INPLASY

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Code sharing in prediction model research: a protocol for a scoping review

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INTRODUCTION

*R*eview question / Objective The aim of this scoping review is to evaluate code availability and repository quality across published prediction model studies that cite the TRIPOD or TRIPOD+AI guidelines, in order to establish a baseline of existing practices to inform development of a TRIPOD-Code checklist.

Background Analytical code is essential for reproducing diagnostic and prognostic prediction model research, either prediction model development, validation and updating research. Yet code availability in the published literature remains limited. While the TRIPOD statements set standards for reporting prediction model methods, they do not define explicit standards for repository structure and documentation. This review quantifies current code-sharing practices to inform the development TRIPOD-Code, a TRIPOD extension reporting guideline focused on for code sharing.

Rationale This scoping review provides a large-scale empirical assessment of code availability and repository quality among TRIPOD-citing studies, with the goal of developing a TRIPOD-Code checklist.

METHODS

Strategy of data synthesis This review will primarily use descriptive synthesis. Outcomes will be summarized as counts and proportions (e.g., proportion of eligible studies reporting code

availability statements; proportion with accessible repositories; and prevalence of predefined repository reproducibility features such as presence of a README, dependency specification, licensing, and seed control). We will report proportions overall and stratified by pre-specified factors (publication year, journal, country of first author affiliation, and whether the study cites TRIPOD versus TRIPOD+AI), using appropriate denominators.

Eligibility criteria This scoping review will include published peer-reviewed articles reporting the development, external validation, or updating of multivariable prediction models for diagnostic or prognostic purposes in healthcare settings. Eligible studies must cite TRIPOD (2015) or TRIPOD+AI (2024) reporting guidelines and may employ any modeling approach (traditional statistical methods or machine learning/artificial intelligence), address any medical domain, and be published from 2015 onwards. We will exclude narrative reviews, systematic reviews, editorials, commentaries, protocols, conference abstracts, studies not reporting actual prediction models, and studies focused solely on model implementation or deployment without original development or validation work. Focusing on TRIPOD-citing studies ensures the population is aware of established reporting standards and allows us to examine adherence to code sharing recommendations, particularly TRIPOD+AI Item 18f, which reports on analytical code availability.

Source of evidence screening and selection The source of evidence is the Pubmed Open Access API. The selection pipeline is automated through the use of a large language model. It is validated against a dataset labeled by two annotators. Disagreements in this dataset were resolved through manual adjudication.

Data management Data management will be conducted using Python, with structured extraction and classification supported by a large language model.

Reporting results / Analysis of the evidence We will report descriptive results as counts and proportions with clearly defined denominators (e.g., proportion of included studies with a code availability statement; proportion with accessible repositories; prevalence of prespecified repository features such as README presence, dependency specification, licensing, and seed control). We will summarize results overall and stratified by publication year, journal, country of first author affiliation, and citation of TRIPOD versus

TRIPOD+AI. To assess reliability of automated extraction and repository characterization, we will validate the pipeline against independent human annotation on a prespecified subset and report performance metrics and error analysis.

Presentation of the results Results will be presented using a PRISMA-style flow diagram for study identification and inclusion. We will provide summary figures describing included study characteristics (year, journal, medical domain, country, model type) and the prevalence of code availability statements and accessible repositories. Repository quality findings will be presented as a figure of predefined reproducibility features (e.g., README presence and content, dependency specification, license, tests, seed control) with overall proportions. We will include a figure showing temporal trends in code availability and repository accessibility over publication years, and (where sample sizes permit) comparative plots stratified by journal and TRIPOD vs TRIPOD+AI citation status. Pipeline validation will be summarized with an error analysis table and performance metrics comparing automated outputs to human annotation on the validation subset.

Language restriction No language restriction is applied in the search strategy.

Country(ies) involved USA; Italy; Belgium; Korea; Netherlands; UK.

Keywords code availability; code sharing; reproducibility; computational reproducibility; prediction models; machine learning; reporting guidelines; TRIPOD-Code.

Dissemination plans We will disseminate the results through publication in a peer-reviewed journal and presentation at relevant conferences and workshops. We will also share a plain-language summary and study materials (e.g., extraction forms, analytic code, and derived datasets where permissible) via an open repository to support transparency and reuse.

Contributions of each author
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