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

- **Exact match baseline method**
  - Searching for the query term cancer through exact matches.

- **Query suggestions and human in the loop**
  - AI suggests cancer-related query terms to be added to the search based on words present in the case series.
  - A human selects cancer, carcinoma, metastatic, malignancy, tumour, melanoma.

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.

Results

<table>
<thead>
<tr>
<th>SYSTEM</th>
<th>RECALL</th>
<th>PRECISION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exact match search</td>
<td>22.2%</td>
<td>82.4%*</td>
</tr>
<tr>
<td>Search with query expansion with English AI model</td>
<td>47.8%</td>
<td>41.4%</td>
</tr>
<tr>
<td>Search with query expansion with biomedical AI model</td>
<td>45.2%</td>
<td>42.0%</td>
</tr>
<tr>
<td>Search with query suggestions and human in the loop</td>
<td>64.0%</td>
<td>63.4%**</td>
</tr>
</tbody>
</table>

*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.