Healthcare doesn't comply with standard economic theories . . . More is not always better, and the best outcome is no intervention
Des Spence, p 49

PERSONAL VIEW **James Le Fanu**

Mathematics medicalises us all

Mathematics—"the language in which God has written the universe," according to Galileo—can also be the enemy of reason. Twelve years ago the financial analyst David Li devised a function that allowed the risk of dodgy subprime mortgages to be repackaged as securitised collateral debt obligations. You don't need to understand what this means because the consequences are familiar enough. The credit crunch, to which this mathematics made so substantial a contribution, would bankrupt sovereign states, require banks to be taken into public ownership, and cost the US economy, it is estimated, a cool $4.6 trillion (£2.9 trillion; €3.5 trillion).[1] And so too in medicine, though here the penalty for deferring uncritically to the authority of mathematics is a tidal wave of iatrogenic illness. Many letters from readers of my weekly medical column in the *Daily Telegraph* recount their experiences of the current enthusiasm for medicalisation. Typically, as one put it, "I visited my surgery for a flu jab in a good state of mind and ended up a worried patient," after the practice nurse seized the opportunity to measure his blood pressure and suggest "a few blood tests." Summoned back a week later they learn they have hypertension or diabetes or raised cholesterol that warrants treatment indefinitely. This is all very baffling because they pride themselves on keeping physically fit ("I still play a reasonable game of tennis twice a week"), but does at least mean they are quick to spot the adverse effects on their wellbeing—unusual aches and pains, swollen ankles, loss of memory, disturbed sleep, and so on: "Within a couple of weeks I went from an active 65 year old to a doddering old man." They are not amused. "Would I be right in thinking the purpose of my joining the vast mass of people taking unnecessary drugs is to boost the practice's income?" inquired one "fit and healthy" 76 year old woman.

The cause of all this is the 2004 general medical services contract, which prioritises a population based approach to the primary prevention of cardiovascular disease. Intuitively it would seem a bad idea to link doctors' remuneration to their success in treating surrogate end points at the expense of old fashioned clinical doctoring.[2]

It would seem a bad idea to link doctors' remuneration to their success in treating surrogate end points at the expense of old fashioned clinical doctoring

Enshrining the general medical services contract at the heart of general practice betrays a consistent disregard for what Jacob Bronowski described as "science's defining ethic—the habit of truth."

Recently, preparing a further edition of *The Rise and Fall of Modern Medicine* (see *BMJ* 1999;319:1276) has provided me with the opportunity to revisit the elaborate façade of epidemiological knowledge portraying the circulatory disorders as the consequence of lifestyle induced risk factors.[3] This inspired, in turn, the so called population based approach as originally proposed by the late Sir Geoffrey Rose. Modest reductions in the quantities of fat and salt in the diet would, he argued, shift downwards the mean distribution of the physiological variables of serum cholesterol and blood pressure, with a substantial impact on preventing heart disease and stroke.[4]

Rose's supposition, improbable given the laws of homoeostasis, that these dietary changes would have the desired effect, was duly refuted by the negative findings of the massive risk factor intervention trials in the 1980s.[5] No matter; his proposed strategy remains a central tenet of public health epidemiology—though those goals of risk reduction are now to be achieved by pharmacological means. But can they?

The problem here is that the striking rise and equally precipitous fall in the incidence of heart disease in the past 60 years is strongly suggestive of some underlying (if unknown) biological cause, which would mean the contribution of those risk factors is not quite as determinant as commonly presumed. It would seem impossible to tell because the mathematical algorithms for the modelling of cardiovascular risk are at least as obscure as David Li's Gaussian copula function. They use, first, the Kaplan-Meier estimate, before calculating the Brier score, the D statistic, and an R^2 statistic ("a measure of explained variation whose higher values indicate more explained variation") before measuring the area under the receiver operator curve.[6]

The upshot is that 3.2 million people in the UK (including almost all over the age of 75) are apparently at "high risk"[7]—all warranting medical treatment for which the evidence of benefit, from drug company sponsored clinical trials, is inevitably coloured by the need to maximise their market share of big pharma's $800bn annual revenues.

There is (much) more. How come those expert committees invariably conclude the cut-off level for initiating treatment should be lowered still further?[8] Why should the contribution of the glycaemic effect of those liberally prescribed statins and antihypertensives to the rising incidence of diabetes—with all the potential to ratchet up the process of medicalisation still further—cause so little concern?[9 10]

Doctors who wish to limit the substantial threat that the general medical services contract poses to their patients' health will discover, when auditing those older than 80 who are taking statins, that half will have symptoms that could be attributed to one or other of the (on average) 10 different drugs they are taking daily. They might then consider applying the commonsensical rule of thumb: "What if this were my mother?"

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References are in the version on bmj.com.

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BETWEEN THE LINES **Theodore Dalrymple**

Innocent tumours

When I was a student I lodged with musicians. One of them was fascinated and horrified by my pathology textbooks, though by comparison with such books of past eras, they were, well, less pathological.

I was reminded recently of the days when my musician friend used to leaf through my books and cry out, "Oh no, look at that!" (and then search for something even worse) when I bought a copy of the third edition of Sir John Bland-Sutton's *Tumours Innocent and Malignant* (1903) in a small secondhand bookshop in the spa town of Malvern. I bought it because it was inscribed by the author (to W Perry Briggs, whom I have not been able to trace) and I suffer from the absurd notion that the signature of an author in a book somehow puts one in closer relation with him, rather as spiritualists believe that séances do.

Sir John Bland-Sutton (1855-1936) was a most remarkable man. The force of his personality emanates almost palpably from his entry in the *Dictionary of National Biography* and its accompanying photograph. He was a small man who was said to have resembled Napoleon. As a surgeon he was dextrous and decisive. He had a ferocious—but constructive—determination to succeed, and he was generous to his juniors.

He was born the second of nine children to parents who were by no means rich. His father was, among other things, an animal slaughterer and market gardener, but also an amateur taxidermist from whom the young John learnt an interest in natural history. He trained to be an elementary school teacher, but was always determined to be a surgeon; he scrimped and saved enough to go to medical school, where in his first years he dissected 12 000 specimens, from fish to stillborn fetuses (numbering 800), becoming—among other appointments—pathologist to the Zoological Society of London.

He was for many years a friend of Rudyard Kipling, and appeared as the character Sir James Belton in Kipling's story "The Tender Achilles." One of the other characters in the story imitates Belton-Bland-Sutton: "In the few precisely articulated words, one could see Sir James himself, his likeness in the face and carriage to the hawk-headed Egyptian god, the mobile pursed lips, and the stillness of the wonderful hands." This is no mean compliment.

As artistic artefacts, the illustrations, though of the ugliest possible phenomena, are beautiful, and of enormously skilful draughtsmanship

NLM

Sir John Bland-Sutton: illustrated pathology

Two things puzzled me about Bland-Sutton's *Tumours* (his double-barrelled name, incidentally, was assumed by deed poll, the union of his middle name and his surname): firstly, the dramatic nature, or grossness of the pathology, of the cases illustrated; secondly, the recognisability of the people who suffered from that pathology.

As artistic artefacts, the illustrations, though of the ugliest possible phenomena, are beautiful, and of enormously skilful draughtsmanship. But do such extreme cases, does such gross pathology (for example, of chondromata), exist nowadays? If not, is it because it does not occur in the first place, because surgical alleviation always attenuates it or because we hide it away, as the Victorians were supposed to have hidden piano legs?

There is no attempt in the book to conceal the personal identity of the afflicted, and in some cases they are even named. Yet oddly enough, the impression given is neither of disrespect nor of prurience, but of sympathy and compassion.

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MEDICAL CLASSICS

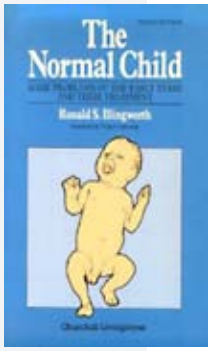
The Normal Child

A book by Ronald S Illingworth; first published 1953

Variation in humanity is so great that it is sometimes challenging to tell the normal from the pathological. This distinction is critical in paediatrics, where variation in children's growth, physical appearance, behaviour, and emotional development can be enormous without amounting to disease. Recognition of the normal child is an acquired skill; one that is fraught with the dangers of overinvestigation and of the failure to reassure parents. Ronald Illingworth's *The Normal Child*, a landmark in the paediatric literature, saved countless doctors—specialist and non-specialist—from the perils of misdiagnosing normality in children.

Illingworth, who was professor of child health at Sheffield University, published the book in 1953. His central thesis was that a thorough knowledge of the normal is an essential basis for knowledge of the abnormal. Lack of knowledge of the normal, he felt, was harmful to the child, parents, and family. As a concept it is still valid today, with much medical teaching emphasising disease and illness rather than health. His literary style was clear and simple and tinged with a forthrightness and sense of humour that came from a lifetime's experience. The child was ever foremost in his thoughts. He instinctively understood the anxiety that parents experience when their worries are unanswered, or unnecessary worry is created by failing to recognise the normal.

Illingworth's delivery can be wryly tongue in cheek: "Most undescended testes are due to cold hands." But this is invariably followed by the practical: "It is said that the most satisfactory way of examining the testes is with the boy squatting, with the knees apart and the hands on the knees for support." His pictures of behavioural conditions are models of clarity and precision. The description of a ruminating baby is typical of his style: "The baby hollows his tongue, clamps the jaws, strains, arches the back with the mouth open and holds the head back. He contracts the abdominal muscles and may make sucking movements of the tongue, bringing milk up." With sharp observation it culminates: "He shows satisfaction at his achievement, obviously enjoying it." Illingworth had an eye for detail.



His advice is ever simple and to the point. On circumcision, a controversy of the time, he says, "The child is the only one who matters in this regard. If there is no particular reason from his point of view for doing the operation, it is unjustified." He was a counterweight to his contemporary Benjamin Spock, whose populist opinion he quotes only to dismiss.

The 10th and final edition was written when Illingworth was 81, and was published posthumously. His highly personal style failed to survive the advent of evidence based medicine. *The Normal Child*, however, stands as a monograph written by a master paediatrician of great humanity that contains timeless descriptions of infant and childhood behaviour and conditions. Today's evidence based paediatric literature might have succeeded Illingworth's book, but it will never replace it.

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FROM THE FRONTLINE **Des Spence**

Why we should read the *Economist*

Working in Australia 20 years ago I rarely phoned home, and there was no email, no Facebook, and no internet radio. Despite Australia being the so called lucky country, I was homesick for unlucky Britain. The Murdochs controlled much of the media in both countries, and I found Aussie newspapers unpalatable. I bought international periodicals like *Time* and *Newsweek* magazines but found them wordy and dull. One day, putting aside my reservations, I picked up the *Economist* from the newsstand. I have been hooked ever since. I may not always agree with what is written but the reporting, the logic, and the explanation of economics is without fault.

Much of healthcare doesn't comply with standard economic theories of production. More is not always better, and the best outcome is no intervention. Paying doctors incentives to treat simply generates expensive and destructive overtreatment and overdiagnosis, a huge global health problem. State funded healthcare, provided by salaried doctors, is good economics, good for patients, and best for quality. These obvious and irrefutable facts, however, seem lost to the world's politicians.

Much of healthcare doesn't comply with standard economic theories of production. More is not always better, and the best outcome is no intervention

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Of course in reality the free NHS isn't actually free but a ravenous monster intent on gobbling up any public resources it can. Rationing, therefore, is not a dirty word in health economics: it is essential; forcing systems to rationalise and prioritise. Patients have no real idea of the high cost of care, and the NHS is abused by a number of them. To counter this, many professionals believe we should introduce token payments. Or present patients with bills, with the final line saying, "paid by the NHS," or at least prescriptions should show the real costs of drugs. But billing (even fake billing) is bureaucratic and potentially expensive. Worse, potentially vulnerable and sick patients will be made to feel guilty or a burden, going against the founding principles of the NHS. Those that routinely abuse the NHS simply wouldn't care and might even take pride in their escalating bills.

There is another way: make doctors and nurses much more cost aware. Investigations, referrals, and drugs are the big ticket costs of the NHS. Doctors often order tests and referrals in a thoughtless, wanton, and routine way, with no consideration to the cost or likely benefit. Indeed, many doctors, not just patients, have no idea of costs of drugs. Health resources are controlled by doctors and nurses, yet postgraduate and undergraduate education completely neglects our duty as minor medical economists. Basic health economics should be a standard part of medical education. Perhaps the *Economist* is as important as any medical journal.

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PAST CARING **Wendy Moore**

The reputation robbing historians

Few medical heroes are allowed to rest in peace, and Joseph Lister is no different. Buried in glory as the saviour who brought us antiseptic surgery, on the centenary of his death Lister's legacy has been roughly exhumed and his bones picked over by historians who threaten to rob him of his reputation. Not only was Lister (1827-1912) not the first to champion antiseptic practices, it now seems doubtful that his methods were the chief cause of reduced hospital mortality, and they may even have caused harm.

Trained in London, Lister worked first in Edinburgh before becoming professor of surgery in Glasgow in 1860. His peers stuck doggedly to empirical practices, but he devoted himself to clinical research and scientific method from the first. Inspired by Pasteur's germ theory, in 1865 Lister tested carbolic acid in dressings, and published his results in 1867 (*BMJ* 1867;2:246-8).

Lister certainly did not invent antiseptic practices. The ancient Greeks used vinegar on wounds. Lister was not even the first to voice the implications of Pasteur's discoveries for surgery. A year earlier, in 1864, Queen Victoria's surgeon Thomas Spencer Wells argued that Pasteur's theory meant antiseptic agents should be applied to wounds. And now it seems that some of Lister's fiercest opponents may even have done more to reduce hospital deaths than he did.

Although surgeons on the continent eagerly embraced Lister's ideas, his methods met with apathy, doubt, and outright hostility in Britain. Sanitary reformers like Florence Nightingale dismissed germ theory and argued that ward hygiene and hospital design were more important than wound antisepsis.

It now seems doubtful that [Lister's] methods were the chief cause of reduced hospital mortality, and they may even have caused harm

Ultimately nobody knows whether Lister's antiseptic drive or better hospital hygiene, nursing, and diet caused the huge downturn in hospital mortality in the 1870s. But Lister should still be toasted for his lifelong campaign to apply scientific principles to surgical practices.

Lister became professor of surgery at King's College London in 1877 and devoted the rest of his life to his antiseptic system. He devised drainage tubes, invented absorbable ligatures, improved dressings, introduced and later abandoned carbolic spray, and embraced asepsis in response to Koch's discoveries—even if he stubbornly operated without mask or gloves. For his services to safer surgery we should all raise a (carefully disinfected) glass.

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Sources: see bmj.com.

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