

Narrative search engine supported by artificial intelligence for finding adverse event reports with specific characteristics

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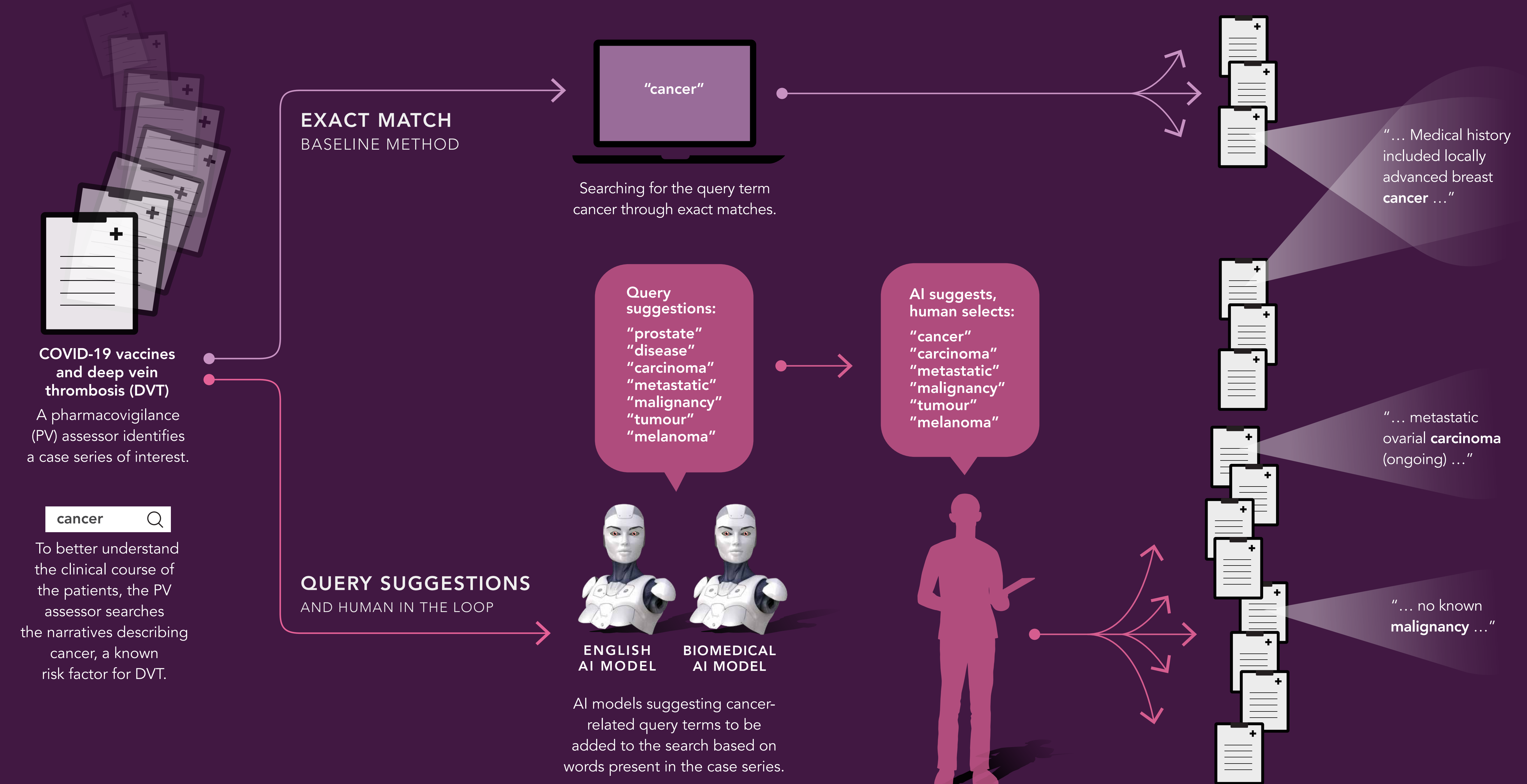
Background

Manual identification and prioritisation of case narratives with clinically relevant information can be challenging when interacting with a large number of adverse event reports, as encountered during the COVID-19 pandemic.

Objective

To explore the feasibility of identifying case narratives with characteristics relevant during signal assessment using a search engine supported by artificial intelligence (AI) as compared to a baseline method.

Method



Evaluation

- A data gold standard was manually created using narratives for five COVID-19 vaccine-adverse event combinations from Vigibase, the WHO global database of individual case safety reports.
- Narratives were labelled as relevant or non-relevant to predefined topics such as cancer by two domain experts.

To evaluate the effect of the query suggestions:

- Without a human in the loop, the three most similar suggested terms from each AI model were automatically added to the query (query expansion).
- With a human in the loop, an experienced PV assessor added their choices of suggested terms from both AI models to the query (query suggestions and a human in the loop).

Results

SYSTEM	RECALL	PRECISION
Exact match search	22.2%	82.4%*
Search with query expansion with English AI model	47.8%	41.4%
Search with query expansion with biomedical AI model	45.2%	42.0%
Search with query suggestions and human in the loop	64.0%	63.4%**

*In 5 of the 15 queries, the exact match search did not retrieve any cases.

**In 1 of the 15 queries, the search with query suggestions and human in the loop did not retrieve any cases.

Conclusions

The overall performance demonstrates that a narrative search engine supported by AI can facilitate the retrieval of additional clinically relevant narratives as compared to exact match search.

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