

**Evidence-Based Medicine and
'Patho-Physiologic Rationale': It's
the evidence, stupid!**

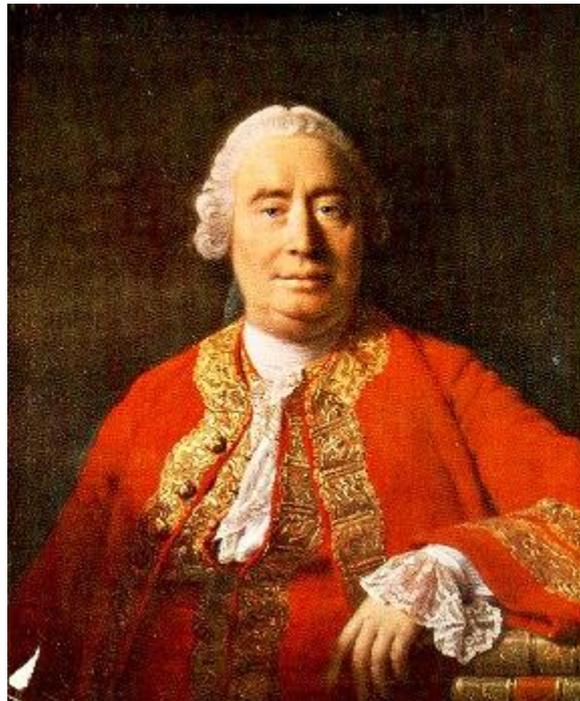
JOHN WORRALL

LSE

Kent Conference July 3 2017

Evidence based everything!

- “A wise man proportions his belief to the evidence.” David Hume *Enquiry Concerning Human Understanding*



And yet

- EBM is alleged to contradict these seemingly obvious truths
- Williamson:
 - It [EBM] views non-CS [clinical study] evidence of mechanisms as either irrelevant to the process of evidence evaluation or as strictly inferior to evidence obtained from clinical studies and analyses of CSs. (Draft, p.8)
- And Jeremy Howick:
 - In stark contrast [to the 'Russo- Williamson thesis'], evidence-based medicine (EBM) proponents do not rate mechanistic evidence at all highly. Mechanistic evidence does not even appear on the most recent, and arguably dominant, evidence-ranking scheme (Guyatt et al. 2008)

EBM and P-P rationale

- the 1992 paper *Evidence-Based Medicine. A New Approach to Teaching the Practice of Medicine* by the 'Evidence-Based Medicine Working Group'
- Begins with EBM 'deemphasizing' pathophysiologic rationale (inter alia) but ONLY as '*sufficient* grounds for clinical decision making'.
- BUT 'the study and understanding of basic mechanisms of disease are *necessary* ... guides for clinical practice'.

EBM and P-P rationale

- JW claims an advantage for EBM + is its ability to solve the problem of extrapolation/external validity
- [Extrapolation] is ubiquitous in medicine because the population within which the bulk of clinical studies establish a correlation (e.g. hospital patients in a particular region who are not too young, not too old, not too ill and not pregnant) rarely coincides with [really 'can legitimately be taken to reflect'] the population within which a treatment is intended to be used. (pp19-20)
- And he claims that, because it allows an evidential role for mechanisms,
- The RWT [and hence EBM+] gives a better account of extrapolation inferences [than 'regular EBM'].
- Yet

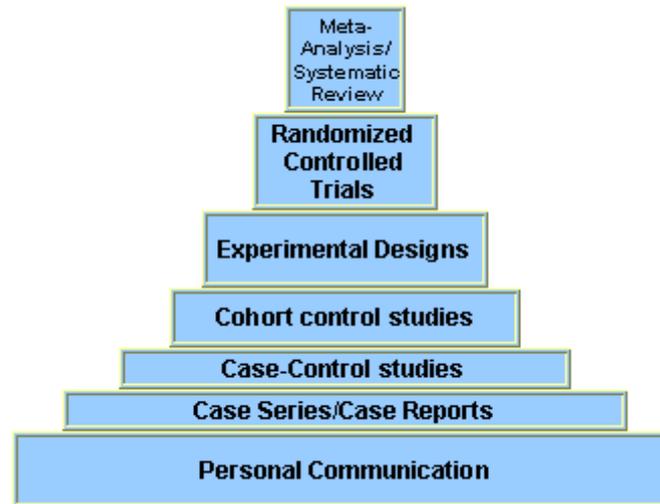
EBM and P-P rationale

- ‘Evidence-based medicine working group’: Evidence-based medicine also involves applying traditional skills of medical training. A sound understanding of pathophysiology is necessary to interpret and apply the results of clinical research. For instance, most patients to whom we would like to generalize the results of randomized trials would, for one reason or another, not have been enrolled in the most relevant study. The patient may be too old, be too sick, have other underlying illnesses, or be uncooperative. Understanding the underlying pathophysiology allows the clinician to better judge whether the results are applicable to the patient at hand ... (p. 2421)

EBM and P-P rationale

- **‘Misapprehensions About Evidence-Based Medicine’:**
- **Misinterpretation 2.** – Understanding of basic investigation and pathophysiology plays no part in evidence-based medicine.
- **Correction.** – The dearth of adequate evidence means that clinical problem solving must rely on an understanding of underlying pathophysiology. Moreover a good understanding of pathophysiology is necessary for interpreting clinical observations and for appropriate interpretation of evidence (especially in deciding on its generalizability).

A typical hierarchy



Why is EBM somewhat suspicious of physiological reasoning?

- Howick: mechanistic reasoning has misled us so often in the past.
- Usual suspects: bloodletting, ventricular ectopic beats
- Poor argument

The “RWT”

- In order to establish a causal claim in medicine one normally needs to establish two things: first that the putative cause and effect are appropriately correlated; second that there is some mechanism which explains instances of the putative effect in terms of the putative cause and which can account for this correlation.
- EBM prioritises clinical studies over evidence of mechanisms that arises from other sources. RWT on the other hand treats all sources of evidence equally (p.8)