Health professionals strive to understand their patients' experience of illness and distress. As we share the frustration and anger of those whose health is undermined by poverty this understanding becomes part of a process of developing solidarity with disadvantaged individuals and communities. Once suffering is expressed, it becomes tangible and demands redress. This is fundamental to medicine and healing; it applies no less to social injustice. If we hear of suffering but do not work alongside the sufferer for redress, we abandon our task.

The International Poverty and Health Network is a worldwide network of people and organisations from health, business, non-governmental organisations, and government who seek to influence policy to protect and improve the health of the world's poor, particularly the poorest in all countries. The network urges that a balance must be struck between social development and growth in income; between the human and financial dimensions of poverty; and between redistribution and market reforms. Our aspiration is to achieve a balance between biomedical and social approaches; between community based health development and a response to individuals; between prevention of disease, promotion of health, and treatment; and between physical and mental health.

Over the next few years supporters of the network will strive to reduce the burden of ill health due to poverty in the following ways:

● Engaging in strategic discussions with the International Monetary Fund, the World Bank, the World Health Organisation, and national governments to ensure that health is put at the centre of development. We urge health impact assessments of all policies.

● Promoting action for health locally, regionally, and nationally by working with sectors such as education, business, agriculture, and transport.

● Building the evidence base on effective interventions to reduce inequalities in health and how improved health can reduce poverty.

● Facilitating exchange among health professionals in north and south about effective ways of working (such as WorldSpace's public health channel, see p 8).

● Ensuring that education programmes for health professionals include information on the impact of socioeconomic inequalities on health and what they can do to reduce such inequalities.

● Encouraging health professionals to work with local communities to improve the health of the poorest.

● Monitoring trends in health inequalities and using the data to influence policy.

We invite others to join us in this endeavour. Why not you?

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We hope that a version of this editorial will appear in many other medical journals. International signatories appear on the *BMJ*'s website.

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Conviction by mathematical error?

Doctors and lawyers should get probability theory right

In a recent case of DNA evidence the probability of a chance match was quoted as 20 million to one. The accurate statement—that the defendant or two other unknown people in the United Kingdom could have committed the offence—is much less impressive. Other evidence was overwhelming, but this may not always be true, especially with matches from DNA databases. Even more problematic than the issue of presenting statistical evidence fairly is the problem of getting it wrong.

On 9 November at Chester Crown Court Sally Clark, a Cheshire solicitor, was convicted, by 10-2 majority, of smothering her two infant children. With conflicting forensic evidence, the Crown's case was bolstered by an eminent paediatrician testifying that the chances of two cot deaths happening in this family was vanishingly small—1 in 73 million. This seriously misunderstands probability theory. It is speculation whether Sally Clark would have been acquitted without this evidence. But with this mathematical error prominent the conviction is unsafe.

Imagine an archery target with two arrows sticking in the very centre of it. This provides greater evidence of the skill of the archer if the target was in place before the arrows were fired than if it was drawn around them afterwards. Probability theory requires calculation of the probability not only of the event in question but also of all events that are as extreme or more extreme.

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When the target is drawn first you calculate the chance of both arrows hitting the centre of the target. But when the target is drawn round the arrows afterwards you calculate the chance of both arrows hitting the same point, whatever that point. With two independent arrows one probability is the square of the other.

Suspicion was drawn to Sally Clark by the occurrence of two deaths so the probabilities should not have been squared. The odds of 1 in 73 million shrink to 1 in 8500. But this figure is itself meaningless. There is in fact a wall full of arrows with the target drawn around the two that are close together and the others ignored. Mathematical formulas for this situation often surprise people. For example, with only 23 people in a room the odds are better than 50% that two of them have the same birthday.

From whole population data Reese calculates the square of the population risk of cot death as 1 in 2.75 million.[1] There are 378 000 second or subsequent births each year in England. So if cot deaths are random events two cot deaths will occur in the same family somewhere in England once every seven years. But cot deaths are not random events. There have been several studies of recurrence. At least one study did show no increase in recurrence rates.[2] But several others showed recurrence rates about five times the general rate,[3–5] implying recurrence somewhere in England about once every year and a half. Two studies showed even higher rates.[6 7]

The fact that studies of recurrence have been done means this event is not vanishingly rare. In a case series of recurrent infant death Emery classified two cases as recurrent cot death out of 12 cases occurring in Sheffield in 20 years.[8] Wolkind et al found five cases in their unsystematic English case series of 57 recurrent infant deaths.[9] Both these studies distinguished cot death from accident, illness, murder, and neglect.

The prosecution used the figure of 1 in 73 million rather than 1 in 2.75 million because of the family's affluence. Yet taking data from an epidemiological group and applying it stereotypically to all members is an example of the ecological fallacy. Social class is a complex reality of interassociated circumstances—education, work, income, lifestyle, culture, contacts, residence, opportunities, social class of origin, etc—statistically summarised for use in population studies by selecting the one variable which performs best as an indicator. This does not mean that individuals have the attributes of the statistical group.

Guidelines for using probability theory in criminal cases are urgently needed. The basic principles are not difficult to understand, and judges could be trained to recognise and rule out the kind of misunderstanding that arose in this case. Never again must mathematical error be allowed to conflict with mathematical fact as if each were a legitimate expert view.

What is our profession's responsibility for the quality of expert evidence given by doctors? Medical evidence is trusted, and we must retain that situation and ensure that it is not abused. It is possible to be an extremely good doctor without being numerate, and not every eminent clinician is best placed to give epidemiological evidence. Doctors should not use techniques before they have acquainted themselves with the principles underlying them.

When errors occur we expect them to be admitted, learnt from, and corrected. Should clinical governance extend to the courtroom? Expert witnesses can hold a substantial part of defendants' lives in their hands. Defendants deserve the same protection as patients.

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Predisposing biases: SJW is a vice president and immediate past president of the Medical Practitioners' Union, which is predisposed to support the civil liberties movement. He has no personal acquaintance with people involved in this case.

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Managing women with epilepsy

Guideline producers now need to pay attention to implementation

In the mid-1800s Sir Charles Locock first used the earliest antiepileptic drug of modern times, potassium bromide, to treat a group of women with catamenial epilepsy. Such gender selection unintentionally pointed to the future recognition that gender matters in epilepsy. We now know about important interactions between epilepsy and its treatment and women's sexuality, conception, pregnancy, motherhood, and menopause; we also know that the offspring's health and heredity may be affected. Literature for clinicians on women with epilepsy has grown steeply in recent years. The Medline database alone contains over 40 review articles published in English in the past 25 years, almost half of which were published within the past five years. Has this expansive literature resulted in better care for women with epilepsy?

The evidence suggests that information has been slow to influence clinical practice. European and American surveys consistently show that clinicians either lack familiarity with or fail to advise epileptic