

Development and evaluation of an AI-driven tool for generating plain language summaries

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Why did we create this tool?

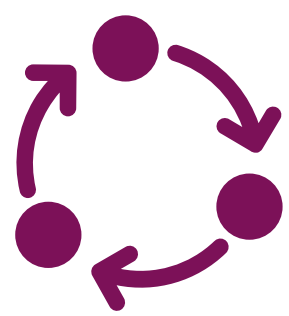
- By explaining complex topics in a way that a non-technical audience can understand, plain language summaries (PLS) help to improve the accessibility of scientific research¹
- Good Publication Practice 2022 guidelines endorse the use of PLS to enhance publications²
- Creating an accurate PLS with a suitable level of readability is often time consuming and may delay publication

Objective

- **To develop and evaluate a user-friendly, artificial intelligence (AI)-enhanced tool to streamline PLS creation for scientific materials**

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How was this tool created, and what can it do?

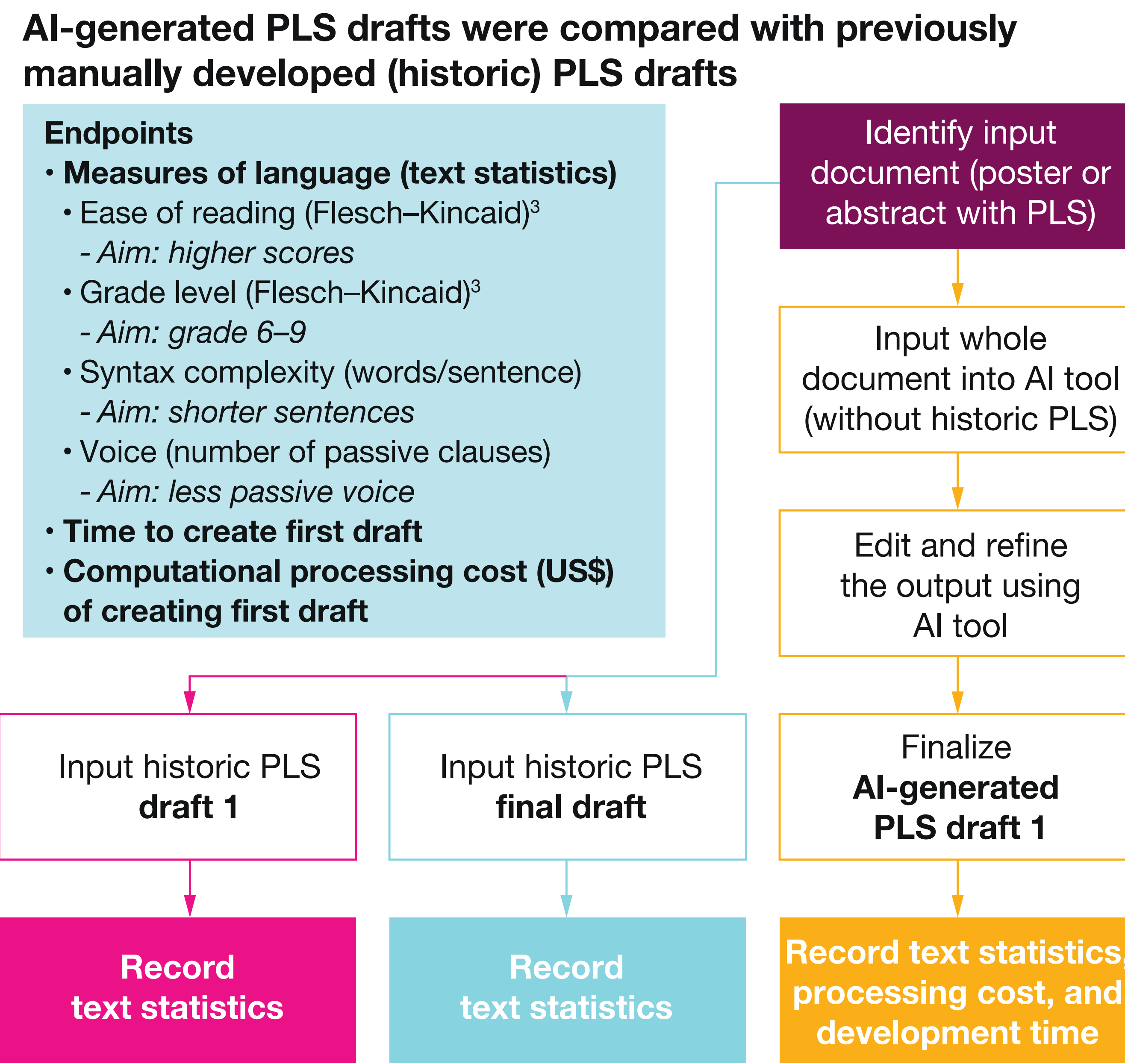
- Initial user feedback was used to develop and iteratively refine an internal ChatGPT-powered AI tool
 - Users uploaded source documents (PDF, Word doc, free text) which were then summarized
 - Users then refined outputs for plain language both manually and using the AI tool
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AI-powered refinement options

 - Simplify
 - Shorten/extend content
 - Explain terms
 - Expand acronyms
 - Remove repetitions
 - Change to active voice
 - Automatic evaluation tools displayed key readability statistics of the output
 - Built-in validity testing cross-checked the output against original document to confirm accuracy

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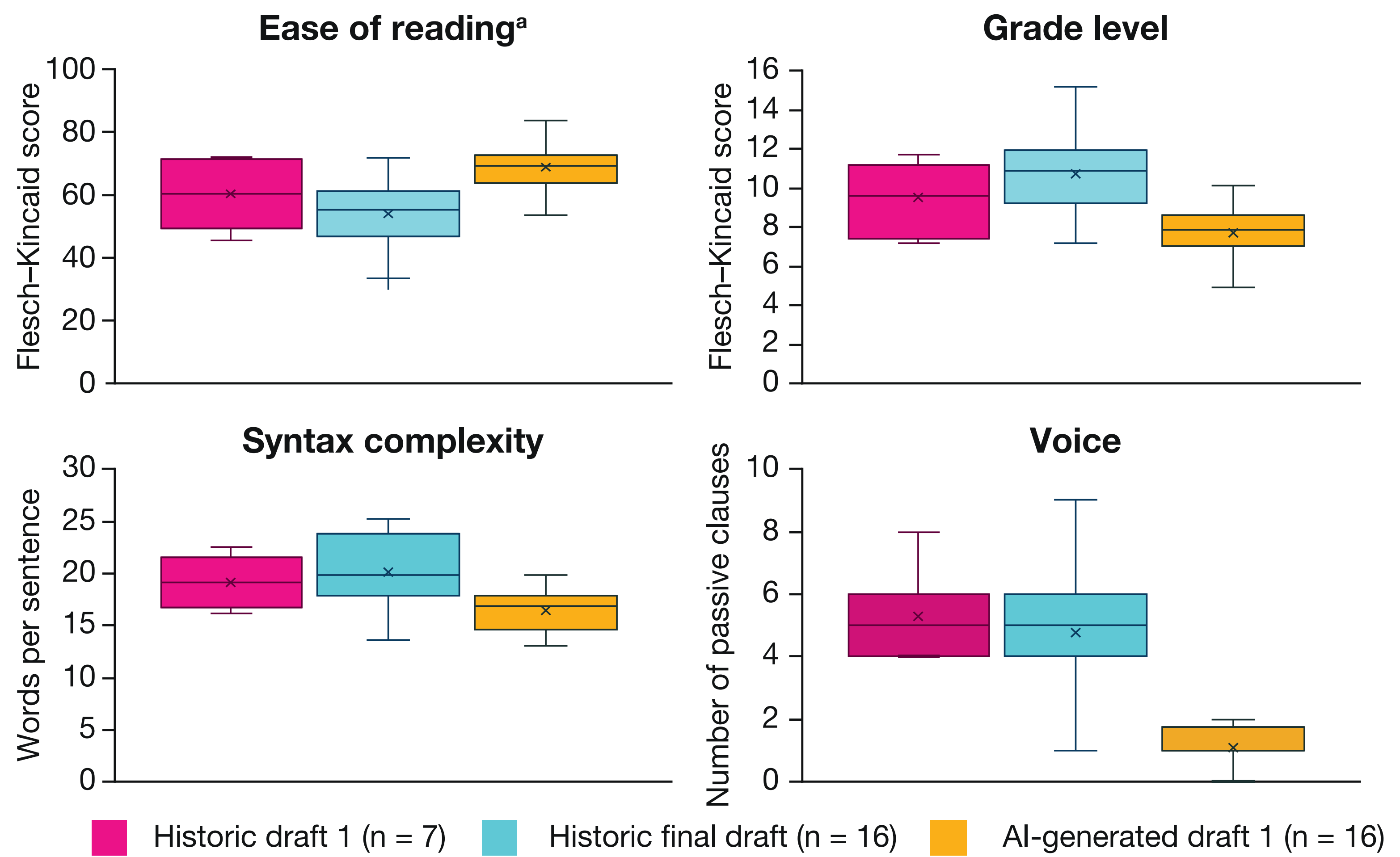
PLS evaluation process



Results

AI-generated PLS drafts had consistent and appropriate levels of complexity

Comparison with historic PLS



Bars indicate range, bottom and top of boxes indicate 25th and 75th percentiles, horizontal line inside box indicates median, x indicates mean.
^aHigher scores indicate that the document is easier to read.

Inputs



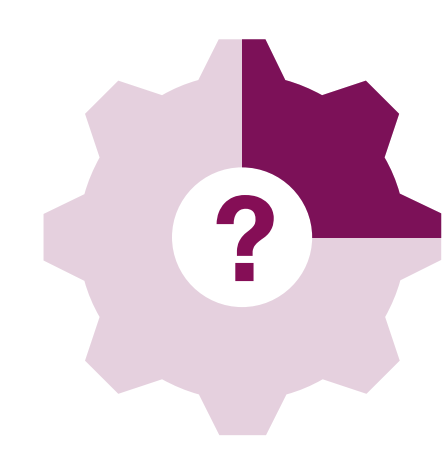
Posters: n = 9



Abstracts: n = 7

Study types

- Phase 2 clinical trial
- Phase 3 clinical trial
- Real world evidence/observational study



Complex methods or results in **25%** of inputs



Inputs covered a wide range of therapy areas

Cardiovascular disease	n = 5
Generalized myasthenia gravis	n = 3
Paroxysmal nocturnal hemoglobinuria	n = 3
Chronic kidney disease	n = 2
Amyloidosis	n = 1
Atypical hemolytic uremic syndrome/thrombotic microangiopathy	n = 1
Diabetes mellitus	n = 1

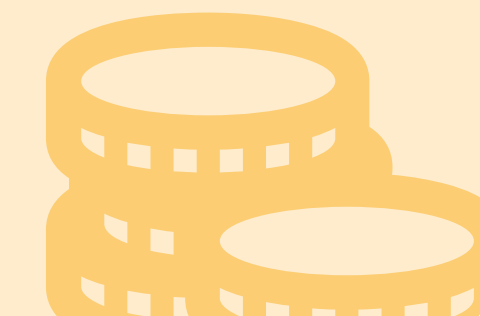
Time to draft 1 (n = 8)

26–59 minutes



Processing cost (n = 15)

US\$0.74 (mean)
Range: US\$0.26–1.56



Plain language summary (AI-assisted)

Why was this research performed?
To create an artificial intelligence (AI)-enhanced tool to make it easier to write plain language summaries (PLS) for scientific materials. These summaries help to explain complex scientific information to people who are not experts in the field.

How was this research performed?
AI specialists used feedback from writers to develop an internal tool powered by ChatGPT, an AI text-generation program. This tool can summarize and simplify the language of a document. To make sure that the summaries were correct, the tool can also check the accuracy of the content against the source material. This pilot study compared the performance of the AI tool against manual writing.

What were the findings of this research?
The AI tool created a total of 16 summaries. These AI-written drafts had a good level of simplicity, with a Flesch–Kincaid grade level of 7.2, which means that they were easy enough for most people to read. It took between 26 and 59 minutes to make each draft, and it cost US\$0.74 to generate the first draft.

What are the implications?
AI-generated PLS were easy to read and cost-effective. This suggests that the AI tool could be used to generate an accurate first draft PLS as a first step in making scientific information more accessible to everyone. However, more research is needed to fully understand how much this tool can help and how it may change the way we include PLS in scientific publications.

The original draft of this PLS was created from the accepted abstract using the AI tool discussed in this poster before manual refinement by authors. First draft statistics: time to draft: 10 minutes; processing cost: US\$0.27; Flesch–Kincaid ease of reading score: 75.0; Flesch–Kincaid grade level: 6.1; mean words per sentence: 13.2; passive clause count: 2.

How might this affect future work?

- The AI tool can be used to generate first drafts of PLS with good readability for little cost
- These findings underscore the potential of AI tools as an efficient first step in PLS development prior to author review and manual refinement
- Use of the tool in normal processes will be evaluated, and feedback from authors will help to further refine and improve the tool

References

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2. deTora LM *et al. Ann Intern Med* 2022;175:1298–304.
3. Kincaid JP *et al. Institute for Simulation and Training*. 1975.

Acknowledgments

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Disclosures

HD, ML and PR are employees of Alexion, AstraZeneca Rare Disease. DG, VP, GC, JD and SF are employees of AstraZeneca.

