Doug Altman Scholarships

1 IF YOU CAN'T BEAT 'EM, JOIN 'EM: COMBATING POOR SCIENTIFIC PRACTICE WITH A QUANTITATIVE, OPEN-ACCESS RESEARCH METRIC

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Objectives Curiosity and altruism are characteristics that we endeavour to nurture within the scientific community. Unfortunately, competition for funding and employment stifle such qualities and incentivize poor scientific practice. In efforts to make decisions about funding and employment more evidence-based, several quantitative metrics intended to reflect the proficiency of a scientist have emerged. Although such metrics were intended to be 'objective,' it is common to manipulate such metrics to one's own advantage. Studies can be published in a piece-meal fashion to increase the number of publications, and scientists can cite their own work even though citing other literature would be a suitable alternative. This is a corrupt cycle that rewards those who use poor scientific practices to inflate these metrics and subsequently acquire more funding in favour of the honest scientist.

Method Given the widespread use of quantitative metrics as a means of assessing performance and funding allocation, one possible solution to combat poor scientific practice may be the introduction of a quantitative metric that measures a scientist's commitment to transparency and open-access (the author suggests this is named the 'Altman index,' in remembrance of Professor Doug Altman and his commitment to scientific integrity). The amount of information available to financial and socio-political stakeholders about a scientist is overwhelming, and decision-making processes regarding funding are undoubtedly influenced by cognitive biases. In addition to open-access journals, there now exists a plethora of open-access tools such as Plaudit,[1] Protocols.io,[2] and the recently announced Reproducible Document Stack.[3]

Results To alleviate pressures on human resources dedicated to assessing a scientist's proficiency, the Altman index would centralise and integrate data produced by end-users of open-access tools into a comprehensive and interpretable metric. This would make open-access more tangible for all stakeholders and allow them to redirect their focus on the humanistic aspects of research. Additionally, making the Altman index publicly accessible would empower those members of the community who want to hold scientists and academic institutions socially accountable.

Moreover, the lack of incentive to publish negative results means that the extant scientific literature is not an accurate representation of reality, and authors may even fabricate or manipulate their results to make publication more likely. The Altman index could also be used to address this bias by rewarding the publication of negative results and making dataset and methodology publicly available.

Conclusions As algorithmic approaches to big data are the current zeitgeist in scientific research, it is important to note that the Altman index is only a starting point in addressing the redistribution of funds to those who have shown commitment to scientific integrity and transparency. Additionally, there is scepticism amongst many scientists and the public about such approaches, so transparency and open-mindedness are crucial in developing the Altman index. As has happened with other metrics, there may be unanticipated adverse consequences with the introduction of the Altman index, and it is important to invest time designing the Altman index in a way that minimises the risk of perverse incentivisation.

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2 TIME FOR A REAL MANIFESTO

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Objectives The scandal of poor medical research is rooted in failings of individuals and institutions. Improving the situation requires us to formulate political solutions and lobby hard for their implementation.

The EBM manifesto is a worthy statement of principles, but it is nebulous and lacks specific objectives. The dire scale of the crisis it eloquently describes threatens to overwhelm the impetus to action with a counsel of despair. The problems are well understood, now we must identify and ruthlessly promote a limited number of achievable and high impact solutions.

Method Five Demands

1. Fix the Research Evaluation Framework

REF rewards academics who demonstrate 'impact', commonly interpreted as trials with positive outcomes that alter practice. REF should be re-engineered to incentivize rigorous and transparent research that matters to patients. Institutional returns should include metrics of patient participation and research integrity, including research registration, data sharing and reporting. Returns for papers with unwarranted deviation from protocols will be prohibited.

2. Overhaul Research Funding

Contractual compliance measures are required for government health funding, with payments made contingent on fulfilment of agreed methodologies and reporting of outcomes. In cases of breaches of such terms, provision must be made for funding 'clawback'.

Results

3. Establish a National Health Research Data Repository

All research data should be submitted on a national repository, including 'lab books' documenting experimental data. Depositing additional documentary evidence such as videos of lab procedures will become an expectation of good practice. Submission of publically viewable, blank research databases and examples of pseudonymised patient data that will be made available for peer (and/or) public review will be a mandatory condition of grant applications. Data which will not be publically accessible must be identified and justified along with the terms under which the data will be made available for peer scrutiny.

4. Standardise & Integrate Journal Submissions

Journals should adopt a uniform format in which papers will be accepted for peer review, whilst the submission platforms should be integrated to eliminate duplication. Achieving this will engage grassroots researchers and could offset additional workload resulting from enhanced reporting and transparency in research.

5. Establish a Health Research Ombudsman

Experience suggests that even with rules, compliance is poor. An ombudsman is required to police fulfilment of obligations including data sharing, trial reporting and the measures outlined above. The ombudsman will respond to concerns from patients and professionals and will have oversight of public funding of health research. The ombudsman will also enlist peer reviewers to conduct audits of ongoing research, akin to the role of Specialist Inspectors in the CQC.

Conclusions The profound problems in health research are widely acknowledged. The underlying causes are dysfunctional incentives, opacity and misalignment of research with patient priorities. There is no prospect that these issues will be resolved if we cannot translate the principles in the EBM manifesto into a set of practical measures. The five actions highlighted are not a panacea but they are practical first steps in overturning the scandal of poor medical research.

3 A REVIEW OF THE MAGNITUDE OF FINANCIAL RELATIONSHIPS WITH INDUSTRY AND DISCLOSURE PRACTICES AMONG CLINICAL PRACTICE GUIDELINE AUTHORS

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Objectives Financial conflicts of interest (FCOI) with the pharmaceutical industry are associated with a sizeable, unidirectional, reproducible effect in favor of 'positive' research findings, per a recent Cochrane systematic review. In the context of clinical practice guidelines (CPG) — consensus documents that singularly guide most aspects of patient care — FCOI may result in biased treatment recommendations. Here, to derive a summary effect of the the magnitude of financial relationships with industry among CPG authors, and the accuracy of relationship disclosure, we synthesize both published and unpublished investigations.

Method Our protocol is publicly available (https://osf.io/MXF4B/). Using a combination of a PubMed search and expert knowledge of available studies, we gathered all published investigations of CPG author financial relationships with industry. Included studies must have used the OpenPayments database to either: 1) quantify the magnitude of financial relationship or 2) assessed the accuracy of disclosure statements among CPG authors. Raw payments data were solicited from all previous studies and converted to money received per author per 1 year. We combined raw payment data to derive summary measures of central tendency (e.g., medians with interquartile ranges (IQR)) for all four categories of OpenPayments data: General (e.g., personal fees such as speaking or honoraria), Research (e.g., direct costs), Associated research (e.g., grants), and Ownership (e.g., stock). We use Stata 15.1 and the command metaprop to conduct a fixed-effect meta-analysis of the proportion of disclosure statements that were accurate across all eligible studies.

Results All data (including area of medicine) and figures are available via OSF (https://osf.io/MXF4B/). A total of 10 studies (4 published, 6 under journal review by our team) with raw payments data comprising 494 CPG authors were retrieved for our analysis of the magnitude of financial relationships. Across all 494 CPG authors, the median total money received from industry per year was $14,286 (IQR $105,964). Authors who received money in each category received (median, IQR): General payments $4,141 (IQR $20,641); Research $3,155 (IQR $5,396); Associated Research $66,541 (IQR $253,552); Ownership $7,199 (IQR $121,417).

A total of 9 studies investigated the accuracy of CPG author disclosure using OpenPayments database. The pooled accuracy of disclosure was 18% (95%CI 16% - 20%). One included study represented 62% of the weight in the meta-analysis. In a sensitivity analysis removing this study, the pooled accuracy of disclosure was 30% (95%CI 27% - 34%).

Conclusions The results of this novel synthesis demonstrate that authors of medical CPGs are heavily conflicted and are likely not representative of most physicians. To curb the effects of FCOI on CPGs, international policy collaborations are necessary to 1) track payments to non-US based physician-authors; 2) improve disclosure of existing FCOIs; 3) encourage divestiture and prevention of future FCOIs.

4 MORE SYSTEMATIC REVIEWS ARE BEING REGISTERED IN PROSPERO EACH YEAR, BUT RECORDS ARE SELDOM UP-TO-DATE

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Objectives Prospective registration of systematic reviews (SRs) is useful as it increases transparency and decreases risk of bias. It also aims to prevent unintended duplication of SRs and facilitates collaboration. Thus, prospective registration is widely recommended in current guidance on SRs. Furthermore, like publishing a SR protocol, registration may increase the methodological quality of the SR.

The international prospective register for SRs, PROSPERO, is the world's first open-access online facility to register SRs. Registration is free of charge and records can easily be updated by the authors. Then a new version of the PROSPERO record is published.

Our primary objective was to determine the proportion of SRs registered in PROSPERO and the influence of publication year, review focus and country on that proportion. Our secondary objectives were a) to compare the basic characteristics of registered and non-registered SRs and b) to assess the up-to-dateness of the PROSPERO records.

Method We searched PubMed for SRs published between 2011 (launch of PROSPERO) and November 2018. We included a random sample of n = 300 SRs that would be eligible for registration in PROSPERO. We excluded scoping reviews, umbrella reviews/overviews and SRs, for which it is mandatory to publish a protocol, e.g. Cochrane reviews.

We extracted data on the following items: Country, focus (therapeutic, epidemiologic, diagnostic, prognostic or other), number of authors, and date of submission, publication and last search. If the SR was registered in PROSPERO, we also extracted the number of versions, status, and date of first and last version.

All data were analysed descriptively. Our primary analysis was based on the whole sample, while our secondary analyses were based on a) the registered and non-registered SRs and b) the identified PROSPERO records. Results