



Estonia eHealth

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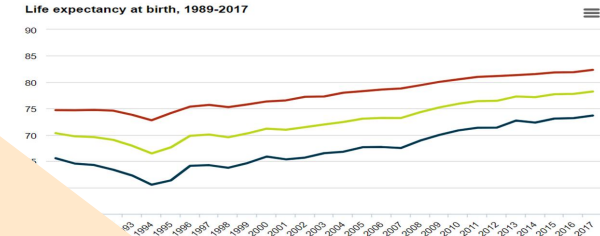
Senior advisor

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Background : Estonia Health



HEALTH AND WELFARE
INFORMATION SYSTEMS CENTRE



Life expectancy
(77.23 years)

>40 systems,
“eHealth network”
private operators
govern by HWISC

Health Services
Organization
Act
“primary
health care”

single
public
purchaser

Health
Insurance
fund (HIF)

Tax 13%
flat-rate

Earmark
social
insurance
tax

1.32
million

(2018)



Population

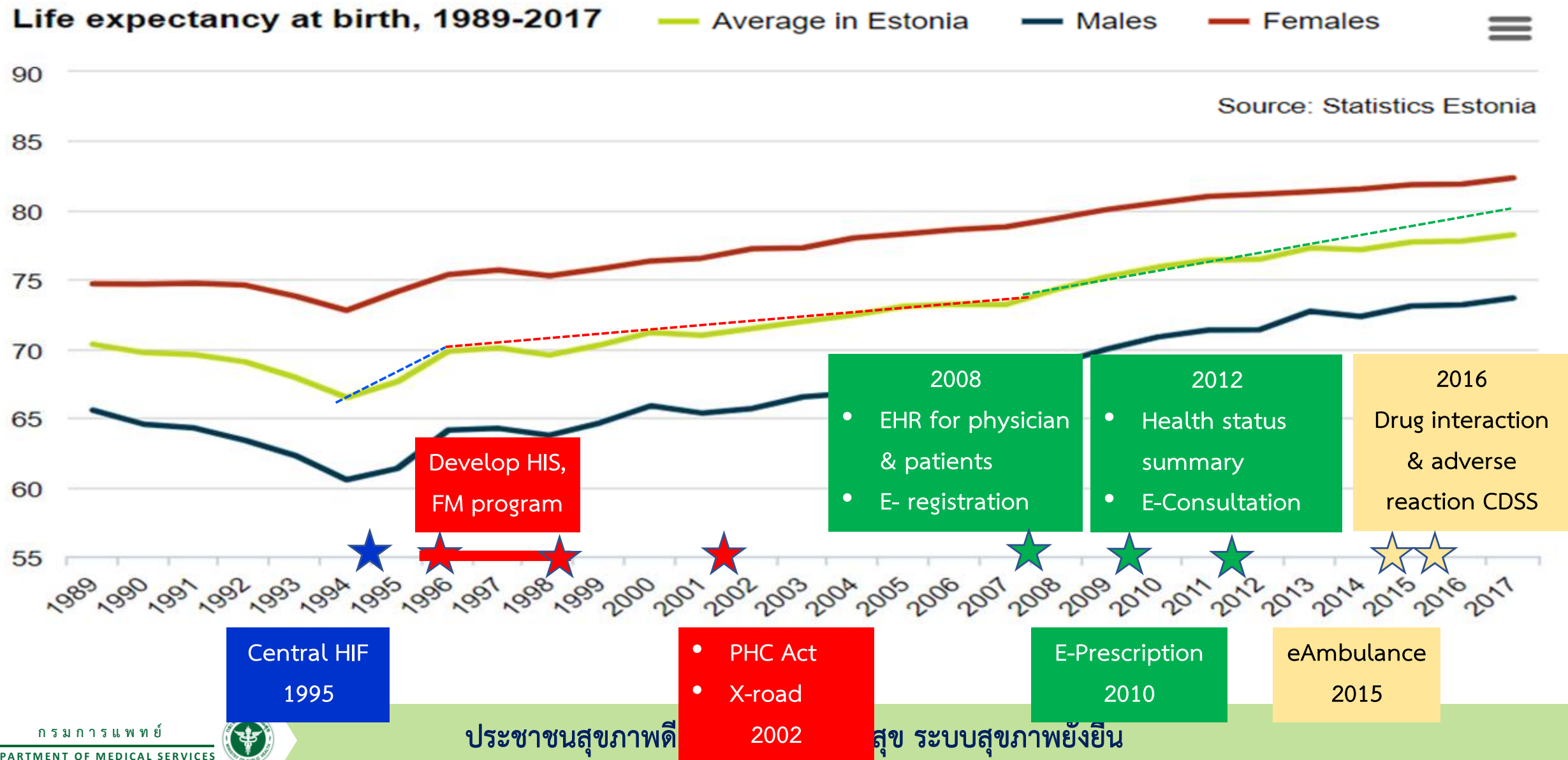
กรมการแพทย์

DEPARTMENT OF MEDICAL SERVICES



ประชาชนสุขภาพดี เจ้าหน้าที่มีความสุข ระบบสุขภาพยั่งยืน

The Never Ending Journey of eHealth-Services





21.03.2018

ESTONIA OFFERS 100,000 CITIZENS FREE GENETIC TESTING

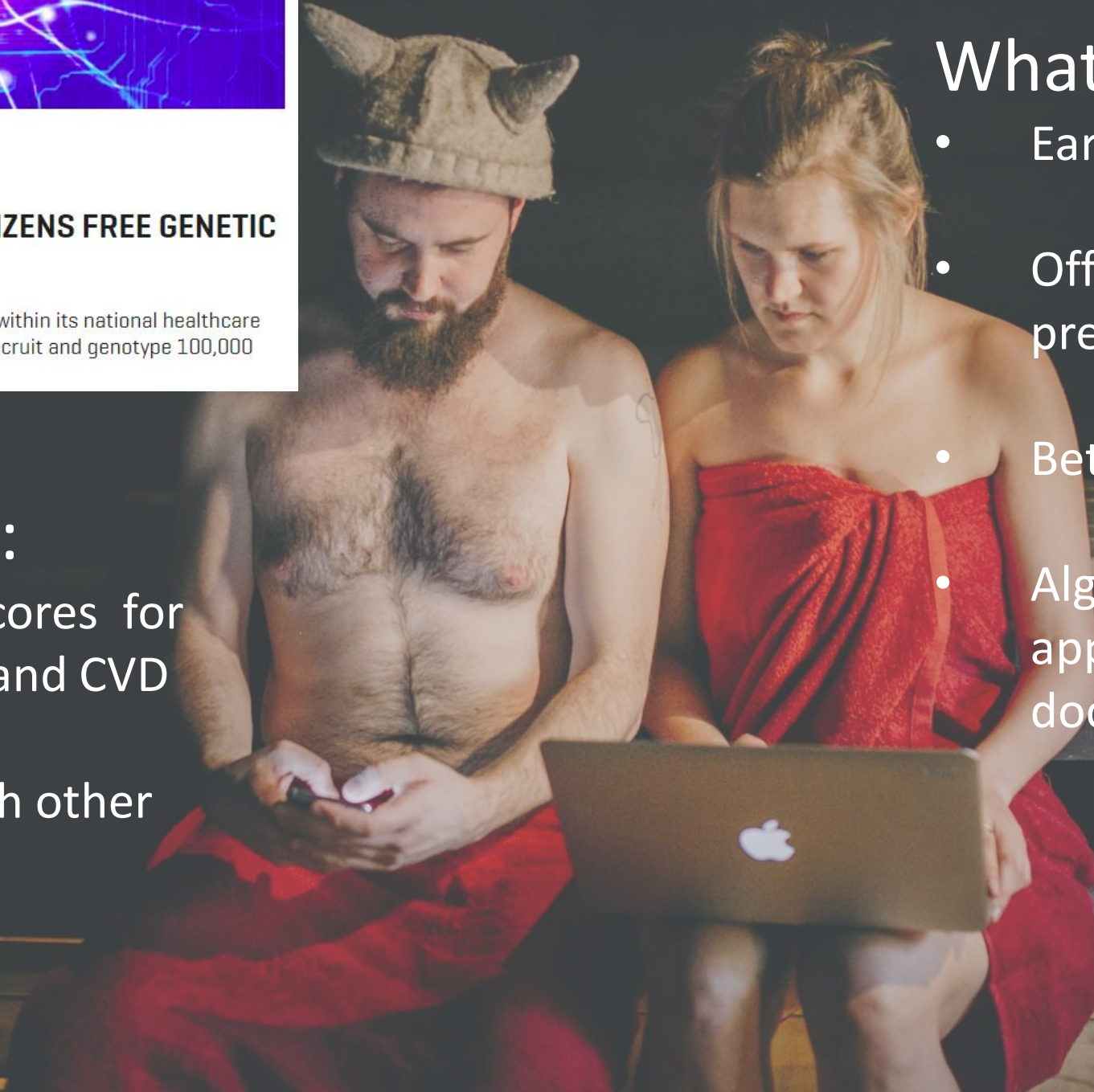
In an effort to develop personalised medicine within its national healthcare system, Estonia has begun a programme to recruit and genotype 100,000 new biobank participants

How it works:

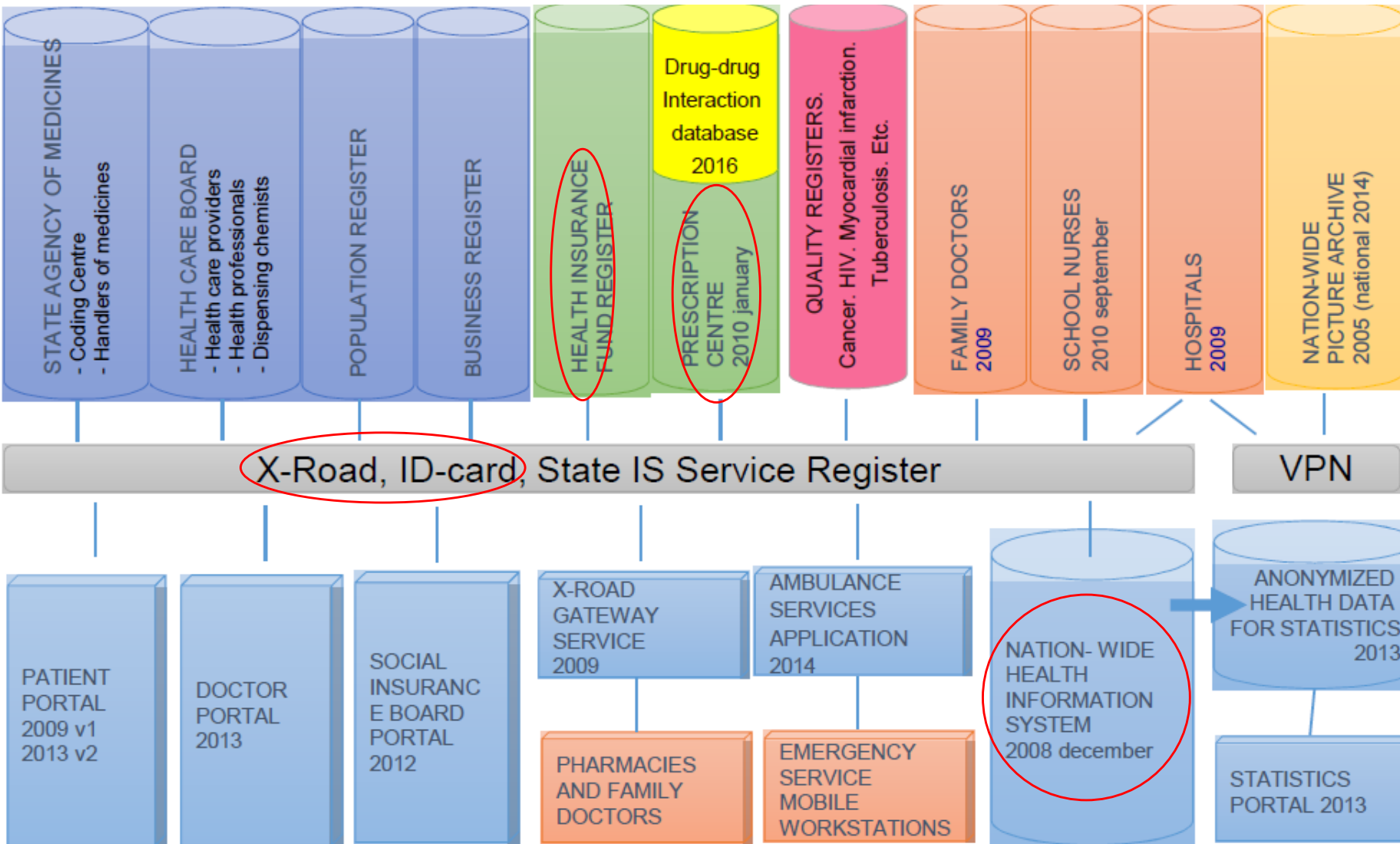
- Genetic Risk Scores for breast cancer and CVD
- Combining with other e-health data

What we expect:

- Earlier detection
- Offering tailored prevention and care
- Better targeted treatment
- Algorithms for CDSS and application for family doctors



Estonia eHealth Architecture : X-Road



X-road

- Data exchange platform
- Interoperability services
- provides standardized and secure way



The 6 main principles “6 whales” of security of Estonian Health Information system

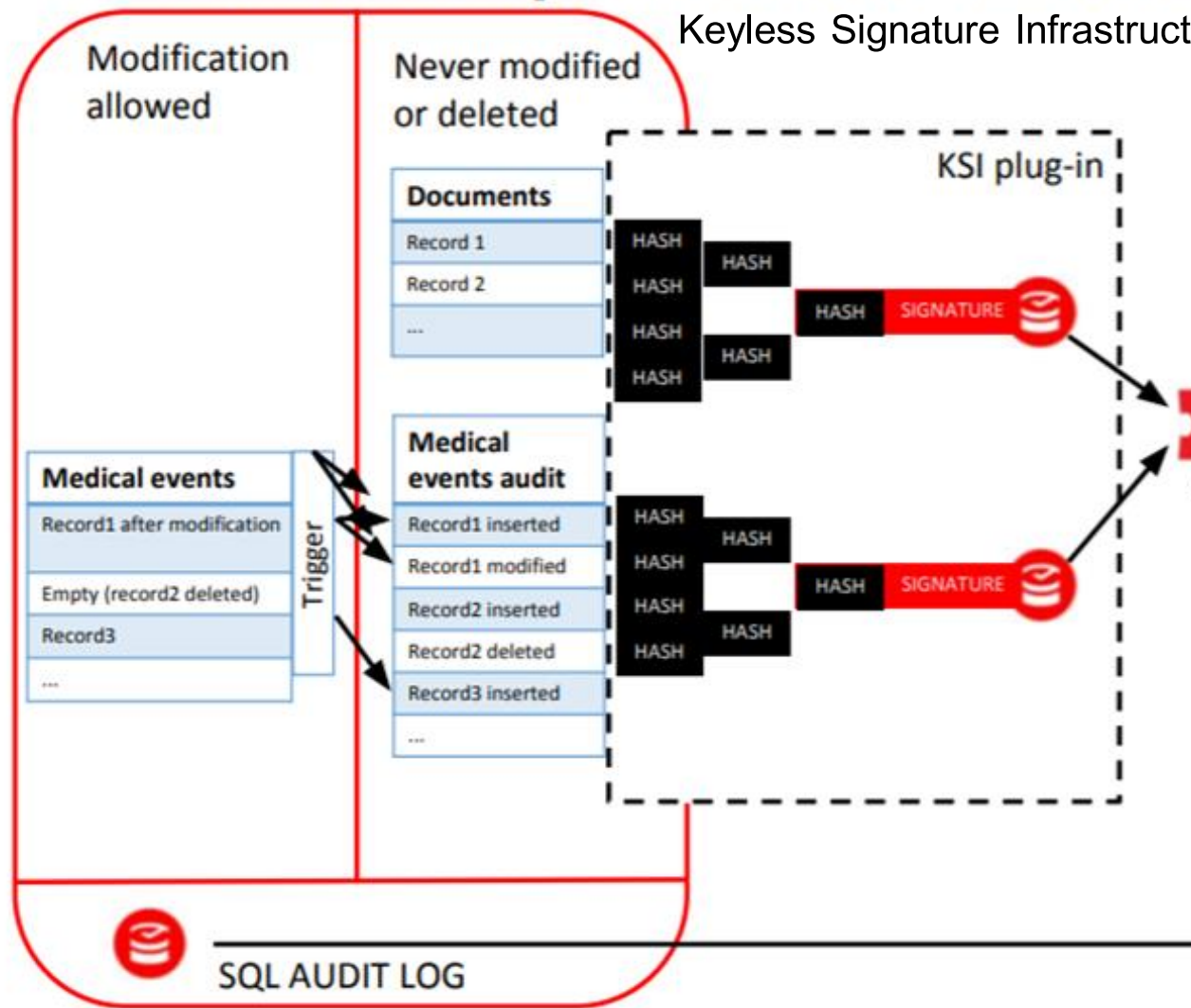
1. **A secure authentication** of all users with ID-card or Mobile ID
2. **Digital signing or stamping** of all medical documents
3. **A maximum accountability (transparency)**: all actions will leave an unchangeable (and unremovable) secure trail, protected by blockchain
4. **Coding of personal data**: separating of personal data from medical data
5. **Encrypted database** that allows to remove the confidentiality risk from the technical administrators
6. **Monitoring** of all actions together with the corresponding counter-measures (both organizational and technical)

SECURITY & AUTHENTICATION



Calendar Blockchain, Estonian National Health Information System

Guardtime KSI implementation in ENHIS database



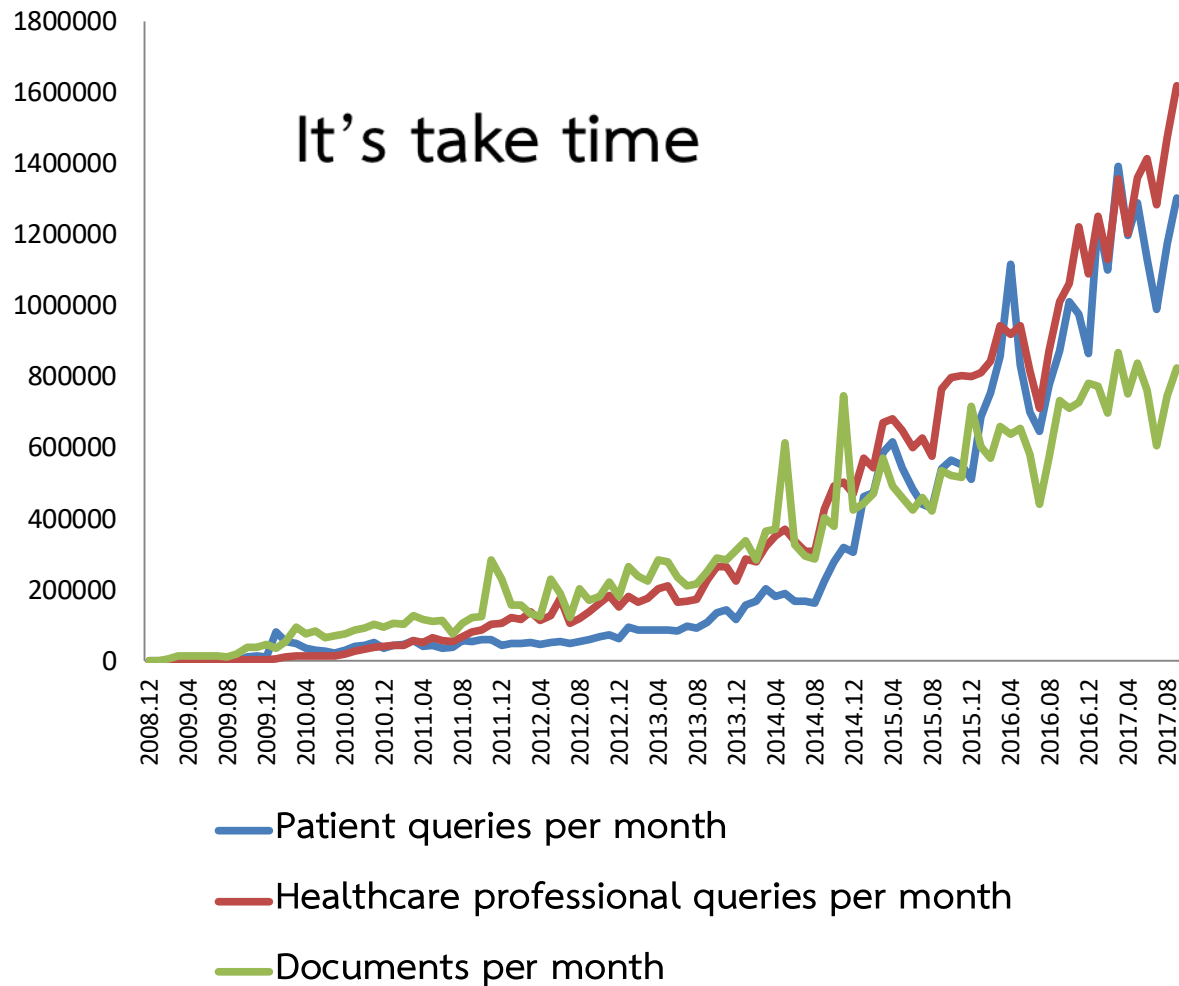
Not database,

Not secure referral system

1. Legally sound proof of records
2. Discover unauthorized changes and report to center
3. Capacity of extremely large systems (terabytes)

Estonia suggestion

It's take time



1. Balance between security and usability
2. Use blockchain for cyber security, not for prevent unaccountability
3. Data quality matters, big data need small data

What's next for Thai eHealth?

Health IT Board : Security & Accountability Law, Regulation

Governing body : health information system center (HISC)
govern by public, decentralize to private operators “SDU”

HISC : standard for interoperability, integrate health
information system, IS maintenance, IT security,

Urgent IS : EHR&PHR, e-Registration/Patient contact center,
e-Consultation, Health status summary

Blockchain : choose the right algorithm for eHealth:

May be one province-one system → one node

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Thank you

แพทย์หญิงปฐมพร ศิริประภาศิริ

ที่ปรึกษากรมการแพทย์

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Laws that regulate eHealth area



1. Health Care Services [Organisation Act](#);
2. Statute of [Health Information System](#) (governments Statute no 131 August 14th 2008);
3. The Statute no 53 September 17th 2008 of Ministry of Social Affairs on [The Composition of Data](#), Conditions and Order of Maintaining of the Documents Forwarded to the Health Information System;
4. [Data protection law](#);
5. [Public Information Act](#).

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- All healthcare providers must send data to Health Information System
 - Access only to licensed medical professionals (other persons have access to personal data in the HIS if such right arises from law)
 - 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's Portal)
 - Patient can declare their intentions and preferences
 - Patient can monitor visits to their HIS. (All actions will leave secure trail).

