

AI-Enabled Rapid Evidence Synthesis for Emergency Outbreak Response



A Prospective Time-and-Cost Evaluation Using Andes Virus as a Case Study

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1 OBJECTIVES

- Rapid evidence synthesis is critical during infectious disease emergencies, but conventional systematic review workflows are resource-intensive.
- This study compared a reviewer-led conventional workflow with an AI-enabled, human-in-the-loop rapid evidence synthesis workflow.
- Andes virus outbreak evidence synthesis was used as the case study.

MAIN OUTCOMES

Person-time • workflow cost • productivity
• eligible-study recall • verification burden • correction rate • unsupported outputs

2 METHODS

Design:

Prospective time-and-micro-costing evaluation.

Search corpus:

PubMed, Embase, and Scopus.

Endpoint:

Review preparation through to a verified evidence table.

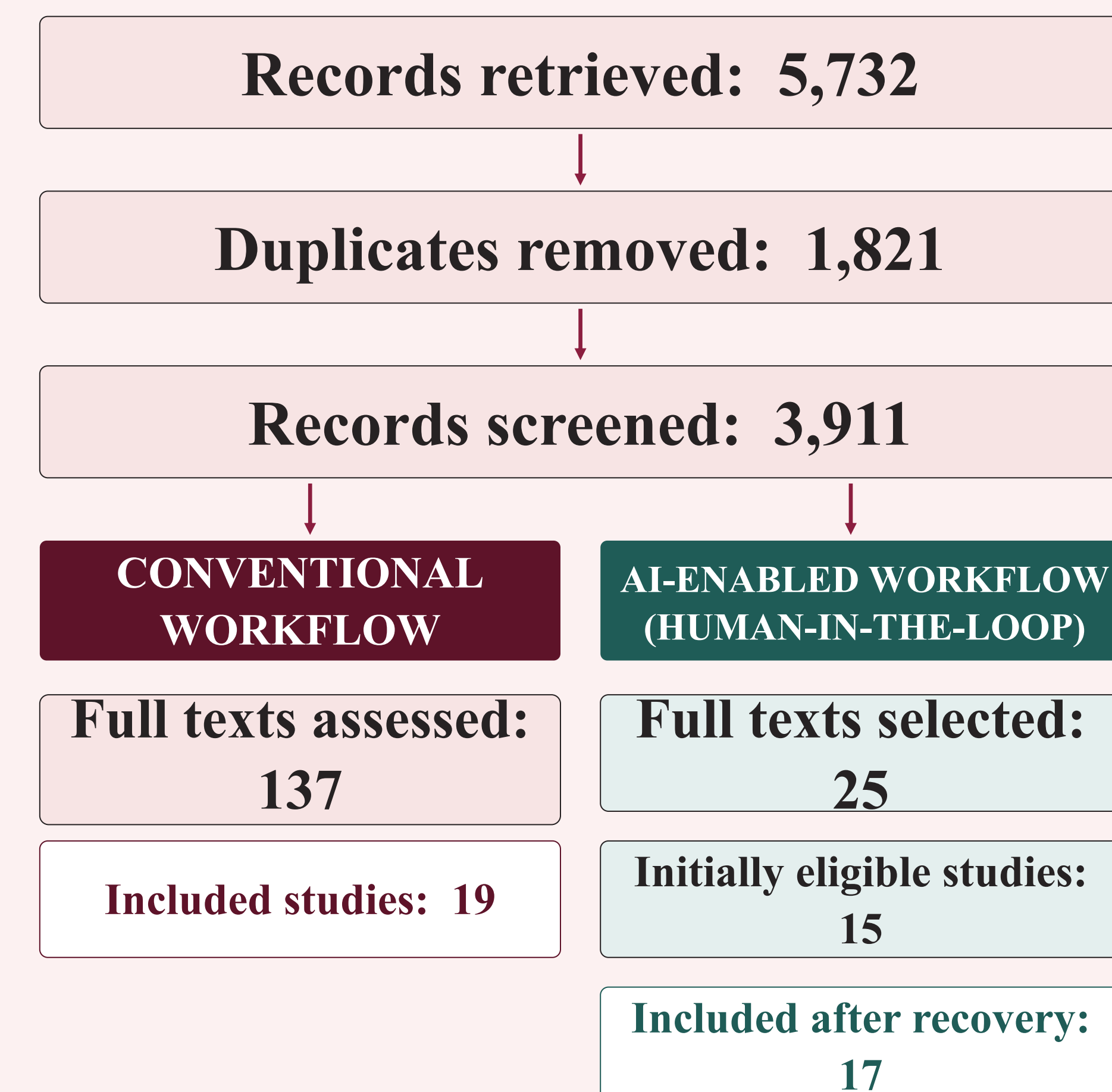
Included AI tools:

Brainstorming, Protocol drafting: ChatGPT 5.4
Title and Abstract Screening: Claude Opus 4.7
Full text screening: Gemini Flash 3.6
Data extraction: Notebook LM

Costing assumption:

Human labor at INR 600/hour, plus full AI/tool subscription costs (per month).

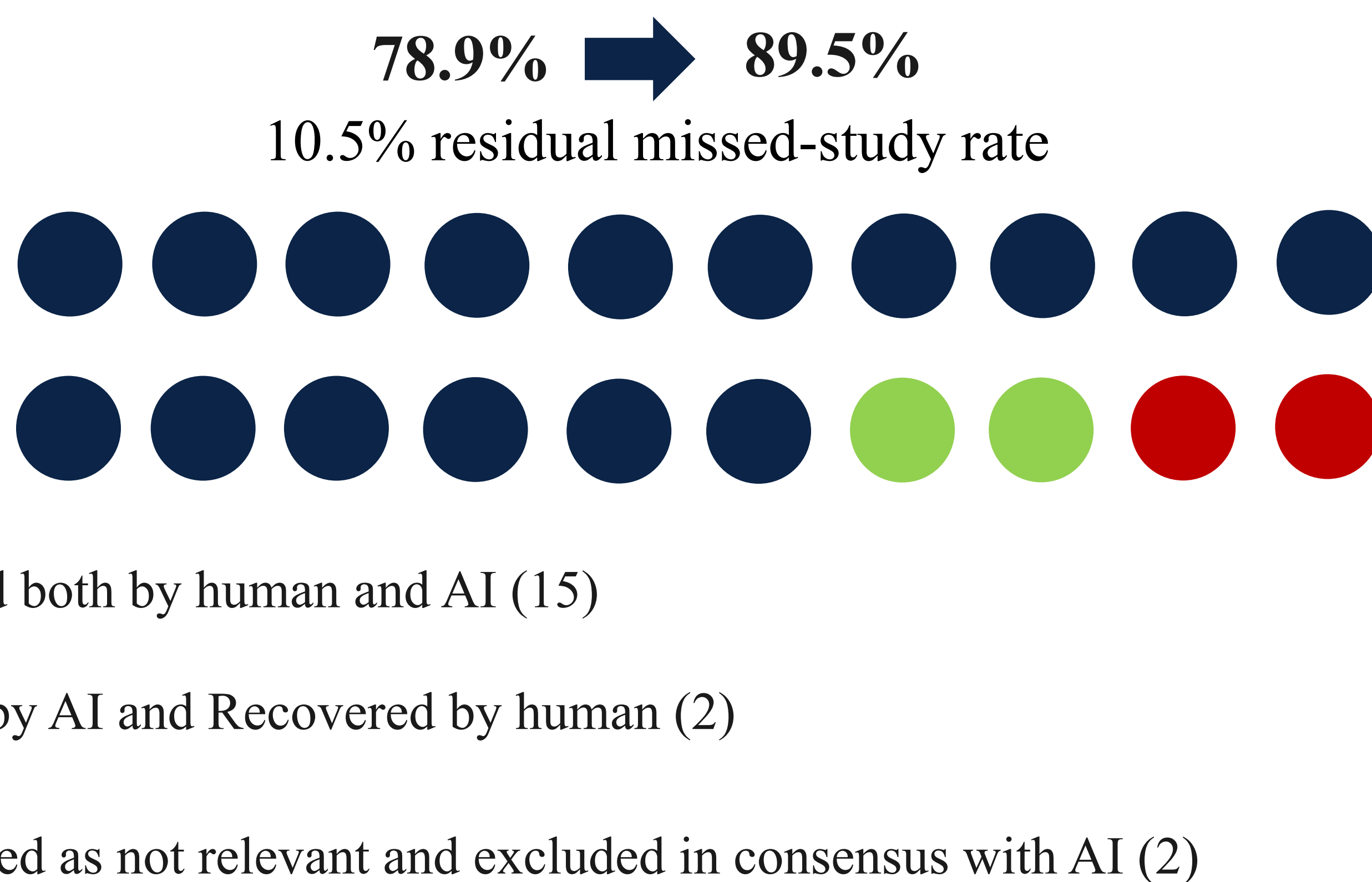
3 STUDY FLOW / WORKFLOW COMPARISON



Both workflows began from the same search and screening funnel; conventional and AI-enabled paths diverged at full-text assessment.

4 KEY RESULTS

SCREENING RECALL (ELIGIBILITY)



Verification burden

AI-extracted fields

748

Required verification

204 / 748 = 27.3%

Corrected fields

6 / 748 = 0.8%

Accuracy and safety

Field-level accuracy

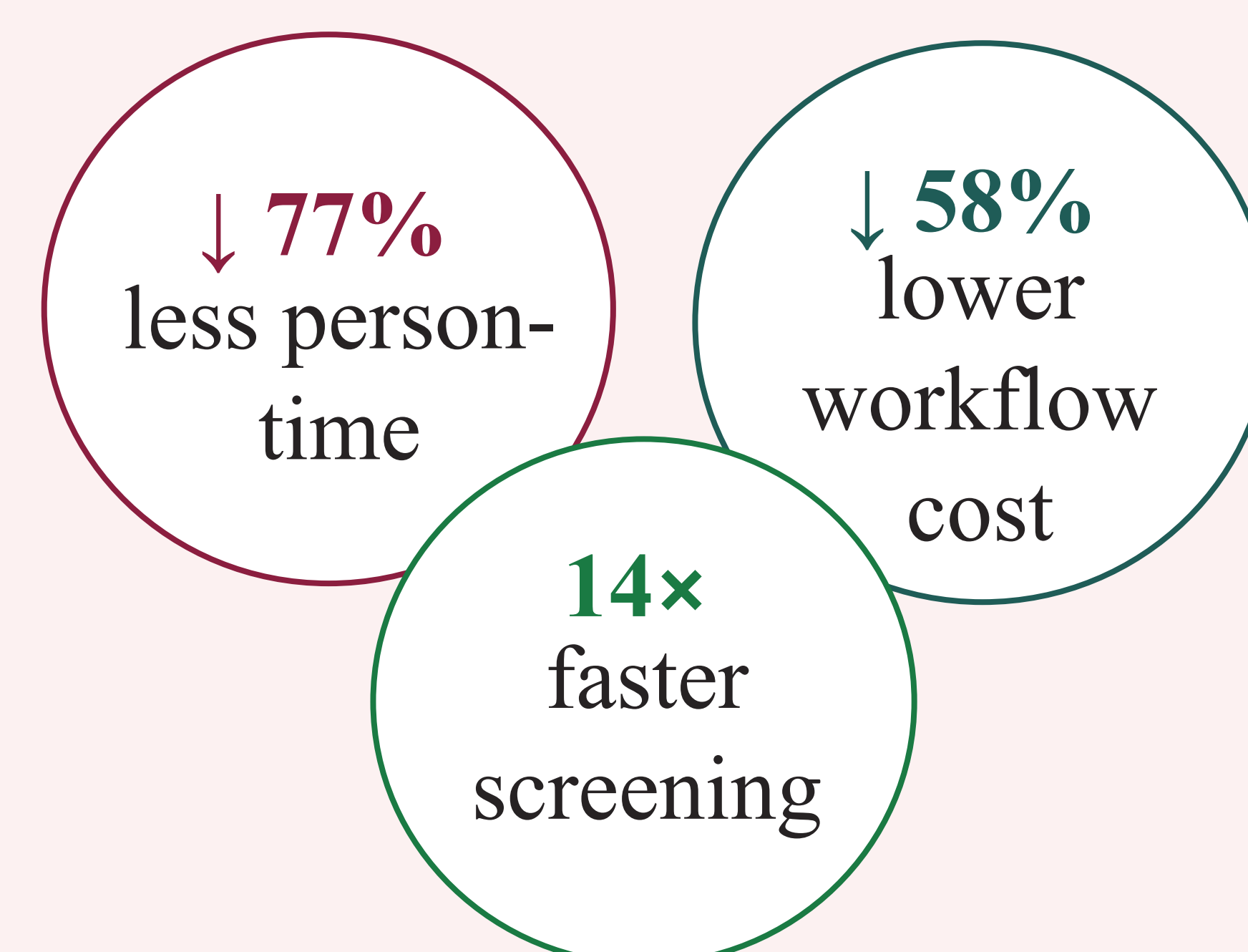
99.2%

Unsupported / hallucinated outputs

0 identified

AT A GLANCE

Metric	Conventional	AI-enabled (human-in-the-loop)	Change
Person-time (hours)	86.05	19.68	↓ 77.1%
Workflow cost (INR)	51,630	21,650	↓ 58.1%
Screening productivity (records/hour)	187	2,607	↑ 13.9x



5 INTERPRETATION

- ✓ AI-enabled synthesis substantially reduced time and cost.
- ✓ Productivity improved markedly, but human verification remained necessary.
- ✓ AI functioned best as an accelerator under reviewer oversight, not as a replacement for reviewers.

6 LIMITATIONS

- ⚠ Residual missed studies remained after verification.
- ⚠ Calendar time and record-level screening agreement were not tracked.

7 CONCLUSION

AI-enabled rapid evidence synthesis reduced person-time and cost in this case study. However, residual missed studies after verification indicate that AI should support, not replace, reviewer-led oversight in emergency evidence generation.

8 ACKNOWLEDGEMENT

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