The Development of Health Information Standards in Thailand

Asia eHealth Information Network (AeHIN) Workshop
UN ESCAP Building, Bangkok, Thailand
8 August 2012

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WHO eHealth Development Model

**eHealth Applications**
- EMR/EHR/PHR, mHealth
- Reimbursement Information System
- Surveillance Information System

**Enabling Components**
- HIS architecture framework
- Interoperability framework
- Health Information Standards

**Foundations**
- Policy, Governance
- Funding
- Infrastructure
Thailand eHealth

eHealth Applications

- Enabling Components
- Foundations
Interoperability

- "the ability of two or more systems or components to exchange information and to use the information that has been exchanged". [The Institute of Electrical and Electronics Engineers (IEEE, USA)]

- "In healthcare, interoperability is the ability of different information technology systems and software applications to communicate, to exchange data accurately, effectively, and consistently, and to use the information that has been exchanged." [The National Alliance for Health Information Technology (NAHIT, USA)]
Different kinds of communication between HIS (Systems Interoperability)

Categories of Interoperability

- Stakeholder Interoperability
- Human/computer Interface Interoperability
- Security/Privacy Interoperability
- Semantic Interoperability
- Business Interoperability
- Functional Interoperability
- Communications Interoperability
- Technical Interoperability
- Environmental Interoperability
- Legal, ethical and societal Interoperability

1. **Interconnectivity** for the ability to exchange information at a network, syntactic, and process flow level

2. **Interchangeability** for the ability to use information at a presentation, semantic, and input/output level

3. **Interoperability** for the ability to use information at an application, pragmatic, and process control level

Levels of Interoperability

- **Basic** — allows data to be exchanged between computer systems
  - Word processing documents, text messages
- **Functional** — describes the standard syntax (format) of the data
  - Document templates, forms, data structures
  - Message standards
- **Semantic** — requires use of standardized content (vocabularies) within the data structure
Interoperability of HIS

Interoperability needs **STANDARDS**

- **Semantics standards**
  - Identifiers: Patients, Providers, Resources
  - Coding: ICDs, National Drug Codes
  - Medical Terminology: SNOMED-CT, LOINC

- **Syntactic standards**: HL7 messaging standards, HL7-CDA (Clinical Document Architecture)

- **Core data sets standards**

- **Security and Privacy standards**
Continuum of Health Vocabularies

- Nomenclature: Highly detailed descriptions (SNOMED-CT)
- Classification: Organized aggregation of descriptions into rubric (ICDs)
- Groupings: High-level categories of rubrics (DRGs)
# Thai Health Information Standards

<table>
<thead>
<tr>
<th>Standards</th>
<th>National</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Core data set standards</td>
<td>Billing data set (12 files/DRG) HC reporting dataset (18 files)</td>
</tr>
<tr>
<td>2. Semantic standards</td>
<td>ICD 10 TM, ICD 9 CM Identifiers: patients, providers</td>
</tr>
<tr>
<td>3. Syntactic standards</td>
<td>X</td>
</tr>
<tr>
<td>4. Security and privacy standards</td>
<td>X</td>
</tr>
<tr>
<td>Type of Standards</td>
<td>Standards</td>
</tr>
<tr>
<td>-------------------</td>
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</tr>
<tr>
<td>1. Core data set standards</td>
<td>Referral letter, Continuity Care Records etc.</td>
</tr>
<tr>
<td>2. Semantic standards</td>
<td>Laboratory terminology, Medicine terminology (Drug Codes), Medical terminology</td>
</tr>
<tr>
<td>3. Syntactic standards</td>
<td>HL7 : Message, CDA</td>
</tr>
<tr>
<td>4. Security and privacy standards</td>
<td>Regulations framework, Authentication/Encryption framework</td>
</tr>
<tr>
<td>Standards</td>
<td>Actors</td>
</tr>
<tr>
<td>--------------------------------------------------------------------------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>Lab. Term. ➔ LOINC</td>
<td>THIS HSRI</td>
</tr>
<tr>
<td>Med. Term. ➔ TMT (SNOMED-CT extension)</td>
<td>THIS HSRI +Thai FDA +GCD +MoPH</td>
</tr>
<tr>
<td>Health Information Standards Maintenance Mechanism</td>
<td>THIS HSRI</td>
</tr>
<tr>
<td>National core dataset for health &amp; non-health</td>
<td>National e-Government Committee + NECTEC</td>
</tr>
<tr>
<td>Referral Document Dataset</td>
<td>BHPS, MoPH + NECTEC</td>
</tr>
<tr>
<td>Standards</td>
<td>Actors</td>
</tr>
<tr>
<td>----------------------------------------------------</td>
<td>-------------------------------------------------------------</td>
</tr>
<tr>
<td>National eHealth Architecture</td>
<td>THIS HSRI</td>
</tr>
<tr>
<td>Health Information Protection/Authentication</td>
<td>National eTransaction Committee, National Health Information Committee</td>
</tr>
<tr>
<td>HL7 CDA, Messaging, Continuity Care Document</td>
<td>THIS HSRI+BHPS MoPH, Universities</td>
</tr>
<tr>
<td>National Providers Identifiers (individual)</td>
<td>BHPS MoPH+THIS HSRI</td>
</tr>
<tr>
<td>Thai Ambulatory Casemix (TAC)</td>
<td>Thai CaseMix Center HSRI</td>
</tr>
</tbody>
</table>
Standards Development Strategies

- Don’t reinvent the wheel: international lesson learnt and standards
- Evolution: Stepwise, Not a big bang
- Identify priority
  - Reimbursement
  - Referral system
- Looking for strong incentive for adoption and avoid resistant
  - Reimbursement system
  - Starting with non existing national standards
Why LOINC?

- No laboratory terminology standard being used in the country
- Needed by both referral and reimbursement system
- Well accepted international standard
- Well accepted by stakeholders in the country
- Available documents and tool (RELMA)
- No license fee
Current developmental status

- Introduced and proposed LOINC standard to professional communities: Royal Collage of Pathologist of Thailand, Department of Medical Sciences MoPH, Hospital Laboratory Society etc.
- Convened two large stakeholder meetings
- Consult international experts
- Pilot mapping codes for reimbursement with LOINC using RELMA
- Anticipate first draft of National laboratory term & code dictionary by the end of year 2012
Stakeholders meetings & workshop
Why we need a new drug terminology?

- Country urgent need to control the rising pharmacy cost.
- Detail drug information at drug item level is needed by health insurance schemes for reimbursement and utilization monitoring.
- Harmonization of the three national health insurance schemes payment mechanism need standard drug terminology.
Increasing of drug expenditure

Million Baht

- Detail price value
- Wholesale value

Year: 1983 to 2008
Increasing of drug expenditure
Current developmental status

- Review currently used drug codes: 24 digits drug codes, GS1 standard
- Review international implementation and lesson learn: US, UK, Australia, Hong Kong, New Zealand
- Propose development of Thai Medicine Terminology (TMT)
- Collaborative work of
  - Thai Food & Drug Administration
  - Bureau of Health Administration MoPH,
  - Thai Health Information Standards development center, HSRI
## Limitation of current drug codes

<table>
<thead>
<tr>
<th>Drug codes</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standards 24 digits drug code</td>
<td>1. Lag of drug packaging information &amp; unit of use</td>
</tr>
<tr>
<td></td>
<td>2. Identifiers use semantic code structure (Smart code) limit evolution</td>
</tr>
<tr>
<td></td>
<td>3. No sustainable standards maintenance mechanism</td>
</tr>
<tr>
<td>GS1 standards (GTIN)</td>
<td>1. For logistic function</td>
</tr>
<tr>
<td></td>
<td>2. No pharmacy &amp; clinical information</td>
</tr>
<tr>
<td></td>
<td>3. License fee for every hospitals which manufacture drugs.</td>
</tr>
</tbody>
</table>
Desiderata of Controlled Medical Terminology

- Content comprehensive, quality
- Concept Orientation
- Non-Semantic Concept Identifiers
- Polyhierarchy
- Formal Definitions
- Graceful Evolution
- Rejection of “Not Elsewhere Classified” Terms
- Multiple Granularities
- Multiple Consistent Views
- Concept Permanence
- Recognize Redundancy

Which Standard Drug Terminology?
Both have similar hierarchical structure for concepts relevant to clinical systems

Members states include:
Australia, Canada, Cyprus, Denmark, Lithuania, New Zealand, Singapore, Spain, Sweden, The Netherlands, United Kingdom, United States.

Developed and maintained by:
IHTSDO (formerly SNOMED RT and UK CTV)

United States
Developed and maintained by:
National Library for Medicine (NLM)

From: S C CHIANG, Building the Medicine Terminology table, Seminar on “Sharing Drug Records in Electronic Health Record (eHR) System – What You Need to Know” 22 & 23 Nov 2010
NHS UK (dm+d)

Australia (AMT)

Hong Kong (HK MTT)

VTM Virtual Therapeutic Moiety

VMP Virtual Medicinal Product

VMPP Virtual Medicinal Product Pack

AMP Actual Medicinal Product

AMPP Actual Medicinal Product Pack

SNOMED-CT extension
Figure 1: Relationships within the AMT using a NZ product as an example.
<table>
<thead>
<tr>
<th>Medicinal Product (MP)</th>
<th>amoxycillin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicinal Product Unit of Use (MPUU)</td>
<td>amoxycillin 500 mg capsule</td>
</tr>
<tr>
<td>Medicinal Product Pack (MPP)</td>
<td>amoxycillin 500 mg capsule, 20 capsules</td>
</tr>
<tr>
<td>Trade Product (TP)</td>
<td>Amoxil</td>
</tr>
<tr>
<td>Trade Product Unit of Use (TPUU)</td>
<td>Amoxil capsule:hard, 1 capsule</td>
</tr>
<tr>
<td>Trade Product Pack (TPP)</td>
<td>Amoxil capsule:hard, 20 capsules</td>
</tr>
<tr>
<td>Contained TPP (CTPP)</td>
<td>Amoxil capsule:hard, 20 capsules, blister pack</td>
</tr>
</tbody>
</table>
Thai Medicine Terminology (TMT)

- Thailand Standard Drug Information and codes
- Adopt SNOMED – CT
- Employ Pharmaceutical/biological product and substance Hierarchies
- Thailand SNOMED-CT extension
<table>
<thead>
<tr>
<th>Table</th>
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<tr>
<td></td>
<td>06 00000004</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>06 00000005</td>
<td>0</td>
</tr>
</tbody>
</table>
คสมสท. THIS.

คสมสท. = ศูนย์พัฒนามาตรฐานระบบข้อมูลสุขภาพไทย เครือสถาบันวิจัยระบบสาธารณสุข

THIS. = Thai Health Information Standards development center