Can the Austrian nation-wide EHR system support the recruitment of trial patients?

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Topics

- Recruitment of trial patients
- Introduction to ELGA
- Open source tool suite ART-DECOR®
- Mapping trial criteria to ELGA
- Results and conclusion
Recruitment of trial patients (1)

• Standards for who can participate
  ▫ Eligibility criteria: inclusion and exclusion criteria
• Time-consuming and expensive manual task
• Idea: automated comparison of EHR data with trial eligibility criteria
Recruitment of trial patients (2)

- **EHR4CR** reference list of commonly used eligibility criteria
ELGA

- Nation-wide Austrian EHR system
- Operative since 2015
- Obligatory participation of all public hospitals, pharmacies and outpatient panel doctors
- HL7 CDA standard for ELGA documents
- Structure of ELGA document types specified as HL7 templates
ART-DECOR® (1)

- Open source tool suite
- Specification of informational concepts
- Design and management of HL7 templates
ART-DECOR® (2)

- ELGA templates publicly available
Research question

To what degree can the EHR4CR eligibility criteria be fed from ELGA data?
Methods (1)

- Represent EHR4CR criteria in ART-DECOR
Methods (2)

- Map EHR4CR criteria to ELGA templates
Results (1)

• 148 ART-DECOR concepts for EHR4CR criteria
• ART-DECOR covers original data types
• Used more specific ART-DECOR data types where seemed appropriate, e.g.:
  ▫ All lab findings: Float $\Rightarrow$ Quantity
  ▫ Gender: String $\Rightarrow$ Code
  ▫ Currently breast feeding: Text $\Rightarrow$ Boolean
Results (2)

Of 148 criteria

- 90 (61%) mapped to structured ELGA elements (e.g. lab values, diagnosis code, gender)
- 8 (5%) mapped to unstructured ELGA elements (e.g. diagnosis text, procedure text, diet)
- 50 (34%) could not be mapped (e.g. currently pregnant, currently breast feeding, menopausal status, spirometry, oxygen therapy)
Discussion (1)

Results comparable with earlier work
- [Ateya et al., 2016] ⇒ 74% of criteria from 228 trials likely to be fed from structured data elements in typical hospital EHR system
- [Köpcke et al., 2013] ⇒ 55% of criteria from 15 trials fed from recorded data of German university hospitals EHR systems
- [El Fadly et al., 2011] ⇒ 13.4% of 1 CRF data elements populated from French university hospital EHR system
Discussion (2)

- ELGA = nationwide interinstitutional EHR system
  - Larger patient cohort to be checked for eligibility
  - Criteria mapping to one single EHR data model
  - Narrower coverage of data elements

- We used common criteria, not „raw“ criteria from existing trials
- We mapped to ELGA templates, not documents
  - Could only check potential existence of data
  - Actual recording rate not considered
Conclusion

• High coverage of EHR4CR eligibility criteria by ELGA document types
• ELGA seems useful for nation-wide recruitment of Austrian trial patients
• Public ART Decor project at
  • https://art-decor.org/art-decor/decor-project--ehr4cr2elga-
Thank you for your attention