

# Probability and Random Processes

## ECS 315

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## 6.2 Independence



### Office Hours:

BKD, 6th floor of Sirindhralai building

Tuesday 9:00-10:00

Wednesday 14:20-15:20

Thursday 9:00-10:00

# Sally Clark



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

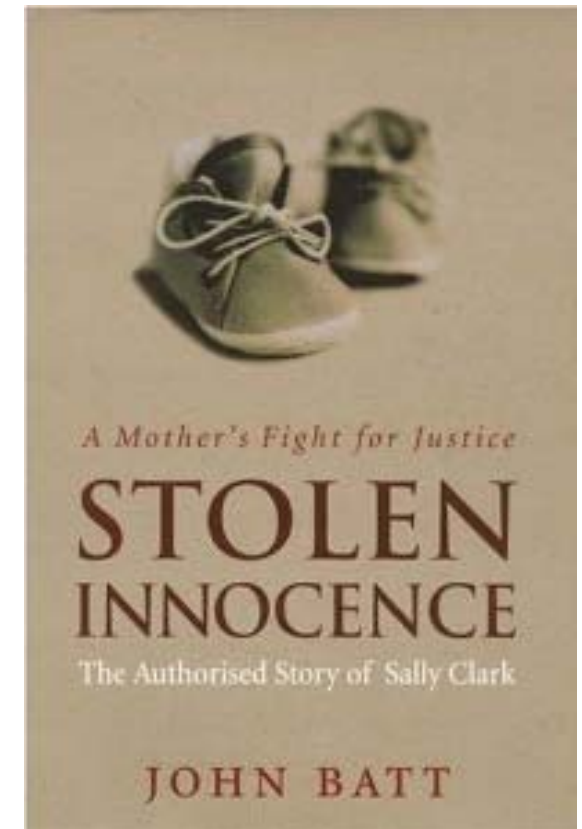
[[http://en.wikipedia.org/wiki/Sally\\_Clark](http://en.wikipedia.org/wiki/Sally_Clark)]

[<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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2. to avoid real or perceived conflicts of interest whenever possible, and to disclose them to affected parties when they do exist;
3. to be honest and realistic in stating claims or estimates based on available data;
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;
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