



# The Royal Statistical Society

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## Royal Statistical Society

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## News Release

**Embargoed until 00.00hrs Tuesday 23 October 2001**

### **Royal Statistical Society concerned by issues raised in Sally Clark case**

The Royal Statistical Society today issued a statement, prompted by issues raised by the Sally Clark case, expressing its concern at the misuse of statistics in the courts.

"In the recent highly-publicised case of R v. Sally Clark, a medical expert witness drew on published studies to obtain a figure for the frequency of sudden infant death syndrome (SIDS, or "cot death") in families having some of the characteristics of the defendant's family. 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.

"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. Not only was no such empirical justification provided in the case, but there are very strong *a priori* reasons for supposing that the assumption will be false. 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.

"The well-publicised figure of 1 in 73 million thus has no statistical basis. Its use cannot reasonably be justified as a "ballpark" figure because the error involved is likely to be very large, and in one particular direction. The true frequency of families with two cases of SIDS may be very much less incriminating than the figure presented to the jury at trial.

"Aside from its invalidity, figures such as the 1 in 73 million are very easily misinterpreted. Some press reports at the time stated that this was the chance that the deaths of Sally Clark's two children were accidental. This (mis-)interpretation is a serious error of logic known as the Prosecutor's Fallacy. The jury needs to weigh up two competing explanations for the babies' deaths: SIDS or murder. Two deaths by SIDS or two murders are each quite unlikely, but one has apparently happened in this case. What matters is the relative likelihood of the deaths under each explanation, not just how unlikely they are under one explanation (in this case SIDS, according to the evidence as presented).

"The Court of Appeal has recognised these dangers (R v. Deen 1993, R v. Doheny/Adams 1996) in connection with probabilities used for DNA profile evidence, and has put in place clear guidelines for the presentation of such evidence. The dangers extend more widely, and there is a real possibility that without proper guidance, and well-informed presentation, frequency estimates presented in court could be misinterpreted by the jury in ways that are very prejudicial to defendants.

"Society does not tolerate doctors making serious clinical errors because it is widely understood that such errors could mean the difference between life and death. The case of R v. Sally Clark is one example of a medical expert witness making a serious statistical error, one which may have had a profound effect on the outcome of the case.

"Although many scientists have some familiarity with statistical methods, statistics remains a specialised area. The Society urges the Courts to ensure that statistical evidence is presented only by appropriately qualified statistical experts, as would be the case for any other form of expert evidence."

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**Notes:**

Founded in 1834, the Royal Statistical Society is one of the world's leading statistical societies, and one of the UK's oldest professional societies. It awards the professional qualification of Chartered Statistician, or CStat, to those who meet its stringent criteria for academic achievement and professional experience in statistics.

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