Hijacked evidence-based medicine: stay the course and throw the pirates overboard

John P.A. Ioannidis\textsuperscript{a,b,c,d,*}

\textsuperscript{a}Department of Medicine, Stanford University School of Medicine, 1265 Welch Rd, MSOB X306, Stanford, CA 94305, USA
\textsuperscript{b}Department of Health Research and Policy, Stanford University School of Medicine, 1265 Welch Rd, MSOB X306, Stanford, CA 94305, USA
\textsuperscript{c}Department of Statistics, Stanford University School of Humanities and Sciences, 1265 Welch Rd, MSOB X306, Stanford, CA 94305, USA
\textsuperscript{d}Meta-Research Innovation Center at Stanford (METRICS), Stanford University, 1265 Welch Rd, MSOB X306, Stanford, CA 94305, USA

Abstract

The article discusses a number of criticisms that have been raised against evidence-based medicine, such as focusing on benefits and ignoring adverse events; being interested in averages and ignoring the wide variability in individual risks and responsiveness; ignoring clinician-patient interaction and clinical judgement; leading to some sort of reductionism; and falling prey to corruption from conflicts of interest. I argue that none of these deficiencies are necessarily inherent to evidence-based medicine. In fact, work in evidence-based medicine has contributed a lot towards minimizing these deficiencies in medical research and medical care. However, evidence-based medicine is paying the price of its success: having become more widely recognized, it is manipulated and misused to support subverted or perverted agendas that are hijacking its reputation value. Sometimes the conflicts behind these agendas are so strong that one worries about whether the hijacking of evidence-based medicine is reversible. Nevertheless, evidence-based medicine is a valuable conceptual toolkit and it is worth to try to remove the biases of the pirates who have hijacked its ship. © 2017 Elsevier Inc. All rights reserved.

Keywords: Evidence-based medicine

My lamentation on hijacked evidence-based medicine (EBM) \cite{1} created some false expectations. Should I regret? According to the Harvard Dictionary of Music, lamentations stopped being composed in the 18th century—why on earth then did I covet a long-abandoned form? Some commentators wondered whether I am contemplating suicide. I have no such intention. Other commentators found an opportunity to rejoice on the demise of EBM. They cried out “I told you so!” Some celebrators offered to replace EBM with anything that pleased their non-evidence-based belief system.

Giovanni Fava\cite{2} belongs to the “I told you so!” group. Or to be more exact “George Engel told you so!” \cite{3} and “Alvan Feinstein told you so!” \cite{4}. I have great respect for Alvan Feinstein, George Engel, and Giovanni Fava. Avoiding to spend much time on 70% of Giovanni’s text to say how much I agree with what he says, this commentary will focus on the estimated 30% where we might disagree.

Fava—and others—often paint a straw man picture of EBM that is easy to tear to pieces. Then, they blame these pitiful shreds to justify some long-expected failure. According to this caricature, EBM is doomed to focus on benefits and ignore adverse events; is interested in averages and ignores the wide variability in individual risks and responsiveness; and ignores clinician—patient interaction, the humane aspect of medicine, and what makes each patient and each patient—clinician encounter special. Fava then also makes the leap that this explains why the limitations of EBM become manifest—with destructive consequences. These limitations include “overall reductionism and insufficient consideration of problems related to financial conflicts of interest” \cite{2}. Fava laments that “the conceptual model that has generated EBM and guidelines lends itself to commercial manipulation, clashes with clinical reality and fosters a dichotomy between medical science and clinical judgment.” In summary, EBM clashes with clinical judgment and is easy prey for the corrupt. Clearly, what Fava presents as EBM has nothing to do with EBM. In reality, EBM espouses clinical judgment and offers the most strenuous resistance against corruption.

In the classic definition by David Sackett, EBM is about “integrating individual clinical expertise with the best external evidence” \cite{5}. Individual clinical expertise is as important as external evidence. EBM suffers, if one of these...
two parts is subverted or hijacked. Individual clinical expertise includes clinical judgment, patient preferences, and patient—clinician communication, all these skills are at the core of practicing EBM. Equally important, there is nothing that says that EBM should focus on benefits and downplay harms or that only average effects should be sought. EBM investigations have probably contributed more to the methodology and applied knowledge of harms and individualized treatment than any other segment of the medical literature. However, rigorous evidence-based approaches show that often information on harms is limited, unreliable, and fragmented [6,7]; subgroup claims are spurious, false, and nonreproducible [8-10]; and individualizing medicine through personalized, precision, predictive, and other p-medicine is mostly a beautiful fairy tale [11-13]. These are not EBM’s faults. Conversely, EBM offers the tools to detect and fix these problems.

“Reductionism” is an easy target to criticize, but I see no reason why reductionism should be connected to EBM in particular. As for financial conflicts of interest, they can affect average effects, treatment benefits, treatment harms, and subgroup or individualized data and precision medicine just as well. Actually, conflicts of interest, financial or other, can affect more easily evidence and results that are more tenuous and have higher uncertainty, instability, and variability of interpretation. In this regard, harms and subgroup effects are probably easier to manipulate that average treatment effects—on average. However, evaluation of all these effect sizes along with evaluation of their biases and uncertainty is within the premises of EBM. Once we move out of these premises, the power of subjective interpretation becomes uncontrolled. Any statement can be made about anything and defended somehow with distorted arguments. The key reason that conflicts of interest are affecting more commonly treatment effects in the form of odds ratios and statistics in the form of \( P \)-values rather than nebulous philological and philosophical statements is that it is more difficult to make money out of philology and philosophy. If one could make money from them, we would have seen far more of this trade. Moreover, even now, sponsors who want to distort results and inferences can distort more easily the subjective interpretation and the spin of the results rather than the results themselves [14,15].

Many nonfinancial conflicts, for example, allegiance biases, can be equally bad or worse than financial ones. Thus, I worry when Fava comes forth with the proclamation [2] that “A critical review by one or two experts who have are free of financial conflicts of interest and are familiar with both the clinical and the research issues of the topic is worth 100 systematic reviews of authors with financial ties and/or little clinical familiarity with the topic.” It took us many decades to contain (not eliminate) the power of content experts. Now Fava wants us to go back to those experts, seeking enlightenment from them. Content experts almost always have strong conflicts, even if financial conflicts can be excluded. The strongest conflict is their own mere existence. A systematic review may have to conclude that content experts simply need to disappear because their trade, their specialty, whatever they do with their lives is wasteful. How many content experts will be willing to commit suicide?—because this is what I am talking about [1]. I clarified upfront that I do not contemplate suicide, neither do these experts contemplate suicide. They are likely to defend their raison d’être to death. I think that content experts may be consulted, but they should not be allowed to run the show [16].

Fava says that EBM “‘needs to be substituted by a comprehensive biopsychosocial framework. Engel identified the key characteristic of clinical science in its explicit attention to humanness, where observation (outer viewing), introspection (inner viewing), and dialogue (interviewing) are the basic methodological triad for clinical assessment and for making patient data scientific’” [2]. These are interesting statements, but, while I sympathize with them, they can end up being empty rhetoric interpreted with bias at will. Besides outer viewing, inner viewing, and interviewing, can we please get some numbers, some clinimetrics, some measurement, some EBM, please. We have had enough nebulous biopsychological sociopsychobiology psychosociobiologically speaking.

I agree with Fava that clinicians are undergoing some major intellectual crisis that “basic science” is detached from them and they are detached from “basic science.” But what a poor term this “basic science” is. I think that EBM is actually the basic science of medicine [17]. Molecular biology and economics, mentioned as some sort of enemies to medicine, are not enemies; they are just two independent scientific fields that medicine can sometimes (not always) put to good use to solve some problems (not all). And, of course, the problems of medicine need to be about health and disease. I am happy to use whatever scientific tools can help solve problems of health and disease. But we need clinicians and even more than clinicians we need patients and healthy people to tell us what the real problems are, what matters to them [18].

In all, I continue to think that EBM has been hijacked—unfortunately [1]. This sad situation has nothing to do with inherent limitations of EBM. EBM does have some limitations, like any conceptual toolbox that ventures to be applied in the real world [19,20]. However, the pirates have hijacked the EBM ship because it is a superb, worthy vessel loaded with goodies that are deemed to have high value. No pirates with some profit-seeking mind would have ventured to capture a sinking tub that had no treasure. We should not abandon our ship without a fight. We would not be able to sail the ocean instead on some little prehistoric canoe of clinical experts that preceded EBM, as Fava suggests. Instead, we should do our best to throw overboard the pirates who have captured the ship and then stay the course to more rigorous, more unbiased evidence that matters for patients and healthy people.
دریافت فوری متن کامل مقاله

امکان دانلود نسخه تمام متن مقالات انگلیسی
امکان دانلود نسخه ترجمه شده مقالات
پذیرش سفارش ترجمه تخصصی
امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
امکان دانلود رایگان ۲ صفحه اول هر مقاله
امکان پرداخت اینترنتی با کلیه کارت‌های عضو شتاب
دانلود فوری مقاله پس از پرداخت آنلاین
پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات