

# Developing the collaboration between the James Lind Library and the *Journal of the Royal Society of Medicine*

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## Introduction

The web-based James Lind Library was established in 2003 to explain and illustrate the evolution of fair tests of medical treatments.<sup>1</sup> The Library contains explanatory essays showing how the misleading effects of biases and the play of chance can be reduced when testing treatments. It illustrates these methodological principles using scans of key historical documents, mostly provided by the Sibbald Library at the Royal College of Physicians of Edinburgh.

Editors at the James Lind Library commission and write articles to show how thinking and measures to develop fair tests of treatments have evolved over centuries. When Kamran Abbasi was making plans for taking over as Editor-in-Chief of the *Journal of the Royal Society of Medicine*, he suggested to Iain Chalmers that each monthly issue of the Society's *Journal* might republish articles that had been published previously in the James Lind Library. Authors would retain copyright in the texts of their articles, and these would remain open access and linked digitally to a wealth of supplementary material in the web-based James Lind Library. These texts would establish a monthly, clinically relevant section of the *Journal*, and at the same time extend the readership of James Lind Library articles and ensure their discoverability in bibliographic databases.

This 'win-win' dual publication arrangement was initiated in 2005<sup>2</sup> with an article on factorial trials authored by Richard Doll, one of the earliest investigators to use this study design, which had been published in the James Lind Library two years previously.<sup>3</sup> Since then, over 200 articles originally published in the James Lind Library have been republished in the *Journal of the Royal Society of Medicine*. These include, for example, brief histories of the introduction of numerical methods to assess the effects of treatments,<sup>4</sup> the evolution of evidence

synthesis<sup>5</sup> and n-of-1 trials,<sup>6</sup> commentaries on avoiding bias in assessing the effects of variolation,<sup>7</sup> therapeutic fashion and publication bias<sup>8</sup> and sponsorship bias in clinical trials,<sup>9</sup> as well as some important personal reflections from, for example, Peter Armitage,<sup>10</sup> one of the British pioneers of medical statistics; David Sackett,<sup>11</sup> the Canadian co-founder of Evidence-Based Medicine; and Milos Jenicek,<sup>12</sup> author (in French) of the first book on meta-analysis in medicine.

Most articles in the James Lind Library are of a length acceptable to the Society's *Journal*; but some are too long and need to be converted into more than one article for republication. For example, Robert Matthews' recent presentation and discussion of the origins of treatment of uncertainty in clinical medicine has been published in two parts in the May and June issues of the *Journal* this year.<sup>13,14</sup>

## The evolution of probabilistic thinking in the evaluation of therapies

These [advances] require only an attention to probabilities, to leading principles, and [...] a quick discernment where the greatest probability of success lies... (Gregory,<sup>15</sup> p. 150)

These words are those of a prominent 18th century Scottish professor, John Gregory, whose published work was translated into French, German, Italian and Spanish.<sup>15</sup> The quotation signals a shift away from the search for an imagined absolute truth derived from theories and from supportive (single) cases, towards estimates of probability resulting from evidence based on numerous facts, comparisons and calculations.

The rise of evidence-based medicine during the past 30 years has led many clinicians to accept that current best knowledge is based on 'probable

estimates' rather than on 'certain wisdom'. Clinician perspectives on evidence-based medicine have been accompanied by research on the sociology of quantification in medicine from various standpoints – philosophical, mathematical, epidemiological, historical, social ethical and political. Only marginally, however, have these studies touched on the emerging use of probabilities in the clinical context.

This gap has now been addressed by Ulrich Tröhler, Emeritus Professor of the History of Medicine at the University of Berne and one of the founding editors of the James Lind Library. He has researched and documented the evolution of probabilistic thinking in the evaluation of therapies during the two centuries leading up to 1900. The resulting 30,000-word article has been published in the James Lind Library,<sup>16</sup> and its text will now be republished as a nine-part series (Figure 1), beginning in this issue of the Society's *Journal*.<sup>17</sup>

### Research methods used

Tröhler's study uses an historical perspective based on his examination of original sources published in several languages. He has considered how, from the beginning of the 18th century, the adoption of methodological approaches to the evaluation of

medical interventions was linked to probabilistic underpinnings, and compared this evolution in the writings of Swiss, French, British and German authors. In brief, Tröhler has documented a comparative European history of the long dawn of a veritable *evaluation science*, up to the first tests of statistical significance in late 19th century Germany. His account is thus based on the history of evaluation of medical interventions, from simple quantification to mathematisation.

Tröhler has analysed the evolving features of the *status quo* in the evaluation of therapies over time, the arguments on which they have been based, the criteria demanded – and negated. He has considered some aspects of the sociology of the promoters and detractors of these approaches. His analyses partly explain why mathematical sophistication has remained largely unrecognised by contemporary clinical practitioners (and even by historians). This holds particularly for a group of British and German authors identified by Tröhler, but who had not hitherto been sufficiently recognised.

Tröhler has demonstrated national interdependence by assessing the extent to which translations and reciprocal quotations have or have not been a feature of the development and application of probabilistic features of the publications examined.

**Figure 1.** Titles of the nine-part series.

#### **Series on probabilistic thinking and the evaluation of therapies, 1700-1900**

- 1 Probabilistic thinking and evaluation of therapies: an introductory overview
- 2 The French road to Gavarret's clinical application of probabilistic thinking: Part 1 French *dramatis personae*
- 3 The French road to Gavarret's clinical application of probabilistic thinking: Part 2 Louis Denis Jules Gavarret
- 4 Development of clinical probabilistic practice in Britain before Gavarret: Part 1 The long 18th century
- 5 Development of clinical probabilistic practice in Britain before Gavarret: Part 2 British perspectives on prominent French researchers
- 6 Theory and clinical use of probabilities in Germany after Gavarret: Part 1 Introducing German *dramatis personae*
- 7 Theory and clinical use of probabilities in Germany after Gavarret: Part 2 Assessments of the state-of-the-evaluative art
- 8 Conclusions and perspectives on probabilistic thinking for the new century: Part 1 200 years of discussions
- 9 Conclusions and perspectives on probabilistic thinking for the new century: Part 2 Social, national and long-term perspectives

He speculates about whether there were national differences in the generation, reception and dissemination of a mindset across the francophone, anglophone and German-speaking worlds. After considering the evidence and applying a long-term, two-century perspective, he concludes that the criteria used for judgements about treatment effects were transnational and remarkably durable over time. Indeed, much of the debate sounds remarkably contemporary.

## A still-evolving history

The two-century span of Tröhler's research on the evolution of probabilistic thinking concludes just after statistical significance testing was introduced in Germany.<sup>16</sup> The research shows that the 18th and 19th centuries were the long-drawn-out dawn of the science of probabilistic testing. Application of the mathematised probabilistic approach in medicine began soon after with British statisticians Karl Pearson,<sup>18</sup> Major Greenwood,<sup>19</sup> Hilda Woods and William Thomas Russell<sup>20</sup> and Austin Bradford Hill,<sup>21</sup> and it became entrenched during the second half of the 20th century.

Guided by its statistics adviser, Robert Matthews, the James Lind Library will continue to add material and articles relevant to this still evolving history, republishing articles in the Society's *Journal*. Current disputes<sup>22</sup> about whether statistical significance testing has done more harm than good and whether Bayesian thinking and analysis should influence the interpretation of statistical data make clear that the history of identifying, quantifying and interpreting uncertainties about the effects of medical treatments is still being written.

### Declarations

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### References

1. Chalmers I, Milne I, Tröhler U, Vandenbroucke J, Morabia A, Tait G, et al. The James Lind Library:

explaining and illustrating the evolution of fair tests of medical treatments. *J R Coll Phys Edinburgh* 2008; 38: 259–264.

2. Abbasi K. A subtle change of spots. *J R Soc Med* 2005; 98: 439.
3. Doll R. Controlled trials testing two or more treatments simultaneously. *JLL Bulletin: Commentaries on the History of Treatment Evaluation*. See <https://www.jameslindlibrary.org/articles/controlled-trials-testing-two-or-more-treatments-simultaneously/> (last checked 9 June 2020) (republished in Doll R. *J R Soc Med* 2005; 98: 479–480).
4. Tröhler U. The introduction of numerical methods to assess the effects of medical interventions during the 18th century: a brief history. *JLL Bulletin: Commentaries on the History of Treatment Evaluation*. See <https://www.jameslindlibrary.org/articles/the-introduction-of-numerical-methods-to-assess-the-effects-of-medical-interventions-during-the-18th-century-a-brief-history/> (last checked 9 June 2020).
5. Clarke M. History of evidence synthesis to assess treatment effects: personal reflections on something that is very much alive. *JLL Bulletin: Commentaries on the History of Treatment Evaluation*. See <https://www.jameslindlibrary.org/articles/history-of-evidence-synthesis-to-assess-treatment-effects-personal-reflections-on-something-that-is-very-much-alive/> (last checked 9 June 2020).
6. Mirza RD, Punja S, Vohra S and Guyatt G. The history and development of N of 1 trials. *JLL Bulletin: Commentaries on the History of Treatment Evaluation*. See <https://www.jameslindlibrary.org/articles/history-development-n-1-trials/> (last checked 9 June 2020).
7. Bird A. James Jurin and the avoidance of bias in collecting and assessing evidence on the effects of variolation. *JLL Bulletin: Commentaries on the History of Treatment Evaluation*. See <https://www.jameslindlibrary.org/articles/james-jurin-and-the-avoidance-of-bias-in-collecting-and-assessing-evidence-on-the-effects-of-variolation/> (last checked 9 June 2020).
8. Hampton J. Therapeutic fashion and publication bias: the case of anti-arrhythmic drugs in heart attack. *J R Soc Med* 2015; 108: 418–420.
9. Jefferson T. Sponsorship bias in clinical trials – growing menace or dawning realisation? *JLL Bulletin: Commentaries on the History of Treatment Evaluation*. See <https://www.jameslindlibrary.org/articles/sponsorship-bias-in-clinical-trials-growing-menace-or-dawning-realisation/> (last checked 9 June 2020).
10. Armitage P. The evolution of ways of deciding when clinical trials should stop recruiting. *JLL Bulletin: Commentaries on the History of Treatment Evaluation*. See <https://www.jameslindlibrary.org/articles/the-evolution-of-ways-of-deciding-when-clinical-trials-should-stop-recruiting/> (last checked 9 June 2020).
11. Sackett DL. Why did I become a clinician-trialist? *JLL Bulletin: Commentaries on the History of Treatment Evaluation*. See <https://www.jameslindlibrary.org/articles/why-did-i-become-a-clinician-trialist/> (last checked 9 June 2020).

12. Jenicek M. Méta-analyse en médecine: the first book on systematic reviews in medicine. *JLL Bulletin: Commentaries on the History of Treatment Evaluation*. See <https://www.jameslindlibrary.org/articles/meta-analyse-en-medicine-the-first-book-on-systematic-reviews-in-medicine/> (last checked 9 June 2020).
13. Matthews RAJ. The origins of the treatment of uncertainty in clinical medicine. Part 1: ancient roots, familiar disputes. *JLL Bulletin: Commentaries on the History of Treatment Evaluation*. See <https://www.jameslindlibrary.org/articles/the-origins-of-the-treatment-of-uncertainty-in-clinical-medicine-part-1-ancient-roots-familiar-disputes/> (last checked 9 June 2020).
14. Matthews RAJ. The origins of the treatment of uncertainty in clinical medicine. Part 2: the emergence of probability theory and its limitations. *JLL Bulletin: Commentaries on the History of Treatment Evaluation*. See <https://www.jameslindlibrary.org/articles/the-origins-of-the-treatment-of-uncertainty-in-clinical-medicine-part-2-the-emergence-of-probability-theory-and-its-limitations/> (last checked 9 June 2020).
15. Gregory J. *Lectures on the Duties and Qualifications of a Physician* (New Ed.). Edinburgh: Creech, 1772/1805.
16. Tröhler U. Probabilistic thinking and the evaluation of therapies, 1700–1900. *JLL Bulletin: Commentaries on the History of Treatment Evaluation*. See <https://www.jameslindlibrary.org/articles/probabilistic-thinking-and-the-evaluation-of-therapies,-1700-1900> (last checked 9 June 2020).
17. Tröhler U. Probabilistic thinking and the evaluation of therapies: an introductory overview. *J R Soc Med* 2020; 113.
18. Pearson K. Report on certain enteric fever inoculation statistics. *BMJ* 1904; 3: 1243–1246.
19. Greenwood M. Is the statistical method of any value in medical research? *Lancet* 1924; 2: 153–158.
20. Woods HM and Russell WT (1931). An introduction to medical statistics. London: Staples Press, 1931.
21. Hill AB. Principles of medical statistics. I. The aim of the statistical method; and General summary and conclusions. *Lancet* 1937; 1: 41–43 and 883–885.
22. Matthews RAJ, Wasserstein RL and Spiegelhalter DJ. The ASA's p-value statement, one year on. *Significance* 2017; 14: 38–41.

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