

## The contribution of Douglas Altman's research to the EVIDENCE Journal

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This journal was born vastly inspired in most of Douglas Altman's research and ideals. Dr. Altman will not be only remembered by his worldwide-spread research pieces. He will be remembered by his ahead-of-time thinking; by his criticism as an effort for a better medical research; and also by his efforts to improve science integrity and reproducibility – that said, all of these with an unparalleled importance beyond scientific pieces that all of us need to have in mind as concepts for practicing, inspiring and guidance. As the associate-editor of the Statistics section of the Evidence Journal, I am more than glad to have the opportunity to comment a thing about his legacy, which inspired me and contributed to a great part of my training; and that will continue all over my career.

In the last years, Dr. Altman had been working in efforts to improve scientific transparency and reproducibility, mainly by the development of scientific reporting guidelines. For example, he was one of the co-founders of the Enhancing the Quality and Transparency of Health Research (EQUATOR) Network, and also had co-authorships in the most important guidelines, such as the Consolidated Standards for Reporting Trials

(CONSORT Statement)<sup>1</sup>; the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA Statement)<sup>2</sup>; or the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE Statement)<sup>3</sup>. Pretty important to say, most of the leading biomedical journals today adhere to the mandatory use of reporting guidelines, as the same recommended by the International Committee of Medical Journal Editors. Notwithstanding, we can say that he predicted the poor reporting several years before in his seminal piece about the poor medical research that I will comment thereafter<sup>4</sup>.

Traditionally, Dr. Altman is recognized by the development of statistical methods, mainly the analysis of agreement between two different methods to measure the same signal – i.e., the Bland & Altman plot<sup>5</sup>; and also by his countless educational scientific pieces with his long-standing collaborator Martin Bland, in which more than 50 statistical notes were published over time in the British Medical Journal (The BMJ)<sup>6-8</sup>. Many of these helped us while students, epidemiologists, care-providers, professors and researchers and will continue to help the future generation.

The scientific community needs to acknowledge him by his contribution to developing a simple and friendly statistics to measure the risk of bias of randomized clinical trials in systematic reviews<sup>9</sup>; or for the  $I^2$  statistics, which substituted the  $Q^2$  statistics years later also through a friendly way to assess heterogeneity of results in meta-analyses<sup>10</sup>, that is widespread through almost every single available statistical package. Nonetheless, another seminal work that could be referred to him is how to interpret results of asymmetry in meta-analyses<sup>11</sup>, in which the so common mislead concept between asymmetry and publication bias among scientists was commented as well.

In respect to his criticism for the way that medical research has been conducted, it can be identified not only by his conference talks, likely by his so-called quote about a part of the medical research that is done by non-research-trained physicians: “The difference between the agronomy and the medical research is that the first one is never done by farmers”, or by the personal interactions in which he disclaimed his thoughts. The literature is plenty of pieces in which his mind-thinking is clear and evident. In 1994, he published his seminal editorial – and perhaps his most influential piece entitled “The scandal of poor medical research”<sup>4</sup>, starting his text with a concept that, years later, became the tone in the scientific community: “We need less research, better research, and research done for the right reasons.” In this piece, he disclaimed the problem of misleading medical research through small and unrepresentative sample sizes, incorrect methods of analysis, the “publish or perish” concept among scientists and the spin of interpretation. Not surprisingly, the meta-research quantitatively confirmed his postulates, decades after<sup>12-14</sup>.

Today, many concepts that can seriously jeopardize scientific results across different study designs and that are completely accepted by the scientific community had his contributions. For example, he provided empirical evidence of how the lack of blinding (a) and the inadequate allocation concealment (b) could affect effect sizes in randomized clinical trials<sup>15</sup>. For regression analysis, he pointed out how the misuse of dichotomization of continuous data could affect coefficients<sup>16</sup>. Nonetheless, some important topics of global epidemiology had his contributions. Here, we can cite his efforts to improve

maternal and newborn health, mainly by protective effects of magnesium sulphate to reduce pre-eclampsia risk during pregnancy<sup>17</sup> and by his work with the INTERGROWTH-21th, mostly developing international fetal and newborn growth charts<sup>18</sup>.

Dr. Altman died in 3rd June 2018 by bowel cancer at 70 years old.

### Competing interests

No financial, legal or political competing interests with third parties (government, commercial, private foundation, etc.) were disclosed for any aspect of the submitted work (including but not limited to grants, data monitoring board, study design, manuscript preparation, statistical analysis, etc.).

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