The Back Pages

viewpoint

The scientific method(s) of primary care

To ordinary GPs, sceptical of arm-waving complexity theorists and qualitative research which tells them what they knew all along, the critique of everything short of the RCT, by Kevork Hopayian,[1] must seem like justification at last for their beliefs.

Like Dr Hopayian, we live in the real world. We also have no doubt that for some research questions — such as whether a drug works for a specific condition — 'the scientific method' is the best tool for the task. But it stretches the point to argue from this premise that other methods of reaching knowledge are inherently inferior. Here, in the spirit of constructive debate, we outline some arguments in favour of diverse approaches.

We don't share the view, developed by positivist philosophers in the early 20th century and extended by Karl Popper in his hypotheticodeductive method, of science as the step-by-step progress towards the goal of ultimate truth about the natural world. Since the 1950s commentators have acknowledged that science does not usually work in such a direct fashion: Kuhn notably argued that science proceeds in phases of 'normal' investigation, which elaborates upon the prevailing scientific consensus, with periodic interruptions (revolutions) in which the consensus about scientific truth is changed.[2] In this scheme the small hypotheticodeductive steps of day-to-day science are complemented by the big changes, or 'paradigm-shifts'.

This is not just scientific political correctness. There are similarities here with the way early evolutionists viewed 'survival of the fittest' as a relentless progression towards the peak of nature's achievements: themselves. But evolution, of science and species, is about adaptation and contingency, rather than stepwise progress towards the goal of perfection. Evolution leads to diversity, and it is that diversity that allows organisms, or ideas, to occupy different environmental niches. Only by scientific diversity can researchers produce knowledge that meets the needs of such a complicated environment as primary care.

However, arguing for diversity by analogy with evolution in nature is not enough. To understand why diverse methods are still 'scientific', we should examine the notion of cause and its implications for science. Philosophers, from the Greeks on, have grappled with this one. There are two dominant schools of thought. The successionist view, developed during the enlightenment by Hume, argues that one cannot prove cause, only observe effects. It is epitomised by the statistical model underpinning epidemiology and the controlled trial: that if an effect persists after controlling for all other variables, then it is assumed to be real. By contrast the generative school of causal thinking, which underpins sciences such as physics and chemistry, considers the direct effects of one object on another in predictable fashions, both in the specifics of the example, and as the embodiment of a principle.[3]

The results of much qualitative work can be seen as emerging from this generative tradition, in which the objects under study are, in themselves, part of the interaction. As with observation of chemical reactions, inductive thought, repeated over a number of scenarios or experiments, can lead to the inference of principles while allowing them to be context specific. Kai's work on parental attitudes to childhood illness, for instance, demonstrates causal pathways and factors in a way which is, to our knowledge, untestable using a hypotheticodeductive model.[4]

Finally, we must realise that while it is tempting to find safety in the numbers provided by statistics, this is often a false security. For the statistics commonly used in biomedicine depend on assumptions of independence, and while it is fair to assume that one person's atrial fibrillation is not affected by whether his neighbour has it or not, it is not so reasonable to assume that his attitudes to health care, beliefs about illness, or expectations of behaviour exist in such a vacuum. Pawson *et al* have pointed out the limitations of experimental approaches in circumstances when the context of an intervention forms part of the causal chain — the researcher ends up controlling out the very things that she is interested in.[3]

Hopayian is not alone in looking forward to a day when we can practice evidence-based health care, in the context of evidence-based policy. We join him in that, with one caveat. As Knottnerus and Dinant pointed out in 1998, in order to practise evidence-based medicine, we need 'medicine-based evidence'.[5] The diversity of primary care medicine demands a diversity of evidence, which one scientific method alone cannot provide.

Chris Burton and Tom Love

1. Hopayian K. Why medicine still needs a scientific foundation. *Br J Gen Pract* 2004; **54:** 400-403.
2. Kuhn TS. *The structure of scientific revolutions.* Chicago: University of Chicago Press, 1962.
3. Pawson R, Tilley N. *Realistic evaluation.* London: Sage Publications, 1997.
4. Kai J. Parents' difficulties and information needs in coping with acute illness in preschool children. *BMJ* 1996; **313:** 987-990.
5. Knottnerus A, Dinant G-J. Medicine based evidence, a prerequisite for evidence-based medicine. *BMJ* 1997; **315:** 1109-1110.

Fifteen years ago I made
my decision to enter
general practice.
I told my boss ...
He was an elegant Italian
professor of cardiology.
He looked at me with the
mildly perplexed air of
someone who tans easily
and eats guava fruit for
breakfast.
It was clear that, gazing
down from his Olympian
world of international
conferences and celebrity
private patients, he
thought I was deranged.

Kevin Baraclough, reviewing the *Oxford Textbook of Primary Care*, page 562

At it's centre, holding
everything together in
the best performance
of her career, is
Uma Thurman.
Raw and sexy,
tough as nails,
Thurman is a revelation.

David Watson, on Kill Bill, page 564

contents

554 **news and diary**
Narrative-based medicine
555 **flora medica**
May journals, deflowered
556 **postcards 2003-2004**
The happy hooker?
Charlotte Allen
557 **fitzpatrick** on fat
558 **miscellany**
Family breakdown
Jenny Wilson
559 **aronson** on mabs
560 **essay**
Multilevel modelling
Amanda Woods
562 **digest and refection**
The *Oxford Textbook of Primary* Care, The Earth, Senescence, and Quentin Tarantino
566 **short story**
It would be a difficult decision —- but ...
Dorothy Crowther
567 **goodman** Kaiser Permante'd
568 **jeffries**
What's a GP worth?