

Crafting High-quality Peer Reviews of eHealth and Informatics Research, with or without AI: a Tutorial

Tiffany I. LEUNG ^{a,b,c,1}, Mina BJELOGRLIC ^{d,e}, Pei-Yun HSUEH ^f, Donghua TAO ^g,
Shefali HALDAR ^h, Amaryllis MAVRAGANI ^{a,i}

^a JMIR Publications, Toronto, Canada

^b Department of Internal Medicine (adjunct), Southern Illinois University School of Medicine, Springfield, IL, United States

^c Care and Public Health Research Institute, Maastricht University, Maastricht, The Netherlands

^d Division of Medical Information Sciences, Geneva University Hospitals, Geneva, Switzerland

^e Department of Radiology and Medical Informatics, University of Geneva, Geneva, Switzerland

^f Pfizer, New York, NY, United States

^g UIC Library of the Health Sciences, University of Illinois Chicago, Chicago, IL, United States

^h Merck & Co., Inc., Boston, MA, United States

ⁱ Department of Computing Science and Mathematics, University of Stirling, UK

Tiffany I. Leung <https://orcid.org/0000-0002-6007-4023>

Mina Bjelogrljic <https://orcid.org/0000-0002-6922-3283>

Pei-Yun Hsueh <https://orcid.org/0000-0002-0737-4983>

Donghua Tao <https://orcid.org/0000-0002-7801-8919>

Shefali Haldar <https://orcid.org/0000-0003-0348-3012>

Amaryllis Mavragani <https://orcid.org/0000-0001-6106-0873>

Abstract. Peer review is a foundation of scholarly and scientific communication for more than 300 years. Modernized peer review models are becoming more prevalent, however, the essentials of engaging constructively with authors in academic dialogue as a peer reviewer are still unchanged. Peer reviews assess the validity of the science and methodological rigor, significance and originality of the research, contributions to scientific advancement, and identify scientific errors and missing/incorrect references. The aim of this tutorial is to provide interactive instruction to participants on essential considerations during the peer-review process. After a brief introduction to peer review and contemporary peer-review models, topics covered will include: (1) how to write high-quality peer reviews, (2) how to evaluate research ethics approvals, (3) what are additional indicators of high quality in a manuscript, (4) use of inclusive language in peer reviews, and (5) generative artificial intelligence (AI) considerations and policies.

Keywords. Peer review, Open science, Publishing, Research

1. Introduction

Peer review is a foundation of scholarly and scientific communication, reported to be more than 300 years old [1]. Peer review encourages authors to produce high-quality research towards scientific advancement and also supports maintenance of integrity and authenticity of scientific work, including validity, significance, and originality of a study. Peer review should strive to be a constructive part of academic dialogue and evaluation, providing a constructive peer review for improved scientific communication. Peer reviews assess the validity of the science and methodological rigor, significance and originality of the research, contributions to scientific advancement, and identify scientific errors and missing/incorrect references [1]. Contemporary considerations also involve considerations on new models of peer review, publication ethics and integrity [2], use of

fact-based and neutral language in reviews [3], and the role of generative artificial intelligence in scholarly communication or in the peer-review process [4].

2. General description of the topic

The aim of this tutorial is to provide interactive instruction to participants on essential considerations during the peer-review process, from perspectives of researchers, editors, and publishers who are also informatics and eHealth professionals. This tutorial may be valuable especially for early career scientists and researchers; however, a general audience could also benefit from commonly observed issues arising in submitted manuscripts that authors may not be aware prior to submission, both for papers and for peer review reports. After a brief introduction to peer review and contemporary peer - review models, topics covered will include: (1) how to write high-quality peer reviews, (2) how to evaluate research ethics approvals, (3) what are additional indicators of high quality in a manuscript, (4) use of inclusive language in peer reviews, and (5) generative artificial intelligence (AI) considerations and policies.

2.1. How to write high-quality peer reviews

[MB, AM, DT] In this section, faculty provide step-by-step guidance for participants to consider when preparing high-quality peer review reports. Providing a high-quality peer review starts with a self-assessment of expertise or fit for the suggested topic. Additional pragmatic considerations (e.g., submitting a review on time) and ethical considerations (e.g., conflicts of interest) will also be reviewed. During this tutorial, checklists would be provided, along with relevant supporting references and resources for further learning; participants will also practice peer review skills, including, for example, using contemporary examples of studies reporting development and/or applications of large language models. Faculty will share tips on getting started with the peer review process, including how to engage with supervisor(s) (e.g., to seek mentorship) and editor(s), and identifying journals and opportunities to peer review articles.

2.2. How to evaluate ethical considerations and approvals

[AM] Ethical considerations and research ethics board approval are essential in study designs involving human subjects. Scientific studies of eHealth and informatics work may require careful ethical considerations or approvals, for example, accounting for aspects of data protection and reuse (e.g., app-collected data), privacy and identifiability of data or individuals (e.g., social media data), data and products collected or created through co-creation [5] or human factors evaluation studies [6], and more. Faculty will discuss crucial aspects of ethical considerations in study designs, and provide participants with guidance on how to thoroughly evaluate this part of manuscripts during peer review. Examples will be provided for practice and discussion during the tutorial, including, for example, trials, surveys with sensitive or not sensitive topics/questions, social media approaches, secondary analysis or public or non-publicly available data.

2.3. Using inclusive language in peer reviews

[TIL, SH] Peer review is a form of academic dialogue. In this section, faculty provide general principles of good practice as a peer reviewer, including use of respectful language, considering aspects also of using fact-based language that is neutral, inclusive, non-judgmental, and ethical. Cases of good practice and opportunities for improvement would be covered, and provision of relevant guidelines and resources for further learning will be provided to participants, for example the AMIA Inclusive Language and Context Style Guidelines [7].

2.4. Generative AI considerations and policies

[PYH, TIL] Although there is general consensus in publishing that generative AI cannot be a co-author on a manuscript, editorial policies vary by journal and/or publisher on whether authors are permitted to use generative AI in writing manuscripts. Use of

generative AI for peer reviewers is even less clear and not frequently addressed, if at all, in editorial policies. Faculty in this part of the tutorial will offer participants with pragmatic guidance and references on whether or not to incorporate generative AI into one's own peer-review process [4].

3. Brief biographies of the faculty

- **Tiffany I. Leung, MD, MPH, FACP, FAMIA, FEFIM** is Adjunct Associate Professor at Southern Illinois University School of Medicine and Scientific Editorial Director at JMIR Publications. Dr. Leung is past co-chair of the Women in AMIA (WIA) Steering Committee, past chair of the WIA Awards & Leadership Subcommittee, and a current American Medical Informatics Association (AMIA) Board Director (2024-2026). She also has given workshop presentations for the European Federation of Internal Medicine's European Advanced School of Internal Medicine on how to write high-quality peer reviews.
- **Mina Bjelogric, MS, PhD** holds Master in Electrical Engineering in 2014 and a Phd in Computational Electromagnetics in 2018 from EPFL, Lausanne, Switzerland; she focused on computational electromagnetics and signal processing for biomedical applications. She joined the Geneva University Hospitals and the Faculty of Medicine of the University of Geneva, where her research aims are developing facilitators for artificial intelligence (AI) tools in medicine with a focus on models using time series, leveraging information found in textual data. Her recent studies focus on building new explainable models for clinical practice and new metrics to evaluate their performance.
- **Pei-Yun (Sabrina) Hsueh, PhD, FAMIA** is the Director of Ethical AI and External Innovation at Pfizer. Pei-Yun (Sabrina) Hsueh, PhD, FAMIA is the Director of Ethical AI and External Innovation at Pfizer. She serves on the Practitioners Board for ACM and is the Chair of the Women in AMIA Steering Committee and Past Chair of Consumer Health Informatics Work Group. As a global leader in health AI innovation and responsible AI enablement, her leadership has also been demonstrated with over 60 technical papers and patents, distinguished paper awards, election to the IBM Academy of Technology, and a new book: "Personal Health Informatics".
- **Donghua Tao, PhD, FAMIA**, is Professor and Associate Dean for Library of Health Sciences at University of Illinois Chicago (UIC). She oversees three health sciences libraries to support education, research and clinical practice in UIC's seven health sciences colleges and the UI Hospital and Clinics and other affiliated hospitals. Dr. Tao is past chair of the Women in AMIA (WIA) Steering Committee and actively participates in AMIA DEI Committees. Dr. Tao's research centers on human health information behavior, user experience & information system/service evaluation and adoption, consumer health informatics, information literacy/health literacy. Dr. Tao has more than 20 years of experience of publishing, grant applications, and professional practices in academic health sciences libraries and informatics.
- **Shefali Haldar, PhD** is an Associate Director of Outcomes Research at Merck & Co., Inc. She conducts research on the design, use, and impact of digital platforms for health informatics and outcomes research. Prior to her current role, she was a Postdoctoral Researcher at Northwestern University and earned her Ph.D. in Biomedical and Health Informatics, with an emphasis on Human-Computer Interaction, from the University of Washington. Dr. Haldar is chair of the AMIA DEI Communications Subcommittee, which developed the AMIA Inclusive Language and Context Style Guidelines, and editorial board member of the journal for Informatics for Health & Social Care.
- **Amaryllis Mavragani** is a Scientific Editor at JMIR Publications, Editor-in-Chief for *JMIR Formative Research* and Editor in *JMIR Public Health and Surveillance* and the *Journal of Medical Internet Research*. She is a PhD Researcher in Information Epidemiology at the Department of Computing Science and

Mathematics in the University of Stirling, and her previous topics of studies include mathematics, astrophysics, and environmental legislation. Her main research interests are in infodemiology, big data, public health, and digital epidemiology. She has authored more than 20 publications in these fields, and has been a peer reviewer in more than 90 journals.

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