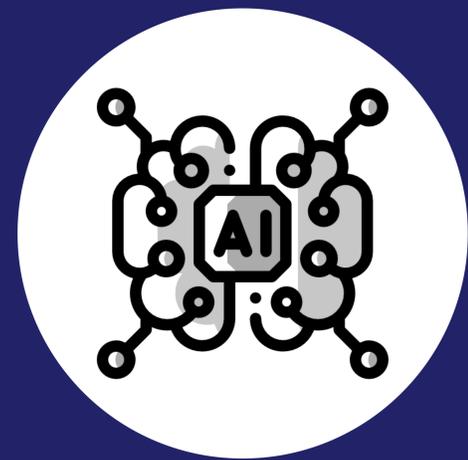


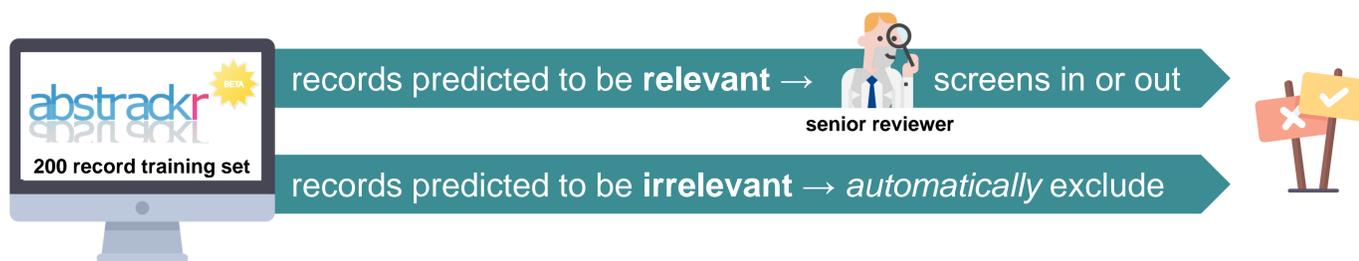
# Using machine learning, systematic reviewers can save considerable screening time without impacting the review's results or conclusions



Machine learning tools can expedite title and abstract screening but adoption has been slow. For **11 systematic reviews** and **6 rapid reviews**, we retrospectively explored the reliability and relative advantages of using **Abstrackr** (a machine learning tool) to:

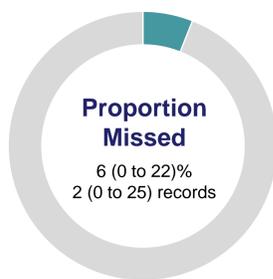
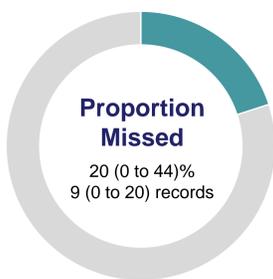
- A. automatically exclude irrelevant records, and
- B. complement the work of one of two independent reviewers

## A. Semi-automated, Single Reviewer Approach (systematic and rapid reviews)

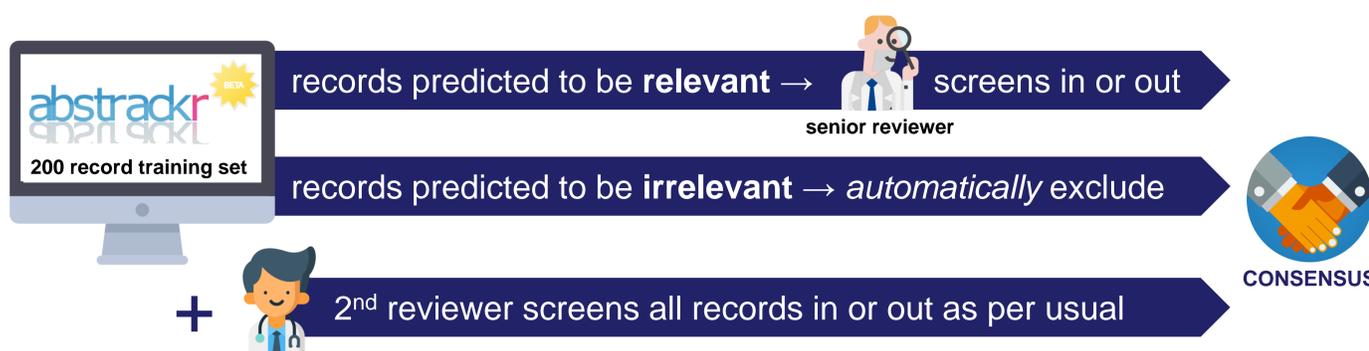


**systematic reviews: 51,585 records**  
median (range): 2,928 (651 to 12,156)

**rapid reviews: 7,714 records**  
median (range): 1,250 (451 to 2,413)



## B. Semi-automated, Dual Independent Screening Approach (systematic reviews)



### BEST BALANCE of BENEFITS and RISKS

- ✓ the findings are supportive of the cautious use of Approach B in systematic reviews
- ✓ Approach B may be more reliable in rapid reviews vs. single-reviewer screening

## RELIABILITY & RELATIVE ADVANTAGES

### saves time

20 (3 to 82) hours were saved in Approach B vs. traditional dual independent screening

### misses few records

1 (0 to 14)% of records were missed in Approach B, i.e., 1 (0 to 6) records in the reports

### outperforms a single reviewer

in 45% of reviews, less records were missed vs. single-reviewer screening

## RESULTS IN CONTEXT

### rigorous reviews have thorough searches

after screening reference lists the # records missed via Approach B fell to 0 (0 to 2)

### small # missed records unlikely to impact results

the few missed records affected a meta-analysis in just one systematic review (2% of all comparisons)

## The reliability and relative advantages of semi-automated approaches to title and abstract screening: making the case for machine learning

Allison Gates PhD, Michelle Gates PhD, Meghan Sebastianski PhD, Samantha Guitard MSc, Sarah A. Elliott PhD, Lisa Hartling PhD

Alberta Research Centre for Health Evidence (ARCHE) and the Alberta Strategy for Patient-Oriented Research (SPOR) SUPPORT Unit Knowledge Translation Platform, University of Alberta, Edmonton, Alberta, Canada

[www.ualberta.ca/ARCHE](http://www.ualberta.ca/ARCHE) | [@arche4evidence](https://twitter.com/arche4evidence) | [@AbSPORU\\_KT](https://twitter.com/AbSPORU_KT) | [absporu.ca/kt](http://absporu.ca/kt)



Knowledge Translation Platform