Thinking of the bigger picture: How Estonia designed future healthcare.

Madis Tiik, MD, Tartu university,
Involved in eHealth development projects in Estonia since 2002.
Nordic School of Public Health -Diploma in Public Health 2003
CEO of Estonian eHealth Foundation 2007-2011
Current activities

- **EU eHealth Task Force group, scientific adviser** - Preparing report for EU Commission, how to improve eHealth after 2020

- Tallinn University of Technology, **Institute of Clinical Medicine, project manager** – Interreg IVA eMedic - Developing New Practices for Teleconsultation and Diabetes

- Vormsi island, **family doctor**

- Tartu University, **PhD student** - thesis “Prerequisites and possibilities for using of information and communication technologies in healthcare: development and regulation health data management system”
Population: 1.32 million
Area: 45,000 km²
Compulsory health insurance paid by employer
  Health insurance tax: 13%
  Health care costs make up 5% of GDP
Income tax: 21% (flat tax)
Healthcare providers are private, municipal or governmental.
  Family doctors (private companies)
  Hospitals (shared companies or foundations)
Snapshot of Estonian health care sector

Government

EHIF

Providers

Out-of-pocket (drugs, dental care, outpatient)

Social tax

Other taxes (VAT, PIT)

Households

Outpatient & inpatient services, drugs …

Ambulance services, infrastructure

62%

10%

25%

Pre-financed via taxes

Out-of-pocket payments

19 + 41 hospitals
468 fam doc practices
524 pharmacies

Enterprises, foreign aid

November 24, 2011
STATE:
- Ministry of Social Affairs-laws and decrees
- Health Board – licenses
- State Medicinal Agency – pharmaceutical and medicinal equipment control

Development Plan / 4y Strategy
Appointment of Management Board
Annual budget
Contracting strategy
Benefit package and reimbursement rates

Health Insurance Fund

Supervisory Board
Members: State (5), Employers (5), Insured (5)

- Family doctors
- Hospitals and out-patient clinics
- Other providers
Estonia is praised for its efficient health system

Source: Health Consumer Powerhouse 2010

Total score for Estonia 638
Total score for Finland 721
e-Estonia

PRECONDITIONS FOR SUCCESSFUL IMPLEMENTATION OF EHEALTH
Information Society

• By 2013
  – All public services are digitally available
  – Public infrastructure is service oriented (x road)
  – Digital authorisation of users, based on the ID card, is the best available in the world
  – Data is stored where it is collected and exchange of the data is available to those who need it
Information society indicators

• 100% of schools and government organisations have broadband connection
• 71% of families have computer at home
• 68% of homes have broadband connection
• 99% of bank transfers are performed electronically
• 94% of income tax declarations made via the e-Tax Board
• Four operational 3G and two 4G networks
• 1139 public WiFi areas for 45 227km²
• 24% of votes were cast over the internet on 2011 (Parliament elections)
ID-Card

• 2002 - introduction of national electronic ID-Card
• 1 163 917 active ID-Cards
• Compulsory for all residents
• Contains:
  • Information shown on the card
  • Certificate for authentication (along with e-mail address Forename.Surname@eesti.ee)
  • Certificate for digital signature

Population: 1,340,415
X-Road was launched in 2001
Some achievements

- 2000: Launch of e-Tax Board
- 2000: Launch of m-Parking
- 2003: Launch of ID bus ticket
- 2005: i-Voting was introduced
- 2007: Introduction of m-ID
- 2007: Launch of e-Police system
- 2008: Launch of e-Health system
- 2010: Launch of e-Prescription
How we reached there?

• 1996: Tiger Leap Foundation to support ICT in schools

• 2001: Look@world starts to build 500 Public Internet Access Points

• 2002: Start of computer usage courses for 100 000 citizens under Look@world project

• 2008: IT courses for healthcare professionals – 15 000 doctors and nurses

• 2009/2010: Come Along, computer usage courses for 100 000 citizens
Founders of the Estonian eHealth Foundation

- Ministry of Social Affairs
- Society of Family Doctors
- Tartu University Clinic
- East Tallinn Central Hospital
- Union of Estonian Medical Emergency
- North Estonian Regional Hospital
- Estonian Hospital Association

Estonian eHealth Foundation Board

Management Board

- Strategy and Architecture Development
- EHR Operation
- Marketing and Channel Management

Family doctors, Hospitals, Nursing Care, Patient Portal, Health Authorities

Governance
Foundation tasks

• Develop new services for citizens and doctors
• Maintenance of EHR system
• Standardisation and developing digital documents
• International cooperation
• Scientific cooperation with universities
• Project management of EU projects
Achievements

EHR SYSTEM. STATISTICS
Estonian EHR = EMR + PHR
Architecture of Estonian healthcare IT
31.11.2011...

... 743 708 (more than 60%) of citizens have digital documents in the central EHR system

... 5660 (95% of doctors) have used the EHR system

... 172959 number of citizens who’s data have been asked from EHR

....33226 number of the citizens who have looked their own data from Patientportal

...472 expressions of will
31.10.2011 – 4596 requests per day

Retrieval of medical documents by healthcare professionals
ePrescription

In September 2011 %
88.4 digital 11.6 paper

Ca 20% prescriptions are not purchased by patients.
PASTE, PRESENT AND FUTURE
ICT and healthcare in Estonia

- Software's for hospital and for GP in 1994
- Digital claims since 1995
- Equipping GP-s with PC-s 1998
- Skipping paper claims 2002
- Legally allowed to use only digital patient record since 2002
ICT and healthcare in Estonia

- **Central EHR**: 2005-2008
- **Health Portal**: 2009
- **Registries Integration (non clinical)**: 2008
- **Standardization**: 2007-2012
- **Integration of different user groups**: 2009-2012

**Value Added services**
- **Health certificate**: 2010-2012
- **Integration with social care**: 2011-2012
- **EbmDS decision support service**: 2011-2012
- **Integrated statistic**: 2010-2012
- **Clinical registries**: 2011-2013
- **Personal Simulation**: 2015
- **Environment data**: 2015?
- **Behaviour data**: 2015?
- **Genetic data**: 2013?

**Secondary use of data**
- **Local EMRs**: 1992
- **Digital Claims & Reimbursement**: 2010-2015
- **Patient empowerment**: 2010-2012
- **Integrated statistic**: 2010-2012
- **Clinical registries**: 2011-2013

**Information Exchange**
- **Local EMRs**
- **Digital Claims & Reimbursement**

**Time**
- **1992**
- **2010**
- **2015**
- **2020**
Lessons learned

IMPACT STUDY
PROCESS
MISTAKES
Distribution of costs and benefits of Estonian e-Health platform (Digimpact study 2010):

Total cost of EHR system development (2005-2010) has been around 10M€ - it is 7.5€ per citizen

http://eng.e-tervis.ee/digimpact-final.html
### EU 2.8 M€

<table>
<thead>
<tr>
<th>EHR</th>
<th>1 599 705</th>
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<tbody>
<tr>
<td>IT solutions</td>
<td>18%</td>
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<tr>
<td>Standardization</td>
<td>34%</td>
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<tr>
<td>Public relations</td>
<td>15%</td>
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<td>Ethics and legislation</td>
<td>12%</td>
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<tr>
<td>Project management</td>
<td>21%</td>
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<tr>
<td>Digital prescription</td>
<td>218 882</td>
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<tr>
<td>Digital Registration</td>
<td>188 223</td>
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<tr>
<td>Digital Images</td>
<td>186 479</td>
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<tr>
<td>Educational project (increasing medical professionals skills in computing)</td>
<td>624 254</td>
</tr>
</tbody>
</table>
Shared services
- Case stories
- Standard contents
- Service levels
- Owners
- Service users
- Service providers

Business process development
- Basic process
- Supportive processes
- Roles, stakeholders
- Data, materials

Challenges of healthcare

Sustainability of healthcare systems
- Chronic disease management
- Efficient patient pathways

Benefits to achieve
- Citizen
- Healthcare provider
- Society

- Reduced number of unused bookings
- Replacing doctors visits with nurses visits
- More efficient time management
- Improved self-management of disease

- Receive medication on time
- Prevent complications
- Shorter visit times
- Better overview of personal medical data
- Patient can add personal self-monitoring data
- Research of personalized healthcare/medication
- Interactive prevention of disease for citizen

Patient portal
- Secure authentication
- Definition user case

Process
- Application integration
- Messages exchanges
- Users rights
- Sharing data
- Coordination of changes
- Monitoring

Services
- Prescription
- Care process
- Diagnostic
- Medical record
- Billing

Service user

15 Years of ehealth development
-PACS
-EHR
-Registry
-Prescription repository
-HIS
-GP
However If you ask me...

...what could we done better

• Start with analyzing business processes in healthcare
  – Optimization of the processes, before standardization
  – Pick-up a right technology to support the process
  – Without knowing the process – do not start any projects

• Support endusers with financial iniciatives

...and what have we learn

• Clear governance
  – Decide who is responsible for whole ehealth development
  – Do not change it during the process
  – Guarantee strong political support
  – Find enthusiastic leaders

• Find best services start with
• Set realistic timeschale for projects
• Must have a vision, goal
Thank you! Questions?

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