UNDERSTANDING AND INCREASING THE IMPACT OF RESEARCH

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Without a clear, shared understanding of the standards of scientific evidence, neither clinicians nor patients can make reasonable decisions. Without such guidance, artificial intelligence (AI), especially large language systems, can flood our channels of communications with vagaries and nonsense.

Our review of 50 clinical practice guidelines showed enormous variations and a fundamental lack of consensus. Most guidelines used evidence-rating systems that ranked only individual studies and disregarded the multitude of relevant information coming from diverse sources. Many of them included statements that are vague and non-reproducible (e.g., well-designed study, future evidence is unlikely to change our conclusions, clear evidence from adequately powered study). The studied evidence rating systems of 9 AI large language systems fared worse than clinical practice guidelines. Controversies of evidence filtering and ranking are further highlighted by the emergence of scientific data and knowledge repositories and the volume of untrustworthy and questionable information submitted to them. In our studies of 100 scientific data repositories, 76% had open submission and only 8% had identifiable contact person/editor, indicating a breakdown in peer-review.

There is an unprecedented need for practicable, multidimensional evidence-rating that can also be used by the lay person and tools for plain language communication of science. Better understanding of what scientific evidence is at the heart of improving the quality and productivity of research, success rate of health care interventions, and public health impact of biomedical research. A richer, multidimensional definition moves evidence beyond “published data” toward structured knowledge that can inform action. A more precise understanding of what counts as valid, strong, and relevant evidence helps improve biomedical research impact through higher quality research design, better reproducibility and transparency, improved translation to practice and policy, and enhanced public understanding of science. The historic quality control methods like peer-review, journal indexing, study typology, and provenance tracking need to be elevated and redefined for multidimensional evidence ranking in the age of artificial intelligence.