Ehealth network meeting
Riga 11 may 2015

Luc Nicolas
Health Telematics, Informatics and Communication Unit
Public Federal Service Public Health
1 country - 11.2 millions inhabitants – 3 languages – 5 governments
Ehealth Roadmap (2014-2018)

Dorian
- Hospitalisation
- Implant
- Laboratoire
- Imaging
- Sumehr
- Therapeutic scheme
- MyCarenet
- Register
- RHM

Gregory
- GP
- Specialist
- Imaging
- Prescriptions
- Chapter 4
- Pharmacist
- MyCarenet
- DMG
- Laboratory
- Status handicapped
- Work incapacity

Hillary
- Psychiatry
- Méthadone
- CPAS
- Ambulance
- Emergency
- Laboratory
- Imaging
- Sumehr
- DMG
- Wachtpost

Emily
- Homecare
- MRS
- Belrai
- Dentist
- Clinical path
- Hospitalisation
- Multidisciplinary collaboration
- Sumehr
- Paliative care
- Home Hospitalisation

Mona
- Auto monitoring
- Tele consultation
- Tele monitoring
- Sumehr
- Personal health record
- Electronic Prescription
- eFact
- eBirth
Belgium Ehealth RM 2013-2018

To be (h)ims

Cont. of Care
Follow-up by patient
Traceability
Invoicing, insurance, ...
Administration
Surveillance & Reserach

Action points 2013-2018

AP 2: Hospital EPD
AP 13: Terminology
AP 12: Training

AP 5: Hub-Metahub
AP 10: Patient Portal
AP 16: Traceability
AP 14: MyCareNet
AP 15: Admin. Simplification
AP 18: Registers

HIMS: hospital information system; EPR: Electronic Patient Record
Sharing data via the hubs & metahub system

2014: Consultation reports, discharge letters and surgery protocols, other reports and corresponding data.

2015: Imaging results and reports, implants placing

2016: Integration of data of other institutions
**Hospital EHR: Minimum data set per discipline** mapped with technical and semantic standards

**End 2014:**
- Mapping rules to normalised clinical language for all main registers
- Publication of functionalities referential (To be implemented by 2017)
- New standardized discharge letter

**End 2015:**
- Minimum Content data set (implementation end 2016)

**End 2016:**
- Structure (instauration fin 2017)
- Schéma de médication de sortie

2017: EHR partially coded

**End 2017:**
- Compulsory system to system communication for feeding registers
Hubs-metahub system: no central storage – only central locator service

5 hubs
3 technical implementations
All Belgian hospitals connected
Hubs-metahub system: today

1: Where can we find data?
2: In hub A and C
3: Retrieve data from hub A
4: All data available

3: Retrieve data from hub C
Extramural data
Federal rules

Informed Consent
Do you have it?

All services supporting continuity of care- approved by privacy commission

Access limited to proved therapeutic relationship
Web Services

The definition of KMEHR is completed by a minimal set of web service operations to support the exchange and the sharing of medical files. Those web services result from concrete implementations initiated throughout the Fprime projects.

In order to unify the interfaces developed within those local and regional initiatives, a revision of those interfaces has been undertaken within the ‘Gly - Belgian Care Providers Telematic Advisory Group’ in the context of the ‘hub-metahub’ architecture. The result of this work is available here. The work currently published has the status of a draft as the definitions must still be validated through effective testing with partners involved in the hub-metahub project. Those tests are currently running.

The ‘hub-metahub’ architecture identifies two sets of web service operations: the operations provided by the hubs to their clients, called ‘intrahub webservices’, and the web service operations provided by the hubs to the other hubs, called ‘interhub webservices’.

The functional specification of each operation is available in the table below.

The following archive file contains the complete XSD structure corresponding to the payload of the webservices. It also contains the WSDL that defines the interface at the interhub level.

```
xsd-hubservices-1.0.zip (2013-06-03)
```

<table>
<thead>
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<th>Status</th>
<th>Last update</th>
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<td>Intrahub</td>
<td>1.0</td>
<td>Draft</td>
<td>2010-07-30</td>
</tr>
</tbody>
</table>
Basic services and authentic sources

Patients, healthcare providers and institutions

Users

Network

Basic services
eHealth platform

Suppliers

ADS

Health Portal

RIZIV-INAMI

eHealth platform Portal

MyCareNet

Healthcare institution software

Care provider software

VAS
**10 Basic services** [www.ehealth.fgov.be](http://www.ehealth.fgov.be)

<table>
<thead>
<tr>
<th>Service</th>
<th>Icon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coordination of electronic sub-processes</td>
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</tr>
<tr>
<td>Portal</td>
<td><img src="image2" alt="Icon" /></td>
</tr>
<tr>
<td>Integrated user and access management</td>
<td><img src="image3" alt="Icon" /></td>
</tr>
<tr>
<td>Logging management</td>
<td><img src="image4" alt="Icon" /></td>
</tr>
<tr>
<td>System for end-to-end encryption</td>
<td><img src="image5" alt="Icon" /></td>
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<tr>
<td>eHealthBox</td>
<td><img src="image6" alt="Icon" /></td>
</tr>
<tr>
<td>Timestamping</td>
<td><img src="image7" alt="Icon" /></td>
</tr>
<tr>
<td>Encoding and anonymization</td>
<td><img src="image8" alt="Icon" /></td>
</tr>
<tr>
<td>Consultation of the National Identification Registers</td>
<td><img src="image9" alt="Icon" /></td>
</tr>
<tr>
<td>Reference directory (metahub)</td>
<td><img src="image10" alt="Icon" /></td>
</tr>
</tbody>
</table>

*27/03/2015*
Authentic Data Sources: Public investment

- Key contribution for interoperability and security
- Need for European Infrastructure

- NATIONAL REGISTER and SOCIAL SECURITY REGISTERS
- CADASTER OF HEALTH PROFESSIONALS (Including agreement attributes)
- MANDATES DATA SOURCE
- HOSPITALS
- PHARMACEUTICAL PRODUCTS and MEDICAL DEVICES
- PATIENT RIGHTS (Health Insurance)
- BEST PRACTICES
- NATIONAL THESAURUS
- REGISTER OF REGISTERS

And many others…
Testing and certification

- **Mini « connecthatons »:**
  - First targeted at Hubs and Metahub (Ehealth)
  - Opened later to local EHR (GP, nurses, etc.)
- Certification of individual Hospitals by Hubs.
- Certification of ambulatory care systems by Prorec/Ehealth platform
Use of HL7 Standards

KMEHR
Kind Messages For Electronic Healthcare Record - Belgian implementation standard

Introduction

This site aims to offer a central point for the documentation of the KMEHR normative elements. It mainly focuses on the most recent version of the norm.

This site replaces the historic KMEHR site sponsored by the CHU of Charleroi, which is no longer being maintained. Most of the content of the present site, however, comes from this historic site.

What is KMEHR?

KMEHR was introduced in 2002. It is an implementation of the fourth recommendation of the Belgian Healthcare Telemedicine Commission, enabling the exchange of structured clinical information.

KMEHR is mainly composed of the following elements:

- an XML schema that defines a general and simple message grammar,
- a set of recognized medical transactions compliant with this grammar,
- a set of reference tables whose values may be used within KMEHR messages.

Those core elements have been complemented by a set of web services implemented in concrete initiatives for the standardized exchange of data between systems.
**Content: based on existing standards**

- **Consider** content already validated and used at international level, based on available standards.

- **Prepare** possible progressive transition from kmehr to HL7-CDA:
  - Mapping headings Kmehr-CDA
  - Based on existing data and **input from Business** prepare CDA specification for lab report and dismissal letter.
Healthdata’s mission is to facilitate the data exchange between healthcare professionals and researchers according to the principle of single multifunctional data collection and the re-use of data, in order to increase public health knowledge and to adjust health care policy, with respect for the privacy of the patient, the healthcare professional and the medical confidentiality.
The challenge for scientific data collection

Variables needed for scientific research question

Register A

Register B

Register C

Register D

Signalitics, typical available in authentic sources

Information needed in context of continuity of care or internal administration

Information mostly not available in primary systems (EPD, HIMS, LIMS, …)
131 registers (and counting..)

1. Ambulatory Care Health Information Lab (RIZIV-INAMI)
2. Annual Hospital Statistics (FOD-SPF)
3. Antwerpen registry of congenital anomalies (EUROCAT)
4. Belgian Abortion Register (FOD-SPF)
5. Belgian AIDS-reference centres (WIV-ISP)
7. Belgian alpha-1 antitrypsin deficiency registry (AlphaOne International Registry (AIR))
8. Belgian Association for Cardio-Thoracic Surgery Database
10. Belgian Cystic Fibrosis registry (WIV-ISP)
11. Belgian Early Warning System for Drugs (WIV-ISP)
12. Belgian familial adenomatosus polyposis registry
13. Belgian Langerhans cell histiocytosis registry (LCH)
14. Belgian Neuromuscular Disease Registry (WIV-ISP)
15. Belgian Patient database for Wilson disease (EuroWilson registry)
16. Belgian Patient registry for rare bleeding disorders
17. Belgian Pediatricians Nephrology Registry (BPNR)
18. Belgian Register for Assisted Procreation (National College of Physicians in Reproductive Medicine)
19. Belgian Register Substitution Treatment (FAGG-AFMPS)
20. Belgian registry of primary immunodeficiencies (ESID European registry)
21. Belgian registry on acromegaly, epidemiology and quality of care (ACROBEL)
22. Belgian severe chronic neutropenia patient registry (SCN international registry (SCNIR)
23. Belgian sickle cell anemia registry
24. Belgian systemic sclerosis cohort
25. Belgian Virtual Tumourbank (Belgian Cancer Registry)
26. Belgian Treatment Demand Indicator Register (WIV-ISP)
27. BINC: Begeleiding in Cijfers
28. Biobank of the pediatric granulomatous arthritis international registry (UZLeuven)
29. Birth Register (VAZG, Observatbru, DGOPLASS, ADSEI)
30. Central Register of Rare Diseases (WIV-ISP)
31. Database Farmanet (IMA-AIM)
32. Database Health Care (IMA-AIM)
33. Database Population (IMA-AIM)
34. Database Palliative care (federatie palliattieve zorg Vlaanderen)
35. Declaration of Infectious diseases (MATRA, WIV-ISP)
36. Drug Related Infectious Diseases (WIV-ISP)
37. Effectiveness of Endometrial Cancer Treatment (EFFECT) (Belgian Cancer Registry)
38. End of career measures (FOD-SPF)
39. Electronic Patient Registration Centers Mental Health Care Flanders
40. European alternating hemiplegia and rare epilepsies registry in childhood (ENRAH)
41. European Antimicrobial Resistance Surveillance Network (WIV-ISP)
42. European network for the study of orphan nephropathies registry (EUINEFRON)
43. European patient registry and cohort for congenital disorders of glycosylation (EUROGLYCANET)
44. European Point Prevalence Survey (PPS AB & HAI; WIV-ISP)
45. European registry of human alveolar echinococcosis: Belgium (EURECHINOREG)
46. European Surveillance of Antimicrobial Consumption (ESAC-Net; WIV-ISP)
47. Flemish Renal Registry (NBVN)
48. Haemoglobinopathies - database
49. Head and Neck: oro-farynxcarcinomen Project (Belgian Cancer Registry)
50. Healthcare Associated Infections & Antimicrobial Use in European Long Term Care Facilities (WIV-ISP)
51. Hospital Financing (FINHOSTA, FOD-SPF)
52. Infectious diseases (sentinel laboratories) (WIV-ISP)
53. Informatietoestroom tussen de ziekenhuizen en de administratie gezondheidszorg (VAZG)
54. Initiative for Quality improvement and Epidemiology in Diabetic Foot clinics (WIV-ISP)
55. Initiative for Quality promotion and Epidemiology in Diabetes care (WIV-ISP)
56. Initiative for Quality promotion and Epidemiology in Diabetes care for children and adolescents (WIV-ISP)
57. Integrated Computerized Network, INTEGO
58. Medical Emergency Services: MUGREG (FOD-SPF)
59. Minimum Hospital Data (FOD-SPF)
60. Minimum Psychiatric Data (FOD-SPF)
61. MIRAGE database (IKAROS; Kind & Gezin)
62. Mortality Register (VAZG, Observatbru, DGOPLASS, ADSEI)
63. National Surveillance of Antimicrobial Use in Belgian Hospitals (WIV-ISP)
64. National Surveillance of Healthcare Associated Infections in Intensive Care Units (WIV-ISP)
65. National Surveillance of Influenza (WIV-ISP)
66. National Surveillance of Meticillin resistant Staphylococcus aureus (MRSA) in Belgian hospitals (WIV-ISP)
67. National surveillance of multi-resistant micro-organisms in Belgian hospitals (WIV-ISP)
68. National Surveillance of Septicemia in the Hospital (WIV-ISP)
69. National Surveillance of Surgical Site Infections (WIV-ISP)
70. Netverschijndend ICT-project van de CLB’s in samenwerking met het departement Onderwijs (VAZG)
71. Newborn college Register
72. ORThopedic Prosthesis Identification Data (RIZIV-INAMI)
73. Pediatric granulomatous arthritis international registry
74. Permanent Sample (IMA-AIM)
75. PROCARE (Belgian Cancer Registry)
76. Prospective collection of tissue, ascites and plasma samples from patients with ovarian cancer (UZLeuven)
77. Qermid©Coronaire stents (RIZIV-INAMI)
78. Qermid©Endoprothesen (RIZIV-INAMI)
79. Qermid©Hartdefibrillatoren (RIZIV-INAMI)
80. Qermid©Pacemakers (RIZIV-INAMI)
81. End of career measures (FOD-SPF)
82. European alternating hemiplegia and rare epilepsies registry in childhood (ENRAH)
83. European Antimicrobial Resistance Surveillance Network (WIV-ISP)
84. European network for the study of orphan nephropathies registry (EUINEFRON)
85. European patient registry and cohort for congenital disorders of glycosylation (EUROGLYCANET)
86. European Point Prevalence Survey (PPS AB & HAI; WIV-ISP)
87. European registry of human alveolar echinococcosis: Belgium (EURECHINOREG)
88. European Surveillance of Antimicrobial Consumption (ESAC-Net; WIV-ISP)
89. Flemish Renal Registry (NBVN)
90. Haemoglobinopathies - database
Healthdata.be services

Index of Belgian data collections health

Management of Business Processes

Data collection technology

Data warehouse & BI reporting
**INVENTORY OF REGISTERS**

Within the Belgian healthcare landscape, there are many active players, each of whom ask specific health(care) professionals for specific information, which can serve various purposes. Think of epidemiological research (e.g., flu epidemic), quality of care, reimbursement, etc. This inventory provides an overview of these so-called registers, how they are organized and exactly what information they collect and publish. More information about the structure and objectives of this inventory can be found on the website of healthdata.be.

<table>
<thead>
<tr>
<th>Register Name</th>
<th>Abbreviation</th>
<th>Responsible Organisation</th>
<th>Main Function</th>
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<tbody>
<tr>
<td>Doc FH</td>
<td>Doc FH</td>
<td>Rijksinstituut voor Ziekte- en Invaliditeitsverzekering (RIZIV)</td>
<td>Administrative function</td>
</tr>
<tr>
<td>Doc N</td>
<td>Doc N</td>
<td>Rijksinstituut voor Ziekte- en Invaliditeitsverzekering (RIZIV)</td>
<td>Administrative function</td>
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<tr>
<td>Données signalétiques des dispensateurs et établissements de soins</td>
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<td>Rijksinstituut voor Ziekte- en Invaliditeitsverzekering (RIZIV)</td>
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<tr>
<td>Nomenclature &amp; pseudocodes</td>
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<tr>
<td>Doc H</td>
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<tr>
<td>Doc P</td>
<td>Doc P</td>
<td>Rijksinstituut voor Ziekte- en Invaliditeitsverzekering (RIZIV)</td>
<td>Administrative function</td>
</tr>
</tbody>
</table>
Capture Data
Automated Data Capture

« TO BE » scenario for most registers in 2018

Data provider

Sending Data Through an API

healthdata.be

Legend
- Identifiers (SSIN, RIZIV, …)
- Metadata (internal ID, type of data, …)
- Medical data

Catalogue with form definition

24/7
The SEMANTIC Roadmap

Snomed-ct based CMV

To Be

ICD-10-CM

Health DATA.be
**Terminology server**

### Sources et classifications

- **ProcessBE cliniques**
  - diagn
  - procéd
  - labo
  - SNOMED

- **ProcessBE administratifs**
  - INAMI
  - ICD10
  - Registres

### Terminologie de référence

<table>
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<tr>
<th>P.T.</th>
<th>desc</th>
<th>Snomed</th>
<th>ICD-9</th>
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<tr>
<td>FR</td>
<td>&lt;txt&gt;</td>
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</tr>
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</table>

- Mises à jour
- Gestion des versions
- Couplage, mapping
- Gestion des règles
- Validation
- Webservice / webap.

### Interfaces de consultation

- Load/Extract
- Requêtes
- Mapping
- Feed back

### Interfaces de Gestion

- Glossaires
- Documentation et références
- Portail

### Utilisateurs

- SVA

### Software

- ProcessBE administratifs ou médicaux
  - Dossier médical,
  - Remboursement,
  - Registre du cancer, ...

### Documentation

- Workflow de validation
<table>
<thead>
<tr>
<th>ICD_10_Code</th>
<th>SNOMEDID</th>
<th>Snomed CT number</th>
<th>EN_Clinical_Label</th>
<th>Fr_Belgium</th>
<th>NL_Belgium</th>
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<tr>
<td>C08.9</td>
<td>M-81473</td>
<td>34603009</td>
<td>Basal cell adenocarcinoma</td>
<td>adénocarcinome basocellulaire</td>
<td>basaalcel adenocarcinoom</td>
</tr>
<tr>
<td>C16.9</td>
<td>M-81423</td>
<td>37995004</td>
<td>Limis plastica</td>
<td>limite plastique</td>
<td>linitis plastica</td>
</tr>
<tr>
<td>C25.4</td>
<td>M-81523</td>
<td>66515009</td>
<td>Glucagonoma, malignant</td>
<td>glucagonome malin</td>
<td>maligne glucagonoom</td>
</tr>
<tr>
<td>C25.4</td>
<td>M-81533</td>
<td>19756007</td>
<td>Gastrinoma, malignant</td>
<td>gastrinome malin</td>
<td>maligne gastrinoom</td>
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<tr>
<td>C44.9</td>
<td>M-84013</td>
<td>57141000</td>
<td>Apocrine adenocarcinoma</td>
<td>adénocarcinome apocrine</td>
<td>apocrien adenocarcinoom</td>
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<td>M-90503</td>
<td>62064005</td>
<td>Mesothelioma, malignant</td>
<td>mésothéliome</td>
<td>mesothelioom</td>
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<td>C49.9</td>
<td>M-91333</td>
<td>54124005</td>
<td>Epithelioid hemangioendothelioma, malignant</td>
<td>hémangioendothéliome épithélioïde malin</td>
<td>hemangio-endotheliaalsarcoom</td>
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<tr>
<td>C56</td>
<td>M-86003</td>
<td>57622002</td>
<td>Thécoma, malignant</td>
<td>thécom malin</td>
<td>maligne thecoom</td>
</tr>
<tr>
<td>C69.2</td>
<td>M-95123</td>
<td>12354007</td>
<td>Retinoblastoma, undifferentiated</td>
<td>rétinoblastome indifférencié</td>
<td>ongedifferentieerd retinoblastoom</td>
</tr>
<tr>
<td>C71.9</td>
<td>M-938FF</td>
<td>115240006</td>
<td>Glioma</td>
<td>gliome</td>
<td>glioom</td>
</tr>
<tr>
<td>C71.9</td>
<td>M-94233</td>
<td>12943006</td>
<td>Polar spongioblastoma</td>
<td>spongioblastome polaire</td>
<td>polair spongioblastoom</td>
</tr>
<tr>
<td>C71.9</td>
<td>M-94243</td>
<td>78838008</td>
<td>Pleomorphic xantchoastrocytoma</td>
<td>xanthoastrocytome pléomorphe</td>
<td>xanthoastrocytoom</td>
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<tr>
<td>C71.9</td>
<td>M-94423</td>
<td>35262004</td>
<td>Gliosarcoma</td>
<td>gliosarcome</td>
<td>gliosarcoom</td>
</tr>
<tr>
<td>C71.9</td>
<td>M-94733</td>
<td>39781001</td>
<td>Primitive neuroectodermal tumor</td>
<td>tumeur primitive neuro-ectodermique</td>
<td>primitieve neuro-ectodermale tumor</td>
</tr>
<tr>
<td>C75.5</td>
<td>M-86803</td>
<td>9903002</td>
<td>Paraganglioma, malignant</td>
<td>paragangliome malin</td>
<td>maligne paraganglioom</td>
</tr>
<tr>
<td>C75.5</td>
<td>M-86933</td>
<td>32512003</td>
<td>Extra-adrenal paraganglioma, malignant</td>
<td>paragangliome extrasurrénalien malin</td>
<td>maligne extra-adrenaal paraganglioom</td>
</tr>
<tr>
<td>D27</td>
<td>M-84600</td>
<td>22116003</td>
<td>Papillary serous cystadenoma</td>
<td>cystadénome papillaire séreux</td>
<td>sereneus papillair cystadenoom</td>
</tr>
<tr>
<td>D27</td>
<td>M-90000</td>
<td>74739000</td>
<td>Brenner tumor</td>
<td>tumeur de Brenner</td>
<td>Brennertumor</td>
</tr>
<tr>
<td>D76.3</td>
<td>M-77880</td>
<td>15960008</td>
<td>Reticulohistiocytic granuloma</td>
<td>granulome réticulo-histioytaire</td>
<td>reticulohistiocytair granuloom</td>
</tr>
</tbody>
</table>
User Interfaces (PM..Assesment?):

- Context sensitive pick list
- Syntactic and semantic search
- Rule Based Code converter
From exchanging to sharing...
From exchanging to sharing
Thanks

Luc.nicolas@health.fgov.be

www.health.fgov.be