Reviewer’s report

Title: Conceptualization of Common LR: A useful Tool for Clinical Diagnostic Reasoning

Version: 4  Date: 18 June 2010

Reviewer: Chris Del Mar

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LRs for BMC Med Ed v2

This manuscript is extensively revised. I now understand much better what is being proposed, something only partly understood previously. I enjoyed reading it. The introduction of examples is a great improvement, and the UTI example is especially good. The teaching of LRs (now introduced) is very helpful.

The essence of the paper is theoretical. It argues that Likelihood Ratios (LRs) are only really of use to clinicians when they have a specific disease in mind (a situation the Authors call 'Diseases Assignment'), and then they can apply LRs to symptoms, signs and tests to decide if the rough estimate of probability of the disease being the cause of the problem changes with a positive or negative item.

Their solution is to think about a new category called 'Category Assignment', in which the possible causes of a set of presenting clinical features are classified in some way (suggestions of some are provided), and then LRs for these groups of diseases are applied. This should enable the clinician to whittle the list down to something more manageable, and arrive at a shortlist of diseases which presumably can then be applied to with the 'Disease Assignment' process.

However I agree that the somewhat shaky theoretical calculations of the combined diseases ('Category Assignment') is best completed with empirical data. Some of this is coming from recent studies, and these might be quoted. [BMJ 2010 Apr 20;340:c1594].

Issues:

1. Does the debate present a novel argument, or a novel insight into existing work?
   Yes. The notion of thinking about how the LRs apply to GROUPS of diseases is new, and helpful. It is useful to start clinicians thinking about what items they should focus on to exclude or include groups of diseases.

2. Does the debate address an important problem of interest to a broad biomedical audience?
   Yes, this is important.

3. Is the piece well argued and referenced?
Yes, with the caveat in Major Compulsory Revisions, below.

4. Has the author used logical arguments and sound reasoning?
Yes, with the caveat in Major Compulsory Revisions, below.

5. Is the piece written well enough for publication? (nb. Since we do not charge for access to published research, we cannot undertake the costs of editing poorly written manuscript. If you tell us that the writing is not acceptable for publication, we will ask the authors to find someone, or an editing service, to help them rewrite it. If you tell us that the manuscript is too poorly written for it to be peer reviewed, we will ask them to rewrite it now.)

No. Although in general well-written, it is clear that English is not the Authors’ native language. They need help in simplifying their language and correcting some English idioms and grammar that have come out wrong.

• Major Compulsory Revisions (which the author must respond to before a decision on publication can be reached)

The main issue is whether the entire somewhat complex model, with its new jargon ('Diseases Assignment', and 'Category Assignment' which will not be meaningful to others), is necessary. It might be easier to say (and understand) if the argument is streamlined. Thus, we should think about non-specific diseases in groups (as argued) and then move to apply disease-specific (= 'Diseases Assignment') LRs as usual.

The other problem is with the specifics of the clinical examples, (although the introduction of clinical examples makes the whole piece much easier to understand). These have some issues that will cause readers to want to quarrel. Table 3 has some extraordinary relative pre-test prevalence figures (I do not believe that clinicians will encounter pneumonia at about the same prevalence as uncomplicated UTI, sinusitis or influenza – and three times that of Strep Throat in Table 3). Once again, (as mentioned in the previous version) absence of neck stiffness does not rule out meningitis!

(Note: I have not been able to examine the Figs 1.A and B)

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Level of interest: An article of importance in its field

Quality of written English: Not suitable for publication unless extensively edited

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.

Declaration of competing interests:
I declare that I have no competing interests