



# Which databases are worth searching for systematic reviews?

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## Introduction & Aim

Database licenses are expensive, searching multiple databases is time-consuming, and customers often ask which ones to choose. We generally recommend Embase, Medline, Cochrane and specialised databases depending on the topic, but we would like to back up these recommendations with retrospective analyses from our previous searches.

Our aim was to identify databases that have a high recall and that uniquely retrieve references later included in systematic reviews.

## Method

We examined systematic reviews for which MGP had performed the literature search. We compared the included references with our unprocessed EndNote files before deduplication to determine in which databases these references had been found. The recall (proportion of included references found in a specific database compared to all included references) and precision (proportion of included references found in a specific database compared to all references found in that database) were calculated. We also counted the number of included references that were only found in one database by our search ("unique hits").

## Results

25 reviews have been analysed, of which 8 belong to musculoskeletal disorders or exercise, 6 to the topic of surgery or transplantation, 5 to dentistry, 1 to veterinary medicine, and 5 to miscellaneous topics. A mean of 1360 references (median 1015, min. 112, max. 8590) had to be screened by the authors of these reviews, and 21 references (median 16, min. 1, max. 67) were included (mean 88 screened for 1 included, median 46, min. 15, max. 508).

The recall was highest for Scopus, followed by Embase, Medline, and Web of Science (Table 1). The precision was highest for Scopus, followed by Medline, and Cochrane Library.

The Cochrane Library was searched in 21 of the 25 reviews, but not a single unique hit (reference included in the review) was found. Biosis was searched 8 times with 1 unique hit.

**Table 1.** Comparison of 8 databases used in 25 systematic reviews.

	How often searched in the 25 reviews	Number of publications included in review (median; minimum-maximum)	Recall (median)	Precision (median)	Number needed to read (median; minimum-maximum)	How many searches revealed unique hits	Percentage of searches with unique hits
Embase	21	9 (2-48)	0.87	0.023	43 (7-407)	9	43
Medline	25	10 (0-49)	0.83	0.045	22 (6-454)	9	36
Cochrane	21	1 (0-8)	0.06	0.028	26 (4-73)	0	0
Scopus	17	11 (4-48)	0.91	0.052	20 (8-159)	8	47
Web of Science	9	10 (0-41)	0.77	0.017	56 (9-145)	4	44
Cinahl	9	3.5 (0-13)	0.15	0.016	35 (18-226)	3	33
PsycInfo	7	1 (0-11)	0.03	0.010	29 (22-98)	2	29
Biosis	8	4 (0-7)	0.30	0.019	31 (8-155)	1	13

## Discussion

In this analysis, we focused on the question which databases had a high recall, precision and unique hits. Our results were in line with previous findings: Embase searches produced a relatively high number of unique hits, but the precision was lower so more references needed to be screened than in Medline [1].

These results may depend on the choice of databases (e.g. we did not search Google scholar), the search strategies (we search the Cochrane Library only with free text terms in addition to Medline/Ovid or Ebsco) and the field of research.

Others have found that specialised databases (on top of Medline) were also needed to retrieve more relevant articles e.g. for unconventional therapies [2].

However, searching Medline or PubMed alone could be sufficient to reach a valid conclusion in a meta-analysis for certain topics, even if some articles are missed [3-5].

## Conclusion

Scopus, Embase, and Medline were the most rewarding databases regarding recall. The Cochrane Library did not yield any unique hits.

More published systematic reviews will have to be analysed for more significant statements. Benchmarking with other search teams is wanted.

## Contact

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## References

1. Bramer WM, Rethlefsen ML, Kleijnen J, Franco OH. Optimal database combinations for literature searches in systematic reviews: a prospective exploratory study. *Syst Rev.* 2017;6(1):245.
2. Stevinson C, Lawlor DA. Searching multiple databases for systematic reviews: added value or diminishing returns? *Complement Ther Med.* 2004;12(4):228-32.
3. Sampson M. Should meta-analysts search Embase in addition to Medline? *Journal of Clinical Epidemiology.* 2003;56(10):943-55.
4. Halladay CW, Trikalinos TA, Schmid IT, Schmid CH, Dahabreh IJ. Using data sources beyond PubMed has a modest impact on the results of systematic reviews of therapeutic interventions. *J Clin Epidemiol.* 2015;68(9):1076-84.
5. Booth A. Over 85% of included studies in systematic reviews are on MEDLINE. *J Clin Epidemiol.* 2016;79:165-6.