

Probability and Random Processes

ECS 315

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6.2 Independence



Office Hours:

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Monday **9:30-10:30**

Monday **14:00-16:00**

Thursday **16:00-17:00**

Sally Clark



[<http://www.sallyclark.org.uk/>]

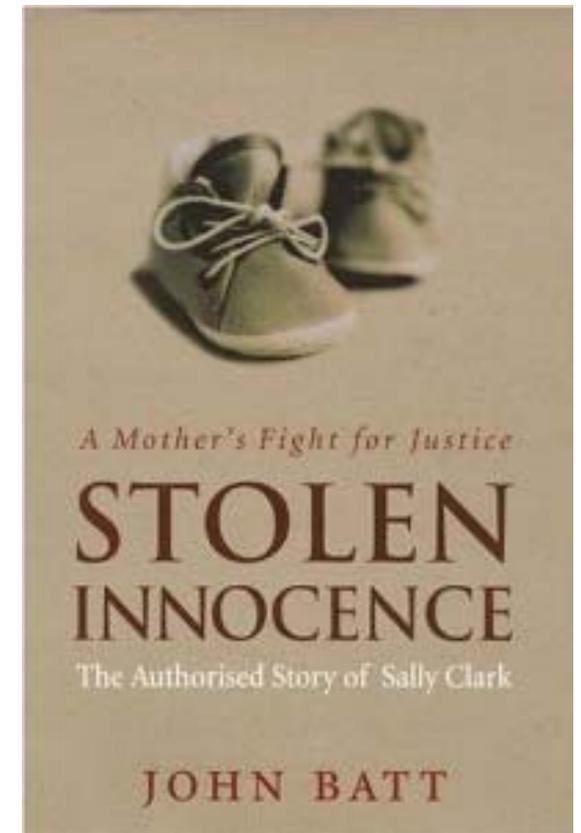
[http://en.wikipedia.org/wiki/Sally_Clark]

[<http://www.timesonline.co.uk/tol/comment/obituaries/article1533755.ece>]



Sally Clark

- **Falsely accused** of the **murder of her two sons**.
 - Clark's first son died suddenly within a few weeks of his birth in 1996.
 - After her second son died in a similar manner, she was arrested in **1998** and tried for the murder of both sons.
- The case went to appeal, but the convictions and sentences were confirmed in 2000.
- Released in **2003** by Court of Appeal
- Wrongfully imprisoned for more than 3 years



Misuse of statistics in the courts

- Her prosecution was controversial due to **statistical evidence**

- This evidence was presented by a **medical expert** witness

Professor Sir Roy **Meadow**,



$$\left(\frac{1}{8500}\right)^2 \approx 10^{-8}$$

- Meadow testified that the **frequency** of sudden infant death syndrome (SIDS, or “cot death”) in families having some of the characteristics of the defendant’s family is 1 in 8500.
- He went on to **square** this figure to obtain a value of 1 in 73 million for the frequency of **two cases** of SIDS in such a family.



Royal Statistical Society



- “This approach is, in general, **statistically invalid.**”
- “It would only be valid if SIDS cases arose **independently** within families, an assumption that would need to be justified empirically. “
- “There may well be unknown genetic or environmental factors that predispose families to SIDS, so that **a second case within the family becomes much more likely.**”

[<http://www.rss.org.uk>]



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4. to reject bribery in all its forms;
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7. to seek, accept, and offer honest criticism of technical work, to acknowledge and correct errors, and to credit properly the contributions of others;
8. to treat fairly all persons regardless of such factors as race, religion, gender, disability, age, or national origin;
9. to avoid injuring others, their property, reputation, or employment by false or malicious action;
10. to assist colleagues and co-workers in their professional development and to support them in following this code of ethics.



Epilogue

- Clark's release in January 2003 prompted the Attorney General to order a **review** of hundreds of other cases.
- **Two other** women convicted of murdering their children had their convictions overturned and were **released** from prison.
- Trupti Patel, who was also accused of murdering her three children, was acquitted in June 2003.
- In each case, Roy Meadow had testified about the unlikelihood of multiple cot deaths in a single family.

