



Enhancing Cardiovascular Adverse Event Detection in ICI-Treated Cancer Patients: Lessons Learned from Natural Language Processing Integration with OMOP CDM

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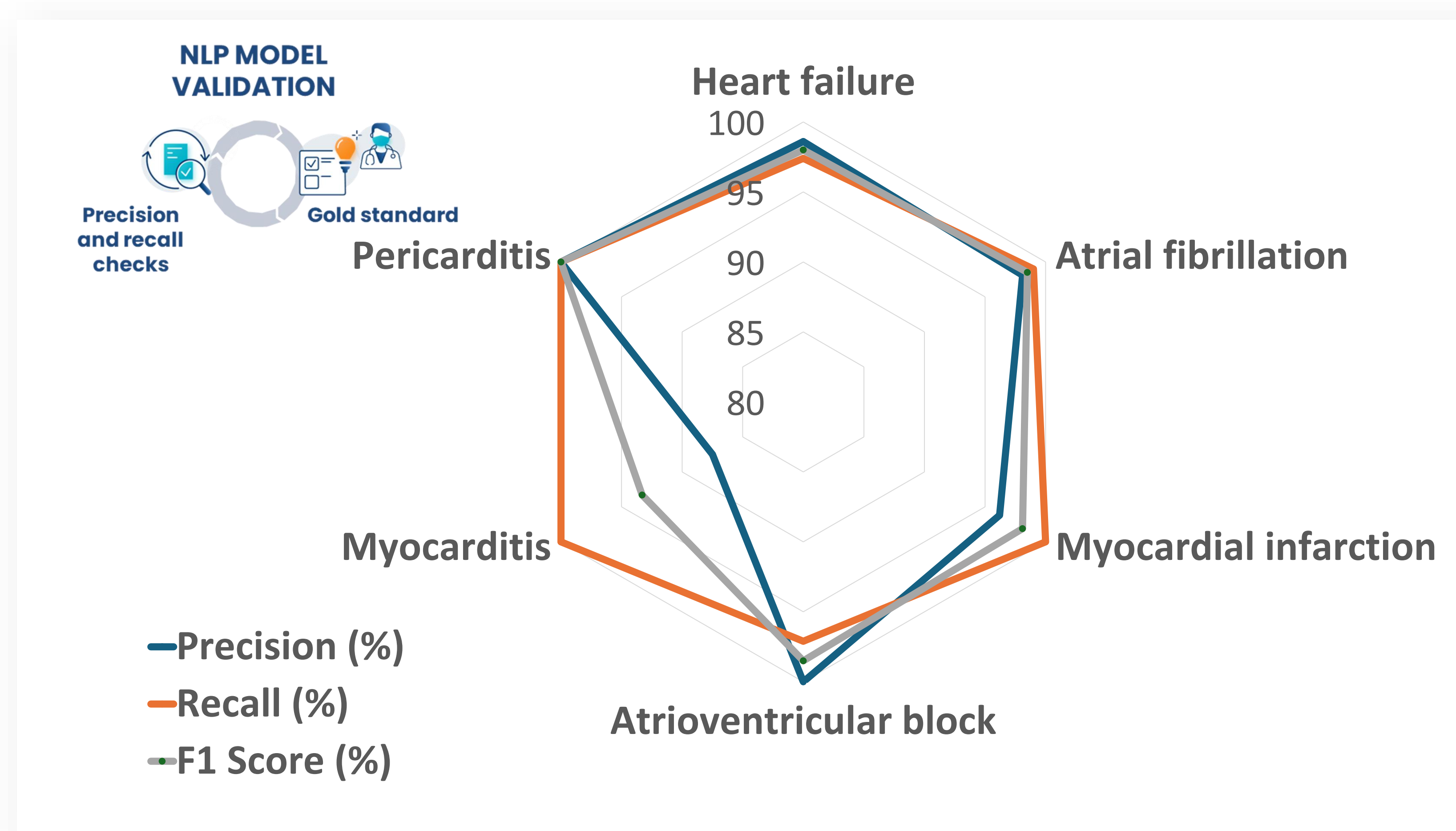
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Background

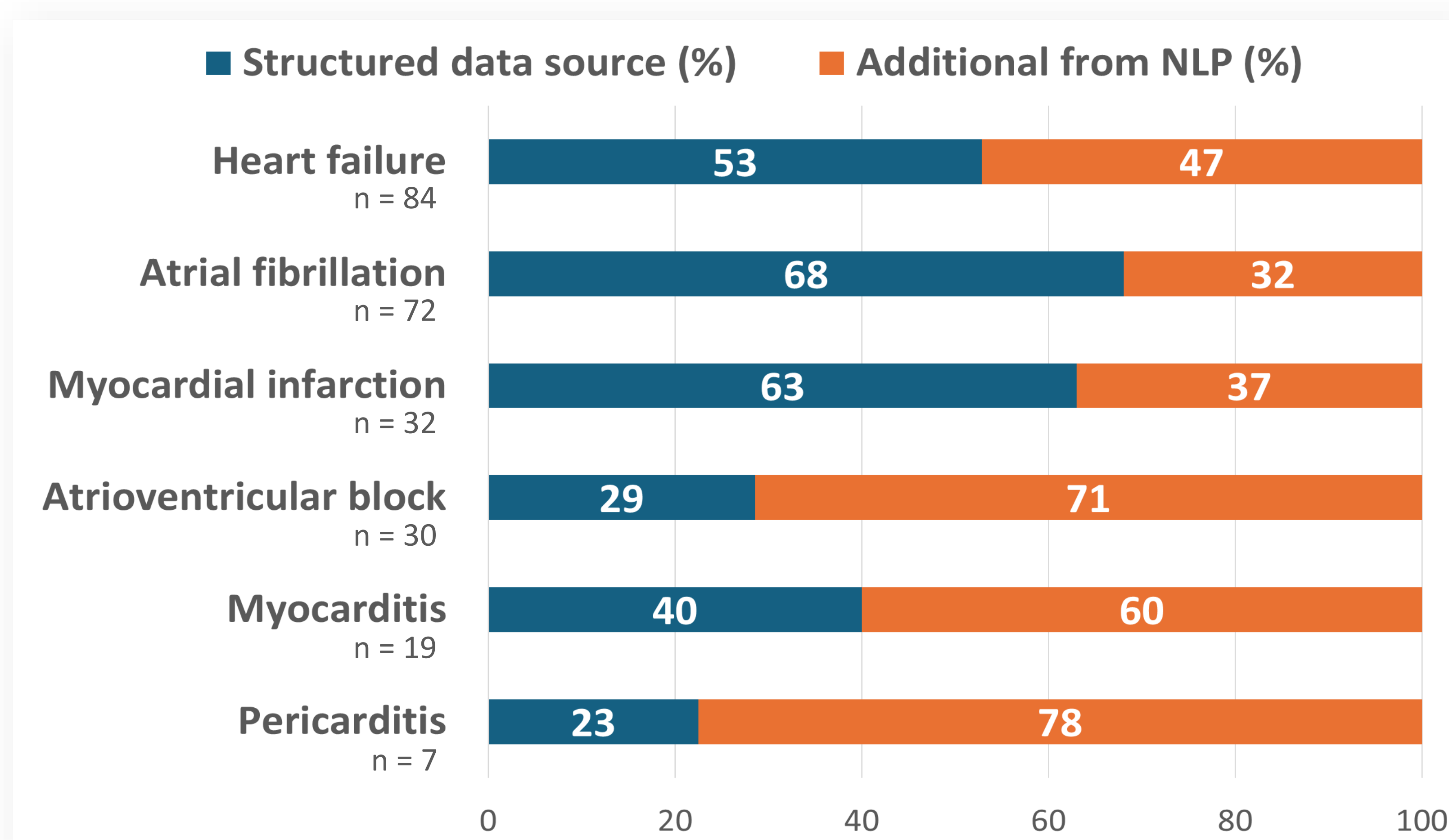
- **Cardiovascular (CV) adverse events (AEs) in cancer patients receiving immune checkpoint inhibitors (ICIs)** are often under-detected in clinical trials.
- Clinical trials typically have strict inclusion criteria and incomplete follow-up, highlighting the **need for real-world data analysis**.
- This study used both **structured data and NLP-extracted unstructured EHR data**.
- The integration of NLP with structured data **enriched the OMOP CDM**, presenting an important **analytic use case** for the OHDSI community.

Results

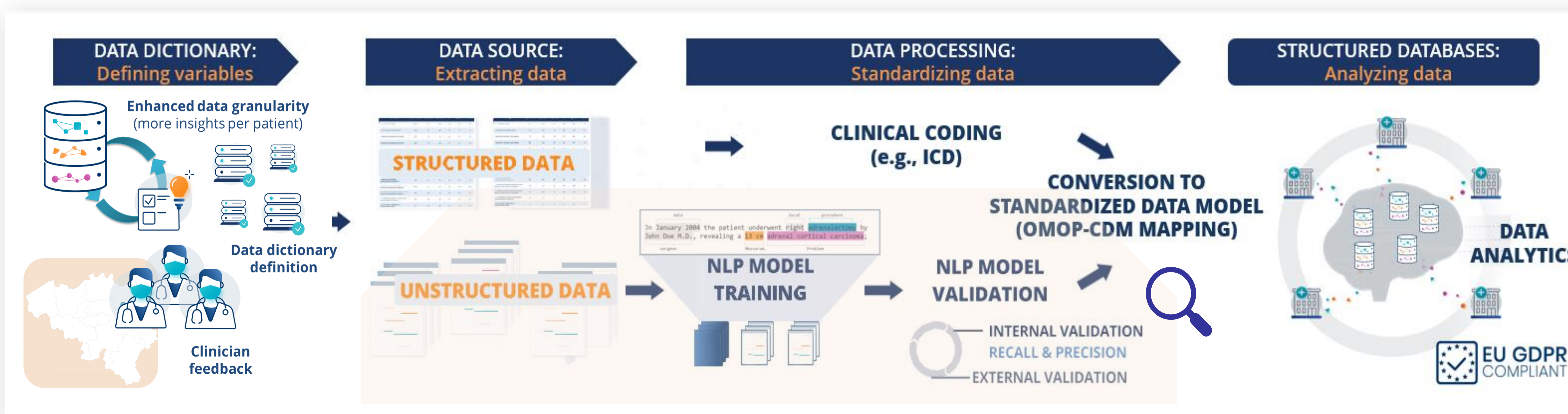
Result 1: The NLP algorithm demonstrated high performance in detecting CV AEs, with precision, recall, and F1 scores consistently exceeding 90%. This underscores the reliability and accuracy of NLP in processing unstructured clinical data for AE detection.



Result 2: Adding NLP-extracted unstructured data significantly increased the detection of CV AEs compared to structured data alone. This highlights the value of NLP in capturing more comprehensive clinical insights in real-world data.



Methods



Conclusions

- NLP enhances the detection of CV AEs in ICI-treated cancer patients, particularly for **less common events** like pericarditis (78%) and myocarditis (60%).
- The **combination of NLP and structured data** improves AE identification, with NLP contributing 32-78% of additional cases across various categories.
- **High precision, recall, and F1 scores** validate the accuracy of NLP, enabling **more comprehensive follow-up and monitoring** in oncology care.

Abbreviations: Adverse event (AE); cardiovascular (CV); common data model (CDM); electronic health record (EHR); immune checkpoint inhibitor (ICI); International Classification of Diseases (ICD); natural language processing (NLP); Observational Health Data Sciences and Informatics (OHDSI); Observational Medical Outcomes Partnership (OMOP).

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