Evidence-based medicine from a social science perspective

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Background
Since the emergence of evidence-based medicine (EBM) in the 1980s, social scientists – including historians, sociologists, anthropologists, political scientists and philosophers – have attempted to reckon with the movement's origins, implications and consequences.

Objectives
This paper reviews the social science literature related to EBM and attempts to draw some conclusions for the future improvement of EBM.

Discussion
The paper divides the discussion of evidence-based into three critiques: the 'statistics' critique, the 'cookbook' critique and the 'neo-liberal' critique. Incorporating social sciences approaches into clinical education and clinical research will be critical to the future development and success of EBM.

SINCE THE EMERGENCE of evidence-based medicine (EBM) in the 1980s, social scientists have attempted to reckon with the movement's origins, implications and consequences. This body of work is premised on the notion that medicine is a social activity as well as a scientific one, and that understanding shifts in medical practice requires an understanding of their implications for politics, economics and culture.

This essay attempts to provide a brief review of the social science scholarship concerning EBM. The arguments of social scientists both for and against EBM can be broadly divided into three main categories: first, social scientists have drawn attention to the limited and specific kinds of evidence that are considered important within EBM; this is labelled the 'statistics' critique. Second, they have argued that EBM fundamentally changes the structure of medical practice, displacing expertise and power away from physicians; this is labelled the 'cookbook' critique. Finally, social scientists have examined the broader social and historical context in which EBM has developed, articulating its links to changes in the structure of governments and public institutions; this is labelled the 'neo-liberal' critique.

The aim here is not to assess these various arguments, nor to argue for or against EBM, but rather to draw attention to their importance for understanding how EBM can evolve and improve. Since this essay is a broad review of what is now a diverse literature, it does not detail specific case studies: the reader is directed to the references for these examples.

Statistics critique

One of the first arguments against EBM to emerge from medical practitioners themselves concerned the status and interpretability of evidence. In the 1990s, clinicians, epidemiologists and medical statisticians began to argue that EBM based on large-scale clinical trials was not necessarily appropriate for managing individual patients. Although the evidence suggested what was **on average** best for patients, that was not necessarily helpful in deciding what to do in any given case.[1] In effect, EBM ran the risk of producing a kind of 'one size fits all' medicine in which individual differences and the specifics of a patient case became irrelevant to care.

Of particular concern here are the effects of EBM on minorities. Such populations may differ in their responses to drugs or other treatments for genetic or environmental reasons. If EBM works with averages taken from large samples, the courses of action it recommends are likely to be less appropriate for minorities. This may even place minority patients at risk.[2,3] Proponents of EBM have argued that this could be remedied with more data taken from studies on minority populations. The more finely segmented the data (by age, ethnicity, gender, etc), the more accurate and useful EBM will become. However, at some point the cost of such studies may outweigh the benefits to be gained from such approaches.

Another version of this critique suggests that it is not merely averaging that is the problem, but the narrow focus of EBM on specific kinds of evidence. EBM – especially in some of its earlier iterations – privileged particular kinds of scientific knowledge, especially the large-scale randomised controlled trial (RCT) and meta-analyses of clinical trials. This discounts other forms of potential evidence. The problem here is not quantification itself, but rather

the sometimes narrow focus on specific quantitative methods as 'gold standards'.

However, practitioners of EBM have also acknowledged the limits of RCTs and come to adopt alternative forms and hierarchies of evidence where RCTs are not practical or ethical.[4] For example, patient narratives were not usually considered 'evidence' within EBM.[5] This loss of the 'patient's voice' has led some clinicians to join forces with medical anthropologists to argue for 'narrative-based medicine' (NBM). These debates raise important questions about what types of evidence and what types of research methodologies should be accepted as legitimate in medical decision-making. As Greenhalgh argued, EBM and NBM may not be entirely incompatible, and EBM may be improved by broadening the types of methods and evidence it considers.[6,7]

Another problem with the focus on statistical, RCT, 'gold standard' evidence is that such evidence is unlikely to always be as good as it seems. Some studies suggest that the kinds of clinical trials on which EBM is based are particularly subject to 'financial bias', including the influences of money from pharmaceutical companies.[8,9] This includes not merely manipulation of research or selective publication of data, but also subtler effects on study design and data interpretation.[10–13] The rise of contract research organisations, which manage clinical trials, analysis and publication for pharmaceutical companies, exacerbates these issues. This is not an argument against EBM in general, but it does mean that physicians need to be highly aware of the sources of evidence that they are using.

Even where financial interests are not at stake, cultural assumptions about bodies and treatments may skew results of RCTs. De Vries and Lemmens[14] report, for example, differing results of clinical trials on home births in Holland that reflect markedly different assumptions about what constitutes a 'normal' birth. The fact that EBM places more emphasis on such evidence makes medicine more vulnerable to the problems associated with such financial and cultural biases.

Cookbook critique

Closely related to these discussions is the set of arguments suggesting that EBM diminishes the important role of the physician in patient care, ultimately decreasing the quality of healthcare. EBM often manifests in the form of single disease-specific 'clinical guidelines', constructed from evidence from clinical trials, providing instructions to doctors for what to do in given situations. Such 'cookbook medicine', as it has been called,[15,16] diminishes the role of the physicians' experience, judgement or skill.[17] Some social scientists and physicians argue that this results in a deskilling of medical practitioners, who become trained only to apply given formulae, rather than closely evaluate and respond to cases on their merits.

These concerns ultimately rest on worries about professional authority. Doctors 'fear the emergence of third parties using guidelines against professionals' interests … guidelines reinforced by financial or legal incentives might become coercive tools to change clinicians' behavior, curtail treatment choice, limit practitioners' autonomy, and further undermine public confidence'.[17] Here a long temporal perspective is valuable: Timmermans and Berg[18] situate EBM within a century-long trend towards **standardisation** in biomedicine and healthcare. This history makes clear that standards are always political and represent particular interests, constantly competing with one another as they are renegotiated.

Such battles continue. The work of political scientists Patashnik, Gerber and Dowling[19] claims that, at least as far as the US is concerned, many patients continue to receive treatments that are known to be unhelpful, unsafe or uneconomical. Among their concerns is that professional medical societies and the continued trust placed in doctors by patients have allowed doctors to continue to resist EBM.

But as Timmermans and Mauck[17] have also pointed out, guidelines tend to be constructed by medical researchers and implemented in a top-down manner, with little consultation. Such guidelines tend to pay little attention to the diverse actors (including nurses, support staff and patients) who will be affected by them; as a consequence, guidelines are often ignored. Through consultation with stakeholders (including doctors), healthcare managers might develop guidelines that recognise the 'interdependent and collaborative' nature of medical work; these would be far more likely to succeed, they argue.[17]

Relatedly, Greenhalgh et al[20] have argued for EBM to pay greater attention to patients' perspectives and values in the design and implementation of care: 'The conceptual frames of EBM effectively configure the patient as an autonomous rational chooser, a model that does not readily translate into the everyday lives of real patients – multifaceted individuals with physical, cognitive, emotional, and social dimensions, who lead messy, idiosyncratic, networked, and often complicated lives in contexts that are shaped by cultural, economic, and political forces'.[20] Importantly, the claims here are not that guidelines can never be useful in any form; rather, these studies suggest that continued work is needed to formulate, frame and implement guidelines in ways that practitioners will be most receptive to.

On the other hand, some sociological studies have found that EBM does not significantly change physicians' behaviour. In fact, in some cases, physicians become more aware of their need to exercise judgement when confronted with EBM.[21] This and other work[22] suggests that the relationship between clinical practice and the 'evidence' of EBM is much more complex than a simple opposition.[23] Again, the conclusion should not be to eliminate guidelines altogether but rather to better understand the sociological aspects of how guidelines are actually followed (or not) in practice and to use this understanding to improve guidelines.

Neo-liberal critique

Another major area of debate around EBM, both in medicine and in the social sciences, is about **power**. In particular, critics have noted the coincidences between the rise of EBM and the increasing surveillance, accounting

and rationalisation of many aspects of life in late capitalism. In this view, the 'audit culture'[24,25] associated with EBM is part of broader political and economic transformations, including the privatisation of public institutions and the declining trust in expertise. Put simply, one of the main concerns is that EBM is not actually about improving patient outcomes, but rather is 'driven by management efforts to improve cost-effectiveness'.[26] Here, EBM stands as part of a broader attempt to rationalise healthcare provision, discipline doctors and serve the ideological ends of neo-liberal corporate actors.

Of particular concern here is not simply the loss of the authority or independence of the physician, but also the subjecting of the doctor (and to some extent, the patient) to regimens of measurement, quantification and accountability. Clinical guidelines are effectively implemented by imposing cost differentials on hospitals and patients (insuring some treatments but not others) and are designed to protect corporations from litigation. According to this view, 'gold standard' really means most 'cost-effective' or 'most efficient'.[27,28] The 'suppression of clinical freedom'[15] associated with these measures is not only something of concern for doctors; it is an issue for every patient, since the corporations that are increasingly making clinical decisions are concerned more with their own reputations (and legal liabilities) and profits above patient care.

Perhaps most problematically, EBM has become associated with a move from 'disease to risk', focusing increasingly on detecting and intervening in non-diseases rather than diagnosing and treating well-established diseases.[29] Patients may now be scored for risks for cancer, heart disease, diabetes and a range of other disorders on the basis of 'evidence-based' measures (often including algorithms). This may lead to overdiagnosis, with serious financial and opportunity costs.[30]

Although this last group of criticisms perhaps represents an extreme view, it does raise an important set of issues about the broader social, political and economic context in which EBM exists. Even if EBM is capable of producing better, more efficient medical outcomes, it may not actually be doing so within the context of the increasing privatisation and corporatisation of healthcare.

Towards an improved EBM

Although the Australian healthcare system may insulate doctors and patients from some of the worst excesses of privatisation and corporatisation, these criticisms remain important for thinking about how to improve EBM and mitigate its negative consequences.

Greenhalgh and her colleagues argue that a 'real' EBM must continue to emphasise clinical judgement above blind following of rules, templates or guidelines. Moreover, the production of 'evidence' in EBM must take into account its **usability**, including the context of use (where, when, how, why) and the likely users (including doctors, nurses, patients and others). Usability must be considered by publishers of medical studies as well as by producers of clinical guidelines and tools.[29] This focus on use would address at least some of the problems associated with the top-down implementation of EBM.

EBM might also be improved by continuing to broaden its scope, particularly by broadening notions of what counts as 'evidence' and broadening the types of research conducted within the scope of EBM. This is one area where the social sciences critiques appear to have had some effect on the attitudes of physicians. It is also a problem for which the social sciences may continue to offer help. Greenhalgh et al suggest that EBM studies should consider 'the experience of illness, the psychology of evidence interpretation, [and] the negotiation and sharing of evidence' as well as the logics of care, intuitive decision making, the social impact of EBM tools, and the impact of financial bias in clinical trials.[29] In other words, the remit of EBM should include knowledge and expertise from diverse fields including cognitive psychology, sociology and economics. This suggests that if EBM is to continue to advance, doctors and clinical researchers will have to work increasingly closely with social scientists and humanists.

Ultimately, all this will depend on education and clinical training. Teaching medical practitioners to be aware of the benefits and the limitations of EBM presents numerous challenges. However, one important step may be the continued augmenting of medical education with the medical humanities. Increased awareness of sociological and anthropological approaches to medicine would be one important road to gradually increasing the effectiveness of EBM.

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