resolve with this approach than with the hit-and-miss methods that are usually adopted.

5 Dawes JDK. Chemotherapy in infections of the ear, nose and throat. Practitioner 1971;207:735-42.

The risks of assessing risks

No scientific or technological activity can be completely free from risk. If we want to be able to use electricity, take drugs when we are ill, and travel by car or plane then people are going to die and be injured as a result. Though risks cannot be totally eradicated, they can be measured, investigated, evaluated, controlled, and reduced; and these studies—and how the public perceives risks—were the subjects of a two-day conference at the Royal Society last week.

Why have scientists begun to measure risks? Probably because people’s attitudes to misfortune have changed: fatality has faded, and when a disaster occurs people now look for a cause and a scapegoat. As Dr P G Harvey of Imperial Chemical Industries said: “This is the first generation that feels it is entitled to immortality.” Often the public have blamed industry and technology for misfortune; applied science and scientists themselves have become suspect; and, as Professor D Pearce of Aberdeen suggested, “risk analysis has appeared as a defence against these accusations.”

Much of the conference was devoted to methods of measuring risk, which all agreed was extremely difficult. Ultimately, the magnitude of any misfortune was a subjective judgment. The social importance of an undesired event, the number of people affected, and the probability of it happening all had to be quantified. Was the death of an infant equivalent to the death of an 80-year-old? Was death by fire equivalent to death by lung cancer? Most speakers agreed that any analysis that treated all deaths as equivalent was worthless. Repeatedly the conference returned to this theme that the way the public viewed risks, which might be “irrational,” was just as important as the way that experts measured them. Experts’ and the public’s assessments were seen as “different but complementary.”

The second problem in measuring risks was that in almost all cases the data were limited and unreliable. Even mortality data related to social class and occupation, a risk measure familiar to most doctors, need to be interpreted with the greatest caution. Yet at least death was an easily defined event and there was a great deal of past experience to predict from. With many risk analyses there was no such past experience—the prime example being a core meltdown in a nuclear reactor. With new drugs, too, there were formidable problems in predicting and measuring risks. Increasingly refined toxicological studies in animals permitted better analyses, but unexpected side effects would always be seen when the drugs were first used in man. Even if they existed past data might be very sparse. Professor E D Acheson from Southampton explained that to predict the risk from an environmental carcinogen the dose-response curve and the exposure of individuals had to be known; yet for only four environmental carcinogens—cigarettes, alcohol, asbestos, and ionising radiation—was there enough information. “No human data are better than indifferent data,” he dolefully concluded. A further problem with measuring risk was assessing the human factor. Men ignored instructions, dropped spanners into important works, and slept through alarms, and sometimes they would deliberately abuse and sabotage.

Once risks have been measured they must be evaluated. With this problem in mind several psychologists spoke at the conference. Undoubtedly a gap exists between the measurements of scientists and the perceptions of the public: evidence was presented that the public regard nuclear power as particularly risky while the experts regard it as relatively safe compared with other forms of energy production. The factors that affect subjective assessment of risk were subtle and complex risks, but among them there was no such past risk was voluntary; whether a hazard was familiar; whether the risk was to an individual or to a whole community; the cause of a hazard; and the size of a catastrophe. Several speakers pointed out that looking back on changes in legislation, large and spectacular catastrophes—for instance, Aberfan and Flixborough—have had a strong effect.

How could risk assessments be used? They can be used to reduce risks—industrial accidents are declining at a rate of about 5% a decade. Secondly, they permit intelligent choices between different technologies; this is, perhaps, most important in relation to energy production. Thirdly, regulatory bodies may soon begin to specify numerically what is an acceptable risk—but how they will decide what is acceptable remains problematical. Risk assessment, no matter how refined it became, can be only one tool in decision making.

Alzheimer’s disease

Dementia is one of the greatest problems facing modern society, and yet one that seems little appreciated. The condition affects one person in every six over the age of 65. 1 2 Those affected survive only one-third as long as healthy people of the same age and sex, but dementia greatly taxes the family and the medical and nursing professions—and, indeed, is a severe burden on the economy.

The most common cause of dementia is Alzheimer’s disease. Postmortem examination of patients with dementia shows its characteristic features in half of all cases; multi-infarct dementia accounts for 20%, and in a further 20% these two disorders are present together.3 Inherited metabolic abnormalities, chronic alcoholism, and other causes account for the remainder. Treataable causes of dementia such as normal-pressure hydrocephalus, vitamin deficiencies, and metabolic disorders form a very small proportion of the total.

Alzheimer’s disease may be readily diagnosed clinically in most cases, and the division into presenile and senile forms is no longer thought worth while. The typical patient preserves his personality in the early stages but shows an inability to learn new material and short-term memory loss. Many patients are also depressed. The diagnosis is confirmed historically by the presence of senile plaques, neurofibrillary
tangles, granulovascular degeneration, and congophilic angio
dopathy. A correlation has been shown between the degree of
dementia and the number of senile plaques.

These senile plaques consist of a dense core of extracellular
amyloid, surrounded by mitochondria, lysosomes, and axonal
boutons. Affected areas show increased oxidative and hydrolase
activity. 2 Immunglobulins have been shown to be associated
with amyloid in the senile plaques. 5 The cells concerned may
be macrophages or microglia or both: such cells are in-
variably found with the amyloid that is detectable in the brains
of aged dogs. 6 The congophilic angiopathy is due to amyloid
in the subependothelial layer of cerebral capillaries and in
the intima and media of cerebral arteries and veins; the source
of the amyloid is probably the serum. 7

Myeloproliferative disorders are more common than would
be expected in first-degree relatives of patients with
Alzheimer's disease; 8 this may be due to a primary or second-
ary abnormality of the microtubules dealing with cell division.
No definite association has been found between Alzheimer's
disease and any of the major histocompatibility haplotypes.
No lymphocyte abnormalities have been found after comparison
with controls matched for age and sex. Serum antibodies
against neurones have been identified, but in detailed studies
done in Glasgow and London these antibodies have also been
shown in patients with other conditions (H Watts, P Kennedy,
M A Thomas, paper in preparation). Studies on cerebral
concentrations of aluminium and silicon have yielded con-
flicting results, but there is some evidence of an increase in
patients with the disease. 9 No virus has been isolated or trans-
mitted from patients, but one important discovery has been
that senile plaques appear in specific strains of aged mice when
they are infected with certain scrapie agents. 10 11

Disturbances in the metabolism of neurotransmitters have
been widely reported, affecting in particular the cholinergic
system and resulting in depletion of choline acetyltransferase
and acetylcholine esterase. 12 13 These findings suggest that
there is either loss of cholinergic cells or degeneration of
cholinergic terminals. In clinical studies in which patients were
given choline or choline-containing substances, however, these
agents were ineffective in improving or halting progression of
the illness. Recently a far wider disturbance of neurotrans-
mitter systems has been postulated, with the dopamine,
gamma-aminobutyric acid, and noradrenergic systems all
affected. 14 15

Despite the plethora of hypotheses, however, objective
analysis of all the data—immunological, genetic, virological,
pathological, and biochemical—shows that we still have no
idea of the aetiology of Alzheimer’s disease.

Audit in general practice

Whoever coined the phrase medical audit has a lot to answer
for. In everyday speech, auditors are cold, authoritarian figures
who visit an organisation to detect fraud, incompetence, or
inefficiency and report back to some central organisation.
In medical practice, audit is a self-monitoring procedure carried
out by doctors on their own work and reported only to the
participants. Yet the authoritarian image persists and was
present, like Banquo’s ghost, for much of the day at the
conference last week at BMA House on medical audit in
general practice (p 1440). If nothing else resulted from that
meeting, it should finally have stilled any fears among GPs that
the BMA’s General Medical Services Committee or the Royal
College of General Practitioners, who jointly organised the
occasion, had any plans for a corps of inspectors.

Like many new concepts in medicine, audit has not always
been helped by the efforts of its enthusiasts to convince the
doubters. Talk of process and outcome and of a whole plethora
of abstract concepts clouds the simplicity of the idea: that
doctors should look at their daily work to see if they can
improve it. The examples described at the conference were
everyday problems. Are all the home visits by the practice
nurses necessary? How helpful are midstream urine examina-
tions in treating urinary infections? Could the care of epileptic
patients be improved? In such cases, the doctors in a group
practice can learn an enormous amount by recording exactly
what they do, comparing their actual practice with what they
thought they did, and deciding after discussion among them-
selves what they will do in future. The crucial step, however,
is the final one: repeating the exercise after an interval to see
whether the good intentions have actually been carried
through.

What the advocates of audit now need to do is to convince
the sceptics and the silent, indifferent majority that the effort
is worth while. Many innovations in general practice are
intellectually stimulating but make little difference to the
quality of care provided to patients. Do auditing procedures
have long-lasting effects—and how can these be measured?
The evidence so far is very persuasive. The enthusiasts should
recognise, however, that many general practitioners will want
to move at their own pace—as they did in adopting ideas such
as health centres and group practice premises, attached nurses,
appointment systems, and deputising services. These have
come into the mainstream of general practice because the
majority became convinced that they were cost effective and of
real practical value. If medical audit passes the same pragmatic
tests it, too, will become routine within a generation.