

## **‘I have never seen a science writer so blatantly biased as Edzard Ernst: his work should not be considered of any worth at all, and discarded’**

finds Sweden’s Professor Robert Hahn, a leading medical scientist, physician, and Professor of Anaesthesia and Intensive Care at the University of Linköping, Sweden.

### **Studies depicting homeopathy as ineffective are bogus**

Prof. Hahn has published over 300 scientific articles in the fields of anaesthesia and intensive care, and has received several research awards. Hahn had not previously come into contact with homeopathy, but his curiosity was aroused by a highly emotional, remarkably unscientific, television debate against homeopathy, apparently organized by the anti-homeopathy campaigning group Vetenskapoch Folkbildning or VOF [translates into English as ‘Science and Education’] One teenager after another said that there were no scientific studies that could prove that homeopathy works, and that Homeopathy had been shown to be one big ‘bluff’.

Prof. Hahn saw clearly that those teenagers could not possibly have the necessary skills, knowledge and maturity to even read, let alone understand, the relevant scientific literature, and that all they were doing was repeating to order VoF’s anti-homeopathy propaganda.

Hahn determined therefore to analyze for himself the ‘research’ which supposedly demonstrated homeopathy to be ineffective, and reached the shocking conclusion that:

**only by discarding 98% of homeopathy trials and carrying out a statistical meta-analysis on the remaining 2% negative studies, can one "prove" that homeopathy is ineffective.**

In other words, all supposedly negative homeopathic meta-analyses which opponents of homeopathy have relied on are scientifically bogus.

The evaluation criteria of medical treatment changed in the mid-1990s. It had previously been held that one should understand the mechanism why a treatment works before being able to accept it. This criterion, however, leads to problems. Many treatments whose mode of action is still unknown are in fact in use today in hospitals with success. Nitrous oxide, commonly used during the birth, is one such example [anaesthetics are another].

Medicine in the mid-90s moved over to the practical concept of "evidence-based", which implies that this was, or should have been, the method used for all the literature in the areas of systematic reviews or meta-analyses. The question now asked was no longer "Do we understand the basic principles of treatment?" but "Does the treatment work, or not?" The removal of any requirement to demonstrate a mechanism makes it a major problem for academics to dismiss alternative therapies.

### **Klaus Linde's Article**

Klaus Linde's meta-analysis from 1997<sup>i</sup> is the first and most honest writing in the field of homeopathy. Linde found an odds ratio of 2.45 and a 2.05 to 2.93 of CI, i.e. a significant result showing a beneficial effect of homeopathy compared to placebo.

This result is based on 89 studies and, interestingly, Linde added in a summary that the results shows how effective homeopathy is in various diseases. Linde's study aroused understandable sensation in the academic world. Then followed a countercurrent of articles that evidently tried to refute the results.

The first criticism was the quality of the study, which can be separated into so-called Jadad scores. When they did this with Linde’s 89 studies, there was a trend for the studies with a low Jadad to show a higher effect. Linde demonstrated<sup>ii</sup>, however, that the positive effects of homeopathy were increased, even at the highest Jadad score levels.

## **Edzard Ernst**

This argument was not accepted by the anti-alternative-medicine activist Edzard Ernst, who was of the opinion that one should draw a line between all Jadad scores except for the highest, and from that calculate the theoretical effect of the best studies<sup>iii</sup>.

In my opinion, this is completely insane, because you thereby replace real data with virtual (i.e. theoretically calculated) data.

In his 2002 paper<sup>iv</sup>, Ernst oscillates, for example, between rejection of articles which show specific effects on diseases, whilst in other instances he rejects articles if they do *not* show specific effects. I've never seen a science writer so blatantly biased as Edzard Ernst.

## **Cucherat's "Type II error"**

Cucherat<sup>v</sup> is basically an honest writer who nevertheless, in contradiction of his own research results, ended in making great efforts to reject homeopathy as a treatment. Conventional meta-analytic statistics were not used in this case; instead, out of five possible analytic methods, Cucherat chose the method which would be the most unfavorable to homeopathy.

Cucherat furthermore fell into using a technique that Edzard Ernst exploited in many studies, namely, to remove virtually any high-quality material. In the case of homeopathy, however, it was not enough to remove 90% of the studies originally envisaged for analysis: the homeopathic treatment continued to show itself as superior to placebo.

As the author proceeded to remove 95-98% of all studies, this naturally tilted the statistics. But at this point, Cucherat's analysis no longer showed that the method of treatment (homeopathy) is bad, but rather that his study lacked sufficient statistical material for analysis. One can say that the author has created a "type II error" deliberately.

I am highly critical of the several points given by Cucherat to justify his rejection of selected studies. Cucherat gives sometimes only marginal details that do not result in exclusion in non-homeopathic studies. First Cucherat removed from his evaluation 101 out of a total of 118 studies: homeopathy nevertheless remained in his analysis as being to a large extent effective. Even as he withdrew further studies and only 9 were left, homeopathy continued to show a statistically-safe beneficial effect.

As he removed yet another 4 studies, the statistics however began to falter and the risk that the effect of homeopathy versus placebo could be explained by chance was now 8.2 out of 100.

The conclusion? Cucherat says that homeopathy was not effective. As far as I am concerned, Cucherat is a coward. At the risk of destroying his career by telling the truth and being in loggerheads with organizations such as the VoF, he did not dare to publish what his material actually showed.

## **Shang et al's selection was equally crazy**

The next meta-analysis was written by Shang et al and published in 1995<sup>vi</sup>. Here, just like Cucherat, 96% of all studies were removed, but in this case the authors sadly failed to specify any reason for that at all. They turned the odds ratio this way and that, until it resulted in the study showing that placebo was 13% more effective than homeopathy, even though the actual evidence showed the precise opposite: i.e. that homeopathy was 13% more effective than placebo. I must also point out that the authors with whom Shang worked had a few years earlier published a very negative article on homeopathy, which makes me doubt the objective starting point of this group.

[Ernst was later to testify to the UK House of Commons Science & Technology committee that Shang was 'clearly devastating for homeopathy'].

**Who can you trust? We can begin by disregarding Edzard Ernst. I have read several other studies that he has published, and they are all untrustworthy. His work should be discarded.**

Both Cucherat and Shang have deliberately created a "Type II error" by ignoring almost all actually existing published studies. The reason? Well, if they had included just a few more trials and had have been content to exclude "only" 90% of the documentation, it would have been found that homeopathy was more effective than placebo. And they surely didn't want that, right? So they simply excluded so much material that they created a "type II error". I assume that the authors had to find some trick to produce the results they wanted from the outset - namely, that homeopathy failed to produce any effect.

This maths games seems anything but respectable. And yet these people could retain their academic purity, still welcome in the hallowed halls of science, and at no risk of being mocked or to be publicly ridiculed by organizations such as the VoF.

I am fascinated to see how much the scientific world is controlled by their ideologies. In the case of homeopathy, one should stick with what the evidence reveals. And the evidence is that only by removing 95-98% of all studies is the effectiveness of homeopathy not demonstrable.

Homeopathy is clearly a taboo subject. I will give three examples of academically trained people's reactions to homeopathy in general, and to my work after this evidence evaluation:

- 1) A colleague commented on Facebook that he was surprised that I was interested in homeopathy when I was otherwise so scientific. Taboo subject, he said! No one is supposed to search for, or evaluate, homeopathy evidence if you want to continue to be considered a good and serious scientist. This kind of fear should not exist in science. But it does exist, and is very striking.
- 2) Another example is the use of derogatory language to suppress all sensible debate on the issue, e.g. Karolinska Institute's Professor of complementary medicine said that 'homeopaths are charlatans who engage in deception'.
- 3) A third reaction is that people simply begin to lie.

As an honest scientist, I have made an appraisal of all the articles I have described here. Far from it being unequivocally established that homeopathy is a "fake medicine", the evidence shows precisely the opposite. Professors are abusing their position by letting their 'ideology' control the scientific message.

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<sup>i</sup> Linde K, Clausius N, Ramirez G, Melchart D, Eitel F, Hedges LV, Jonas WB. **Are the clinical effects of homeopathy placebo effects? A meta-analysis of placebo-controlled trials.** Lancet 1997;350:834-43.

<sup>ii</sup> Linde K, Scholz M, Ramirez G, Clausius N, Melcart D, Jonas WB. **Impact of study quality on outcome in placebo-controlled trials of homeopathy.** J Clin Epidemiol 1999;52:631-6.

<sup>iii</sup> Ernst E, Pittler MH. **Re-analysis of previous meta-analysis of clinical trials of homeopathy.** J Clin Epidemiol 2000;53:1188.

<sup>iv</sup> 2002 (Br J Clin Pharmacol 2002; 54: 577-582)

<sup>v</sup> Cucherat M, Haugh MV, Gooch M, Boissel J-P. **Evidence for clinical efficacy of homeopathy. A meta-analysis of clinical trials.** Eur J Clin Pharmacol 2000;56:27-33.

<sup>vi</sup> Shang A, Huwiler-Münterer K, Nartey L, Jüni P, Dörig S, Sterne JA, Egger M. **Are the clinical effects of homeopathy placebo effects? Comparative study of placebo-controlled trials of homeopathy and allopathy.** Lancet 2005;366:726-32.