

## A third of systematic reviews changed or did not specify the primary outcome: a PROSPERO register study

### Summary

We found that approximately one-third of published systematic reviews had a discrepancy between the outcomes reported in the PROSPERO record versus the review publication. However, evidence of outcome reporting bias was not observed in our sample.

### Implications

Our study suggests that non-Cochrane review authors have similar outcome reporting behaviors to Cochrane review authors. We recommend that: all non-Cochrane reviews are registered with PROSPERO, review authors carefully consider the selection of primary outcomes, peer reviewers should check PROSPERO to see if there are any discrepancies between the record and review publication, and journals are encouraged to focus acceptance on registered systematic reviews.

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### What is the current situation?

- Research consistently has found that more than one-third of published systematic reviews (SRs) have an undisclosed discrepancy between the outcomes reported in the protocol versus final review.
- Outcome reporting bias “occurs when a study in which multiple outcomes were measured reports only those that are (statistically) significant”.
- No previous study has explored outcome reporting bias of SRs registered in the international Prospective Register of Systematic Reviews (PROSPERO), which was established in 2011 and is an open-access online facility to prospectively register SRs.

### What is the objective?

(1) To examine outcome reporting bias of published SRs registered in PROSPERO; and (2) to assess the methodological quality of these SRs.

### How was the review conducted?

- Retrospective cohort study. The primary outcomes from non-Cochrane SR publications were compared with those reported in the corresponding PROSPERO records; discrepancies in the primary outcomes were assessed as upgrades, additions, omissions, or downgrades.
- Relative risks (RR) and 95% confidence intervals (CI) were calculated to determine the likelihood of having a change in primary outcome when the meta-analysis result was favorable and statistically significant.

### What did the review find?

- In November 2013, 2,426 protocol records were registered with PROSPERO and 343 were completed SRs. 140 of these were potentially relevant, and 96 were finally included in our study.
- A discrepancy in the primary outcome occurred in 32% of the included reviews, and 39% of the reviews did not explicitly specify a primary outcome (s); 6% of the primary outcomes were omitted.
- There was no significant increased risk of adding/upgrading (RR, 2.14; 95% CI: 0.53, 8.63), or decreased risk of downgrading (RR, 0.76; 95% CI: 0.27, 2.17) an outcome when the meta-analysis result was favorable and statistically significant.
- There was no significant increased risk of adding/upgrading (RR, 0.89; 95% CI: 0.31, 2.53), or decreased risk of downgrading (RR, 0.56; 95% CI: 0.29, 1.08) an outcome when the conclusion was positive.