

Current transformation of Finnish health care system

-changes in organization structure and information systems

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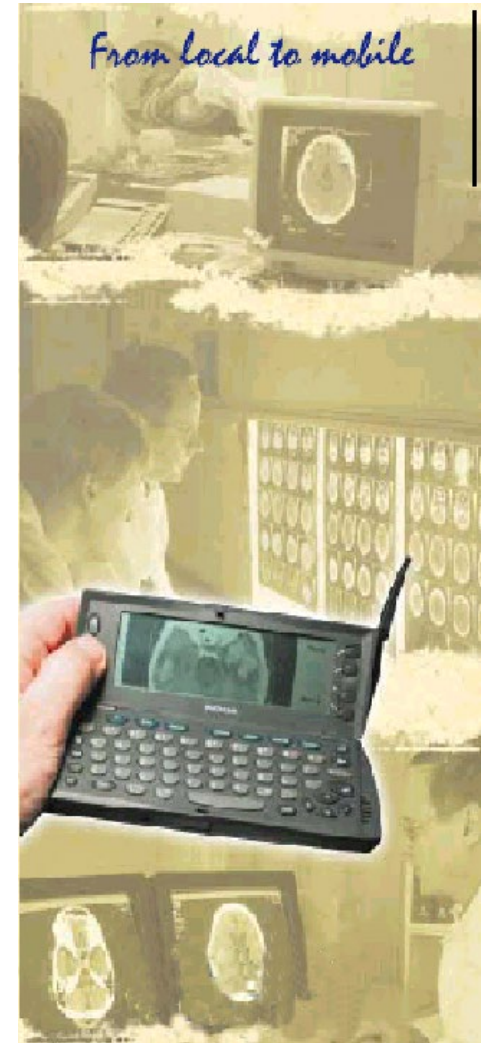


Content of the lecture:

- Digitalization in Finland
- Organization of healthcare until 2022
- Availability of digital tools
- Health Information Exchange, the “Kanta”
- The 2023 Reform of healthcare, social welfare and rescue services
- Anticipated effects on services and information systems
- The challenges related to the reform



Telemedicine, teleradiology and electronic medical records have been used in northern Finland since the beginning of the 1990s.



MOMEDA, the world's first healthcare mobile app, was developed in OULU in 1998-2000.



Finnish Digital Health environment

- Digitalization in Finnish society
- The organization model behind development
- Availability of information systems

The Digital Economy and Society Index (DESI) is a composite index that summarises relevant indicators on Europe's digital performance and tracks the evolution of EU member states in digital competitiveness.



DESI 2022

Digital Economy and Society Index



HUMAN CAPITAL



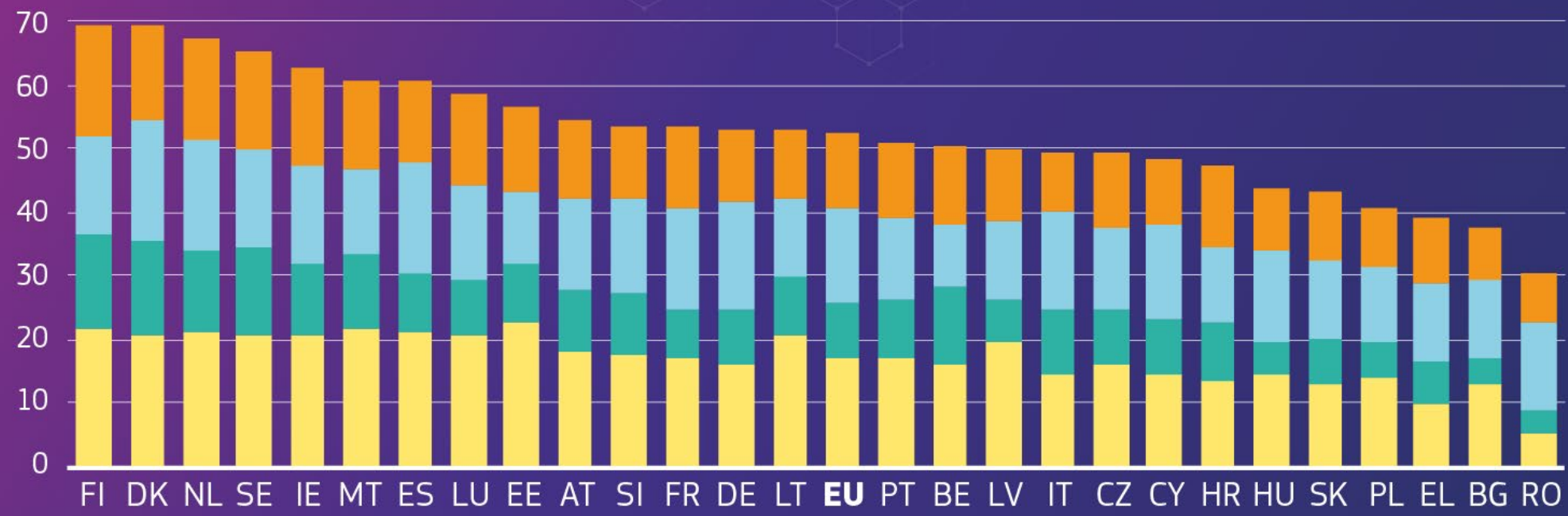
CONNECTIVITY



INTEGRATION OF DIGITAL TECHNOLOGY



DIGITAL PUBLIC SERVICES



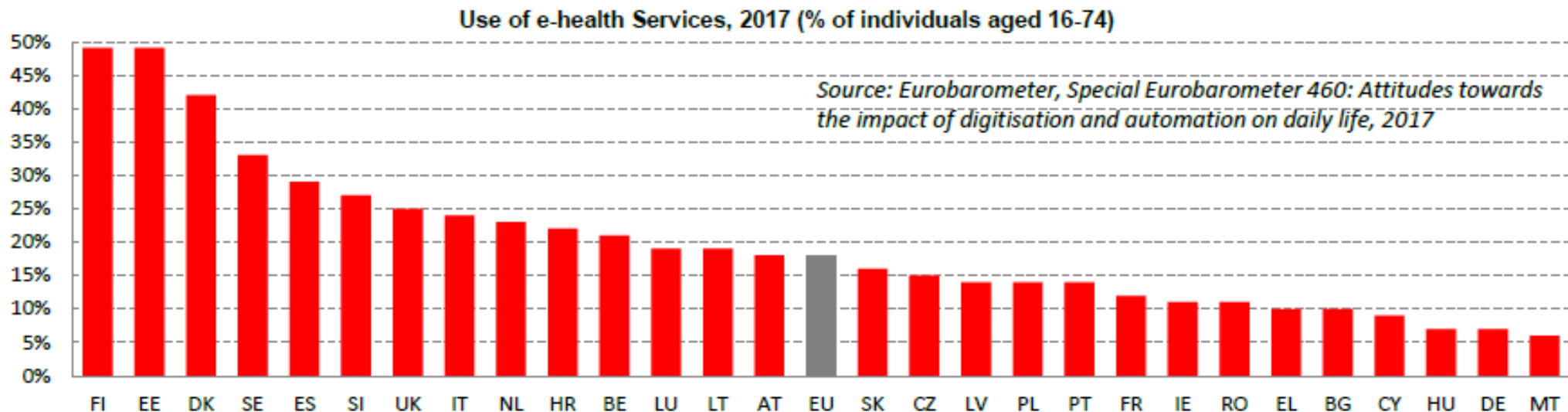
#DESIEU #DigitalEU



Finnish citizens as users of on-line health services

Almost 50% of people in Finland and Estonia used e-health services, followed by Denmark (42%) and Sweden (33%).

Only 18% of people in the EU have used on-line health and care services without having to go a hospital or a doctors surgery.



DESI Report 2019 – Digital Public Services

10



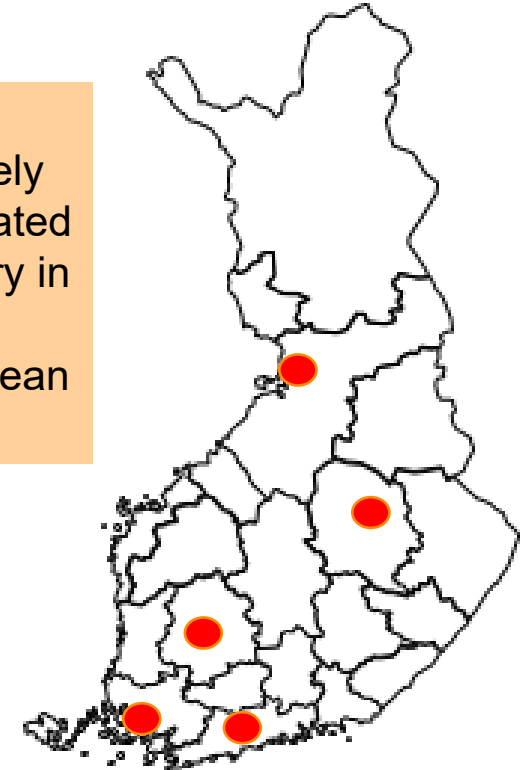
European Commission



Facts: the Finnish health care system until 2022

1. Finland has a population of **5.5 million** inhabitants, average population density is 18 persons / km².
2. **All citizen are covered by public health care services**, and **public sector** provision is **75%** of expenditure and financed by taxes. (until 2022 mainly municipality taxes)
3. **Private sector** and **occupational healthcare** provide supplementary services (**25%** of expenditure).
4. Total health expenditure was **EUR 21.1 billion** in 2018, which is **9.0%** of GDP.
5. Until 31.Dec 2022 there were **21 hospital districts** providing **secondary care services**, 5 of them include a university hospital for **tertiary care services**. All were owned by municipality organizations.
6. Until 31.Dec 2022 there were **137 healthcare centers** maintained by municipality organizations providing comprehensive **primary healthcare services (incl LAB, X-RAY, Patient wards)**. Social welfare and rescue services were under separate municipality administration.
7. Physicians, nurses, etc. work as salaried employees in public care.

Most sparsely populated country in the European Union



Until 31.Dec 2022:
21 hospital districts
and 137 healthcare centres,
TOTAL 158 public healthcare
service providers



Availability and extent of use of information systems in healthcare

- University of Oulu is the responsible partner.
- Long time series: 2003, 2005, 2007, 2011, 2014, 2017, latest data collection 2020*
- Long-term monitoring data, latest after the full implementation of the national Kanta system.
- A comprehensive sample of healthcare organizations: e.g. 2020: 100% of specialized healthcare, 96% of primary healthcare units (population coverage 99%) and the largest private ones.

*Reponen J, Keränen N, Ruotanen R, Tuovinen T, Haverinen J, Kangas M (2021). Tieto- ja viestintäteknologian käyttö terveydenhuollossa 2020. Tilanne ja kehityksen suunta. THL raportteja 11/2021



<https://urn.fi/URN:ISBN:978-952-343-771-5>

X (Twitter): @reponenjarmo

Oulun yliopisto

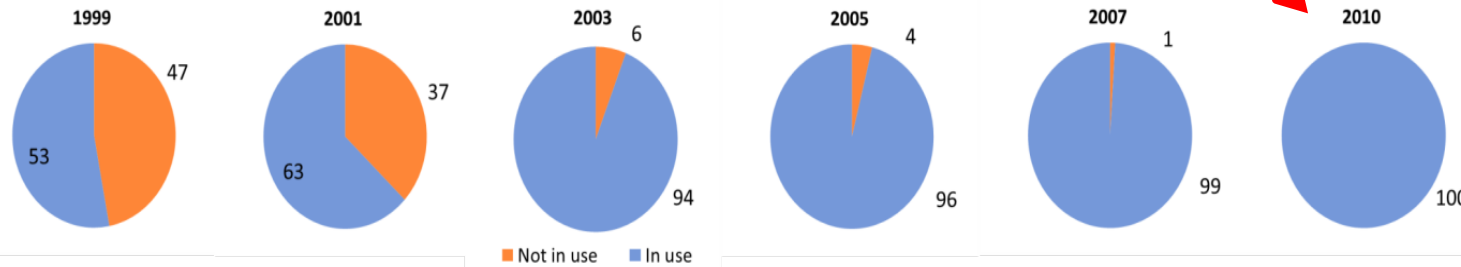


1 st wave of digitalization:

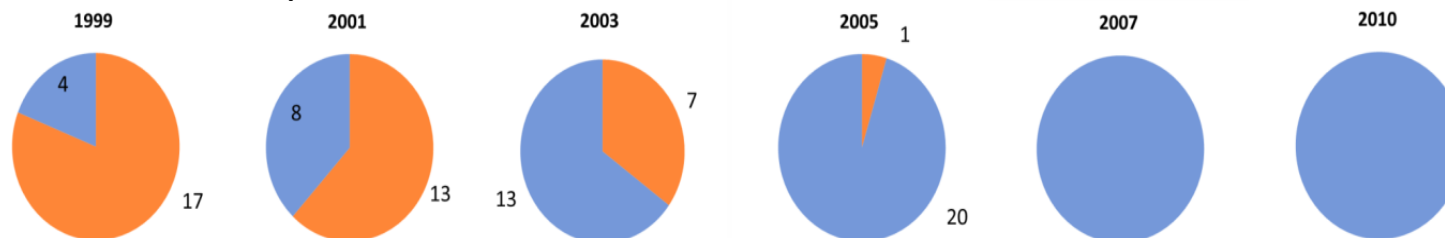


In Finnish public healthcare the local electronic health record systems were 100% digital in 2010.

Health centres, %



Hospitals districts, n.



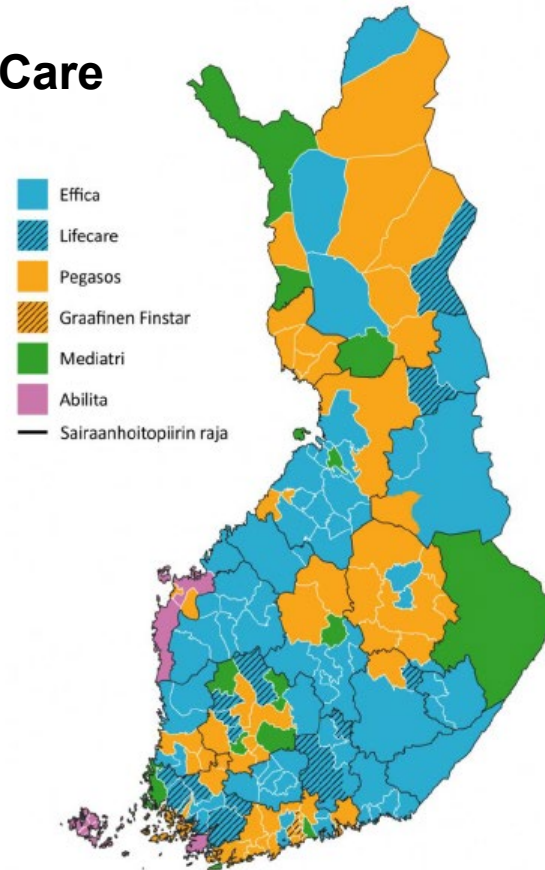
Reponen Jarmo; Kangas Maarit; Hämäläinen Päivi; Keränen Niina. Tieto- ja viestintäteknologian käyttö terveydenhuollossa vuonna 2014 - Tilanne ja kehityksen suunta . THL Raportti: 2015_012.
<http://www.julkari.fi/handle/10024/126470>



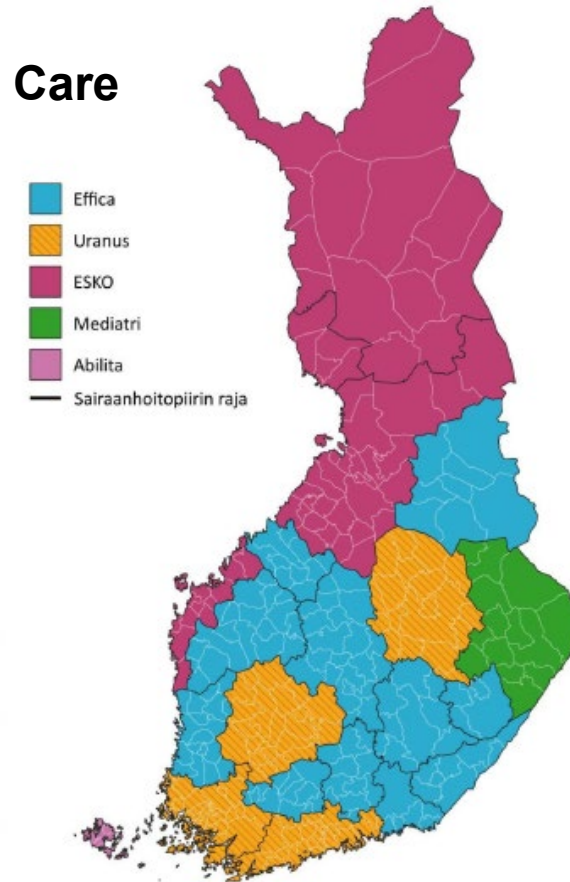
However, the public primary care and secondary care used different systems in the same geographical area !

(before 2011, each legal entity was required to have its own system by law)

Primary Care



Secondary Care





Results summarizing the regional eHealth maturity

Finland's summary eHealth profile: primary and secondary care 2017

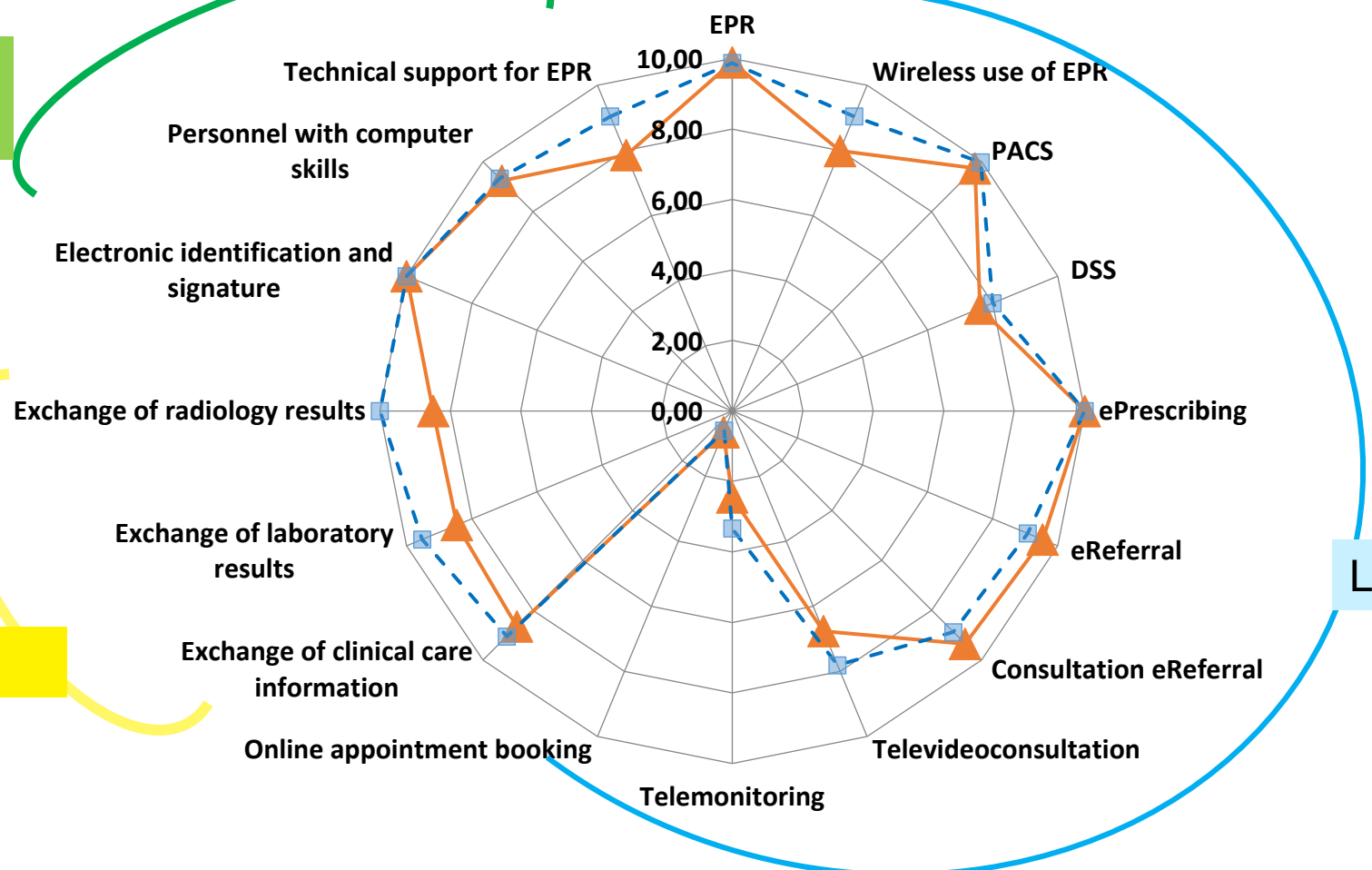
Data security and ICT skills

16 summary indicators

Regional integration

Local applications

Development needs: decision-making support, utilization of information produced by the patient, appointment services, regional data transfer and 24-hour user support



—▲ Primary care, Finland 2017
-■ Secondary care, Finland 2017

Source: Reponen J, Kangas M, Hämäläinen P, Keränen N, Haverinen J. Use of information and communications technology in Finnish health care in 2017. Current situation and trends. National Institute for Health and Welfare (THL). Report 5/2018. (In Finnish with English abstract). <http://urn.fi/URN:ISBN:978-952-343-108-9>



eHealth-maturity: most advanced are regions with same EHR system and health administration – in favor of the current health and social care reform.

[Original Paper](#)

National Development and Regional Differences in eHealth Maturity in Finnish Public Health Care: Survey Study

Jari Haverinen^{1,2}, MSc, MHSc; Niina Keränen^{1,3}, MHSc, MD; Timo Tuovinen^{1,3}, MD; Ronja Ruotanen¹, MHSc; Jarmo Reponen^{1,3}, MD, PhD

¹FinnTelemedicum, Research Unit of Medical Imaging, Physics and Technology, Faculty of Medicine, University of Oulu, Oulu, Finland

Figure 2. The status of the eHealth profiles of different types of health care organizations. EPR: electronic patient record.

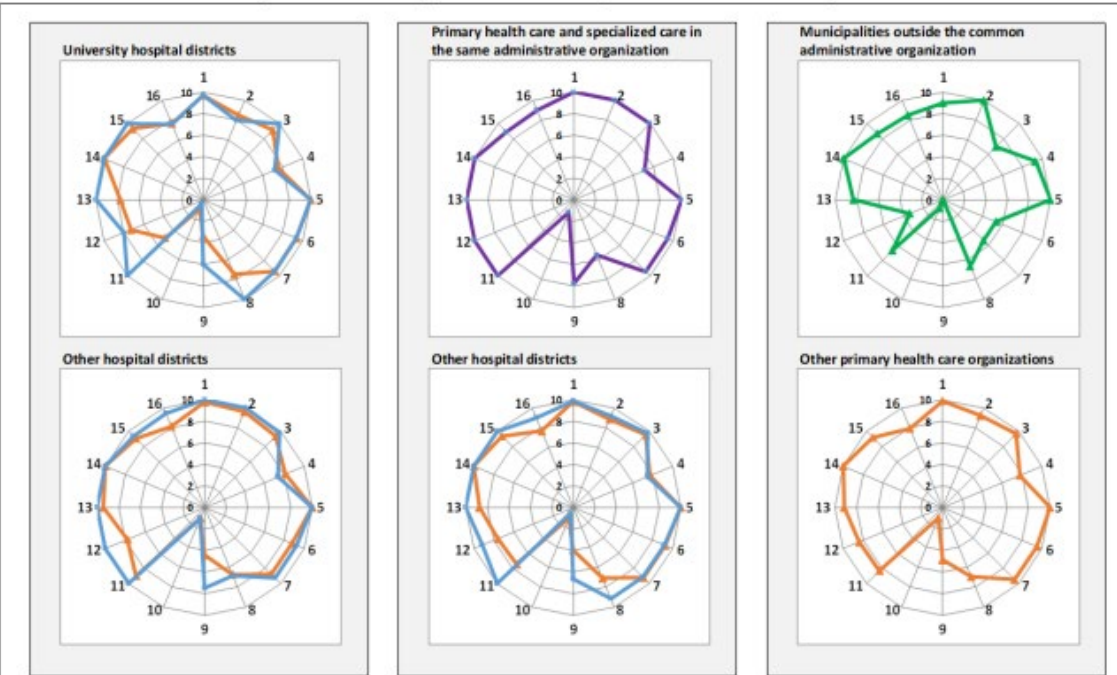
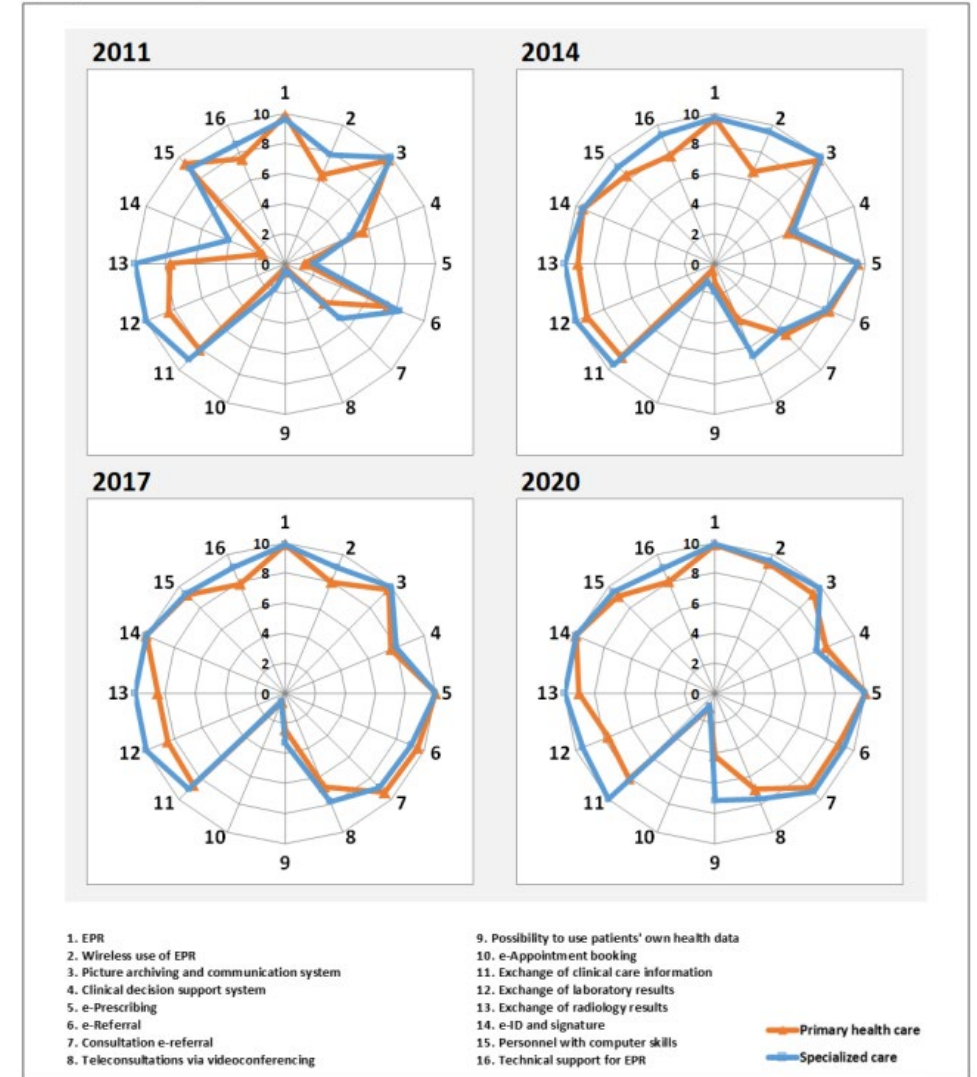
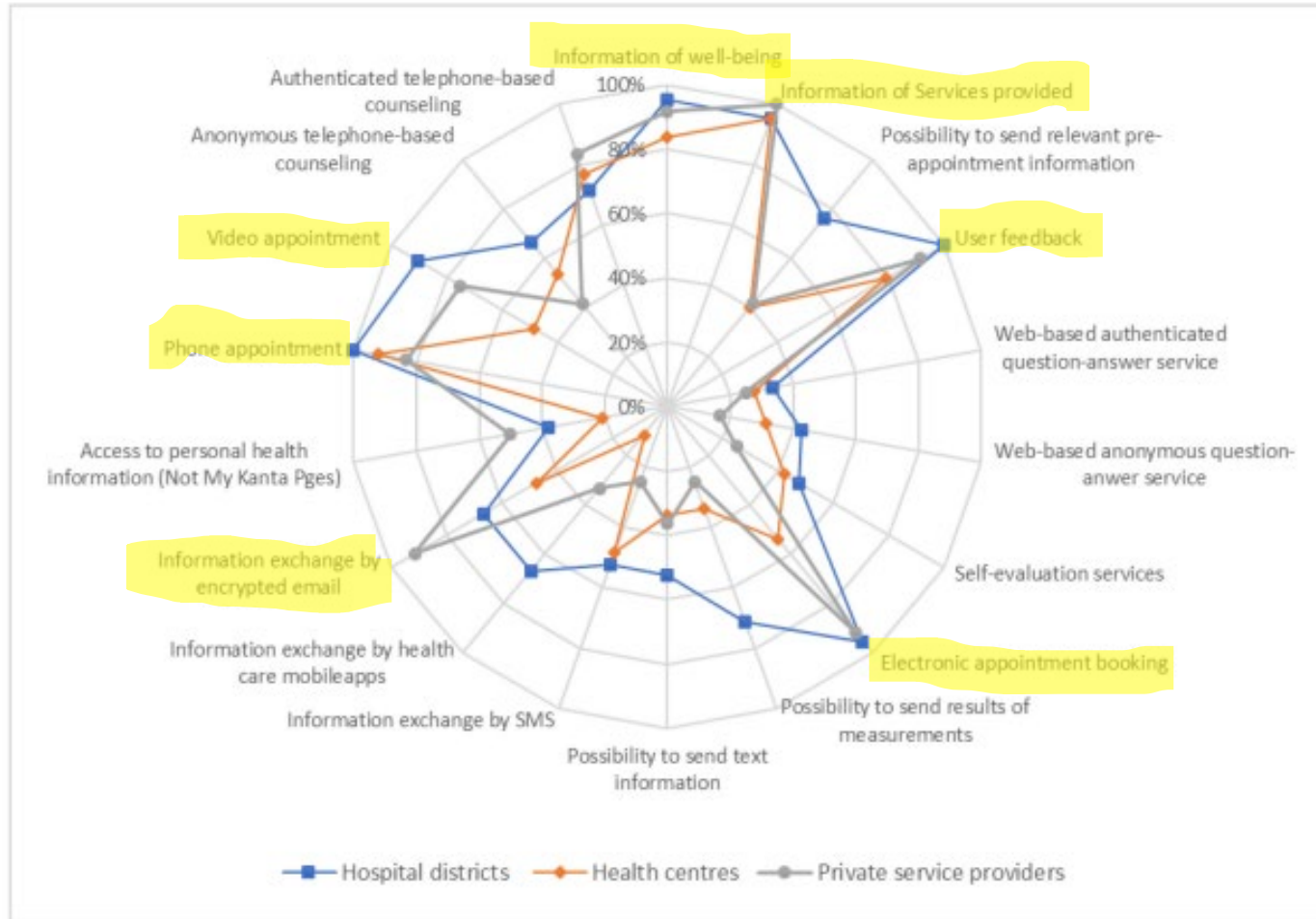


Figure 1. The national development in the maturity level of eHealth in the years 2011, 2014, 2017, and 2020 (modified from the studies by Reponen et al [19,20]). EPR: electronic patient record.





Differences in the availability of e-services to citizens:



- By 2020, public health care providers had the widest range of direct services available to citizens. Specialized care was ahead of primary care.
- The private sector offered citizens more secure communication and the ability to view their own health information directly from the service provider's own system. Promotes adherence.

Ruotanen, R., Kangas, M., Tuovinen, T., Keränen, N., Haverinen, J., & Reponen, J. (2021). Finnish e-health services intended for citizens – national and regional development. *Finnish Journal of EHealth and EWelfare*, 13(3), 283–301.

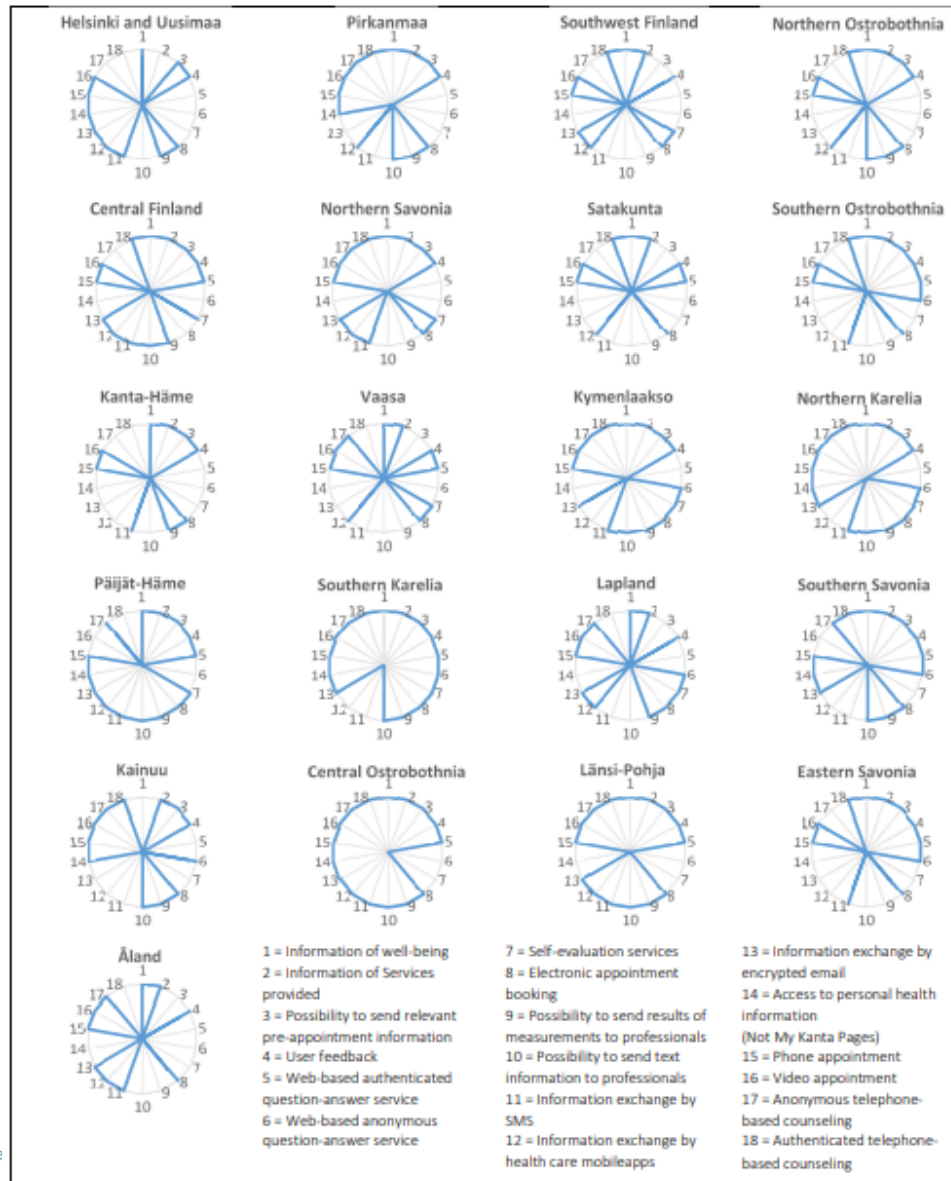
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Oulun yliopisto

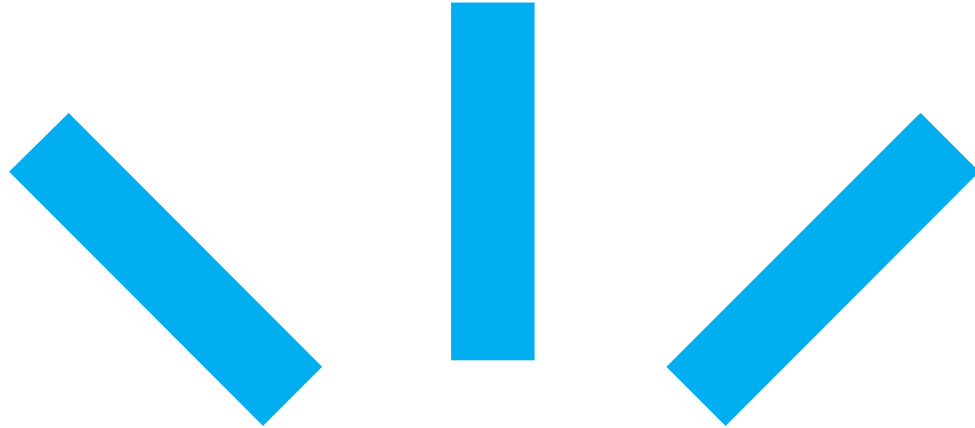


Regional differences in digital services for citizens:



- The differences between the specialized care hospital districts in the extent of digital healthcare services available to citizens are considerable.
- >>the regions have very different starting points regarding the "maturity" of available services to citizens.

Ruotanen, R., Kangas, M., Tuovinen, T., Keränen, N., Haverinen, J., & Reponen, J. (2021). Finnish e-health services intended for citizens – national and regional development . *Finnish Journal of EHealth and EWellfare*, 13(3), 283–301.



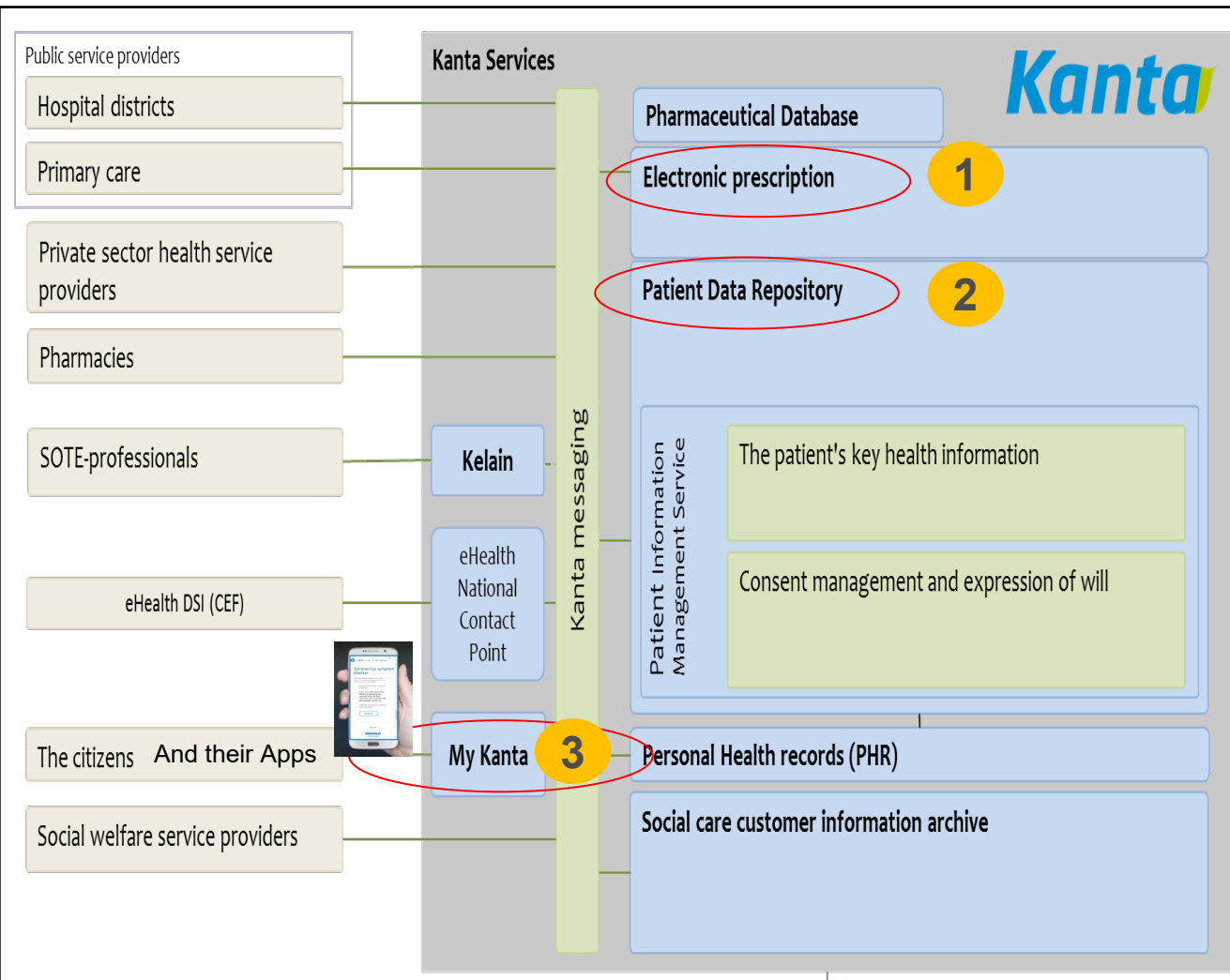
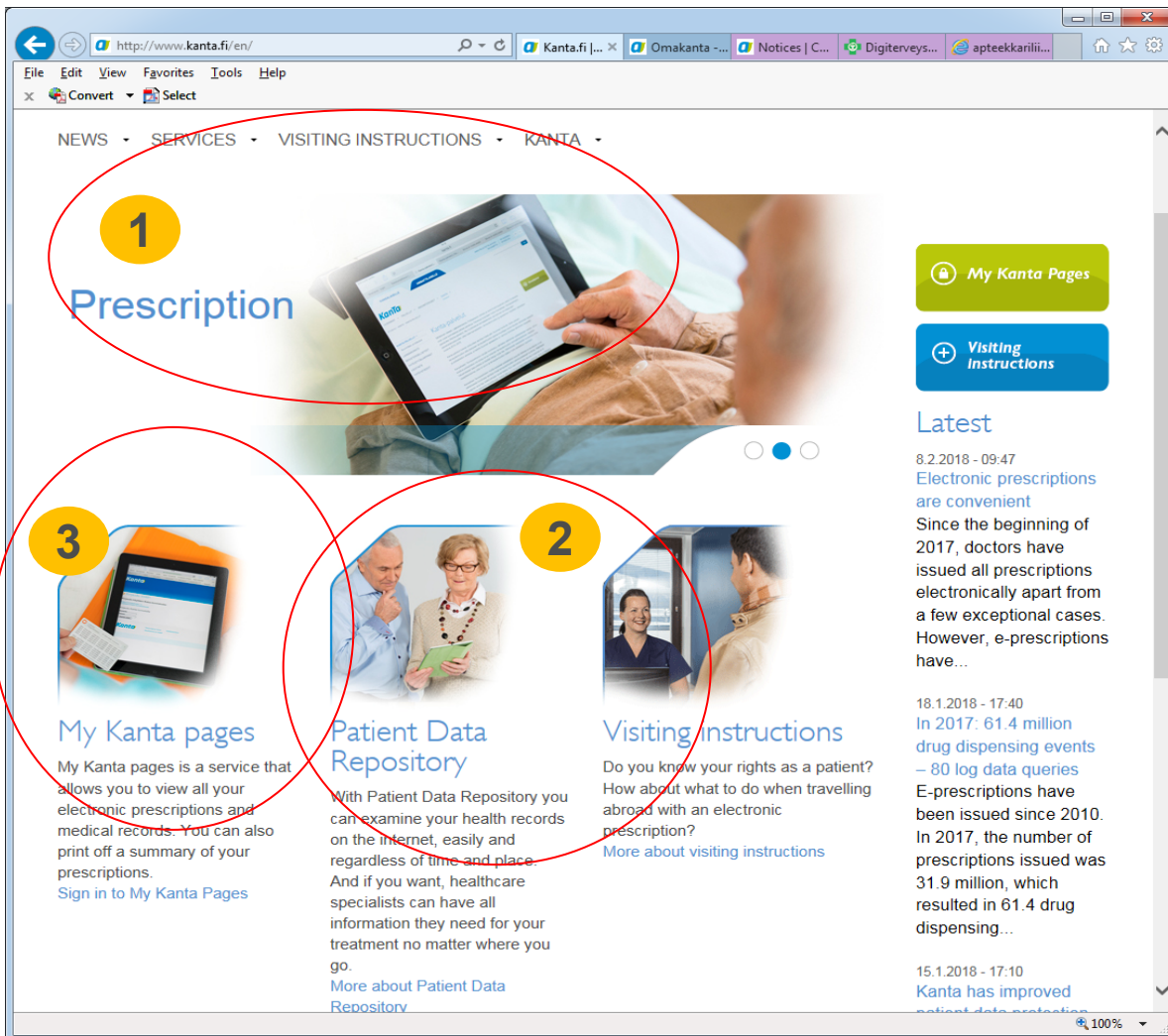
Structure of Finnish Health Information Exchange "Kanta"

**A national exchange service and repository
connecting all service providers since 2010**



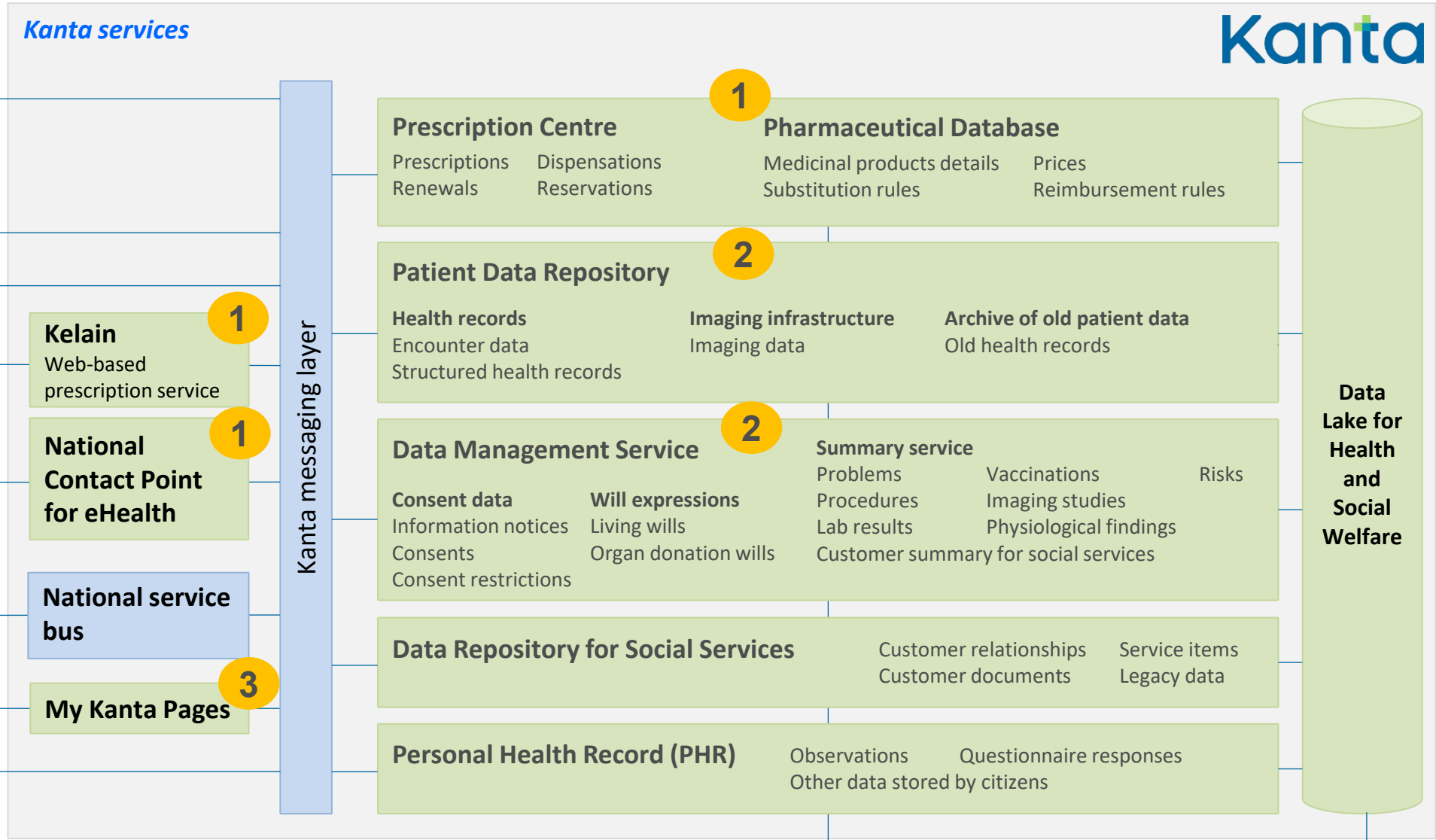
National Health Information Exchange (HIE) in Finland - 13 years of EHR archive, ePrescription and Citizen access

Kanta
2010-2023



User groups

- Healthcare service providers**
Primary care organizations
Hospital districts
Private healthcare providers
- Providers of social services**
- Pharmacies**
- Healthcare professionals**
- eHealth Digital Service Infrastructure**
- Receivers of medical certificates**
- Citizens**
and apps used by them



Main standards

- HL7 V3: CDA R2 L3 and Medical Records
- HL7 FHIR (Kanta Personal Health Record)
- JSON, XHTML (PHR and social services)
- PDF/A (old patient data and social services)
- IHE IT-I Profiles (imaging and eHDSI)
- W3C XML DSig
- WS Addressing, WS-I
- TLS, X.509

Other national services

- Population register**
Demographic data
- Suomi.fi**
Authentication, e-Authorizations, Message exchange
- HCP and SCP register**
Professional rights
- Certification service**
Certificates, Smart cards
- National code server**
Code systems, Pharmacy register, Organization register, Terminologies, Data structures

Use of Kanta services in healthcare by 2020

Kanta

1

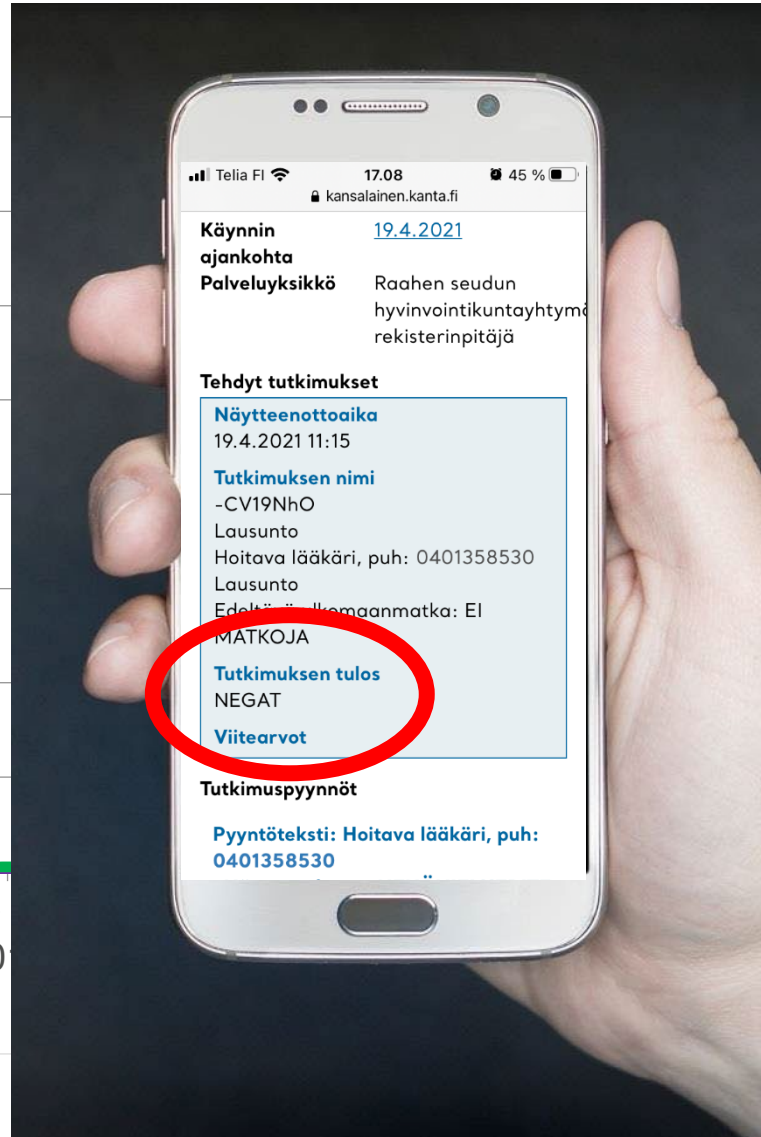
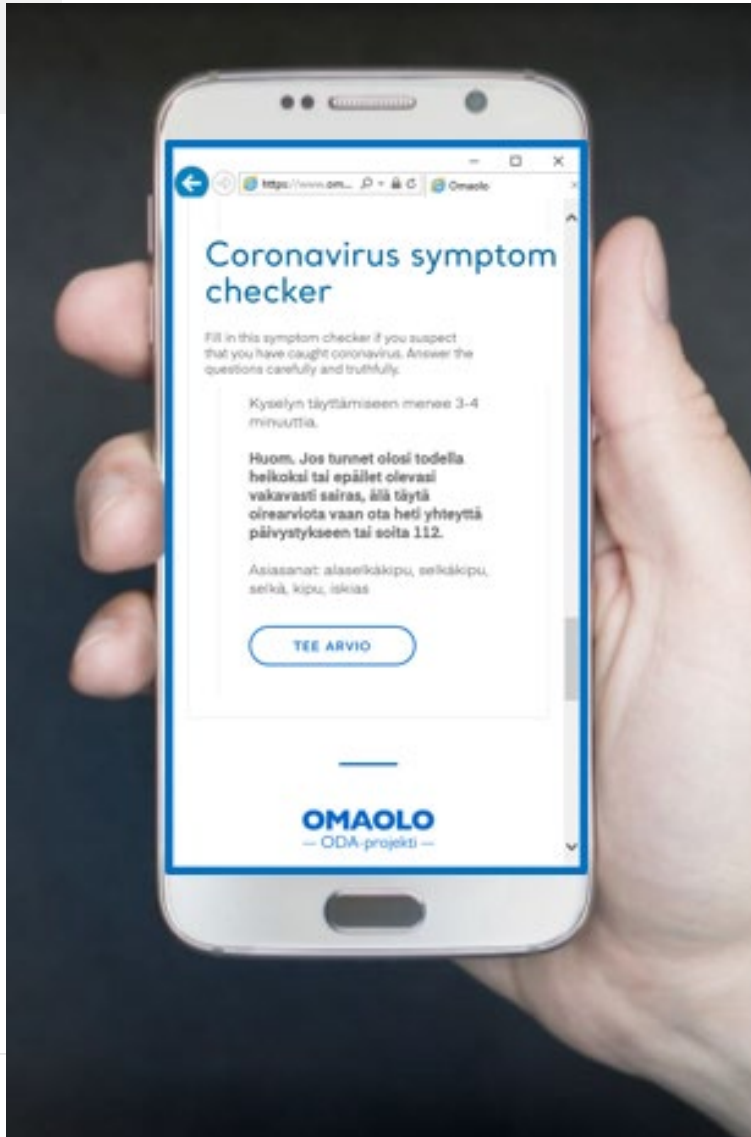
- Prescription Centre
- 182.7 million e-prescriptions
- 100% Public Hospitals
- 100% Public primary healthcare centres
- 100% Community pharmacies
- 1,400 Private healthcare service providers
- 100% of prescriptions and medicine dispensation data are electronic
- 80% population were prescribed medicine by electronic means

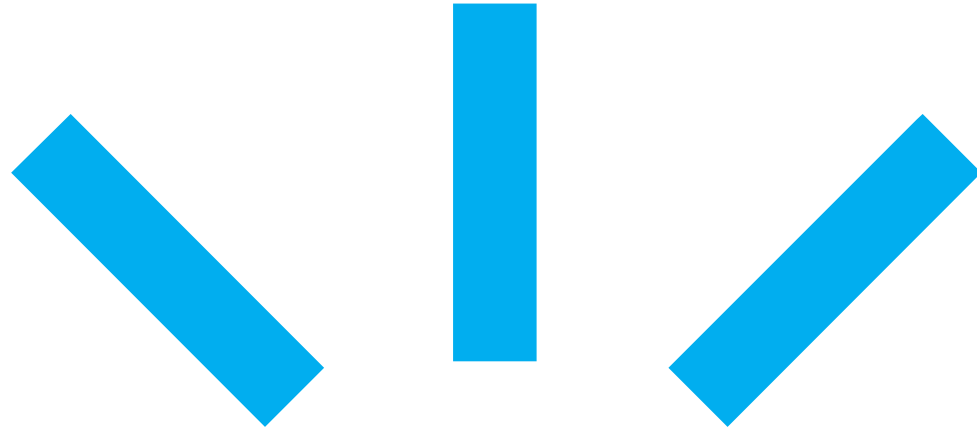
2

- Patient Data Repository
- 1.6 billion records
- 100% Public Hospitals
- 100% Public primary healthcare centres
- 1,300 Private healthcare service providers
- Over 6 million persons have health data in the patient data repository
- Kanta contains the legal "master" patient record.

Cross-border electronic prescription exchange between Finland, Estonia, Croatia, Portugal, Poland and Spain

Sign-ins and persons visiting **My Kanta Pages** (national patient accessible electronic health record) by month in Finland 2010–2021.





The 2023 reform has changed the structure and financing policies of public health care

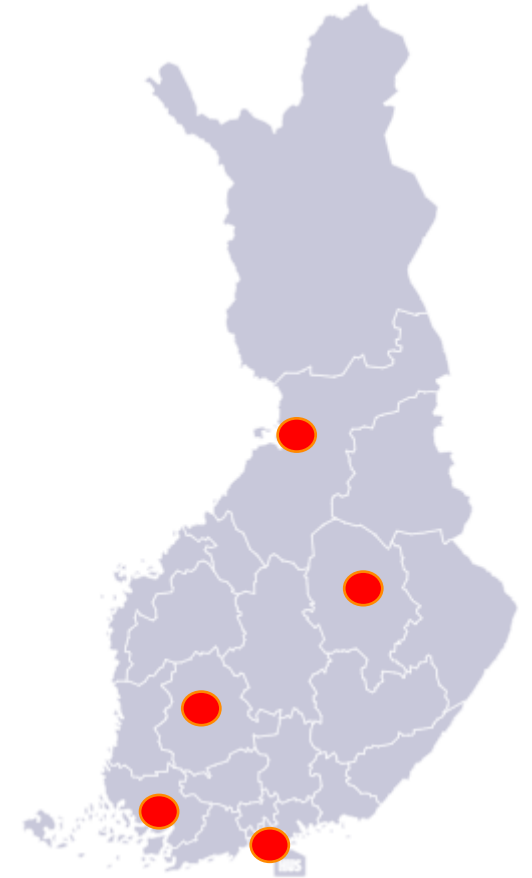
Acceleration of digitalization of services



Reform of healthcare, social welfare and rescue services, since 2023

The largest **reform** in health care and social welfare services since 50 years!
(In 1972 physicians were employed by primary healthcare centres.)

1. **Since 1st of Jan, 2023, 21 New Wellbeing Service Counties + City of Helsinki + Autonomous County of Åland** are in charge of **Public health care and social welfare services**. **Helsinki University Hospital** provides highest tertiary care. = **total 24 actors**. (Instead of 21+137=158 in 2022)
2. **The funding is coming from the state taxes**, the municipalities have not a role anymore. Small customer fee.
3. Those Service Counties will join **Primary care, Secondary care and Social welfare services** plus **Rescue services under one administration**.
4. **The information systems will be joined together in each of the counties**, many megaprojects that will take years.
5. 10/24 areas had joint information systems for primary care and secondary care already in 2022, the rest 14 have a lot of work ahead
6. 7/24 areas had at least partly social care systems combined in 2022, the rest 17 have work to do.
7. Physicians, nurses, and others continue working as salaried employees.



After 1st Jan 2023:
24 new actors in charge
of public health care



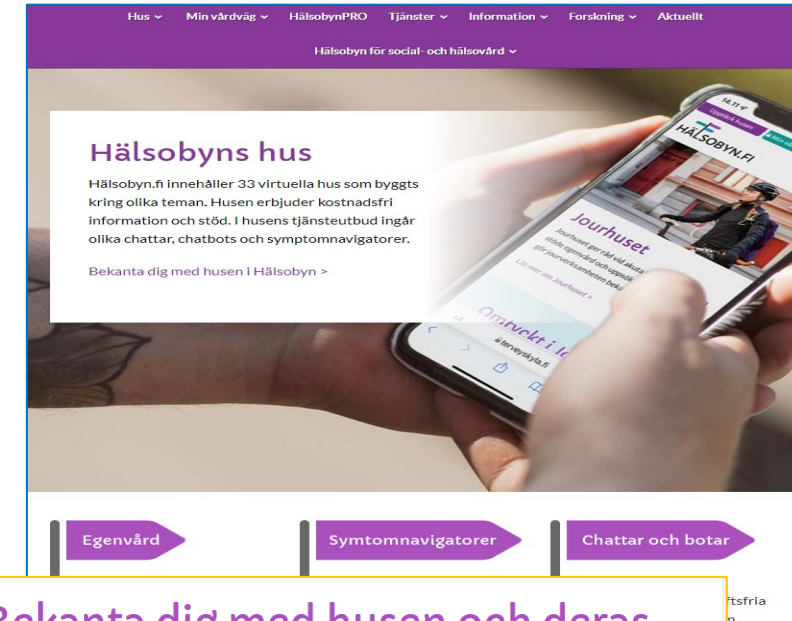
Anticipated effects of the healthcare, social welfare and rescue services reform:

- **More centralized financial control:** the government will decide the resources given to public healthcare, no possibility to compensate with local taxes. Allowed resources are calculated according to expected needs.
- But: All the new welfare service counties have announced that they will have **deficit in their budget** this year. **Total 1.2 billion €**, makes an average of 50 million € / county. Only three years time to compensate for that.
- This will **force into new means of providing digital services**. Many local healthcare centres will be closed down and public sector is increasingly utilizing **"virtual healthcare centres"**.
- **Chat and video consultations** will increase. Also calling **"116117"** before contacting emergency services or local healthcare center. There is more responsibility transferred to the **citizens**.



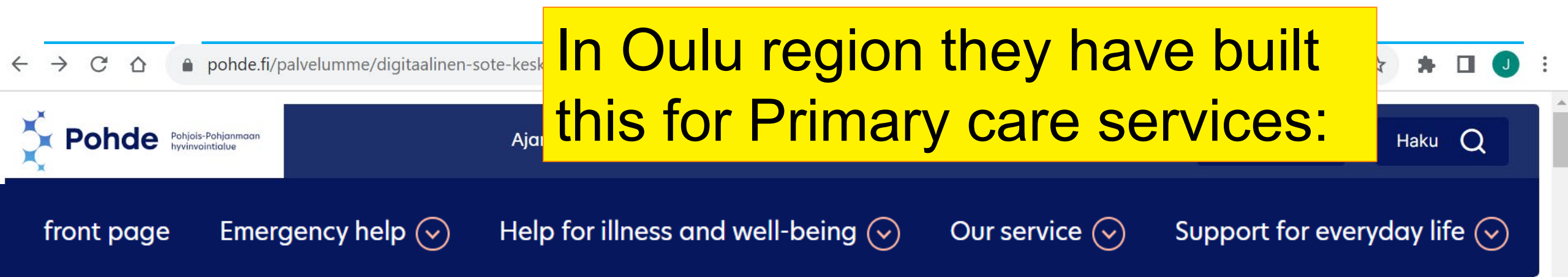
eHealth at home: Health Village, all five university hospitals involved

- Terveyskylä.fi (Health Village) –web services provide healthcare services in various speciality domains:
- 1. **"Virtual houses"**, more than **33** different (2023) in operation, from mental health self management to pain management, from rehabilitation to emergency guidance and weight management.
 - Open services and general guidance without registration. Empowering the patient/citizens
- 2. **Digital Care Pathways** (DCP, more than **120**), prescribed out-patient clinic services, authorised access.
 - DCP:s are connected to a host hospital and to its care processes, monitored by regular staff. E.g post-infarct care for cardiology patients, Sleep apnea home care.
- 2. **Professional pages**, and **Researcher's toolbox**, authorised access needed.
 - Includes national guidelines and local protocols intended for physicians and nursing staff. Researcher's toolbox makes it easier to collect RWD, real world data



Winners of the 2018 Microsoft Health Innovation Awards

In Oulu region they have built this for Primary care services:



[Etusivu](#) > [Palvelumme](#) > Digitaalinen sote-keskus

Digital social security center

The digital social and health center is an alternative to doing business in a health center. The digital social security center is expanding to the entire welfare area.

On this page, we tell you how you can do business there.



X (Twitter): @reponenjarmo

 Digital social security center

What things can you handle at the Digital Social Security Center?

You can contact us, for example, in the following matters:

- upper respiratory tract infections, such as prolonged runny nose or cough, skin symptoms, intestinal symptoms, sexually transmitted diseases, urinary tract infections
- musculoskeletal disorders such as back pain
- mental health problems or life crises
- long-term illness symptoms and medication review
- the need for sick leave and a doctor's statement or certificate
- review of X-ray or laboratory results with the doctor
- assessment of the traveler's vaccinations.



Digitaalinen sote-keskus

Sosiaali- ja terveystieteiden verkossa

> Chat-vastaanotto

Nivala, Sievi, Alavieska, Ylivieska, Haapajärvi, Pyhäjärvi, Reisjärvi, Haapavesi ja Pyhäntä.

> Mielensterveys-chat

Oulu, Nivala, Sievi, Alavieska, Ylivieska, Haapajärvi, Pyhäjärvi ja Reisjärvi

Arvioi oireesi Omaolossa [↗](#)

Saat arvion hoidontarpeesta ja tarvittaessa yhteyden terveydenhuollon ammattilaiseen.

> Videovastaanotto

Osallistu ennalta varatulle etävastaanotolle.



Anticipated effects of the healthcare, social welfare and rescue services reform:

- **The information systems will grow together:** those 14 regional service providers that do not have a common healthcare information system are going to acquire a new one in the next years.
- Every county have to **integrate Social Welfare ISs.**
- There will be massive projects in terms of integration and project management. A great concern about the **availability of vendor resources.**
- It is expected that **information flow** between sectors within a welfare service county will improve efficacy.
- More uniform information systems allow **intelligent use of data** across regions. E.g. two out of the five university hospitals have their "datalakes" and data analytics up and running. The rest three are building their capacity. New possibilities for data intensive research.



Some national service extensions:

The new Act on Secondary Use of Health Data (2019):

-A single FINDATA authority gives permissions to utilize data in KANTA repository, regional EHRs and other resources for research & development & innovation.

-Finland is pioneering the principles of secondary usage of health data that are defined in the European Health Data Space (EHDS) initiative.

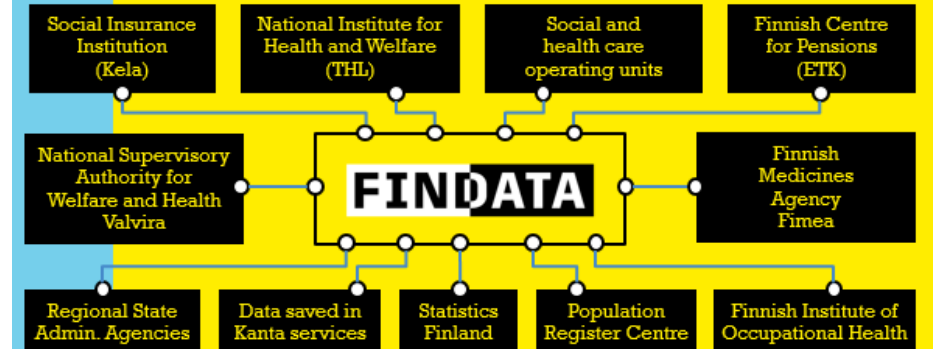
The new Act on Customer and Patient Information (2021):

-Social welfare services have to connect to Kanta after a transition period (2024-2026) = One national repository for social welfare.

-Citizen's own personal health record and welfare app information becomes visible to professionals.

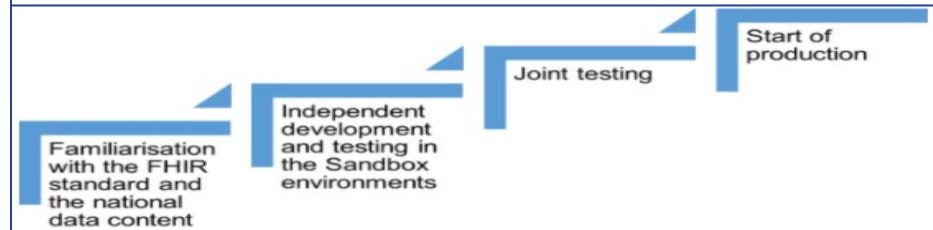
-Expected to speed up development of apps and services.

The following controllers will provide access to data specified in the Act through Findata



Personal Health Record

Personal Health Record is a Kanta service in which users may enter information on their wellbeing. In future users may give their consent to social and healthcare service providers for the use of the data in support of decisions concerning their health and wellbeing, as well as an aid for diagnostic purposes.





Final discussion of the challenges related to the healthcare, social welfare and rescue services reform:

- The **financial resources** seem not to be sufficient because their level were estimated before the energy crisis and recession.
- There is already **shortage of personnel** in the public sector due to a chronic shift to the private sector.
- With this money and these people - Are we able to perform the **service provision changes** successfully? So that citizens will still have the services they need?
- Healthcare information systems **do** have a long track record in terms of content definition and interoperability. **Social welfare information systems** are not yet so established and require a lot of work.
- Restrictions in **data access policies, requirements of secure operating environments and costs of the national data permit authority** have already had a negative effect to research initiatives.



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‘Intelligence is the ability to adapt to change.’
Famous quote by Stephen Hawking

Take skal du have! Thank you!

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