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## Reporting guidelines are part of a complex behaviour intervention

The publishing community began to take note. The International Committee for Medical Journal Editors encouraged journals “to ask authors to follow [reporting] guidelines” [1]. Concerned editors sought ways to adopt reporting guidelines, and more and more journals [2]; [3] have since found a range of strategies to introduce reporting guidelines into their policies, outlined in [Table 1](#tbl-journal-policies). There is variation in the degree of enforcement (from passive recommendation through to compulsory enforcement) and variation in the guidelines subject to the policy; PRISMA and CONSORT and more commonly enforced than STROBE, say, and many reporting guidelines in EQUATOR’s library are not enforced nor endorsed by any journals. Instead of listing reporting guidelines by name, many journals keep their instructions vague and merely recommend authors find an appropriate guideline on EQUATOR’s website.

Table 1: Examples of how journals have introduced reporting guidelines into their policies. Journals also differ in the reporting guidelines they enforce. For example, some journals may only have policies for randomised trials or systematic reviews, whereas other journals may enforce guidelines for other study types. To my knowledge, no journal explicitly advises *against* using a reporting guideline.

| Enforcement type | Example |
| --- | --- |
| Enforcing adherence | An editor or peer reviewer checks the article body for reporting guideline adherence and asks the author to add missing items. |
| Requesting peer reviewers use reporting guidelines | Editors ask peer reviewers to consider reporting guideline adherence as part of their review. Some editors may supply the reviewer with the relevant checklist. The reviewer can choose whether to review reporting. |
| Enforcing checklist submission | Editorial staff require authors to submit a completed reporting checklist as part of manuscript submission. Some journals may refuse to process a submission when the checklist is missing. Some journal submission systems may include fields for authors to upload their checklists, whereas other journals may expect authors to upload checklists as a supplementary file. |
| Journal endorsement | The journal’s instructions to authors recommends authors follow reporting guidelines. Guidelines may be specified, in which case journals may link to guideline specific websites, to the guideline publications, or to the EQUATOR Network website. Sometimes journals include a general statement but do not name guidelines, instead referring authors to the EQUATOR website with an instruction to follow “relevant guidance”. |
| Publisher endorsement | Sometimes reporting guideline policies are set at the level of the publisher, as is commonly done for editorial policies. Individual journals may point authors to their publisher policies. |
| No policy | Journals have no policies regarding reporting guidelines. |

Other stakeholders have begun incorporating reporting guidelines into their policies. Conferences like the Peer Review Congress ask applicants to use reporting guidelines when writing their abstracts. MedRxiv, a large preprint server, asks authors to declare they have “followed all appropriate research reporting guidelines, such as any relevant EQUATOR Network research reporting checklist(s)” [4].

EQUATOR have developed training programmes based on reporting guidelines. The training covers different ways to use reporting guidelines, including drafting manuscripts, checking manuscripts you have written, and appraising the reporting of someone else’s manuscript. Researchers have developed writing software to help authors apply reporting guidelines when drafting [5, 6], online applications to facilitate checklist and flow diagram completion [7, 8], and resources for reviewers to check compliance [9].

Hence over the years, a system has organically grown around reporting guidelines, driven by separate groups of people doing what they felt was sensible. This system includes the guidance resources themselves (the publications, checklists, flow diagrams), the websites that host those resources (guideline websites, the EQUATOR website, publisher’s websites), organisations that promote or enforse their use (EQUATOR, publishers, ICMJE), and staff at those institutions (researchers, editors, reviewers). These components all have the same aim: to influence what information researchers include in their articles.

As the Medical Research Council notes, a system with multiple components (like those listed above) is one of many hallmarks of a complex intervention: “an intervention might be considered complex because of properties of the intervention itself, such as the number of components involved; the range of behaviours targeted; expertise and skills required by those delivering and receiving the intervention; the number of groups, settings, or levels targeted; or the permitted level of flexibility of the intervention or its components.”. The reporting guideline system exhibits these sources of complexity, as described in [Table 2](#tbl-complexity).

Table 2: Sources of complexity within reporting guidelines and the system drives their use.

| Source of complexity | Example |
| --- | --- |
| Number of components involved | Reporting guidelines often consist of guidance documents, checklists, and flow diagrams, and other tools. These are disseminated through websites, publishing platforms, submission systems, and they are endorsed and enforced by staff at stakeholders including publishers, the EQUATOR Network, conference organisers, and pre-print platforms. |
| Range of behaviours targeted | Guidelines comprise “reporting items”. Some items are relatively simple, like asking the author to specify their study design in the title. Others are harder, perhaps because they require time, expertise, or prerequisite tasks. For instance, some items may require authors to have conducted their study or analysis in a certain way, or to have collected particular information. |
| Expertise and skills required by those delivering and receiving the intervention | Academics from a particular field write reporting guidelines for their peers (as opposed to a lay audience), and so authors, editors, and reviewers must have sufficient expertise to use them. |
| The number of groups, settings, or levels targeted | Groups: Users of reporting guidelines differ in their field of expertise, their experience, place of work.  Settings: Although mostly written with authoring in mind, most guideline developers may also hope their resources are used by editors or peer reviewers for checking or appraising research articles.  Guidelines are written with individuals in mind, but their efficacy is generally measured at group level (e.g. articles from a particular field published in a period time). |
| Flexibility of the intervention or its components | There is variation between guideline content, resources, and the implementation strategies that development groups, publishers, and other stakeholders employ. |

Viewing reporting guidelines as part of a complex behaviour change intervention may seem novel. Researchers often call reporting guidelines “tools” or “strategies” (#REF). In “A history of the EQUATOR Network”, Doug Altman refers to reporting guidelines as “resources” that “influence” reporting, but he does not call them interventions. However, I believe my perspective is not radical. I will now outline studies exploring the efficacy of reporting guidelines, and argue that these studies take a systems perspective too although they seldom acknowledge it explicitly.

1. ICMJE | Recommendations | Preparing a Manuscript for Submission to a Medical Journal.

2. Koch M, Riss P, Umek W, Hanzal E (2016) [The explicit mentioning of reporting guidelines in urogynecology journals in 2013: A bibliometric study](https://doi.org/10.1002/nau.22726). Neurourology and Urodynamics 35:412–416

3. Sharp MK, Tokalić R, Gómez G, Wager E, Altman DG, Hren D (2019) A cross-sectional bibliometric study showed suboptimal journal endorsement rates of STROBE and its extensions. Journal of clinical epidemiology 107:42–50

4. medRxiv.org - the preprint server for Health Sciences.

5. Barnes C, Boutron I, Giraudeau B, Porcher R, Altman DG, Ravaud P (2015) [Impact of an online writing aid tool for writing a randomized trial report: The COBWEB (Consort-based WEB tool) randomized controlled trial](https://doi.org/10.1186/s12916-015-0460-y). BMC Medicine 13:221

6. Hawwash D, Sharp MK, Argaw A, Kolsteren P, Lachat C (2019) Usefulness of applying research reporting guidelines as Writing Aid software: A crossover randomised controlled trial. BMJ Open. <https://doi.org/10.1136/bmjopen-2019-030943>

7. Haddaway NR, Page MJ, Pritchard CC, McGuinness LA (2022) [PRISMA2020: An R package and Shiny app for producing PRISMA 2020-compliant flow diagrams, with interactivity for optimised digital transparency and Open Synthesis](https://doi.org/10.1002/cl2.1230). Campbell Systematic Reviews 18:e1230

8. Struthers C, Harwood J, de Beyer JA, Dhiman P, Logullo P, Schlüssel M (2021) [GoodReports: Developing a website to help health researchers find and use reporting guidelines](https://doi.org/10.1186/s12874-021-01402-x). BMC medical research methodology 21:217

9. Compliance Questionnaire | ARRIVE Guidelines.