

The Estonian eHealth experience - strategy and results

Piret Simmo

Estonian eHealth Foundation

Standardization manager

27.09.2011

Agenda

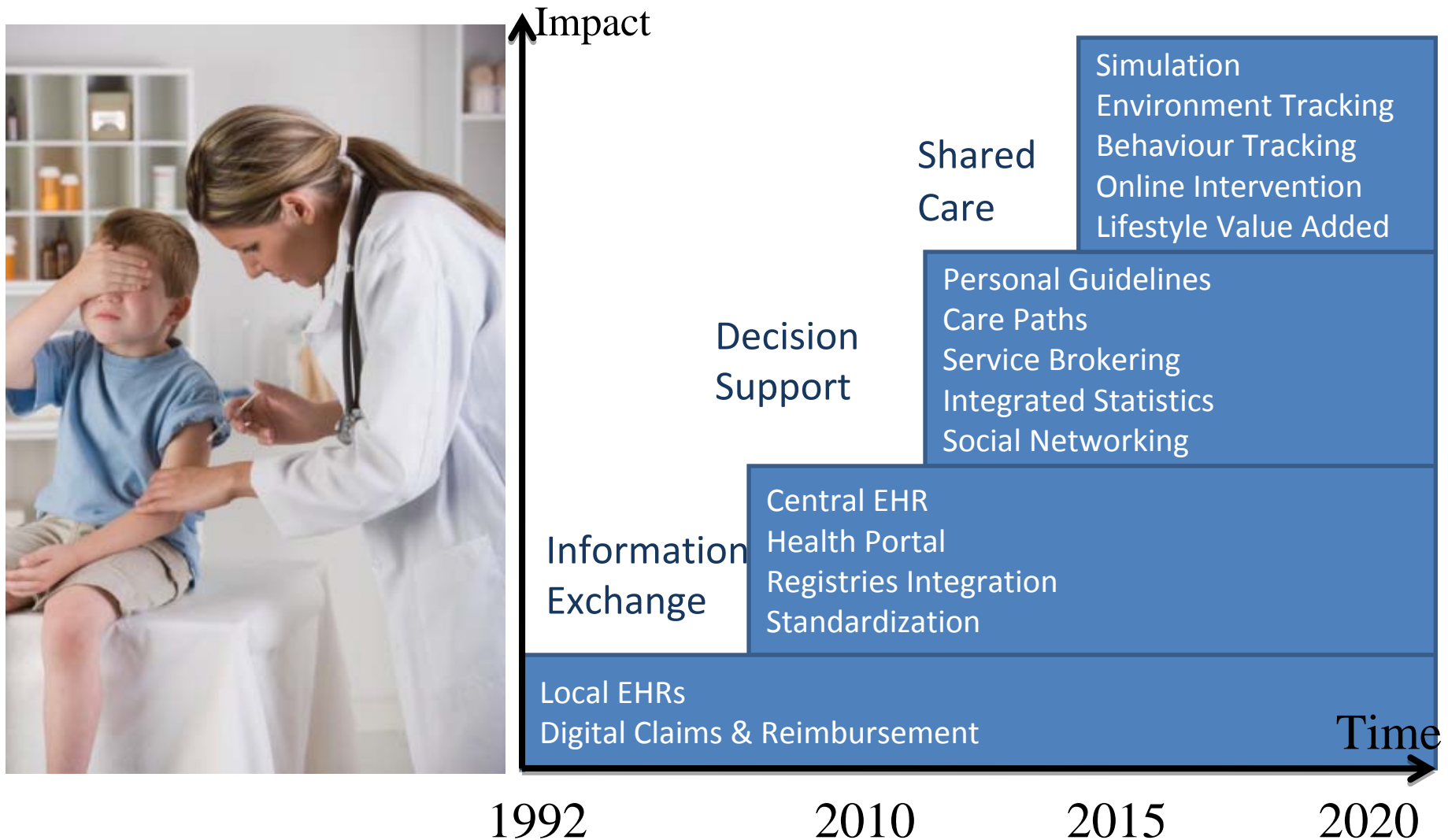


- Some history
- Legal environment
- eHealth Foundation
- Estonian central HIS
- Problems
- Acceptance
- Results
- Next steps



E-TERVIS
EESTI E-TERVISE SIHTASUTUS

Way to go



Towards National EHR



E-TERVIS
EESTI E-TERVISE SIHTASUTUS

- ICD10 – in wide use since 1997
- “6th of May Act”
 - Healthcare documentation content regulation
 - and related code lists
- 2000 eHealth planning begun
 - Including standardizations
- 2003-2005 EHR project preparation
- 2006-2008 EHR project, HL7
- 2008 National EHR documentation content Act
- 2009 EHR in production
- 2010 SNOMED NRC
- 2011 Ambulance, eLabs & LOINC

Some history



- 2000 start to plan eHealth projects
- 2003-2005 eHealth project preparation
- April 2005 – Ministry of Economic Affairs that coordinates allocation of structural funds made the funding decision for four eHealth projects:
 - Electronic Health Record (1.6 mln €)
 - Digital Registration (0.2 mln €)
 - Digital Images (0.2 mln €)
 - Digital Prescription (0.24 mln €)
- 26 October 2005 Estonian eHealth Foundation was established
- 2006-2008 eHealth projects
- 18. December 2008 National HIS went to production

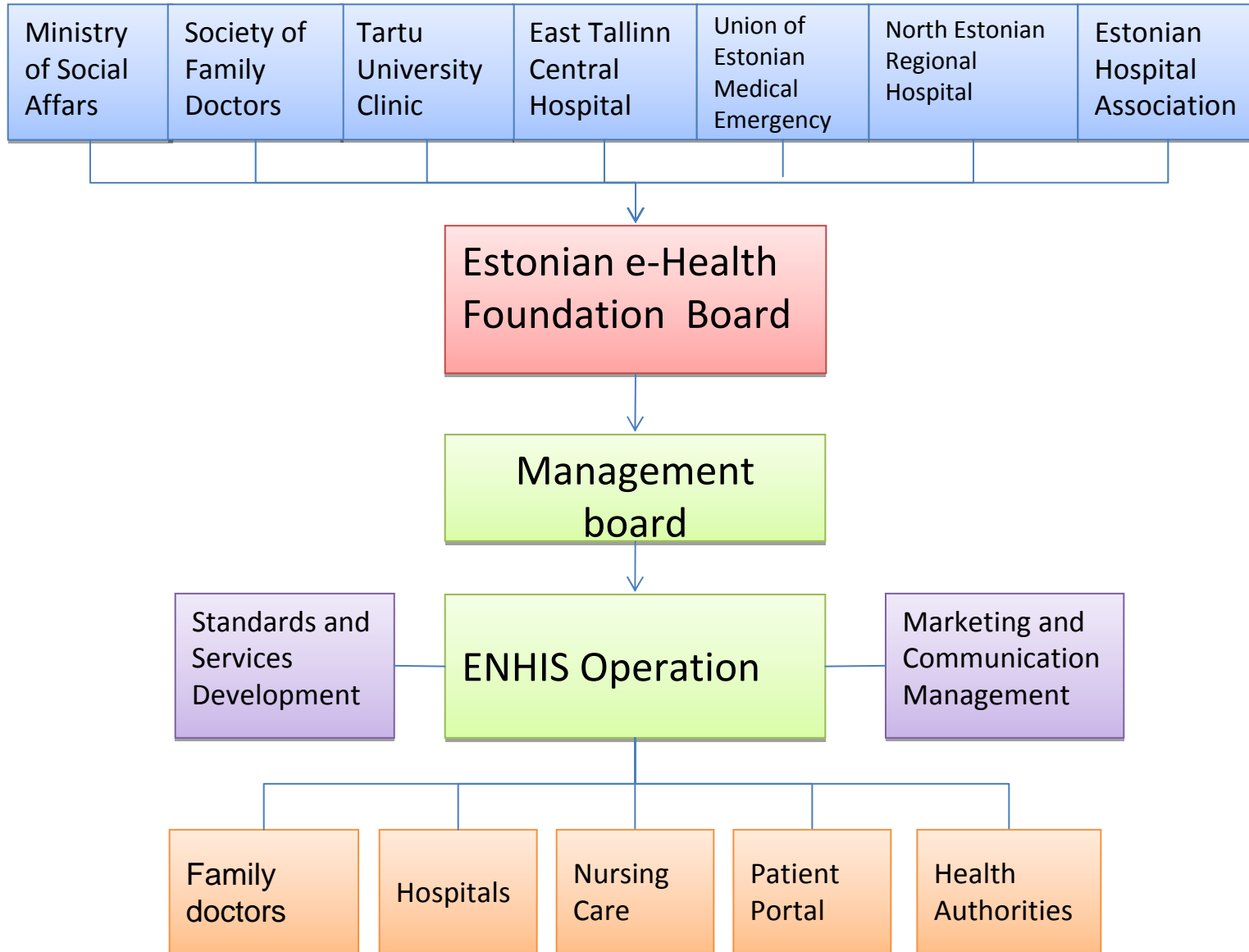


- Founded 18.10.2005
- Founded by main stakeholders
 - Ministry of Social Affairs
 - 3 biggest hospitals
 - North Estonian Regional Hospital, Tartu University Hospital, East Tallinn Central Hospital
 - The Estonian Society of Family Doctors
 - The Estonian Hospitals Union
 - Union of Estonian Emergency Medical Services
- Financed from the State budget (1.6 mln € - 2011)
 - Additional funding of development projects, ie ESF.

Organization



E-TERVIS
EESTI E-TERVISE SIHTASUTUS



Healthcare IT in Estonia



- Relatively consolidated Healthcare software market
- Electronic Health Records implemented inside hospitals and in most centres of family doctors
- Major hospitals starting to provide access to their IT systems to external parties
- Good Internet access
- Expectations from patients to get e-services

Legal environment of eHealth

- The Health Information System Act was prepared to
 - regulate the development and maintenance of the health information system
 - Lay down the necessary requirements to the patient, health service provider, etc
- Debate of the bill
 - Government (spring 2007)
 - Parliament (autumn 2007)
 - Accepted 20.12.2007
- Government regulatory act of Health information system 15.08.2008
- Ministerial act for digital documentation
 - Updated regulatory
 - Documentation data sets, stakeholders and implementation schedules

eHealth Foundation tasks

- Develop new services for citizens and doctors
- Estonian Health Information System services management
- Standardisation and developing digital documents
 - OID management, terminology management, publishing of technical standards
- International cooperation
- Scientific cooperation with universities

Data access policy: opt out

- All healthcare providers must send data to EHR
 - Regulated by the law
- Access only to licensed medical professionals
 - The attending doctor concept
- ID card for authentication and digital signature
- Patient has the right to close his/her own data collected in the central database (*opt out*)
- Patient can access their own data
- Patient can declare their intentions and preferences
- Patient can monitor visits to their EHR

Major architectural decisions of HIS



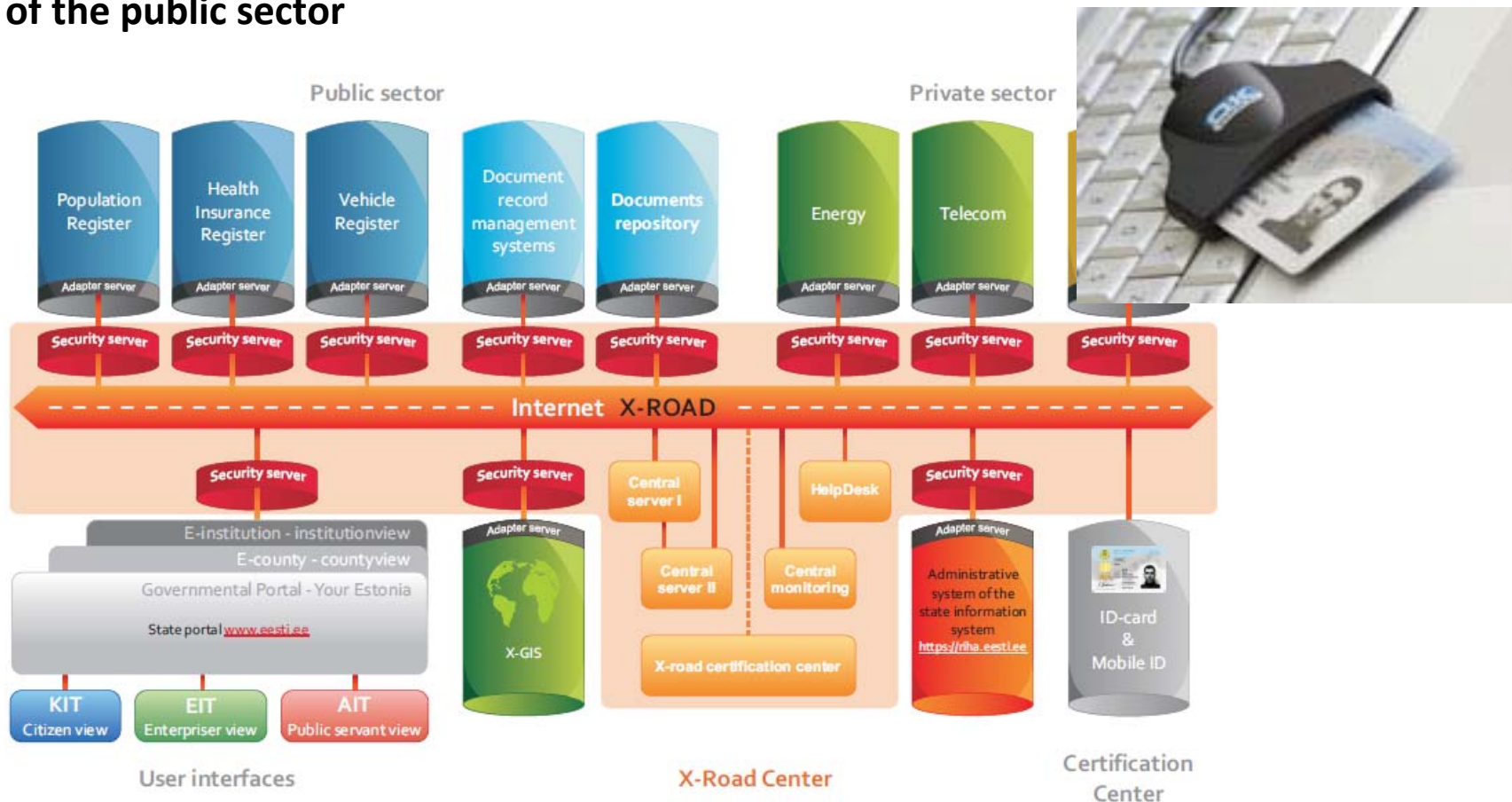
- Integration through Central system (Opt-out)
- HL7 v3 (extended)
- Documents are kept in XML format (HL7 CDA)
- All structured data fields have OID-s
- Only final versions of clinical documents are sent into central system
- Reuse of national infrastructure
 - ID card for authentication and digital signature
 - Xroad for secure communication

X-road and ID card



E-TERVIS
EESTI E-TERVISE SIHTASUTUS

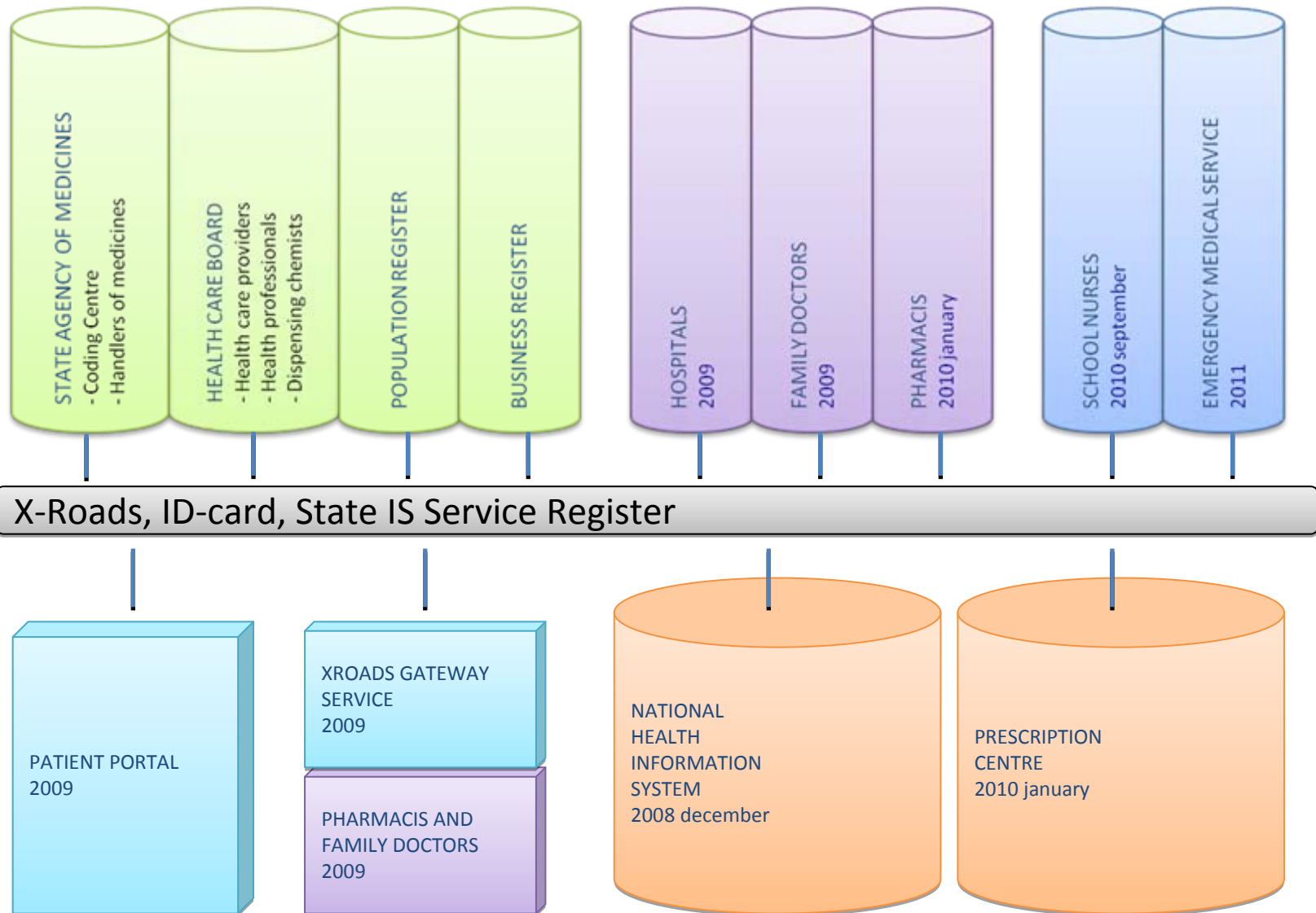
- A platform-independent secure standard interface between databases and information systems to connect databases and information systems of the public sector



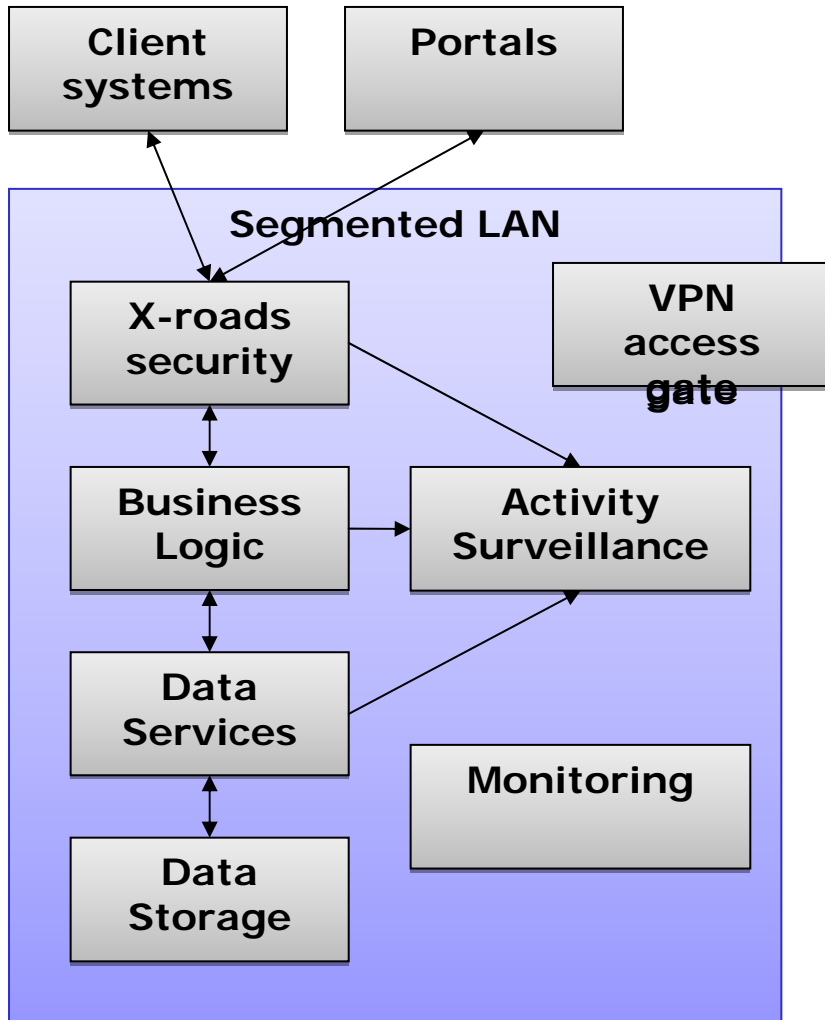
Architectural “Big picture”



E-TERVIS
EESTI E-TERVISE SIHTASUTUS



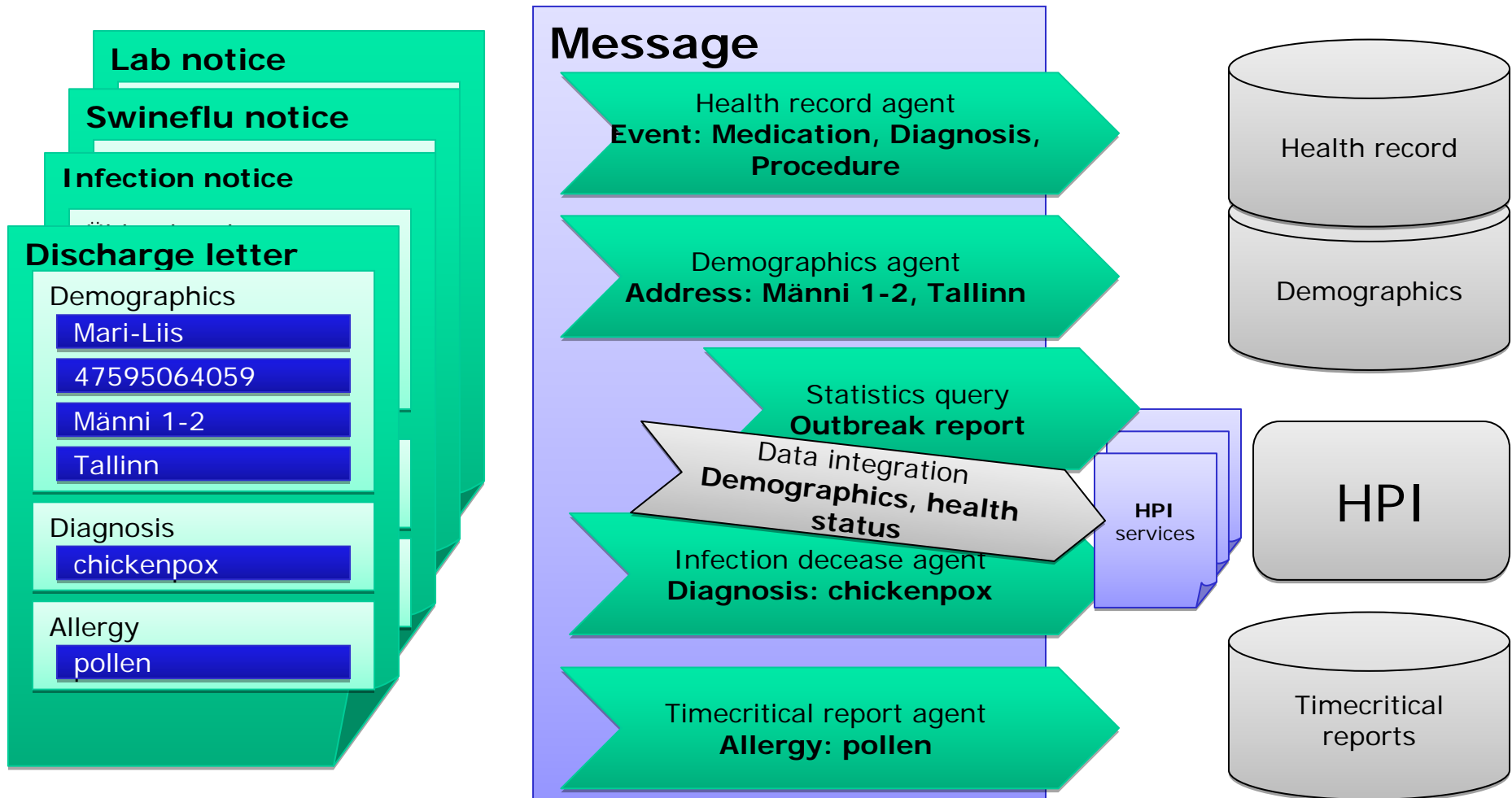
Technical solution



- HIS, GPIS
- Oracle Portal
- MISP
- xRoad Gateway
- Tomcat, Sybase IQ, Webfocus
- webMethods Integration Server
- webMethods Broker
- Oracle DBMS, Advanced Security, Database Vault
- Nagios, Cacti

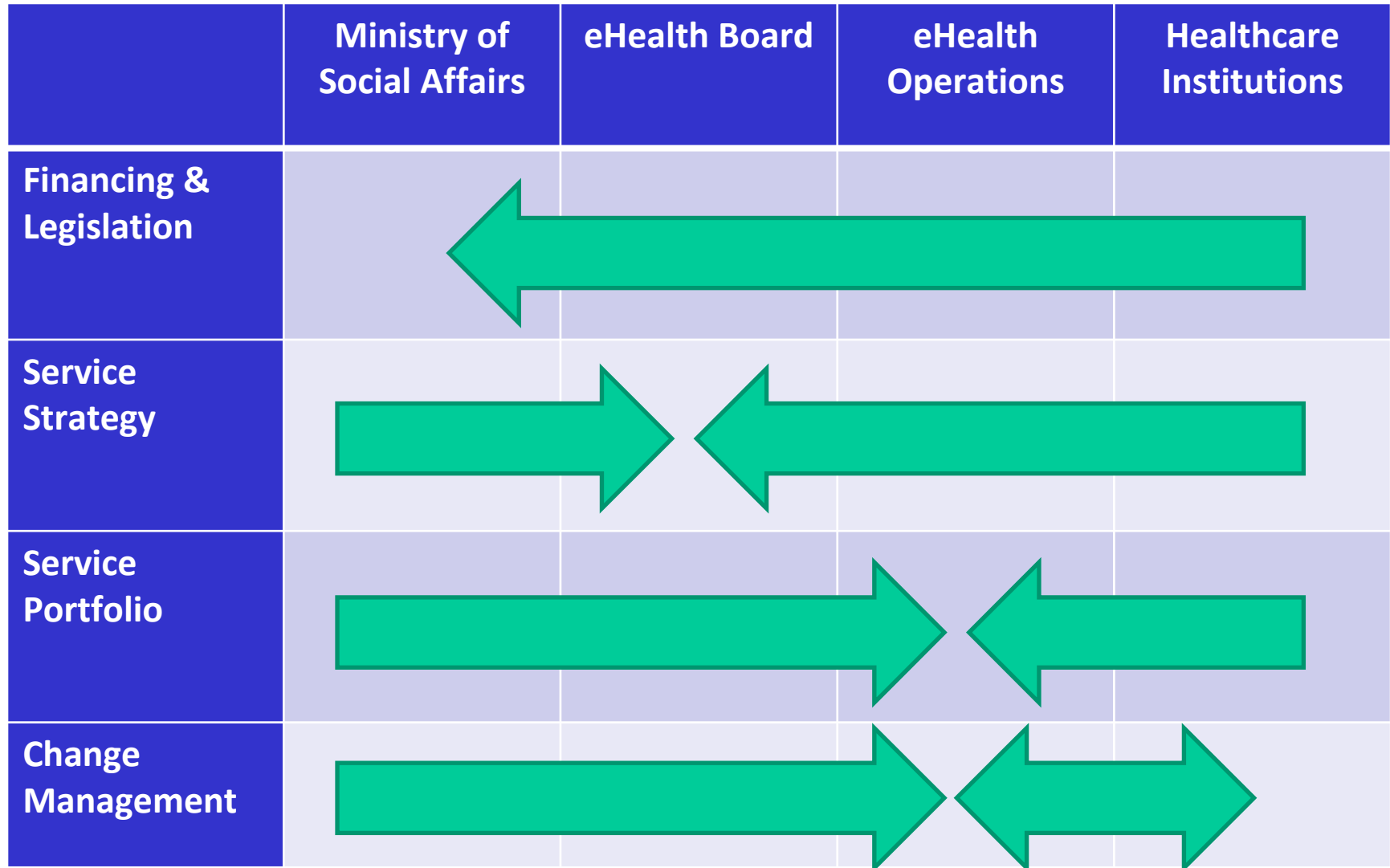


Document processing





eHealth Governance

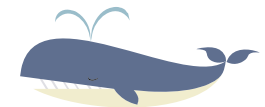


The 5 main principles “5 whales” of security of Estonian eHealth system



E-TERVIS
EESTI E-TERVISE SIHTASUTUS

1. **A secure authentication** of all users
2. **A maximum accountability (transparency)**: all actions will leave an unchangeable (and unremovable) secure trail
3. Separating of personal data from medical data, so-called **coding of personal data**
4. **Encrypted database** that allows to remove the confidentiality risk from the technical administrators
5. **Effective monitoring tool** of all actions together with the corresponding counter-measures (both organisational and technical)



Problems



- Resources where planned only for central development
- Performance is important
 - Define monitoring spots
 - Root cause analysis
- Data quality is important
 - Define rules, check them
- Balance between security and usability
 - Family doctors don't want PIN every document

Acceptance

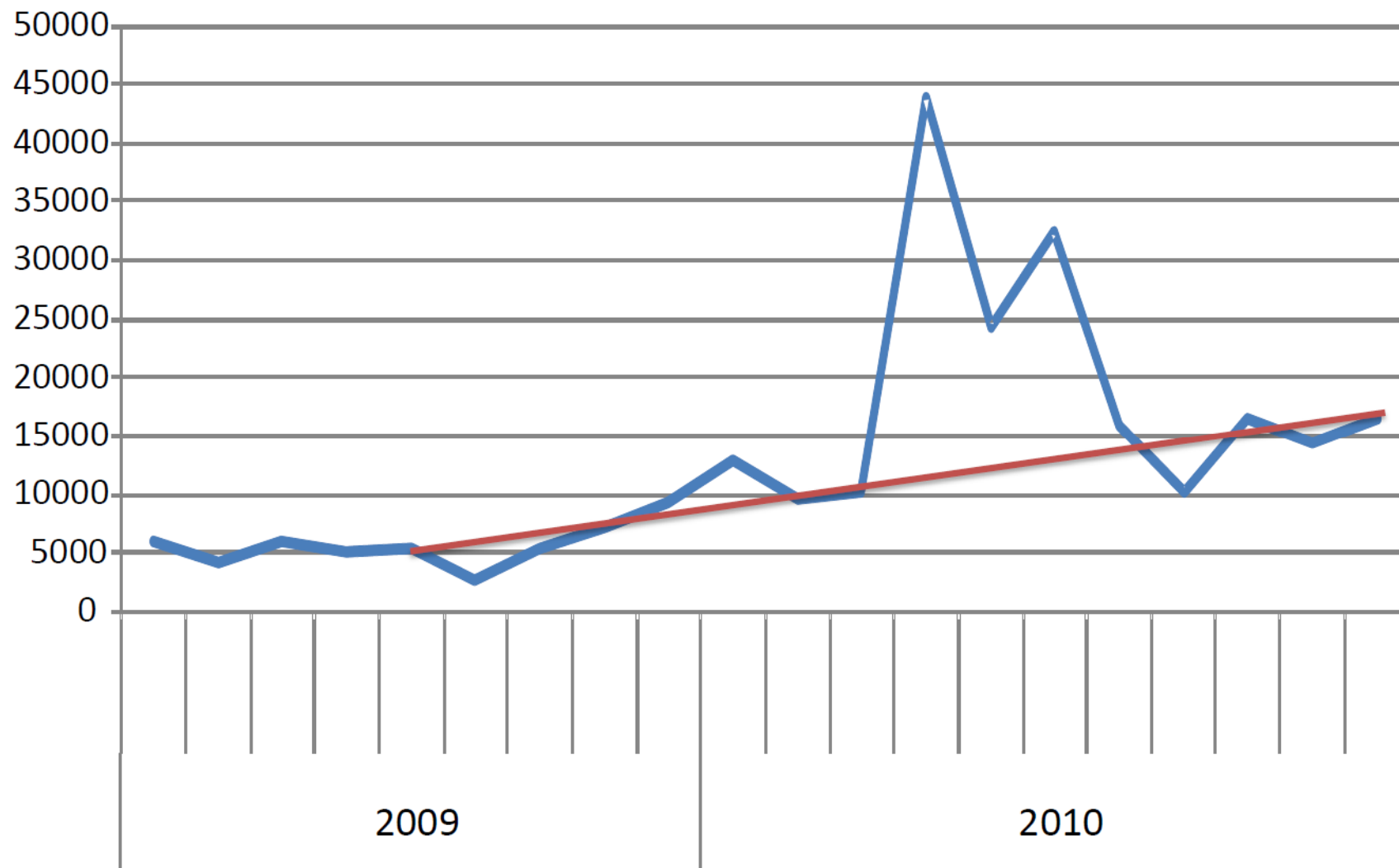


- Over 90% of Hospital discharge letters are digital
- Ambulatory case summaries sending level is low
 - 700 000 visits per month
 - 50 000 ambulatory documents per month
- Patient portal usage is low
 - 33882 unique visitors (2,6% of population)
 - 711990 person have documents (55% of population)

Discharge letters per month



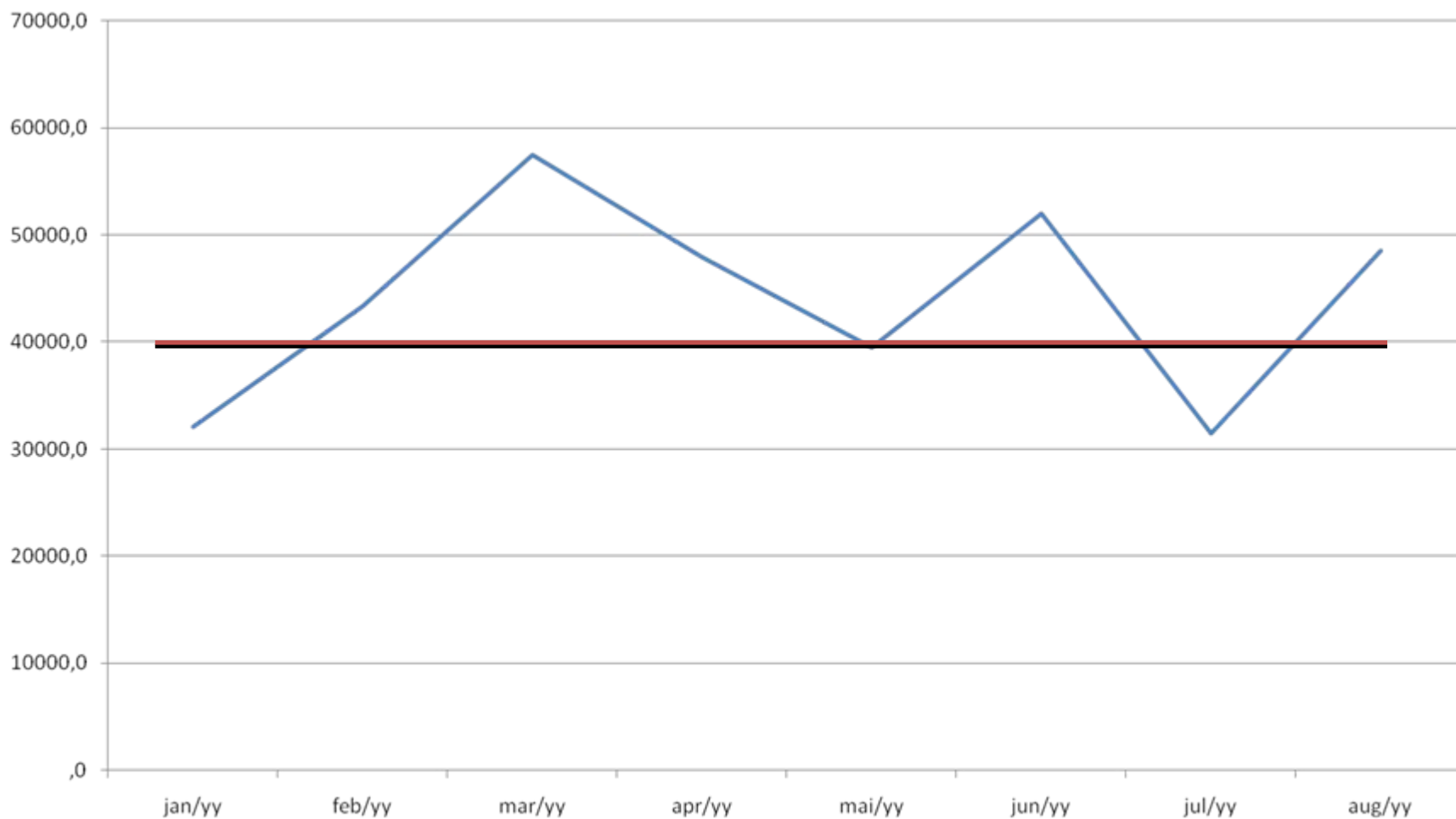
E-TERVIS
EESTI E-TERVISE SIHTASUTUS



Ambulatory summaries per month



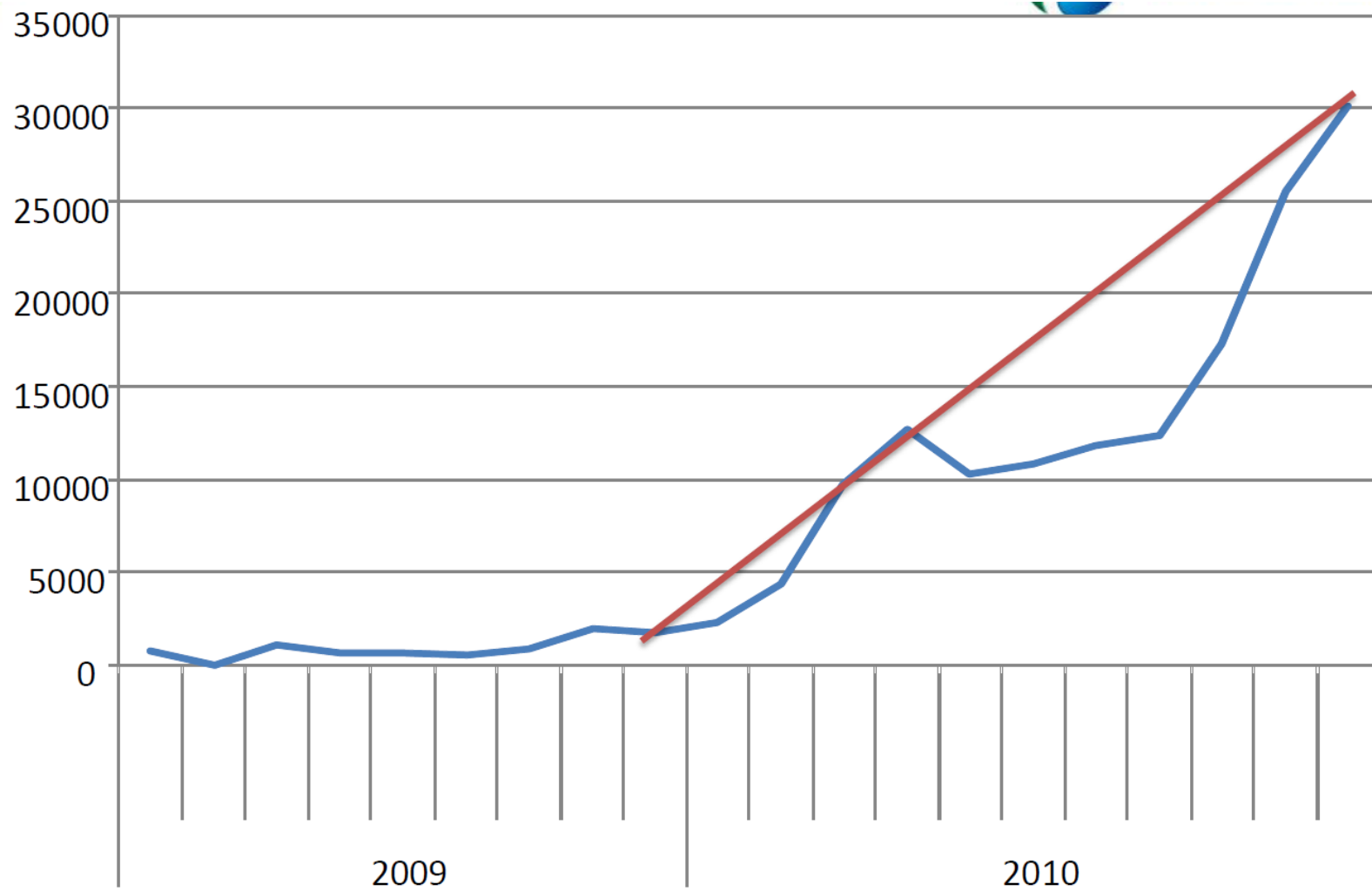
E-TERVIS
EESTI E-TERVISE SIHTASUTUS



Queries per month



E-TERVIS
EESTI E-TERVISE SIHTASUTUS

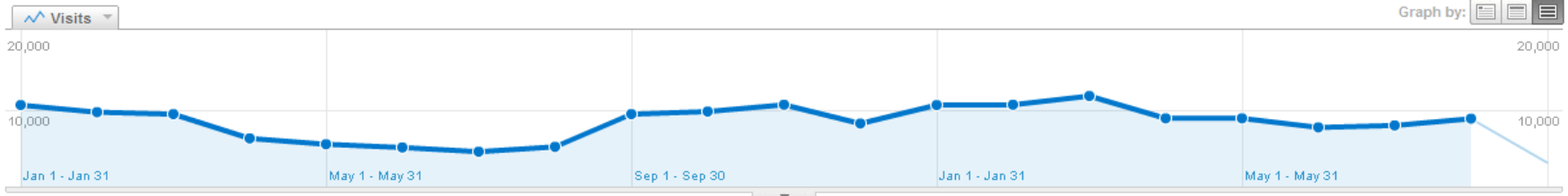


Patient portal Google Analytics statistics



Dashboard

Jan 1, 2010 - Sep 13, 2011



Site Usage



175,342 Visits



1,277,705 Pageviews

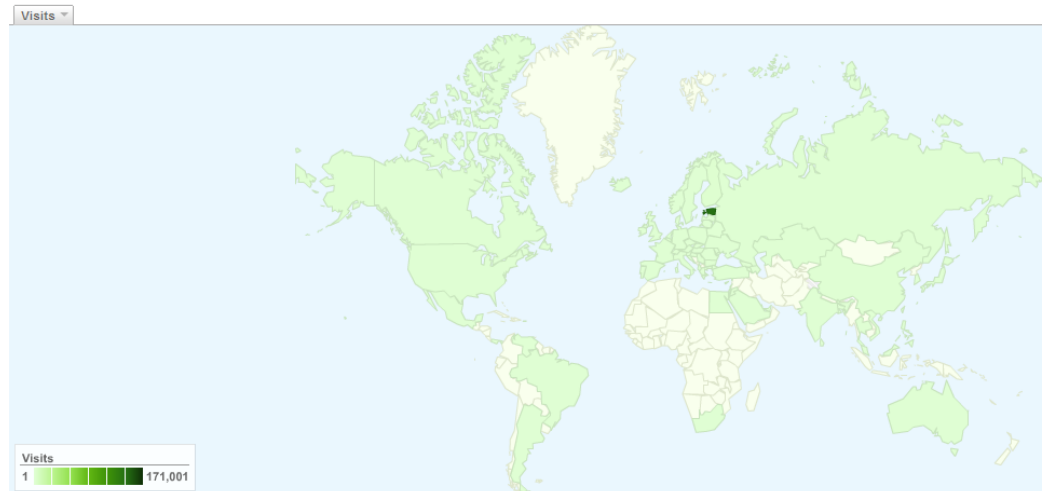


7.29 Pages/Visit



00:03:06 Avg. Time on Site

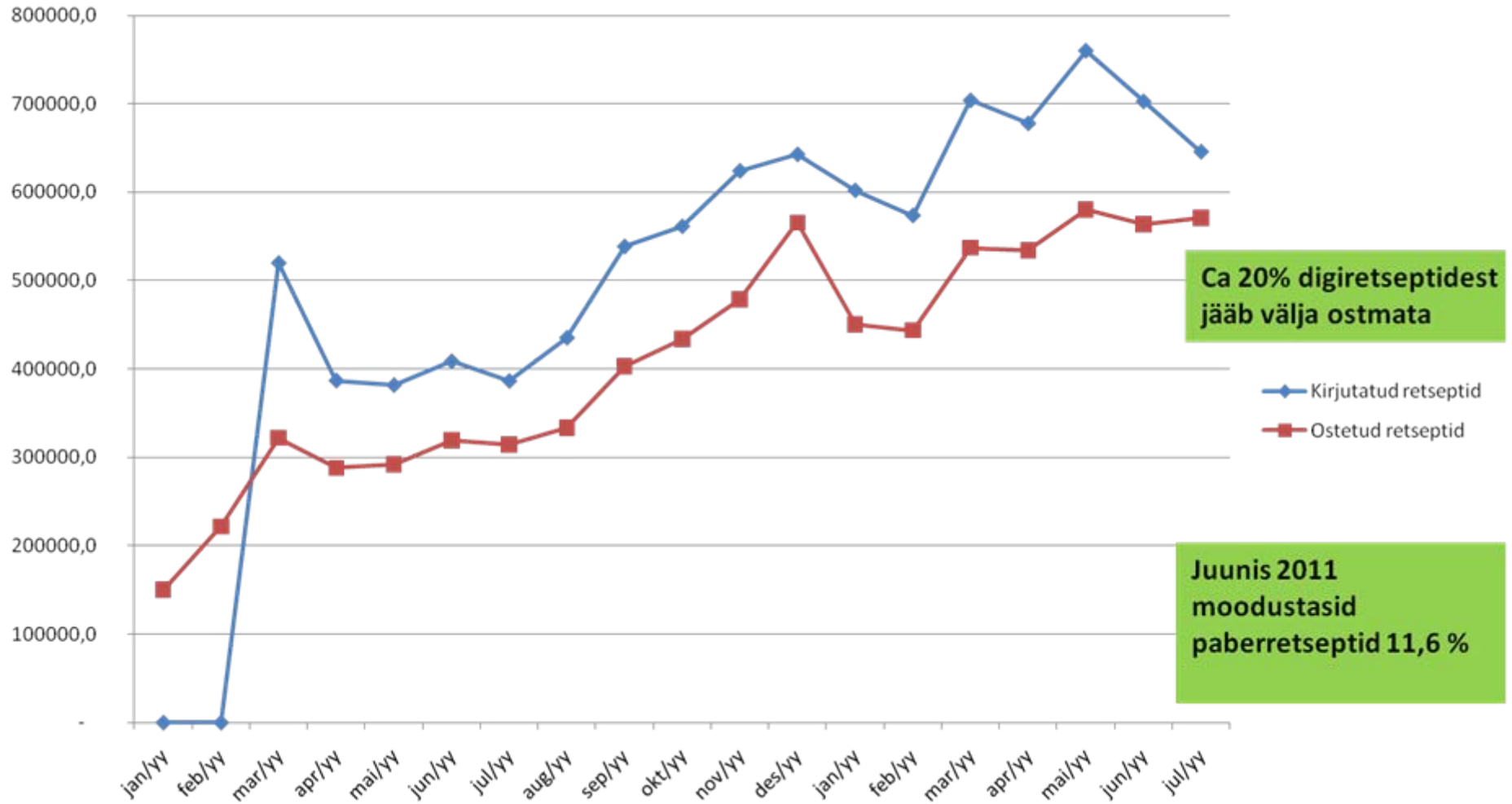
Map Overlay



ePrescription



E-TERVIS
EESTI E-TERVISE SIHTASUTUS



31.08.2011...



E-TERVIS
EESTI E-TERVISE SIHTASUTUS

- ... **703 708** persons information - **55 %** of population
- ... Doctors who have sent documents – **3629 – 55%** of doctors
- ... Doctors who have made queries - **4071 - 69%** of doctors
- ...patients number whos data have been requested from HIS
172959 – 13% of population
- Patient portal **33226** unique users **7,3 %** of active users

Next steps



E-TERVIS
EESTI E-TERVISE SIHTASUTUS

- Ambulance project 2011
- Statistics for all users 2013/2014
- New Patientportal
- Demographics
- Decision Support
- Laboratory 2012
- Image archive



E-TERVIS
EESTI E-TERVISE SIHTASUTUS

Thank you!

Pirets@etervis.ee

<http://www.e-tervis.ee>