

# Ericsson Nikola Tesla Group



Ivan Lupić  
Digital Society, Business Development



# An associated member of Ericsson Corporation



## Segments



### Telco & Managed services

Trusted advisor to our customers  
Market leader on our markets



### Digital Society (DS)

Partner of choice that leads digital transformation in selected I&S verticals like e-Health, land registry, etc.



### R&D

R&D Center is positioned as one of the best performing within the global R&D organization, reliable and competent in strategically important segments



### Services

Highly competent and competitive service hub providing quality technical, consultative and innovation capabilities

# Our experts - globally recognized for their excellence



3,490

of employees in Croatia,  
B&H, Kosovo

91%

of highly educated  
experts

31%

of employees  
younger than 32

38 years old

average employee  
age

73% : 27%

gender ratio male : female

24%

of women in  
managerial positions

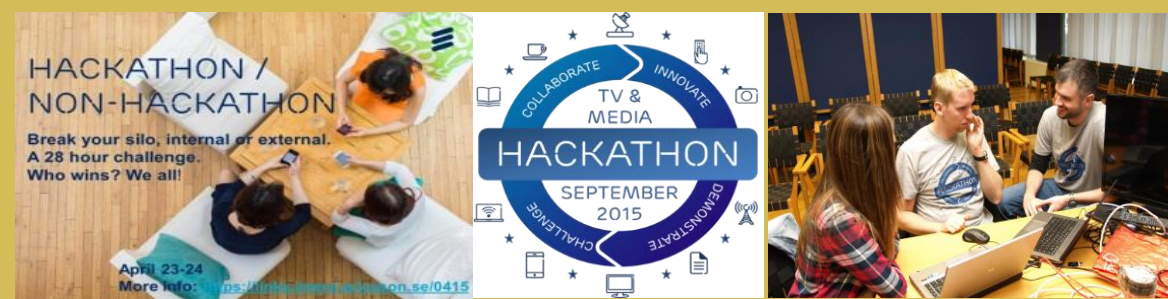
*\*data for the Group*



# We encourage new ideas



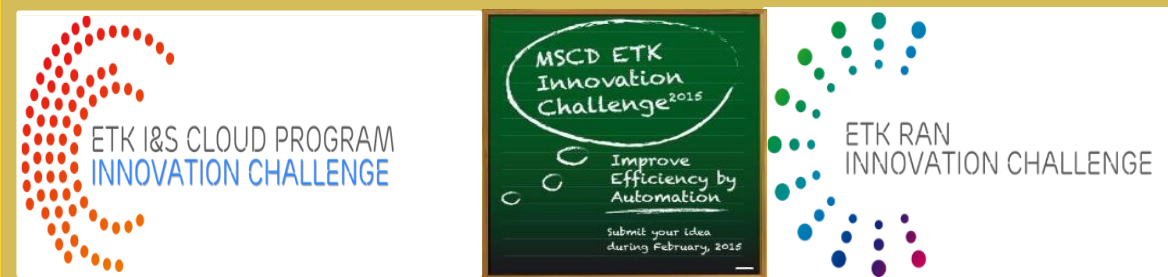
## Hackathons



## Innovation Days



## Innovation Challenges



## Ericsson Nikola Tesla Summer Camp



## Ericsson Garage Croatia



Innovation culture

Partner of choice for selected industries, leading digital transformation together with our customers.

# Digital Transformation of Society

## Domains and key offerings



### Digital Government

- Case management solutions
- Archiving solutions
- Learning solutions
- Geospatial analysis

### Land Administration

- Land registry
- One stop shop
- Building registry
- Infrastructure registry
- Professional domain solutions

### Transport

- National access point
- Traffic management
- Automatic fare collection
- Passenger information system
- Railway solutions

### Healthcare

- 4 national informatization projects
- Electronic health record
- E-prescription, E-referral, E-booking
- Telemedicine

### Smart Energy

- Smart Building
- Smart city lighting
- Energy infrastructure protection

### Environment

- Water quality management
- Nature preservation solutions
- Industry environment
- Urban development

### National security and public safety

- National infrastructure protection
- Border and Area security

### Horizontal solutions

- Data Jedi (Data Management)
- OD Matrices (Big Data)
- WebGIS
- Virtual assistant
- Private 5G networks

# Digital transformation



ICT



Social  
networks



Mobile  
technologies



Cloud  
computing



Internet of  
Things (IoT)



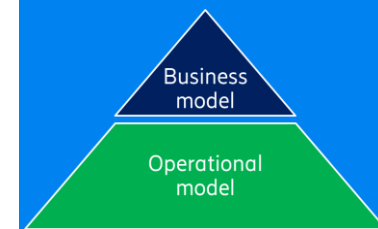
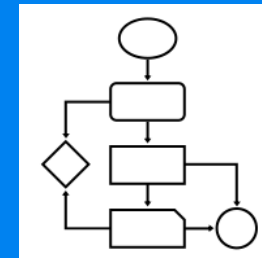
Data analytics

AI +



## Challenging and changing:

- Business processes
- Business models
- Operational models



# Imagine a complex system where:

Focus is on the process and the service provider and not the customer

Costs are mostly fragmented, isolated and not easily manageable

Processes are mostly fragmented and isolated

Decisions are often made upon individual knowledge and experience

Ordering process is mostly manual and paper based

Experience is mostly individual and not truly shared

Information for any participant in the process is mostly fragmented, isolated and not always available



# Why health-care services are in



World

Africa

Americas

Asia

Australia

China

Europe

India

Middle East

More

The Observer  
NHS

**Toby Helm,**  
**Shanti Das, Jon**  
**Henley** *in Paris*  
**and Kate**  
**Connolly** *in*  
**Berlin**

Sun 8 Jan 2023 09.00  
GMT



## Sick man of Europe: why the crisis-ridden NHS is falling apart



# ChatGPT says:



Another question: can you please define eHealth?



eHealth is the use of digital technologies, such as the internet, mobile devices, and wearables, to improve health, healthcare, and wellness. This can include the use of online health information, telemedicine or virtual consultations, electronic health records, and mHealth (mobile health) applications for self-monitoring and self-management of health conditions. The goal of eHealth is to improve access to health information and services, enhance the quality of care, and support patient empowerment and self-care. It is also expected to play a key role in reducing healthcare costs, improving health outcomes, and addressing challenges such as the shortage of healthcare professionals in certain areas.

# Challenges in healthcare today



Provide good care at  
an affordable cost

+



Increase availability  
of care for all

+



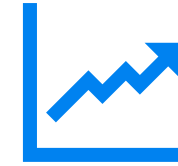
Help people  
stay healthy

+



Demographic  
shift

+



Rise in chronic  
diseases

=

?

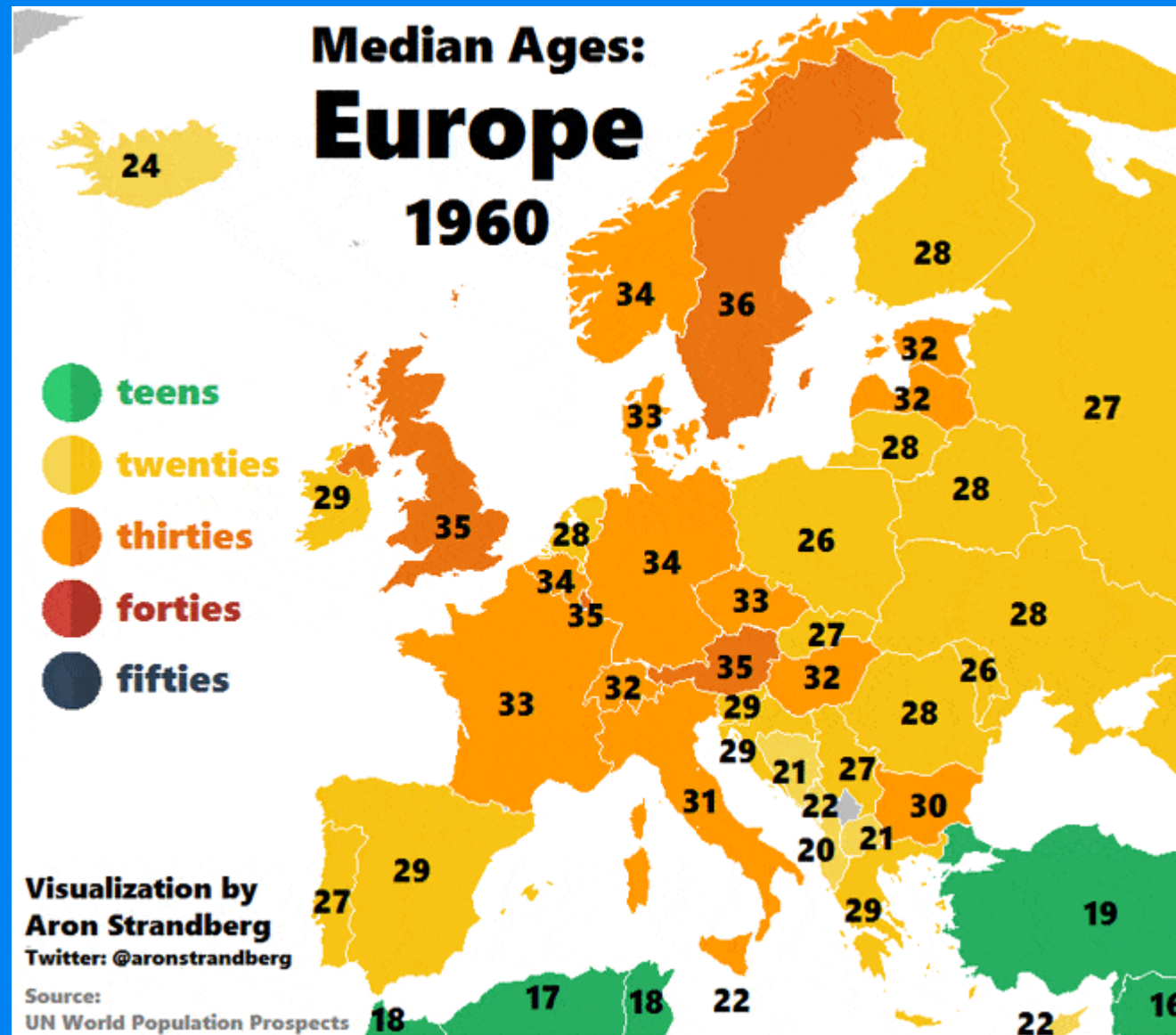
More developed parts of the world

- Rising healthcare expenditures
- Pressure on healthcare service delivery
- Care of aging populations



Less developed parts of the world

- Poor healthcare delivery infrastructure
- Lack of trained personnel
- Managing non-communicable diseases in addition to communicable diseases



<https://www.weforum.org/agenda/2017/11/these-animations-show-the-western-world-is-rapidly-ageing>

# Key types of healthcare system funding

## Beveridge

- Government funding from tax revenues
- Free services available to all
- E.g. UK, Spain, Sweden, Veterans and No Veterans
- Challenge: long waiting lists, ageing population

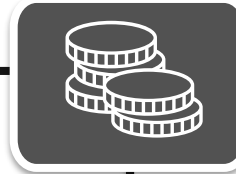
## Bismarck

- Funding through contributions from employees and employers
- E.g. Germany, Japan, France, Netherlands
- Challenge: population not under employment, ageing population

### Croatia

Beveridge ↔ Bismarck

Mandatory insurance system + state budget transfers



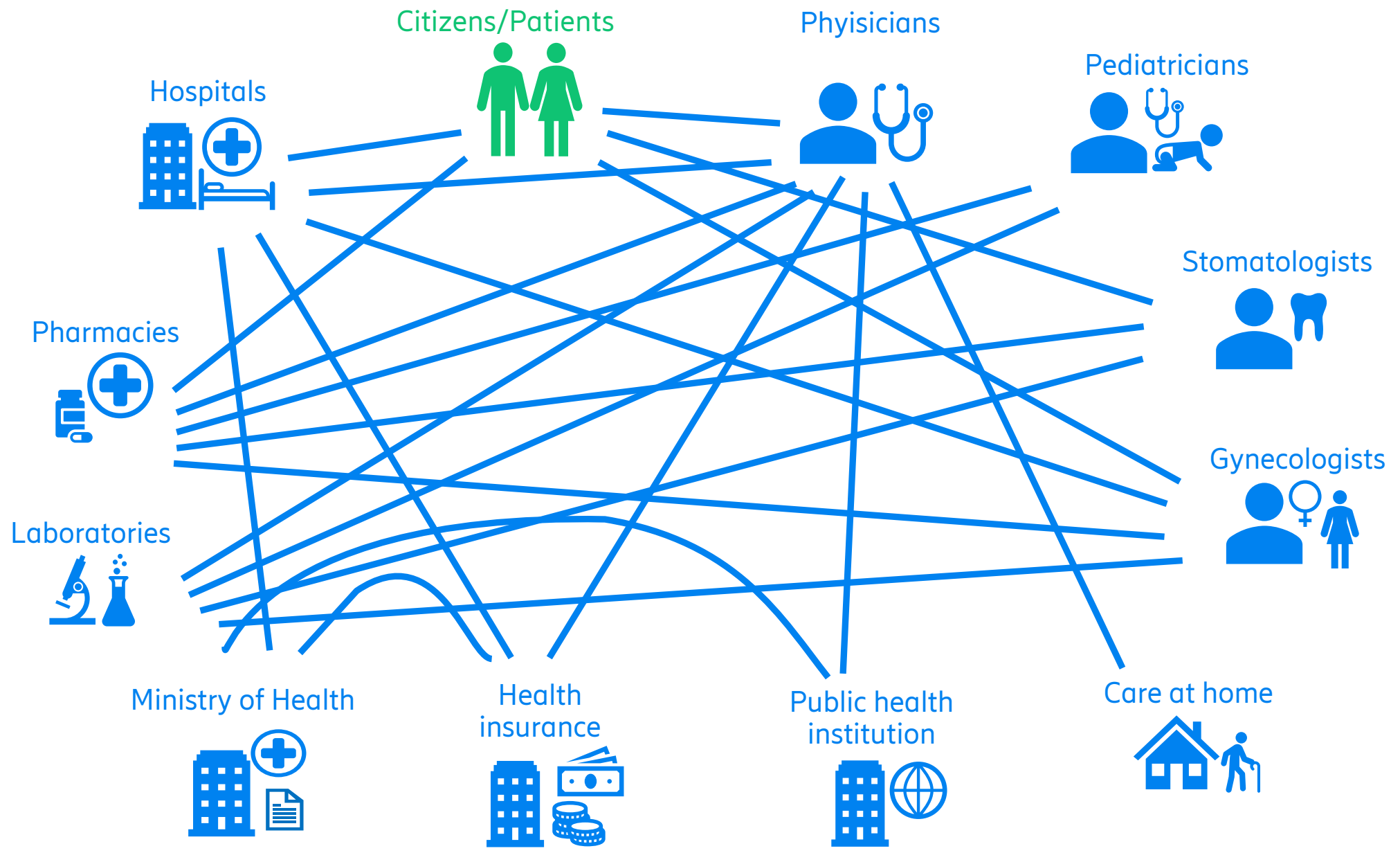
## National Health Insurance

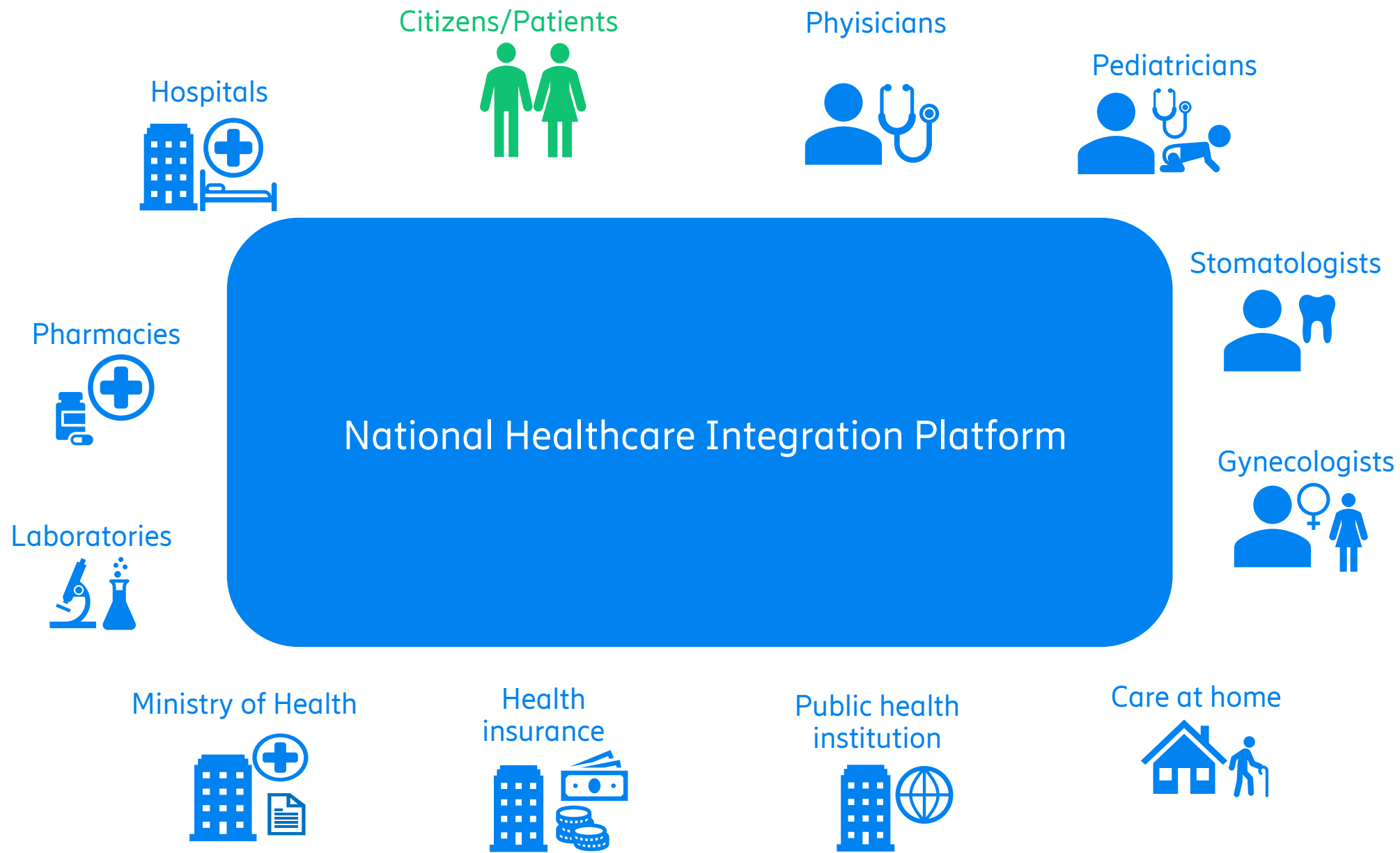
- Funding through a state-operated insurance scheme that every citizen pays into
- E.g. Canada, South Korea, Taiwan, (US: Medicare)
- Challenge: long waiting lists

## Out-of-Pocket

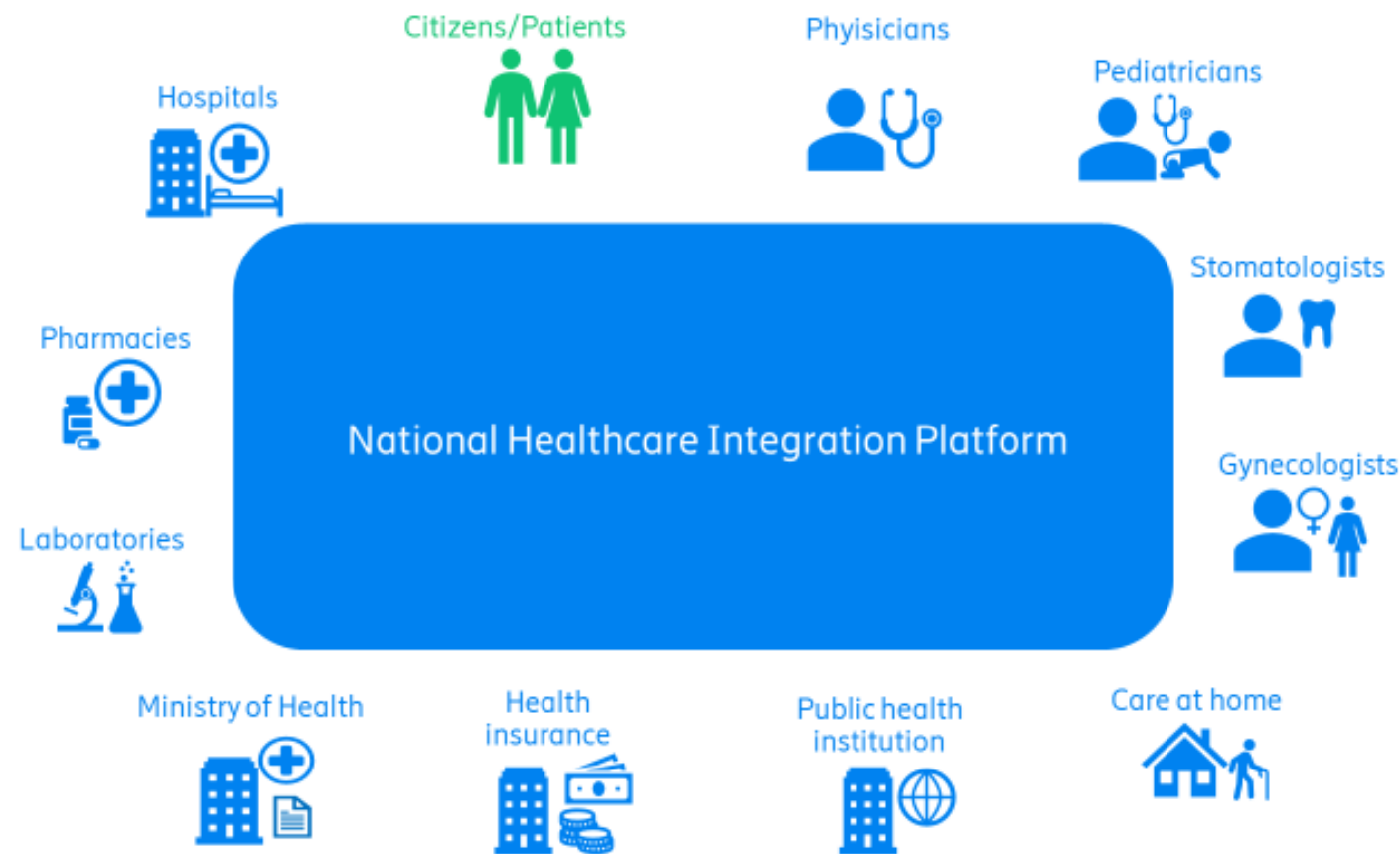
- Individuals pay for own care
- E.g. rural areas of India and China, parts of Africa and South America, (US: uninsured individuals)
- Challenge: unavailable and unaffordable care, especially for the poorest citizens







# eHealth in Croatia



## Integrated healthcare applications / information systems (No.)

- Family doctors – 8
- Pediatricians – 7
- Gynecologist - 8
- Dentist – 7
- School medicine - 1
- Laboratory IS (within primary care) - 5
- Community pharmacy apps- 4
- Outpatient specialistic care – 20
- Home care apps– 13
- Physical therapy at home apps - 12
- Laboratory IS (microbiology) – 5
- Apps for dispensation of medical aids – 10
- Hospital information system - >5



## E-prescription

(connected to EU crossborder system for prescription exchange)

60+ millions prescriptions yearly  
98,7% e-prescriptions



## E-referral (PHC laboratory)

15.000 people do not have to travel

## E- referral (incl. specialist opinion/discharge letter)

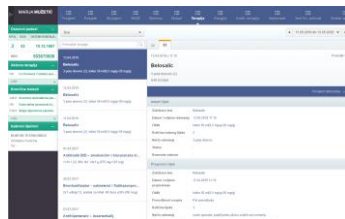


15+ millions\* referrals

\*yearly

## EHR

(connected to EU crossborder system for patient summary exchange)



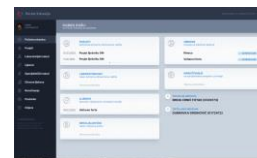
50+ millions individual patient summaries yearly (from PHC)

Diagnosis, status, procedures, medications, referrals...



malignant and infectious diseases report  
sick-leave registration  
"Communication msg."  
(8 different ways of utilization)  
Teeth status registration  
procedures registration  
panel (different vital signs and measurements) registration...

## Patient access to data & services



Patient portal  
(part of eGov infrastructure)



Mobile application



over 1.000.000 requests daily on insurance status and other administrative patient data

## National prevention programs

(Cervix, breast cancer, colon cancer / lung cancer)



## E-medical aids

Prescribing, approval (information system or human), dispensing

## Home care

Prescribing and reporting on performed home care

## Physical therapy at home

Prescribing, approval and reporting on performed therapy

## Teleradiology

Initially 4 locations connected (Hvar, Brač, Trogir i Vrgorac)  
Instant access to radiology pictures created on any location  
video communication for consultations and  
Coordinated simultaneous access to pictures



Document registry/repository  
(HL7 CDA documents)

# My EHR



Pharmacies across Croatia  
EMR N

...

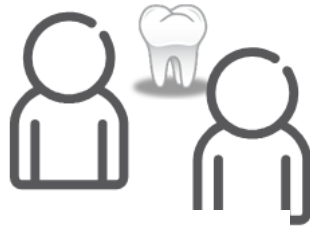


Doctors'  
application

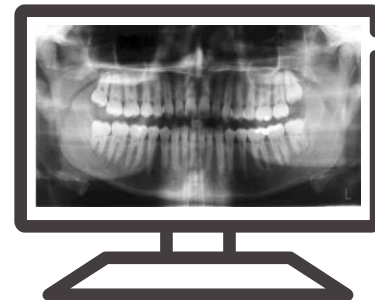
Nurses'  
application



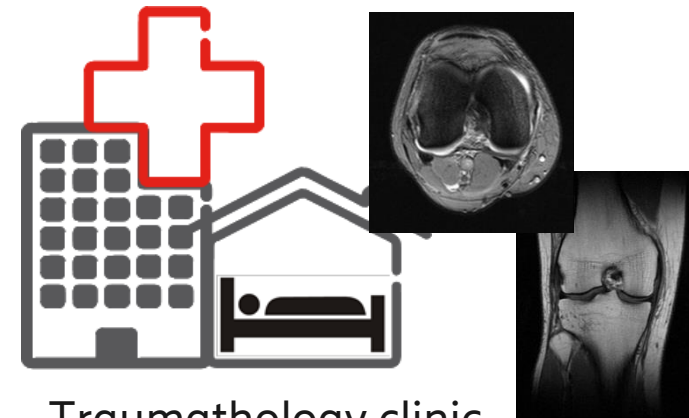
GP  
Electronic medical record  
EMR 1



Dentist  
EMR 2



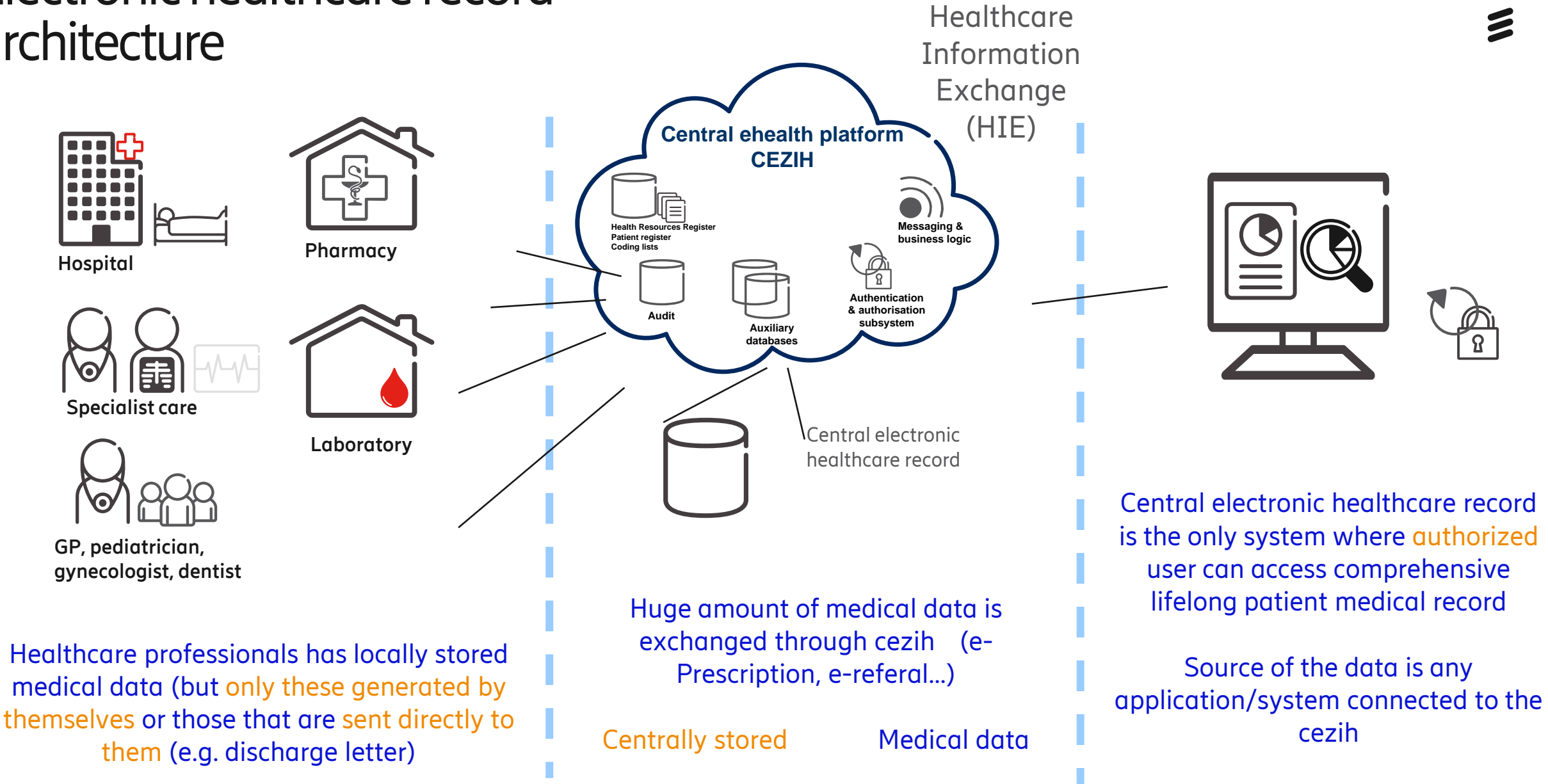
General Hospital Dubrovnik  
EMR 4



Traumatology clinic  
EMR 3



# Electronic healthcare record - architecture



# National EHR in Croatia



BLAGICA ČUDIĆ

OSNOVNI PODACI

SPOL	Ž
DOB	69
DATUM ROĐENJA	11.11.1953
MBO	129223860

IZABRANI  
LIJEČNICI

+

ALERGIJE

LIJEKOVI U 30 DANA

KRONIČNE  
BOLESTI (3/22)

—

H53.1

Subjektivni vidni...

N39

Drugi poremećaji...

H53.1

Subjektivni vidni...

Otvori sve

>

Pregled	Posjeti	Slučajevi	Nalazi	Terapija	Alergije	Cijepljenja	Propisane uputnice	Ostalo
Kronične bolesti (4/22) <div>Više &gt;</div>				Akutna stanja (4/11) <div>Više &gt;</div>				
H53.1	Subjektivni vidni poremećaji			M25.5	Bol u zglobu			
N39	Drugi poremećaji urinarnog sustava			N81.6	Rektokela			
H53.1	Subjektivni vidni poremećaji			N95	Menopauzalni i drugi perimenopauzalni poremećaji			
M17	Gonartroza /artroza koljena/			Z12.4	Specijalni skrining-pregled za otkrivanje zloćudne novotvorine g			
Lijekovi izdani u zadnjih 30 dana				Alergije				
Nema rezultata.				Nema rezultata.				
Antikoagulantna terapija				Implantati				
20.02.2019	Alergija na KLAVOCIN I HIRAMICIN, kožna reakcija, nije medicinski dokazana			Nema rezultata.				
Veći kirurški zahvati				Ostale spec. nap.				
12.12.2019	Pacijent u tijelu ima nazočan KOLJENO			20.02.2019	Napomena: Majka (58): "srce ili izljev krvi na mozak". Otac (62): ciroza			
12.12.2019	Pacijent u tijelu ima nazočan D. Arthroplastica sin.c. EPT (TEP koljena)							
12.12.2019	Pacijent u tijelu ima nazočan KOLJENO							

Pregled

Posjeti

Slučajevi

Nalazi

Terapije

Alergije

Cijepljenja

Propisane uputnice

Ostalo

Svi posjeti

Pretraži

<

Svi datumi

>

15.07.2022

Posjet liječniku OM

Slučajevi

R00 Abnormalnosti otkucaja srca

17.06.2022

Posjet liječniku OM

H53.1 • M17 • M25.5

14.06.2022

Posjet ginekologu

N90.8 • Z12.4

13.06.2022

Posjet liječniku OM

M17.0

10.06.2022

Posjet ginekologu

15.07.2022

Posjet liječniku OM

Liječnik:

TESTNI DOKTOR CR30

Ustanova:

USTANOVA TESTNI DOKTOR CR30 USTANOVA DOMA ZDRAVLJA ZA TESTIRANJE PROMOVIRANJA NOVIH FUNKCIONALNOSTI PORTALA ZDRAVLJA (900007524)

Vrsta posjete:

Posjet liječniku OM

Anamneza

-

Status

-

Dijagnoze

R00 Abnormalnosti otkucaja srca

Preporuka liječnika

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Anamneza

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Status

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Dijagnoze

# National patient portal in Croatia

Web portal ([portal.zdravlje.hr](https://portal.zdravlje.hr))

The screenshot shows the home page of the e-Građani portal. The top navigation bar is red with the e-Građani logo and links for filtering services, user profile, and login. The main content area is titled "DOBRO DOŠLI na Portal zdravlja za pacijente". It features a sidebar with navigation links: Početna stranica, COVID-19, Posjeti, Komunikacija, Uputnice, Naručivanje, Lijekovi, Obnova lijekova, Laboratorijski nalazi, Specijalistički nalazi, and Postavke. The main content area is divided into several sections: "POSJETI" (Visits) with a list of visits to a general practitioner; "UPUTNICE" (Instructions) with a link to view e-instructions; "NARUČIVANJE" (Booking) with a link to view appointments; "IZABRANI LIJEČNICI" (Selected Doctors) with a link to view primary care doctors; "LIJEKOVI" (Medications) with a list of medications; "OBNOVA" (Renewal) with a link to renew prescriptions; "LABORATORIJSKI" (Laboratory) with a link to view laboratory results; and "SPECIJALISTIČKI" (Specialist) with a link to view specialist results.

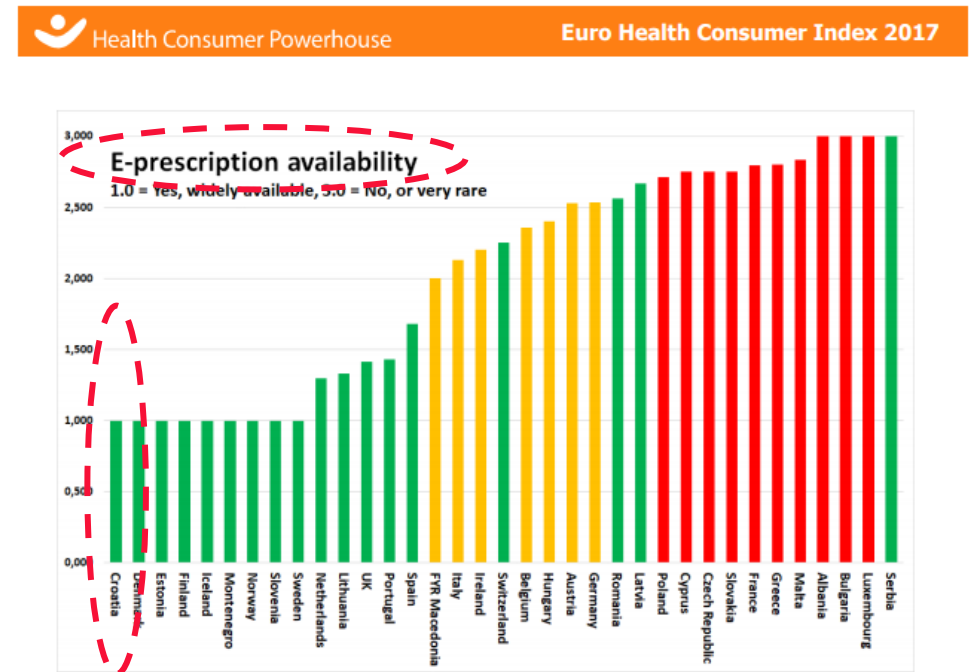
The screenshot shows the COVID-19 section of the e-Građani portal. The top navigation bar is red with the e-Građani logo and links for filtering services, user profile, and login. The main content area is titled "COVID-19 Cijepljenje i testiranje". It features a sidebar with navigation links: Početna stranica, COVID-19, Posjeti, Komunikacija, Uputnice, Naručivanje, Lijekovi, Obnova lijekova, Laboratorijski nalazi, Specijalistički nalazi, and Postavke. The main content area is divided into several sections: "Digitalna potvrda EU-a za COVID" (Digital EU COVID certificate), "Naručivanje za cijepljenje protiv COVID-19" (Booking for COVID-19 vaccination), "Ostvarena cijepljenja" (Completed vaccinations), "VAŠA TESTIRANJA" (Your tests), "28.05.2021. PCR test" (PCR test), "21.05.2021." (21.05.2021.), "PROIZVOĐAČ" (Manufacturer), "NAZIV CJEPIVA" (Vaccine name), "OZNAKA DOZE" (Dose label), "VRSTA CJEPIVA" (Vaccine type), "SERIJA CJEPIVA" (Vaccine series), "USTANOVA" (Institution), "CJEPIO/LA" (Vaccinated by), and "21.05.2021." (21.05.2021.).

The screenshot shows the Vaccination section of the e-Građani portal. The top navigation bar is red with the e-Građani logo and links for filtering services, user profile, and login. The main content area is titled "NARUČIVANJE na pregledu i pritrage". It features a sidebar with navigation links: Početna stranica, COVID-19, Posjeti, Komunikacija, Uputnice, Naručivanje, Lijekovi, Obnova lijekova, Laboratorijski nalazi, Specijalistički nalazi, and Postavke. The main content area is divided into several sections: "Naručivanje kod liječnika primarne zdravstvene zaštite" (Booking with primary care doctor), "Naručivanje za cijepljenje protiv COVID-19" (Booking for COVID-19 vaccination), "VAŠE NARUČBE" (Your bookings), "NEMATE AKTIVNIH NARUČBI..." (You have no active bookings...), "PROŠLE I OTKAZANE NARUČBE:" (Previous and cancelled bookings:), "20.07.2021. u 14:00" (20.07.2021. at 14:00), "Pfizer/BioNTech COVID cijepljenje - druga doza" (Pfizer/BioNTech COVID vaccination - second dose), "USTANOVA INZ - RTS" (Institution INZ - RTS), "15.07.2021. u 10:30" (15.07.2021. at 10:30), "Prvi pregled infektologa" (First visit to an infectious disease specialist), "USTANOVA INZ - RTS" (Institution INZ - RTS), "08.07.2021. u 12:40" (08.07.2021. at 12:40), "1. IZBOR ORDINACIJE" (1. Selection of appointment), "2. IZBOR TERMINA" (2. Selection of time), "3. POTVRDA TERMINA" (3. Confirmation of appointment), "DAN" (Day), "29.11.2021. Ponedjeljak" (29.11.2021. Monday), "SAT" (Saturday), "18:00 - 18:10", "18:10 - 18:20", "18:20 - 18:30", "18:30 - 18:40", "18:40 - 18:50", "18:50 - 19:00", "19:00 - 19:10", "19:10 - 19:20", "19:20 - 19:30", "19:30 - 19:40", "19:40 - 19:50", "19:50 - 20:00", "RAZLOG" (Reason), "razlog posjeta (opcionaino)" (reason for visit (optional)), "PROŠLI KORAK" (Previous step), "IDUĆI KORAK" (Next step).

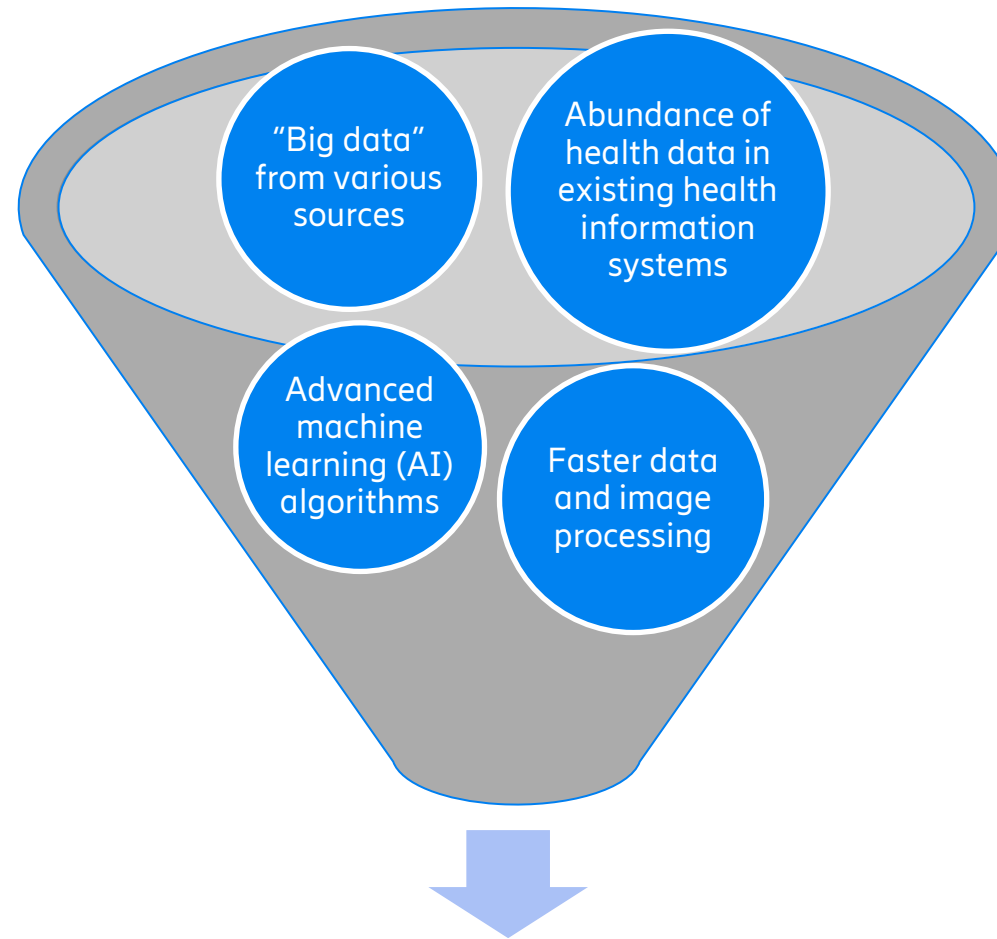


# National eHealth information systems

## Our experiences







**Predictive health analytics**  
**Improved healthcare decision support**  
**Advanced clinical trials**

# Lessons with national healthcare information systems learned so far...

In general:

- There are no “one-size-fits-all” solutions.
- There are no “silver bullets” or universal solutions.
- Not all pain points should be addressed simultaneously.
- It's not about technology, it's about processes.

# EU Single Market



More info at <https://single-market-economy.ec.europa.eu>

Public procurement is enormously formal but there are ways to deal with that fact....

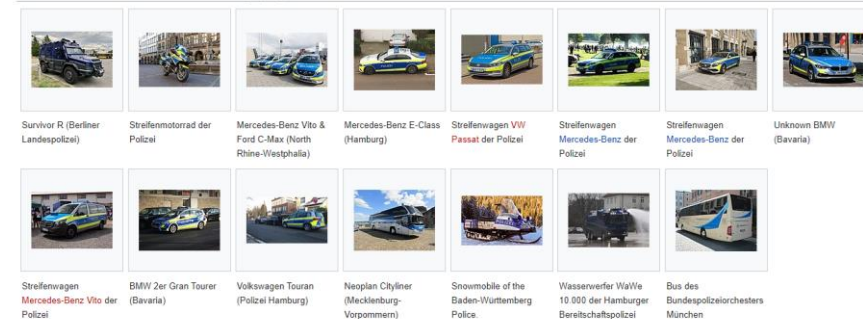
EU Public Procurement is conducted within harmonized EU single market which makes it easy (or easier) to participate due to similar (or identical) basic rules and CPV (Common Procurement Vocabulary).

## Police vehicles in Germany

From Wikimedia Commons, the free media repository

Deutsch: Deutsche Polizeifahrzeuge, auch historisch

New blue-silver and blue-white livery [\[ edit \]](#)



# Neighbouring countries...



1. Some countries outside EU tend to harmonize their Public procurement systems with EU rules (Candidates countries + EU neighborhood policy) and that makes participation somewhat easier than in those markets/countries with rules completely different than in EU.
2. There is a need for standardization of rules in different markets outside EU in order to achieve benefits arising from healthy multinational/multiregional competition in Public Procurement.
3. Closed and restricted markets with isolated and specific rules can not expect best value for public money (barriers).
  - Overt: Tariffs, Set-aside programs, Buy-national provisions, Price preference for local, Direct to local
  - Covert: Obligation to supply products with local inputs, Obligation to have subsidiaries in the country to bid, Language barriers, Bureaucracy,



<https://www.ericsson.hr/>