ASSESSING SNOMED CT FOR LARGE SCALE EHEALTH DEPLOYMENTS IN THE EU

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(on behalf of ASSESS CT consortium)
ASSESS CT GOAL

• To contribute to the debate on semantic interoperability of eHealth services in Europe.
• To investigate SNOMED CT's fitness for EU-wide eHealth deployments.
• Within the Horizon 2020 Program of the European Commission
• Duration February 2015 - July 2016
• 14 European partners
ASSESS CT METHODOLOGY

Goal: investigate the fitness of SNOMED CT as a potential core reference terminology standard for EU-wide eHealth deployments

Survey of current use of SNOMED CT in Europe and beyond

Evidence-based assessment of its clinical fitness for purpose

Socio-economic assessment of costs & benefits

Barriers

Enablers

Success indicators

Drivers

Stakeholders
ASSESS CT OBJECTIVES

Goal: investigate the fitness of SNOMED CT as a potential core reference terminology standard for EU-wide eHealth deployments

Survey of current use of SNOMED CT in Europe and beyond

METHODS:
Literature review, Questionnaires, Workshops, Focus groups, Case studies

RESULTS
• Use of SNOMED CT rather limited (2016)
• Reuse and standardisation major benefits
• Need to map to local terminologies and information models
• Tooling & Education crucial for adoption
• Context of use to be well-defined
• Incremental, use case based introduction
• International collaboration
• Ecosystem of standards needed
• Major barriers: expertise, licence policy, costs, complexity
ASSESS CT OBJECTIVES

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METHODS:
Annotation experiments for multilingual clinical corpus and information models
NLP compared to human annotation
SNOMED CT compared to UMLS-based terminology scenario

RESULTS
• For English: concept coverage (70-90%) and agreement comparable / better than alternative
• Generally fair / poor inter-annotator agreement (40-60%)
• Partly localised versions (NL, FR): insufficient coverage
• NLP comes 80% close to human annotations
• Term coverage: acceptable only for English → need for interface terms
• Feasibility of bootstrapping interface terminology
ASSESS CT OBJECTIVES

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METHODS:
• economic and financial analysis of SNOMED CT adoption
• business modelling
• develop indicators for cost/benefit modelling
• analyse adoption barriers

RESULTS
• Business model with step-wise path to adoption
• Cost indicators: Licence, decision-making, release management, translation, mapping, piloting, terminology mapping, capacity-building, tooling
• Net economic value of SNOMED CT adoption and implementation yet to be demonstrated
• Observatory needed collecting and analysing existing regional and MS evaluations

socio-economic assessment of costs & benefits

Drivers

Stakeholders
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FIVE RECOMMENDATIONS

Assessing SNOMED CT for Large Scale eHealth Deployments in the EU

ASSESS CT Recommendations
December 2016

FIRST RECOMMENDATION

Any decision about the adoption and role of terminological resources, including SNOMED CT, must be part of a wider, coherent and priority-driven strategy for optimising the benefits of semantic interoperability in health data, and of the overarching eHealth Strategy of the European Union and its Member States.
SECOND RECOMMENDATION

SNOMED CT is the **best candidate** for a core reference terminology for cross-border, national and regional eHealth deployments in Europe.
THIRD RECOMMENDATION

SNOMED CT should be part of an ecosystem of terminologies, including international aggregation terminologies (e.g., the WHO Family of Classifications), and including local/national user interface terminologies, which address multilingualism in Europe and clinical communication with multidisciplinary professional language and lay language.
FOURTH RECOMMENDATION

The adoption of SNOMED CT should be realised incrementally rather than all at once, by developing terminology subsets that address the interoperability requirements for prioritised use cases, and expanding this set over some years.
FIFTH RECOMMENDATION

Mechanisms should be established to facilitate and co-ordinate European Member State co-operation on terminology and semantic interoperability, including common areas of governance across national terminology centres, eHealth competence centres (or equivalent national bodies).
ACKNOWLEDGEMENTS
Interoperability ecosystem

"Models of Use"
Contextual embedding of terminologies

"Models of Meaning"
Describe characteristics of (classes of) domain entities

Information Models
Reference Terminologies
Interoperability ecosystem

Core Reference Terminology

Other Reference Terminologies

Core reference terminology supplemented by and mapped with other reference terminologies.
Interoperability ecosystem

AKA classification systems: non-overlapping classes in single hierarchies, for data aggregation and ordering
Interoperability ecosystem

Information Models

SNOMED CT
CURRENT USE OF SNOMED CT

- Methodology:
  - Literature review
  - Focus groups, Questionnaires, Workshops
  - Case studies
## CASE STUDIES: DRIVERS FOR ADOPTION

<table>
<thead>
<tr>
<th>Driver</th>
<th>X-Border PS Problem List</th>
<th>Rare Diseases Registries</th>
<th>National PS Problem List</th>
<th>National Laboratory Report</th>
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<tr>
<td>Better quality and safety of care to individual patients</td>
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<td>- More complete coded documentation.</td>
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<td>- Better overview of each patient’s information.</td>
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<td>- Better records to enable decision support.</td>
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<td>- Support the adoption of point of care evidence based clinical guidelines</td>
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<td>- Improved patient safety</td>
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<td>Enriched EHR data exchange for continuity of care</td>
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<td>- Underpinning multi-professional collaboration.</td>
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<td>- Sharing EHRs with patients.</td>
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<td>Cost reduction (in the healthcare system)</td>
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<td>- Reduce duplicate data capture through better interoperability</td>
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<td>- Capture reporting and reimbursement codes at source, in a more efficient way.</td>
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<td>- Consolidate from multiple existing terminologies.</td>
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<td>Optimising reimbursement</td>
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<tr>
<td>Analysis (secondary) uses</td>
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<td>Cross-border information and knowledge sharing</td>
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### Legenda

- Yes
- Substantially Yes
- Partially
- Substantially No
- No
AN EXAMPLE ADOPTION WORKFLOW

1. Prioritise the drivers and initial business use cases
2. Secure multi-stakeholder engagement and buy in
3. Plan early adoption environments and success criteria
4. Equip terminology / competence centres: expertise, funds

5. Develop clinical models, guideline rules, decision support etc.
6. Supplement with other reference terminologies as needed
7. Acquire SNOMED CT, establish it as the reference terminology
8. Adopt or develop user interface terminologies

9. Develop messages models, registry APIs, etc.
10. Modify reimbursement rules to use routine data
11. Promote the benefits of structured and coded data to clinicians
12. Support vendors with adoption, UI adaptation, legacy data migration

13. Evaluate and disseminate the costs, benefits, lessons
14. Plan deployment and subsidise the changeover period
15. Fund and support organisational change and system updates
16. Educate clinicians, patients

ASSESS CT
ANNOTATING VALUE SETS

- End point: Concept coverage
- Methods
  - ADOPT: SNOMED CT only
  - ALTERNATIVE: UMLS subset
  - ABSTAIN: local German terminologies