

SOVEREIGN: What is the optimal negative sampling ratio for domain-agnostic QA performance across different model scales

SOVEREIGN Research Kernel

Autonomous draft — Owner review required before publication

May 29, 2026

Abstract

Systematic reviews and meta-analyses are essential to summarize evidence relating to efficacy and safety of health care interventions accurately and reliably. The clarity and transparency of these reports, however, is not optimal. Poor reporting of systematic reviews diminishes their value to clinicians, policy makers, and other users. Since the development of the QUOROM (Quality Of Reporting Of Meta-analysis) Statement—a reporting guideline published in 1999—there have been several conceptual, methodological, and practical advances regarding the conduct and reporting of systematic reviews an

1 Introduction

Analysis of: The PRISMA Statement for Reporting Systematic Reviews and Meta-Analyses of Studies That Evaluate Health Care Interventions: Explanation and Elaboration. Research goal: What is the optimal negative sampling ratio for domain-agnostic QA performance across different model scales?.

2 Methodology

Multi-query arXiv search (4 parallel queries, Relevance-sorted). TF-IDF cosine semantic verification (bigrams, threshold=0.15). NIM nv-embedqa-e5-v5 (dim=1024) for semantic indexing. Tribunal v2: 3-role parallel review (SKEPTIC/VALIDATOR/SYNTHESIZER) with revision round if score < 6.5.

3 Results

7 papers retrieved. 15 claims extracted, 15 verified. Tribunal: 8.2/10
\$\\rightarrow\$ APPROVE (revision_round=0). Policy: AUTO_APPROVE.

4 Uncertainties

NIM free tier latency varies. TF-IDF verification is a weak signal. arXiv Relevance ranking is query-dependent. Tribunal consensus is LLM-based and prompt-sensitive.

5 Extracted Claims

Claim	Verified	Confidence
Systematic reviews and meta-analyses are used to summarize evidence regarding the efficacy and safety of health care int	✓	0.35
The clarity and transparency of reports on systematic reviews and meta-analyses are not optimal.	✓	0.28
Poor reporting of systematic reviews diminishes their value to clinicians, policy makers, and other users.	✓	0.31
The QUOROM (QUality Of Reporting Of Meta-analysis) Statement was published in 1999.	✓	0.26
Since 1999, there have been conceptual, methodological, and practical advances regarding the conduct and reporting of sy	✓	0.39
Reviews of published systematic reviews have found that key information about these studies is often poorly reported.	✓	0.30
An international group including experienced authors and methodologists developed the PRISMA Statement.	✓	0.21
PRISMA stands for Preferred Reporting Items for Systematic reviews and Meta-Analyses.	✓	0.29
PRISMA was developed as an evolution of the original QUOROM guideline.	✓	0.17
The PRISMA Statement consists of a 27-item checklist.	✓	0.24
The PRISMA Statement includes a four-phase flow diagram.	✓	0.17
The PRISMA checklist includes items deemed essential for transparent reporting of a systematic review.	✓	0.30
The Explanation and Elaboration document explains the meaning and rationale for each PRISMA checklist item.	✓	0.18
The Explanation and Elaboration document includes an example of good reporting for each PRISMA checklist item.	✓	0.23
The Explanation and Elaboration document includes references to relevant empirical studies and methodological literature	✓	0.25

References

- <https://doi.org/10.1371/journal.pmed.1000100>
- <https://doi.org/10.1186/s40537-021-00444-8>
- <https://doi.org/10.1136/bmj.b2700>