boarding school](#) in Surrey. Goss studied at [Durham University](#), where he was a member of [University College](#), and graduated in 1974 with a [Bachelor of Arts](#) (BA) degree. He was later appointed an [honorary fellow](#) of [Durham Law School](#).

Dramatis personae (3/4)

Retired paediatrician Dr Dewi Evans (lead prosecution expert)



Dramatis personae (4/4)

Lady Justice Thirlwall (chair of Thirlwall Inquiry)



Twins and multiples

Baby	Baby's fate
A	Neonatal death
B	Survived
E	Neonatal death
F	Survived
J	Survived
J's sibling	Died In utero > 24 wks
L	Survived
M	Survived
N	Survived
N's sibling	Unknown
O	Neonatal death
P	Neonatal death
O & P's sibling	Survived
Q	Survived
Q's sibling	Died In utero > 24 wks

Let's look more closely at the timeline

2nd half 2016 ...

- Letby moved to administrative tasks [no reason given]
- Management degrades unit to Level 1
- Deaths stop abruptly
- RCPCH (Royal College of Paediatrics and Child Health visits hospital
- A coroner had already determined natural death in all cases [root cause often “extreme prematurity” or “congenital deformations”; immediate cause “sepsis” or “pneumonia”. A new pathologist reviews at deaths. All are explicable, but in two cases further forensic investigation would be needed. [No preserved biological samples, no investigation performed at time of death]
- In 2015 and 2016, 6000 births in total. One expects $6 \times 0.3 = 1.8$ unexplained deaths

The RCPCH report

Published early 2017

- Extremely critical of clinical management of CoCH NICU
- Only two consultant rounds per week, should have been two per day
- No neonatologist
- Not enough sufficiently qualified nurses
- Insufficient guidance given to trainee doctors
- Too many cots/incubators in too small rooms
- Apparatus kept in hallway, insufficient apparatus

Let's look more closely at the timeline

End of 2nd half 2016 ...

- Lucy Letby believes she had been publicly bullied and unjustly accused by 6 paediatricians and one obstetrician, and her removal from patient care was uncalled for
- Brearey had been collecting evidence in his “drawer of doom”
- Gossip overheard in canteen lunch queue “seems you have an angel of death in your unit”
- She starts up a formal complaint procedure
- Her complaint is investigated by an external committee which upholds her complaint. Report states that consultants have lied.

Let's look more closely at the timeline

Early 2017 ...

- Consultants are ordered by management to apologise in person and writing to Lucy Letby
- Management starts discussing “managing out” Brearey and Jayaram
- Management contact Chester Constabulary [some deaths still unexplained, forensic investigation still needed].
- Note: the RCPCH team did not include a statistician or epidemiologist. **The cause of the spike has still not been investigated!** Brearey and Gibbs present statistics which suggest there was no increase in activity or acuity
- Brearey and Jayaram panic. Contact police directly

Early 2017 ...

- Thanks to Thirlwall we now have the WhatsApp group chats and emails between the consultants in this crucial period
- The consultants had been explicitly discussing how to “pique the interest” of the police by cherry picking statistics; Jayaram brings up a fantasised story “**etched in his memory for ever**” involving Letby and Baby K
- The notion that many unexplained and unexpected collapses and deaths involved a strange mottling of the skin (or a strange rash) starts to be discussed ... air embolism? **Lee & Tanswell 1989**

[Review](#) > [Arch Dis Child](#). 1989 Apr;64(4 Spec No):507-10. doi: 10.1136/adc.64.4_spec_no.507.

Pulmonary vascular air embolism in the newborn

[S K Lee](#)¹, [A K Tanswell](#)

Affiliations + expand

PMID: 2658851 PMCID: [PMC1592039](#) DOI: [10.1136/adc.64.4_spec_no.507](#) [↗](#)

Lee & Tanswell 1989

Lee's sign

- A remarkable shifting pattern of mottling (pink on grey) occurs in 10% of Vascular Air Embolisms
- It is unique to Vascular Air Embolism
- The CoCH doctors claim to have seen it again and again!

March, May, 2017 ...

- Jayaram and Brearey visit the police and convince them to investigate
- Operation Hummingbird is started in May
- Police request medical notes of all deaths Jan 2015 – June 2016 and of all babies experiencing unexplained and unexpected collapses [who do you think compiles that material?]
- Newspaper report police investigating a cluster of unexplained deaths at CoCH NICU
- Dewi Evans turns up at police station and diagnoses criminal activity in 10 minutes over a cup of coffee. Suggests police get nursing rosters

The police investigation

Tunnel vision; violation of standard rules of procedure

- Letby is arrested for questioning three times: 2018, 2019, 2020
- TV cameras are ready in the street
- The third time she is charged with murder and attempted murder
- Police dig up her front garden in Chester and search the gutters of her house
- Brearey, looking through old medical notes, discovers the two insulin cases
- Due to Covid, trial only starts in 2020, lasts 10 months

What never happened

- Mothers' medical notes were never investigated
- Police started to get advice from a statistician (Prof Jane Hutton) but the local CPS told them to “drop that line of enquiry”, which they did
- Dewi Evans was the sole medical expert during the police investigation (standard procedure is to recruit a multidisciplinary medical team)
- The case was handled by the regional CPS while the case required national level

What did the defence do?

Why was the defence so feeble?

- One defence expert witness did testify during the trial: the plumber
- The defence sole medical expert witness was never called to the stand
- Five key requests were made to the judge, all five were turned down:
 - Request that prosecution reveals how the 25 cases were selected?
 - Request to bar Dewi Evans as expert witness (letter from Lord Justice Jackson)
 - Request to bar jurors who talked about case in a pub and admitted media influence
 - Request to go through the indictments in order, prosecution & defence for each indictment. Judge ruled all prosecution first, then all defence
 - “Each indictment stands on its own” yet: first trial convictions can be used to evaluate case of baby K in second trial
 - [Prosecution kept saying: “Letby is the common denominator”]

Pretrial meeting of experts

- About 10 scientific experts for prosecution
- One for the defence
- My guess: the judge was convinced of Letby's guilt. Perhaps her defence team was too

What convinced judge, jury, and public?

The insulin poisonings

- There is no evidence at all that anyone tampered feeding bags of otherwise administered insulin without authorisation
- Three insulin experts (all NHS employees) testified that the **only** explanation of the anomalous insulin/C-peptide ratios observed for babies F and L was administration of insulin
- One of them is the co-author of a standard paper on the question. Her testimony contradicts her own published work

[Review](#) > [Diabetes Res Clin Pract.](#) 2013 Sep;101(3):248-54.

doi: 10.1016/j.diabres.2013.05.002. Epub 2013 Jun 14.

Forensic aspects of insulin

[Vincent Marks](#)¹, [Gwen Wark](#)

Affiliations + expand

PMID: 23751444 DOI: [10.1016/j.diabres.2013.05.002](#) [↗](#)

V Marks, G Wark (2013), Forensic aspects of insulin

***Diabetes Research and Clinical Practice* 101 (3) 248–254**

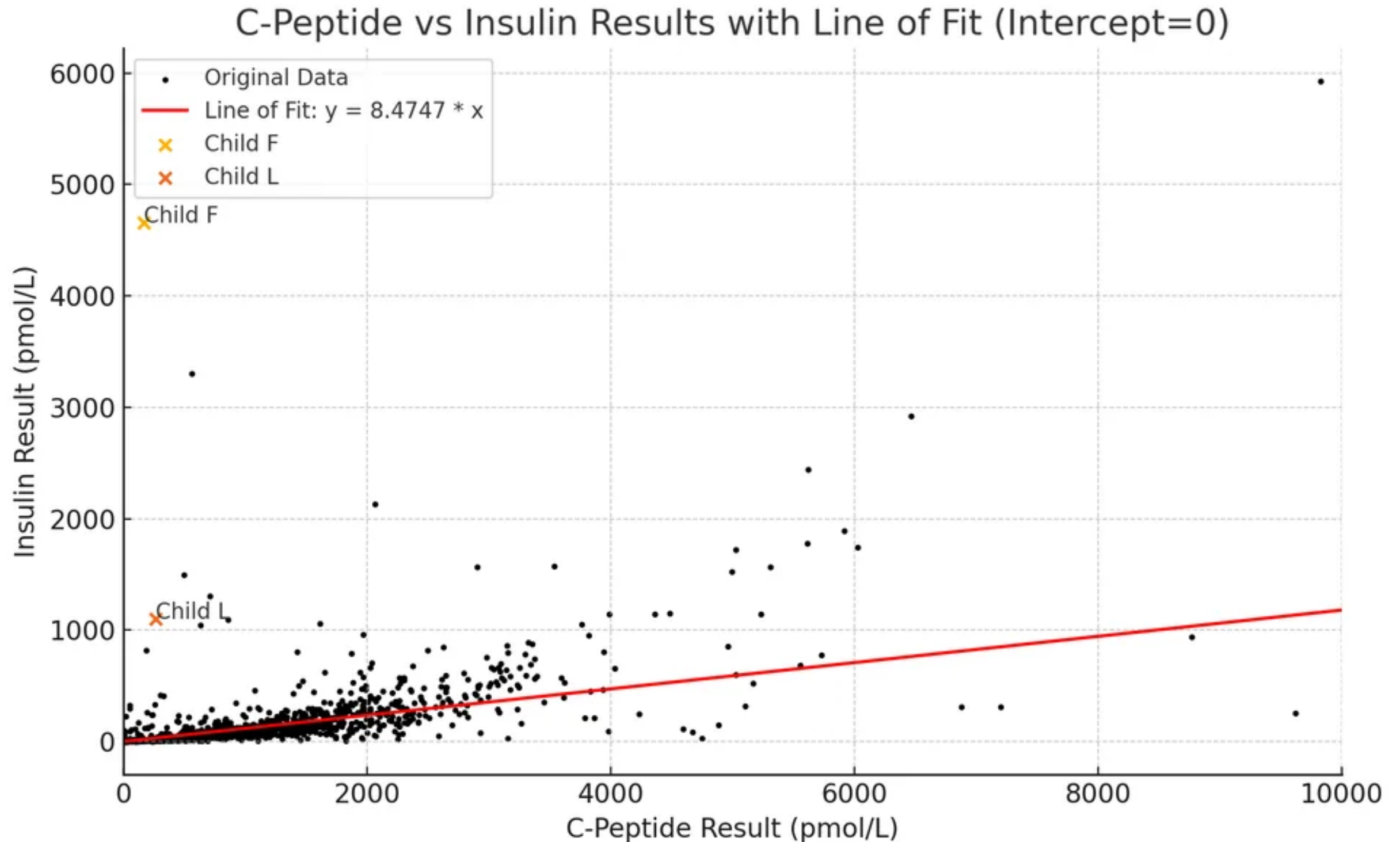
Insulin or, more appropriately, hypoglycaemia gives rise to a wide variety of interactions with the law. In most cases its role is not seriously open to question occasionally however, it is. This is especially true of situations in which insulin is suspected of having been used inappropriately or maliciously. The major differences between investigation of hypoglycaemia in clinical and forensic situation are that in the latter the history is often unreliable, appropriate samples for analysis were not collected, preserved or labelled correctly and analytical results are likely to be challenged on grounds of specificity, accuracy and interpretation. Immunoassay remains the mainstay of clinical investigation of hypoglycaemia but likely to become displaced by mass-spectrometry in the forensic situation especially now that human insulin is being replaced by synthetic insulin analogues for the treatment of diabetes.

Discussion in social media

- “Thanks to a Freedom of Information request, blood test records from (2020-2023) the Liverpool University Hospitals NHS Foundation Trust are available for a quick analysis.”
- https://www.reddit.com/r/LucyLetbyTrials/comments/1e8l9oc/comparing_insulin_and_cpeptide_levels_in_lucy/
- 1368 measurements (later period, newer machine)

Year of Test	C-Peptide Result (pmol/L)	Insulin Result (pmol/L)	NA = Sample haemolysed and therefore no result
2020	2498	817	
2020	1806	169	
2020	1442	88	
2020	34	3	
2020	343	19	
2020	1513	298	
2020	3041	650	
2020	98	115	
2020	2254	318	
2020	NA	NA	

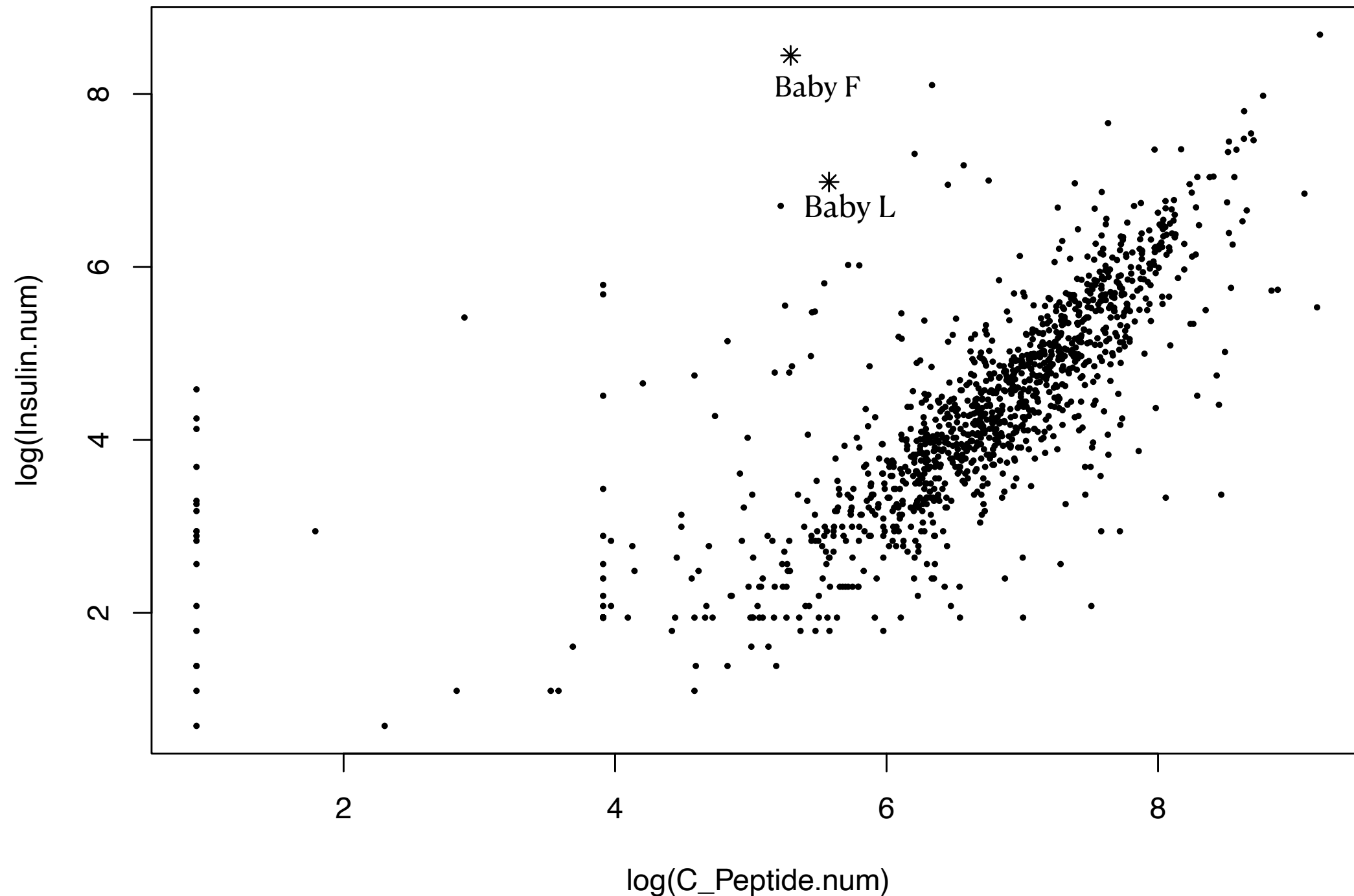
The wrong plot



[https://www.whatdotheyknow.com/request/
blood_test_records_for_insulin_a](https://www.whatdotheyknow.com/request/blood_test_records_for_insulin_a)

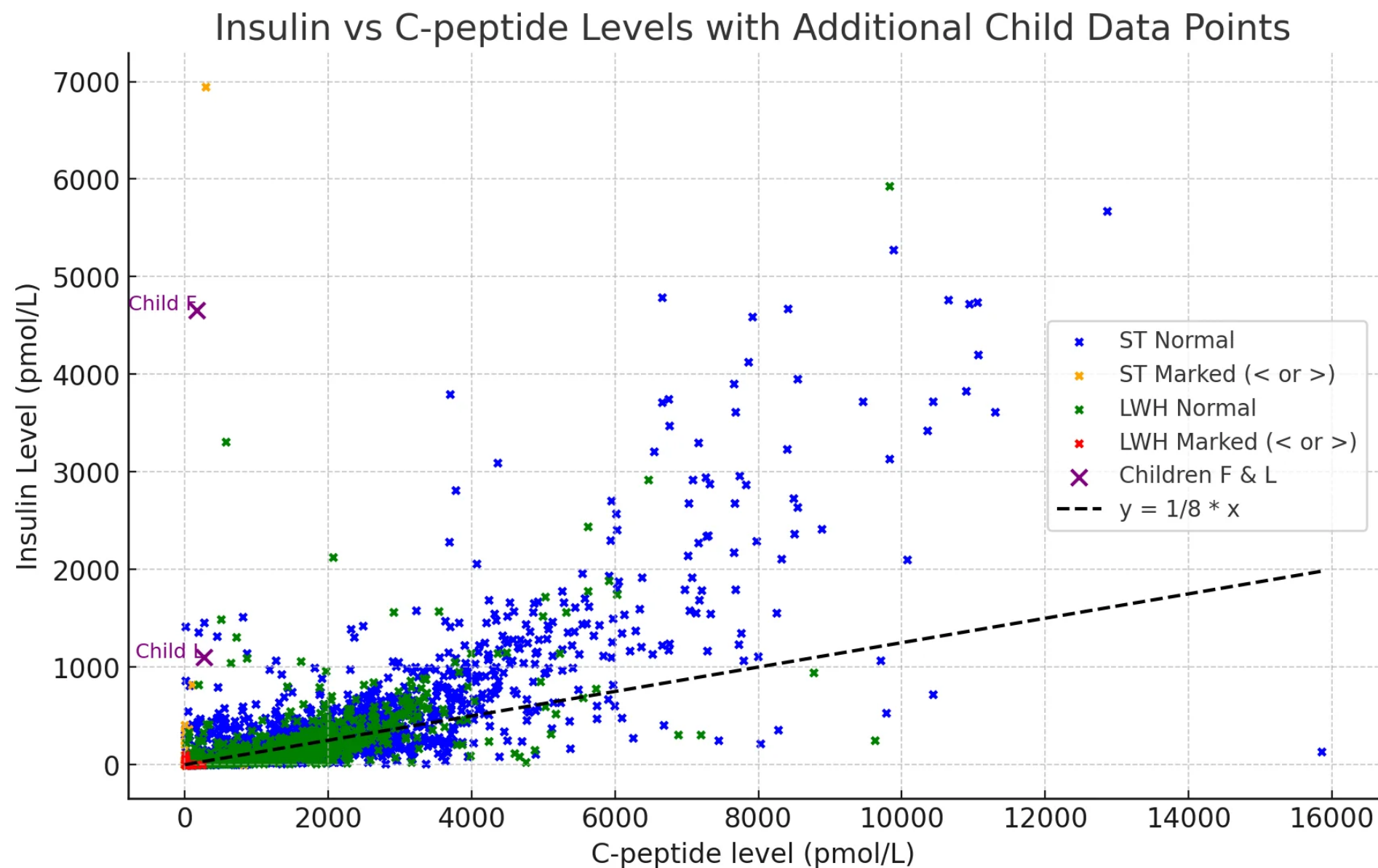
The correct plot

- Child F: C-Peptide < 169, Insulin 4657
- Baby L: C-peptide 264, Insulin 1079



Another wrong plot

More data, from a different hospital



New developments

...and controversy

- Chase and Shannon
 - Chase JG, Shannon HD (2026) Inverted insulin to C-Peptide ratios in neonatal intensive care: is there something we don't know? *Front. Pediatr.* 14:1900675. doi: 10.3389/fped.2026.1900675
- Ismail and Wilkinson-Herbots; Neil Aiton
 - Ismail AAA, Wilkinson-Herbots HM (2016) Insulin/C-peptide interpretation in infants with hypoglycaemia of unknown origin. *Annals of Clinical Biochemistry: International Journal of Laboratory Medicine.* 2026;0(0). doi:10.1177/00045632261489517

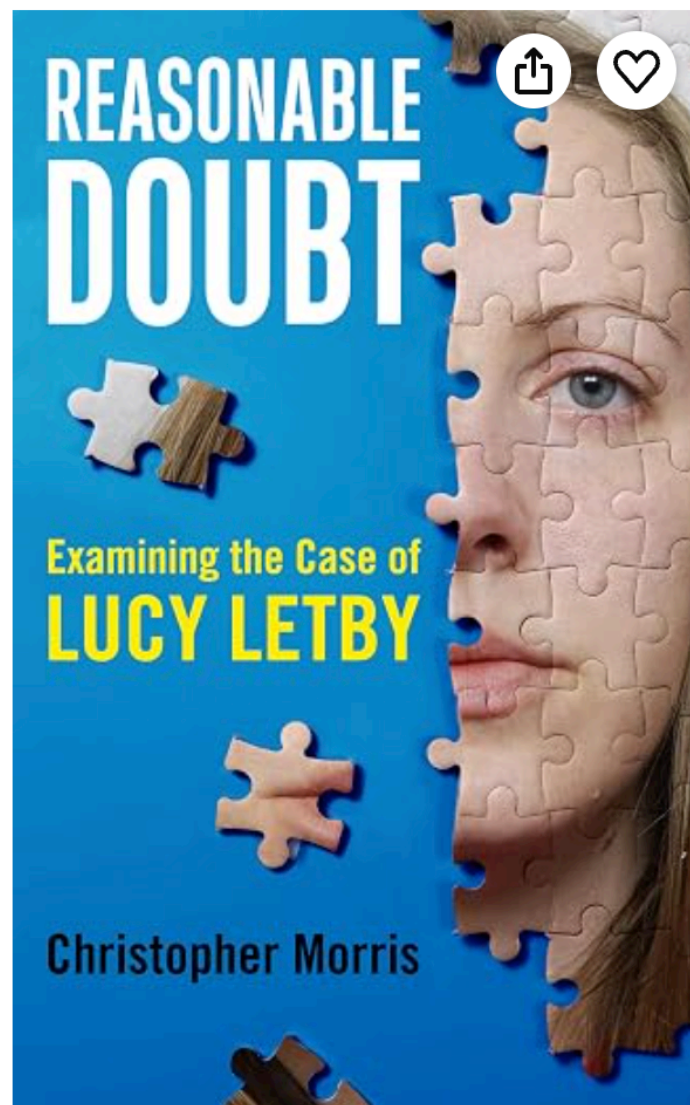
Some further titbits

Three crucial medical witnesses were granted anonymity

- One anonymised doctor had recently accidentally caused the death of baby Noah Robinson by wrong insertion of a breathing tube!
- One anonymised doctor became rather close with Lucy Letby ask was the only one of the “higher up” colleagues to support her. At her trial he betrayed her trust. His betrayal was rewarded by rapid promotion. However later the Mother of one of the baby’s accused him of having given confidential information about her baby to Letby. As a result he was fired from his consultant position in Liverpool. He also got cancer. Committed suicide, about the same time as former Cambridge Prof. Jason Arday. He was given anonymity to protect his wife and two children who at the time were doing GCE examinations!

A very important resource

- <https://www.amazon.nl/-/en/Christopher-Morris-ebook/dp/B0GSKLM8D6/>



Reasonable Doubt: Examining the Case of Lucy Letby (English Edition)

English edition | by [Christopher Morris](#) (Author), [Christopher Morris](#) (Author) | Format: Kindle Edition

4.9 ★★★★★ (197)

[See all formats and editions](#)

Christopher Morris believes Lucy Letby has been the victim of a miscarriage of justice, and that her guilty verdict is not beyond reasonable doubt. He is not the only one.

Ever since the nurse was condemned to fifteen life sentences, highly-regarded professionals in their fields have gone on record to raise concerns about the evidence used to convict her. The science behind how her victims died, the reliance on circumstantial evidence, and the interpretation of the statistics used against Lucy Letby are all being questioned. Controversially, the defence did not call an expert witness to challenge the medical evidence presented by the prosecution. Nobody, except her lawyers, knows why.

In a quest to find out if he is correct, the author has interviewed scores of those experts. He has also pored over the thousands of documents submitted to the Thirlwall Inquiry, which is examining what went wrong at the Countess of Chester Hospital, as well as the transcripts of the trial. He has pulled this vast amount of information together into an engrossing journey through the uncertainties many feel undermine the conviction of Lucy Letby.

The answer matters for us all, as it raises serious questions about whether our justice system really does seek the truth.

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