SNOMED CT in action in Belgium
First implementation approaches and examples

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Member of the General Assembly of IHTSDO
Paris – Ministère de la Santé – 13/10/2015
Presentation Overview

- Introduction
- National Action Plan e-health 2013-2018
- National Release Center – Terminology Center
- Support effective implementation of SNOMED CT
- First implementation results, some examples
- Conclusion
Belgium joined the International Health Terminology Standards Development Organisation (IHTSDO®) in September 2013 following a strategic decision to adopt SNOMED CT® as the main Belgian health system’s clinical terminology.

http://www.ihtsdo.org/member/belgium

terminologie@health.belgium.be

http://www.terminology-center.be
National Action Plan e-Health 2013-2018

  - Organisation of a Round Table Conference at the end of 2012 with regards to the healthcare informatization process
  - Approved by the Interministerial Conference of April 29th 2013
  - Brought up to date in 2015
    - Validation of the updated plan on October 14th 2015.
The action plan is structured around five pillars

- The exchange of information by health care providers based on a common architecture;
- The increase of the involvement of the patient and his knowledge on e-health;
- The realization of a national terminology policy;
- The administrative simplification and efficiency;
- The introduction of a flexible and transparent governance structure in which all relevant authorities and stakeholders are involved.
Develop a national terminology policy
  ▪ Installing a national terminology center
    ▪ Providing the necessary tools
    ▪ The development of a reference thesaurus, primarily based on SNOMED-CT
  ▪ Mapping with various coding systems
  ▪ Development of an electronic platform with Evidence Based Practice guidelines and information
  ▪ Providing a standard user interface
  ▪ Incremental implementation plan tailored to different users
National Release Center – Terminology Center

Federal Public Service

Health, Food Chain Safety and Environment

National Release Center
SNOMED CT

National Release Center is a part of the FPS of Health, Food Chain Safety and Environment
National Release Center – Terminology Center

1. Primary contact point for IHTSDO regarding all aspects of management of SNOMED CT

2. Support effective implementation and deployment of SNOMED CT

3. National distribution and licensing of SNOMED CT

4. Optionally produce and distribute a National SNOMED CT Extension

5. Document, report and support requests for proposed updates and enhancements to SNOMED CT
National Release Center – Terminology Center

IHTSDO

National Release Center (NRC)

Users
- Clinical users
- System owners
- Health Information Managers
- System developers
- Researchers
- Etc.

Other IHTSDO Members (other NRCs)

IHTSDO Governance Bodies
- General Assembly
- Management Board

IHTSDO
- Delivering SNOMED CT

Governance Bodies
- Management Board
- General Assembly
Support effective implementation

- Potential Use Case (5)
  - Chosen with a view to deployment

- Planned Use Case (10)
  - Use cases prepared for deployment

- Use Case in Progress (10)
  - Use cases developed to be deployed

- Deployed Use Case
  - Different degrees of maturity are possible
Support effective implementation

- **Proactive**: an active search of use cases is performed, based on the needs/demands of the potential users. It may occur that these needs/demands do not necessarily involve the explicit request for the use of SNOMED CT. It is the role of the Terminology Centre to explore the potential of each of these applications and, if possible, to incorporate SNOMED CT.
- **Level of activity**: the model must maintain a minimum level of activity and has to have a constant input/output. The arbitrarily determined minimum level of activity:
  - 5 "potential use cases"
  - 10 "planned use cases"
  - 10 "use cases in progress"
Distribution and licensing of SNOMED CT

- Usage of SNOMED CT starts with a licence
  - Anyone who uses SNOMED CT needs a license
- The NRC provides a licensing and distribution system
  - Immediate access to International Release of SNOMED CT and to the National Extension in the near future
- What is your use case?
  - Importance of this system for implementation and implementation support
### Distribution and licencing of SNOMED CT

<table>
<thead>
<tr>
<th>Agreement Type</th>
<th>Count</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual - Research</td>
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<td>8.2%</td>
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<tr>
<td>Individual - Personal</td>
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<td>3.3%</td>
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<tr>
<td>Individual - Healthcare Provider</td>
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<td>4.9%</td>
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<tr>
<td>Individual - Educational</td>
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<td>3.3%</td>
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<td>6.6%</td>
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<tr>
<td>Academic - Development</td>
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<td>Academic - Healthcare Provider</td>
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<tr>
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<tr>
<td>Commercial - Healthcare Provider</td>
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<td>0.0%</td>
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<tr>
<td>Other</td>
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<td>8.2%</td>
</tr>
<tr>
<td>Application not completed</td>
<td>2</td>
<td>3.3%</td>
</tr>
<tr>
<td><strong>Total Affiliates</strong></td>
<td>61</td>
<td></td>
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</tbody>
</table>

Potential implementors, potential sharing of results, sharing of approaches, sharing of lessons learned, …
### 3 Distribution and licensing of SNOMED CT

Implementation workshops: bringing together people with the same planned usage, with the same goals

<table>
<thead>
<tr>
<th>License Usage</th>
<th>2015-01 – 2015-12</th>
</tr>
</thead>
<tbody>
<tr>
<td>License Type</td>
<td>Academy</td>
</tr>
<tr>
<td>Current Usage</td>
<td>none</td>
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</tbody>
</table>

#### Planned Usage:
- EHR Incorporation of SNOMED and experimenting how SNOMED could be used to cross-map with ICD-10
- Structurization and standardisation of internal (diagnostic) terminology

#### Purpose:
- Providing structured information to the coding department in order to facilitate ICD-10 coding
- Data analysis

#### Implementation Status:
- In Planning Stage
Produce and distribute a National Edition

Reference Sets (used to refer to existing SNOMED CT components):
- To represent subsets
- To indicate language/dialect preference for terms
- To represent maps to other code systems or classifications
4 Produce and distribute a National Edition

- Alpha release: BE_Extensie_1507_Alpha.zip
- Has been distributed to the Affililates
- Consists of
  - Snapshot release file types: contain the current version of every component
    - Simple Reference Sets (‘Subsets’)
    - Language Reference Sets (translated terms)
Produce and distribute a National Edition

- Simple type reference sets
- Contains a list of references to one or more components
- Subsets for clinical specialties and disciplines
- Can be used for problem lists or care plans

<table>
<thead>
<tr>
<th>Hematology/Oncology</th>
<th>Orthopedics Extremities</th>
<th>Cardiology</th>
<th>Injuries</th>
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</thead>
<tbody>
<tr>
<td>History</td>
<td>Orthopedics Non-Extremities</td>
<td>Common Lab Procedures</td>
<td>Sample taking</td>
</tr>
<tr>
<td>Mental Health</td>
<td>Orthopedics</td>
<td>Emergency</td>
<td>Sample taking site</td>
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<tr>
<td>Musculoskeletal</td>
<td>Pediatrics</td>
<td>Endocrino/Uro/Nephro</td>
<td>Ophtalmology</td>
</tr>
<tr>
<td>Neurology</td>
<td>Primary Care</td>
<td>Gastro/Entero/InfectiousDiseases</td>
<td>Injuries Combined</td>
</tr>
<tr>
<td>OBGYN</td>
<td>Skin/Dermato/Respiratory</td>
<td>Nursing</td>
<td>Functioning</td>
</tr>
</tbody>
</table>
- **Subsets for procedures**

<table>
<thead>
<tr>
<th>System</th>
<th>System</th>
<th>System</th>
<th>System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auditory System</td>
<td>Urinary System</td>
<td>Mediastinum And Diaphragm</td>
<td>Female Genital System</td>
</tr>
<tr>
<td>Cardiovascular System</td>
<td>Hemic And Lymphatic System</td>
<td>Muskuloskeletal System</td>
<td>Maternity And Delivery</td>
</tr>
<tr>
<td>Digestive System</td>
<td>Integumentary System</td>
<td>Nervous System</td>
<td></td>
</tr>
<tr>
<td>Endocrine System</td>
<td>Intersex</td>
<td>Neuro And Neuromusc</td>
<td></td>
</tr>
<tr>
<td>Eye And Adnexa</td>
<td>Male Genital System</td>
<td>Respiratory System</td>
<td></td>
</tr>
</tbody>
</table>
Produce and distribute a National Edition

- Dutch Language Reference Set
  - First alpha release available
  - Distributed to Affiliates

- French Language Reference Set
  - First alpha release under construction

- Validation and review of translation according to IHTSDO guidelines is ongoing:
  - Dutch: Netherlands
  - French: France and Switzerland
  - IHTSDO: supervision and coordination
Produce and distribute a National Edition

- Complete the Language Reference sets:
  - 30,000 Dutch concepts are being reviewed
  - Dutch concepts prepared by the Netherlands

- Add Map reference sets for local systems
  - SNOMED CT to VG-MZG
  - ...
  - Maps developed internationally will be distributed through IHTSDO channels.

- Important: National Extension is dynamic, open to input and responsive to the needs of the users.
First implementation results, some examples

- **Three examples**
  - Implementation of SNOMED CT in a structured EHR
    - Hôpital Erasme, Brussels Belgium
    - In-house development
  - Implementation of SNOMED CT in the EHR: secondary use of data for ICD-10-BE
    - Ziekenhuis Netwerk Antwerpen (ZNA), Antwerp Belgium
  - Commercial product
    - Mapping of SNOMED CT to Belgian Nursing Minimal Data Set: proof of concept
  - University Hospitals Leuven, Leuven Belgium
    - In-house development for several hospitals
Timing

- Deployment ongoing in Gastroenterology, Digestive Surgery, Nephrology, Urology
- From October 1, Anesthesiology, Cardiology, Cardiac Surgery, Vascular Surgery, Thoracic Surgery, …
- End scheduled April 2016

Lessons learned

- Use of a SNOMED CT structured EHR is feasible and opens many perspectives in the portability of Health data
- We still need to improve our terminology services (synonyms, relationships, refsets)
- A continuous information and communication of the future benefits is mandatory to end-users
- Adequate training before deployment already allows to fine-tune the terminology and the user interface.
Implementation of SNOMED CT in a structured EHR
Hôpital Erasme, Brussels Belgium

Access to precoordinated terms (blue buttons)

Precoordinated terms

Possible to add free text

Source: Hôpital Erasme, Brussels Belgium
Access to attributes for further post-coordination
Implementation of SNOMED CT in the EHR: secondary use of data for ICD-10-BE

Problemlists (English)

Source: ZNA, Antwerp Belgium
Implementation of SNOMED CT in the EHR: secondary use of data for ICD-10-BE

SNOMED CT based rapid selection problem lists

Source: ZNA, Antwerp Belgium
Implementation of SNOMED CT in the EHR: secondary use of data for ICD-10-BE

Access to attributes for further post-coordination

ICD-10-BE codes not visible for physicians only for coders

Possible to add free text

Source: ZNA, Antwerp Belgium
Implementation of SNOMED CT in the EHR: secondary use of data for ICD-10-BE

- POC for general surgery, vascular surgery and gastro-enterology
  - rule based mapping from SNOMED CT to ICD-10-CM
  - One-to-one mapping from SNOMED CT to ICD-10-PCS (ZNA)
  - Information can be added using attributes and free text

- Result: meaningful and structured SNOMED CT data available for coding ICD-10-BE
  - Serves as input for the coding team
  - Machine-readable for coding software
Implementation of SNOMED CT in the EHR: secondary use of data for ICD-10-BE

- Prerequisites:
  - Dutch Language Reference Set is needed for further implementation
  - Complex map Reference Set is needed from SNOMED CT to ICD-10-PCS
  - Software to interpret Rule Based Maps is needed
- Last but not least: SNOMED CT
  - Supports care process
  - Supports administrative process by simplifying it
Mapping of SNOMED CT to Belgian NMDS

Mapping of SNOMED CT to Belgian NMDS

Source: University Hospitals Leuven, Leuven Belgium
Difficult and slow start
  - Support in IHTSDO E-learning

Common language = solid and powerful foundation

Step-by-step process
  - Incremental implementation approach
  - Statutory registrations are prioritized
  - Yardstick for current clinical documentation

Useful for validation of SNOMED CT nursing subset

Advanced decision support – (Q)-indicators

Results are immediately transferable to other hospitals: broad implementation range

Mapping of SNOMED CT to Belgian NMDS
Conclusions

- Implementation needs to be driven from different angles at the same time
- Start immediately with small implementation projects
  - Learning curve for implementers as well as users
  - Training is needed
  - Put translation high on the agenda, but keep in mind that not all implementation approaches require translation and that implementation project can start before translation is completed
  - Cooperation and sharing on international level is useful
- Start with the NRC as soon as possible, when human resources are limited, prioritize the responsibility areas
## Conclusions

<table>
<thead>
<tr>
<th>Responsibility area</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Manage licenses (manually or automatically)</td>
<td>1</td>
</tr>
<tr>
<td>Distribute International Releases</td>
<td>2</td>
</tr>
<tr>
<td>Manage Extensions: reference sets, mappings, translations</td>
<td></td>
</tr>
<tr>
<td>Authoring</td>
<td></td>
</tr>
<tr>
<td>Release</td>
<td>6</td>
</tr>
<tr>
<td>Distribution</td>
<td></td>
</tr>
<tr>
<td>Maintenance</td>
<td></td>
</tr>
<tr>
<td>Tooling</td>
<td></td>
</tr>
<tr>
<td>As user service: To enable users to access and explore SNOMED CT</td>
<td>8</td>
</tr>
<tr>
<td>As NRC tool: Support SNOMED CT management</td>
<td>7</td>
</tr>
<tr>
<td>Manage change requests for organizations in the country</td>
<td></td>
</tr>
<tr>
<td>Offer education, promotion and training</td>
<td>4</td>
</tr>
<tr>
<td>Engage stakeholders</td>
<td>3</td>
</tr>
<tr>
<td>Implementation consultancy</td>
<td>5</td>
</tr>
</tbody>
</table>