Oral presentation:

Integration services to enable regional shared Electronic Health Records

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Oslo, 2011-08-30
Square one...

One patient. Many (uncoordinated) systems.
Health information technology in Portugal

Transfer of patient identifiable data: Any data transfer routinely

<table>
<thead>
<tr>
<th>Base</th>
<th>Indicator</th>
<th>Source</th>
</tr>
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<tbody>
<tr>
<td>All GPs</td>
<td>D1: Using electronic networks for transfer of patient data (cf. indicator annex for more information), % values.</td>
<td>empirica, Pilot on eHealth Indicators, 2007.</td>
</tr>
</tbody>
</table>
The regional focus in health care

Referrals:
Total: Emergency / Appointments

Line size reflects information flow volume between institutions

PCO: Primary Care Organization

Hospitals:
- Hospital Águeda (9,524)
- Hospital Aveiro (48,934)

PCOs:
- PCO Albergaria
- PCO Aveiro
- PCO Ílhavo
- PCO O.Bairro
- PCO Vagos
- PCO Murtosa
- PCO S. Vouga
- PCO Águeda
- Other PCO

Total Referrals:
- 6,949 Emergency / 3,802 Appointments
- 4,578 Emergency / 2,392 Appointments
- 9,425 Emergency / 6,592 Appointments
- 2,831 Emergency / 689 Appointments
- 14,814 Emergency / 12,779 Appointments
- 2,030 Emergency / 1,925 Appointments
- 2,511 Emergency / 1,800 Appointments
- 2,923 Emergency / 2,701 Appointments
- 2,000 Emergency / 2,000 Appointments
- 2,037 Emergency / 12,779 Appointments
- 512 Emergency / 4,500 Appointments
- 1,171 Emergency / 749 Appointments
- 422 Emergency / 749 Appointments
- 4,211 Emergency / 3,110 Appointments
- 1,101 Emergency / 3,110 Appointments
- 712 Emergency / 1,800 Appointments
- 512 Emergency / 4,500 Appointments
- 2,186 Emergency / 2,392 Appointments
- 4,211 Emergency / 3,110 Appointments
- 1,101 Emergency / 3,110 Appointments
- 422 Emergency / 749 Appointments
- 222 Emergency / 2,701 Appointments
- 2,000 Emergency / 2,000 Appointments
Objective: regional connected care

- Connect “information silos”
  - Virtual Regional EHR
- Connect different professionals
  - eCommunication
- Connect health professionals and the citizen
  - Patient Access
RTS – Telematic Health Network in the Aveiro area

- **Clinical partners**
  - Hospital Infante D. Pedro (~400 bed/ ~150 doctors)
  - Hospital Distrital de Águeda (~100 bed/ ~25 doctors)
  - Sub-Região de Saúde de Aveiro (6 Primary care units/ ~150 doctors)

- **R&D technological partner**
  - University of Aveiro

- **Population:**
  - ~350,000 citizens
The Aveiro’s approach

- One virtual system
- Using a semantic integration layer
- Without disrupting production information systems
Enabling the Regional View: coherent information, services and security models

Regional applications build on the *middleware*

Regional View
(information model + security model + service interfaces)

Existing distributed sources across partner institutions.
Sitting at the system core: the integration engine

- **Information bus**
  - Bring together heterogeneous sources
  - Proactive data discovery

- **Catalog of known care episodes**
  - Index + linking
  - Clinical data is kept at origin (no replication)

- **Semantic alignment**
  - wrapper level
Virtual Regional EHR, linking to clinical data in multiple institutions

One patient, many information sources.
rEHR: Access episode details (radiology)
rEHR: Access episode details (lab)
Security framework

- **Infrastructure security**
  - RTS is deployed on the private national Health Information Network
  - Communications on secure channels (SSL)
  - Services API implements the WS-Security

- **Professionals authentication and authorization**
  - Role based authentication
  - “circle of trust” between the partner institutions: cross-certification agreements (Gomes, 2007)

- **Auditing and traceability**
  - All user actions are logged
  - Patients are able to monitor the access to their data
Results

- Access to:
  - +11,000,000 care episodes
  - +350,000 citizens
- 12 information sources integrated
  - 8 organizations (2 Hospitals, 6 PC).
- Clearance from the Portuguese data protection agency
Discussion

- **Virtual EHR**
  - vs materialized views
- **Integration view**
  - vs clinical messaging
- **Based on data discovery processes**
- **Groundbreaking work in Portugal**
  - Reusable platform for multi-institutions patient data access

- **Missing**
  - Formal models
- **Next steps**
  - Access to ePrescriptions
  - Extend to more sources and partners
Integration services to enable regional shared Electronic Health Records

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www.rtsaude.org