

2:00pm Forum: regional, national and international experiences

(Room Louis Armand)



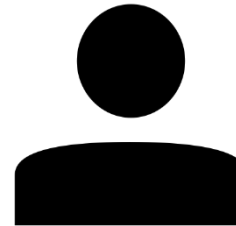
Moderator:
Francesca Colombo
Head of the Health Division, OECD
(IT)
[@OECD_Social](#)



Ran Balicer
MD, PhD, MPH
Director, Clalit
Research Institute
(ISRAEL)
[@RanBalicar](#)



Harpreet Sood
MD, Associate
Chief Clinical
Information
Officer, NHS
England (UK)
[@hssood](#)



Donglei Feng
Phd, Wan Da
Fullway Healthcare
(China)



Ain Aaviksoo
Deputy Secretary
General for E-services
and Innovation, Ministry
of Social Affairs of the
Republic of Estonia
(EST)
[@ainaaviksoo](#)

Organised by



Healthcare improvement through data: Innovation in practice

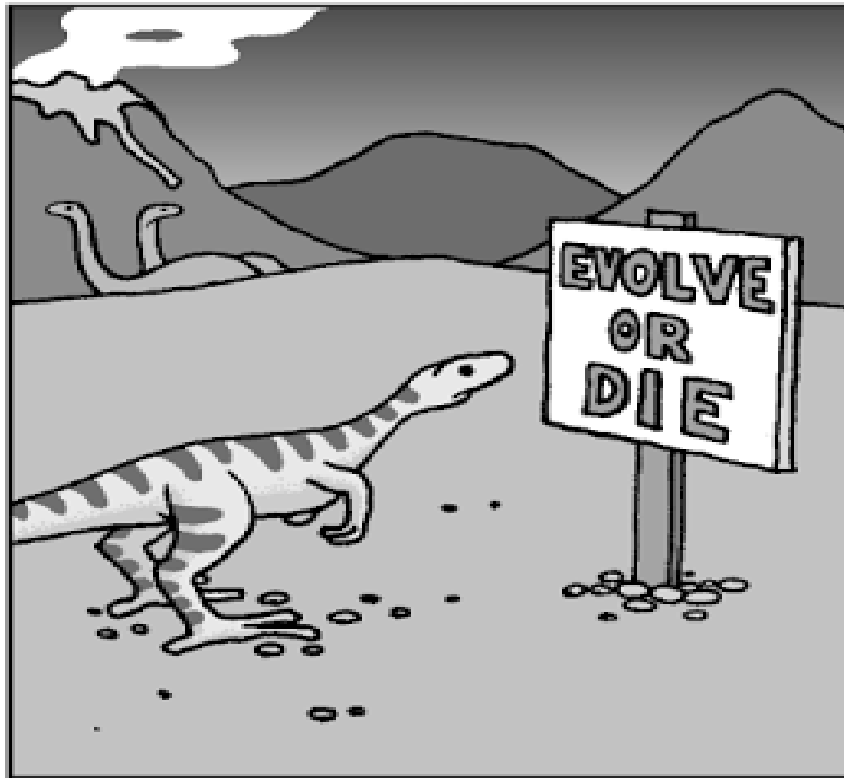
Prof. Ran Balicer MD, PhD, MPH

Director, Health Policy Planning, Clalit Healthcare Services, Israel

Director, Clalit Research Institute, Israel

Chair, Israel Society for Quality in Healthcare

Where we are



Why 500 startups in digital health? Israel's 4 I's



[Digital health nation: Israel's global big data innovation hub.](#)

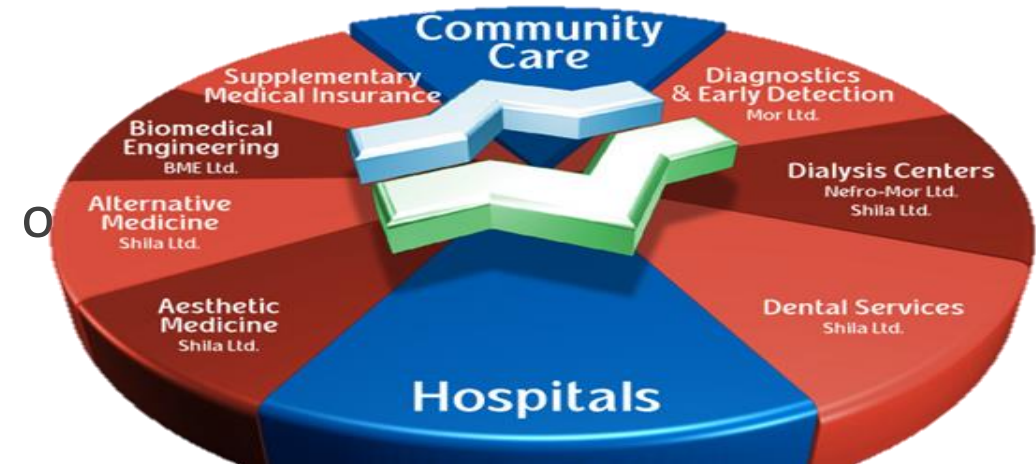
Balicer RD, Afek A.

Lancet. 2017 Jun 24;389(10088):2451-2453.

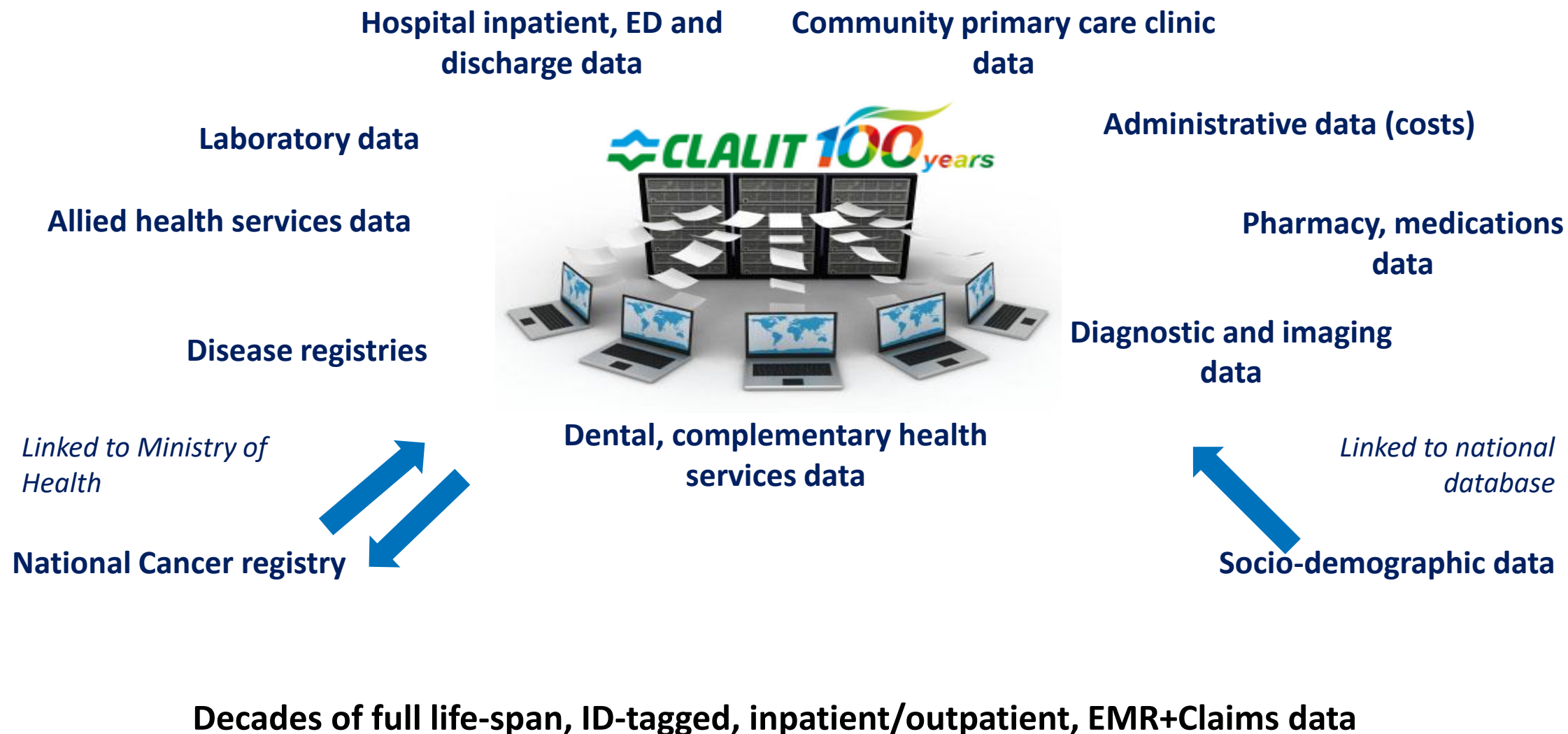
THE LANCET

Clalit Health Services: Israel's integrated Sick Fund

- » **Established 1911**
- » **53% market share** - 4.2 million members
 - Over-representing low SES, minorities, elderly
- » **All services under one 'roof'**
 - >1,500 community clinics
 - 30% of Israel hospital beds
 - National leader in tele-care,



Data integration at Clalit (>50% of Israelis, 4.3M)



Ideation is cheap, Implementation is hard



Translation: Closing the research-practice gap



» Interdisciplinary innovation incubator, since 2010

- Data scientists, Clinicians, epidemiologists...

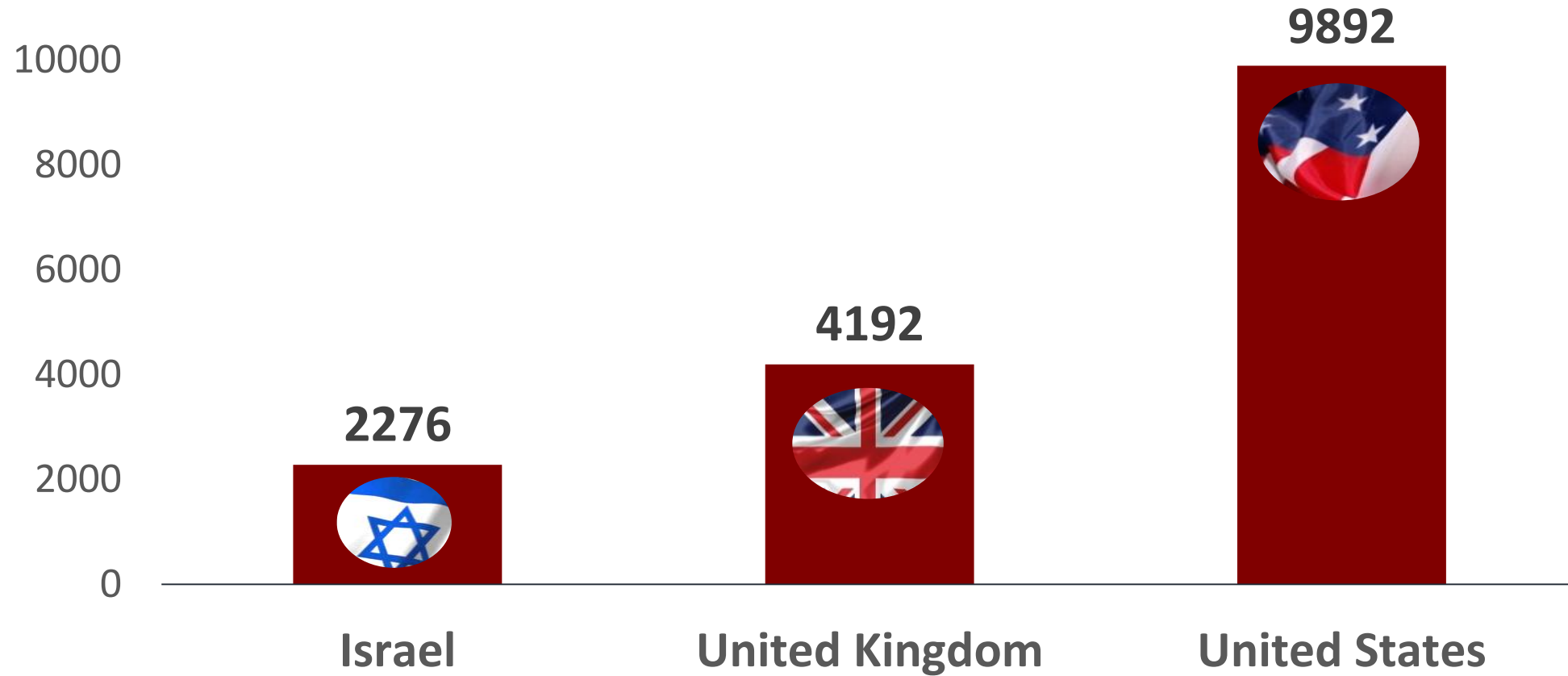
» Mandate: Turn data to insights, insights to tools

- Real-life Effectiveness / Outcomes Research
- Advanced analytics and predictions
- Data-driven care models design

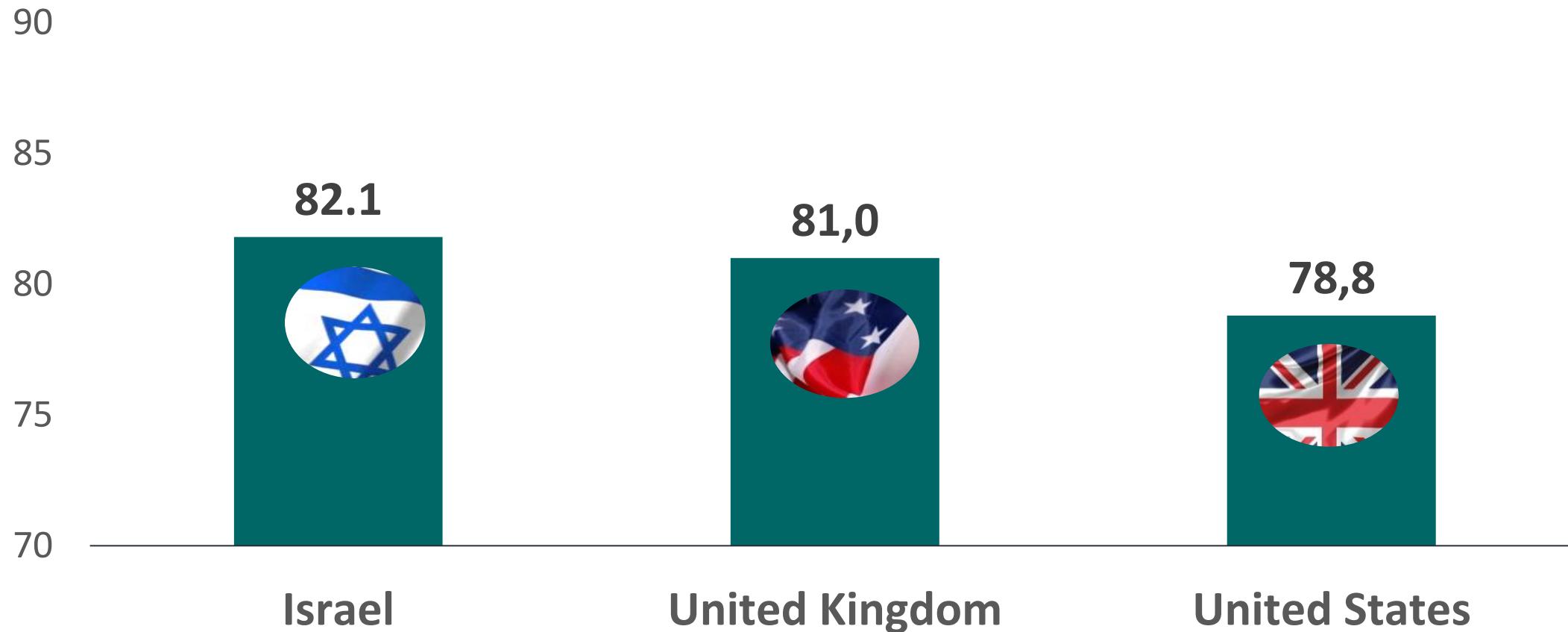
» Rapid Translation: research -> practice



Health expenditure per capita as PPP\$



Life expectancy at birth



Transforming care through data



Proactive care: preventing deterioration



Improving **test interpretation** accuracy



De-vesting futile interventions & policies



Precise Tx: Tx selection by personal expected impact



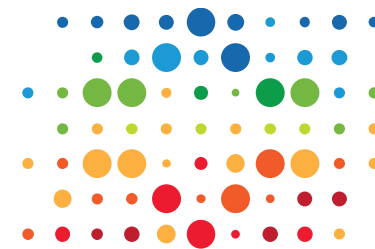
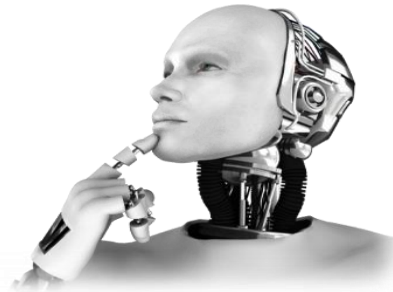
Safeguards from error & missed care opportunities



Patient self-care decision support

Innovation in practice



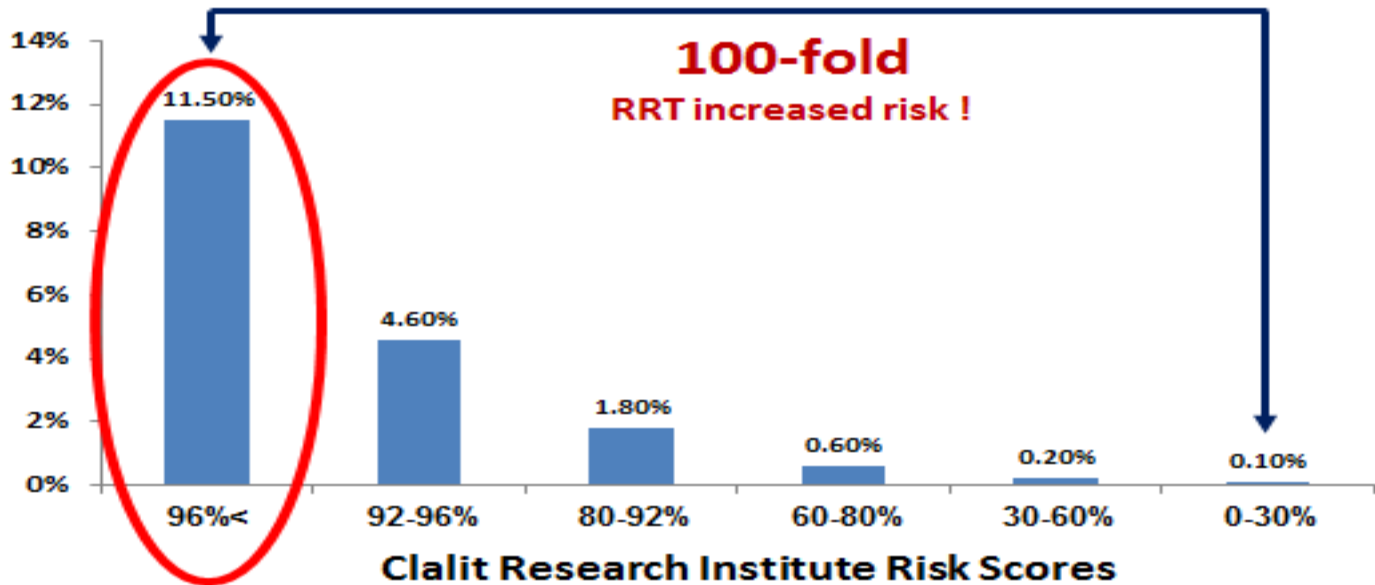


Clalit
Research
Institute

Predictive care: Preventing Renal Failure



5-year deterioration rates to RRT
among CKD stage 3 patients, Clalit



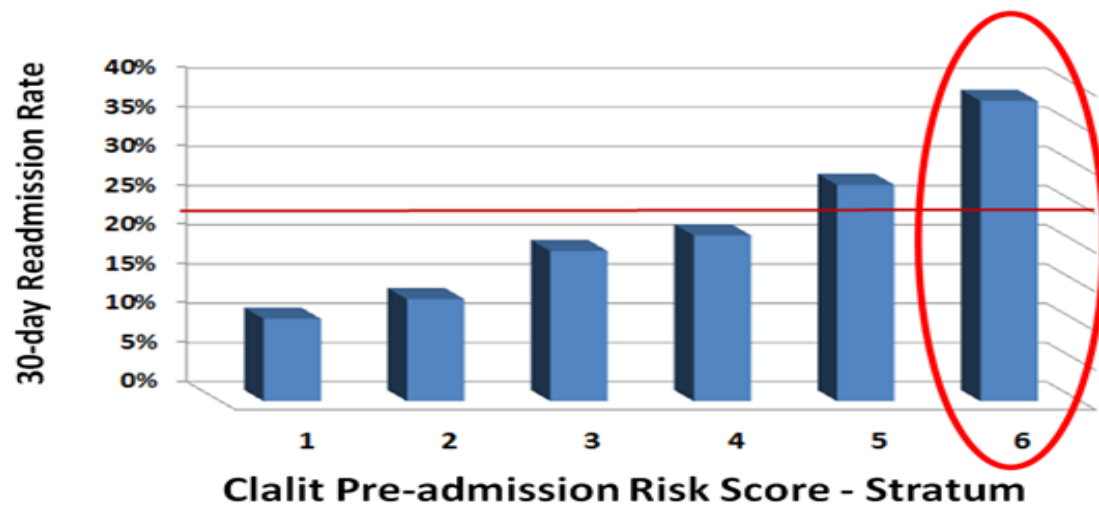
Readmissions prevention



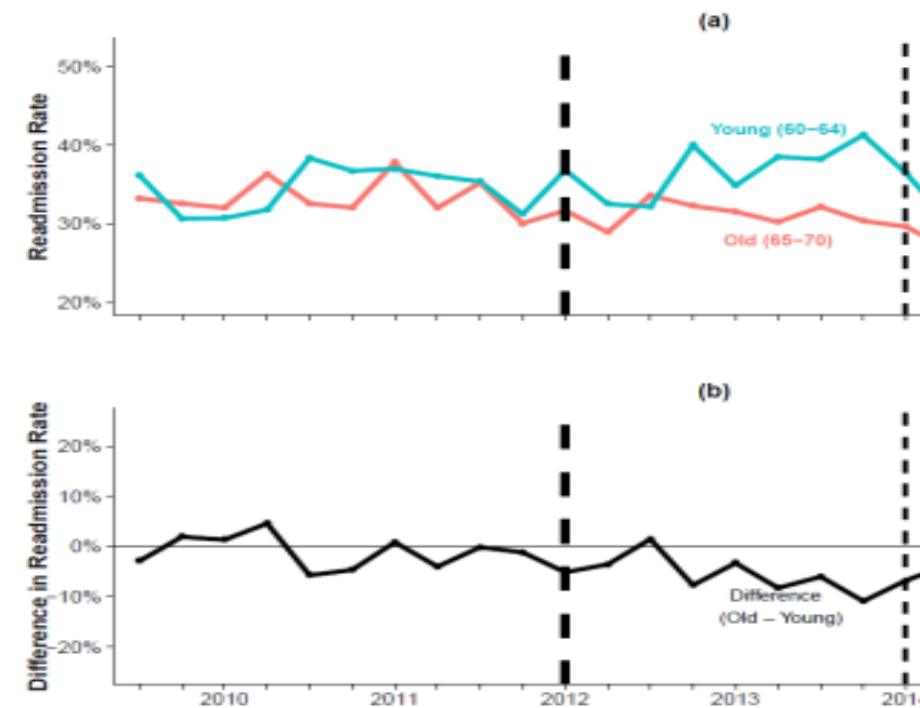
Predict Readmission -> Integrated action

Predicting 30-Day Readmissions With Preadmission Electronic Health Record Data

Efrat Shadmi, PhD,† Natalie Flaks-Manov, MPH,† Moshe Hoshen, PhD,† Orit Goldman, PhD,† Haim Bitterman, MD,†‡ and Ran D. Balicer, MD, PhD†§*



Outcome: 12% reduction



Are we providing futile care?



Medscape Multispecialty ▾
News & Perspective Drugs & Diseases CME & Education

Journal Watch > Journal Watch (General)

Pneumococcal Polysaccharide Vaccine: Efficacy Remains Controversial

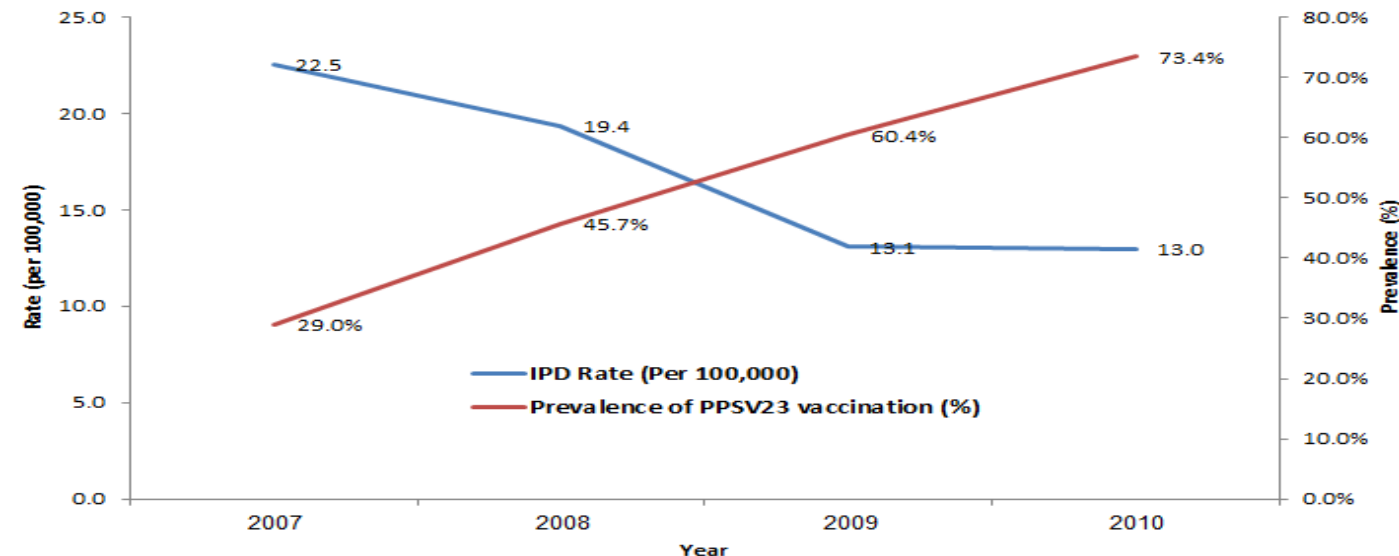
Allan S. Brett, MD

[Disclosures](#)



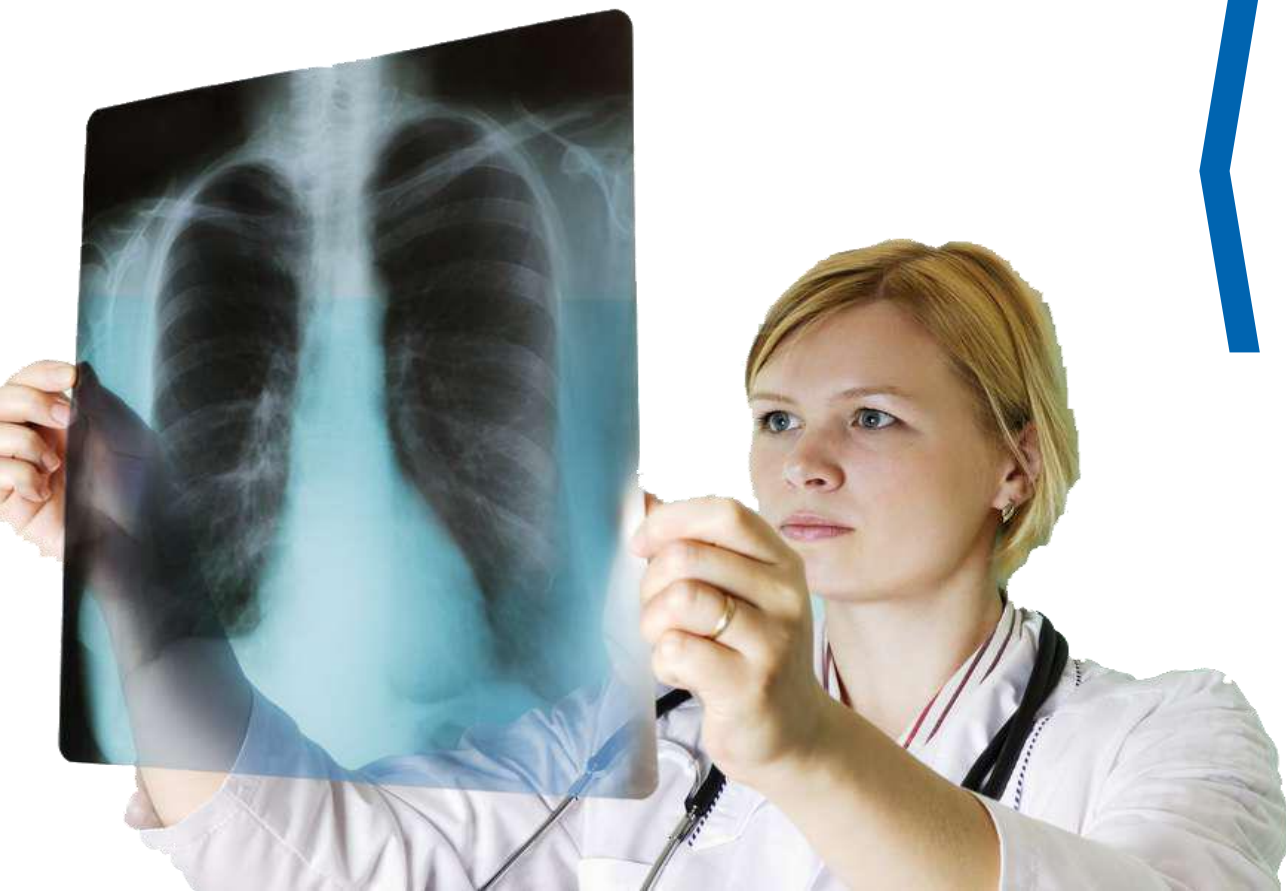
Harnessing real-world evidence from EMRs

IPD rate (per 100,000) and prevalence (%) of PPSV vaccination in Clalit Members (65+ year old)

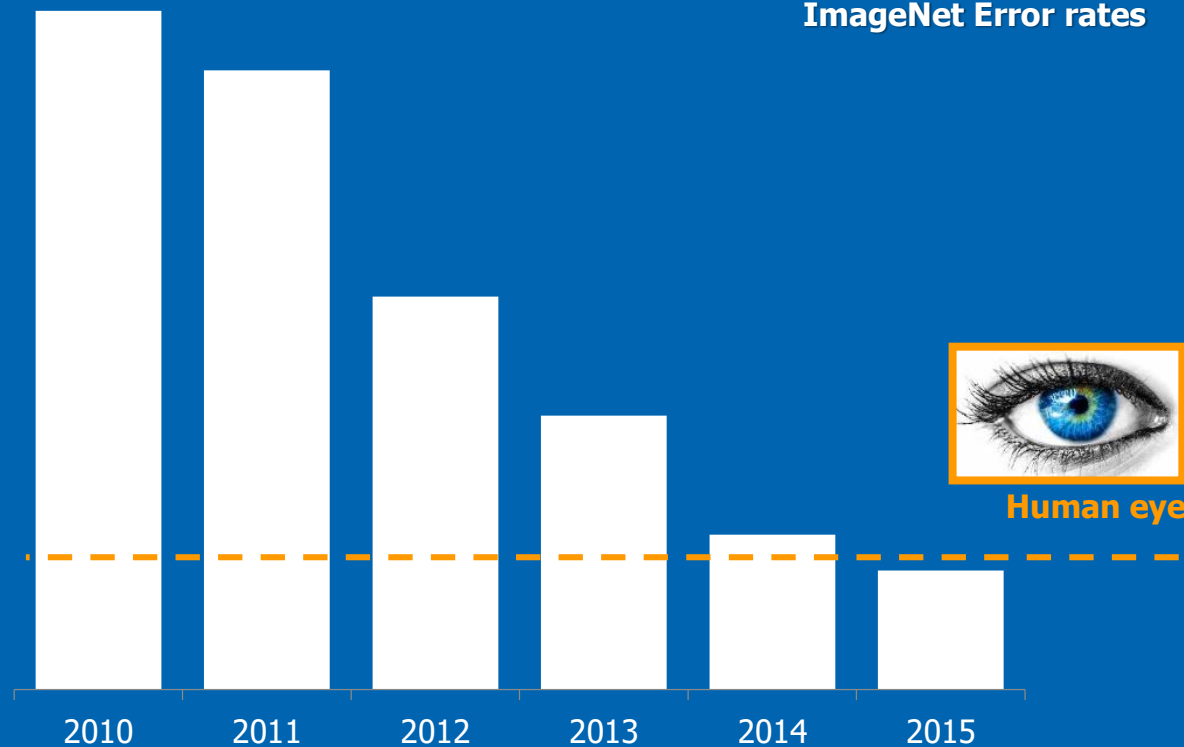


Computerized

vision

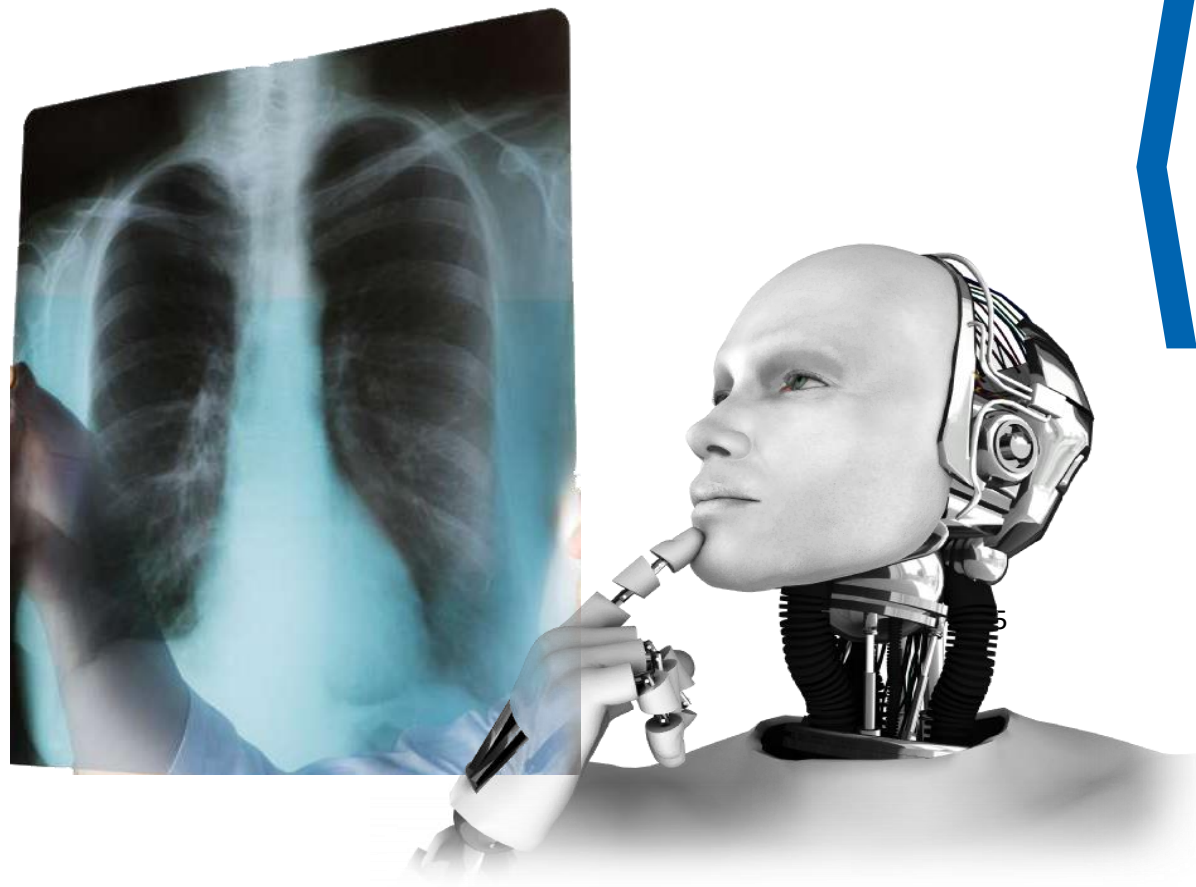


ImageNet Error rates

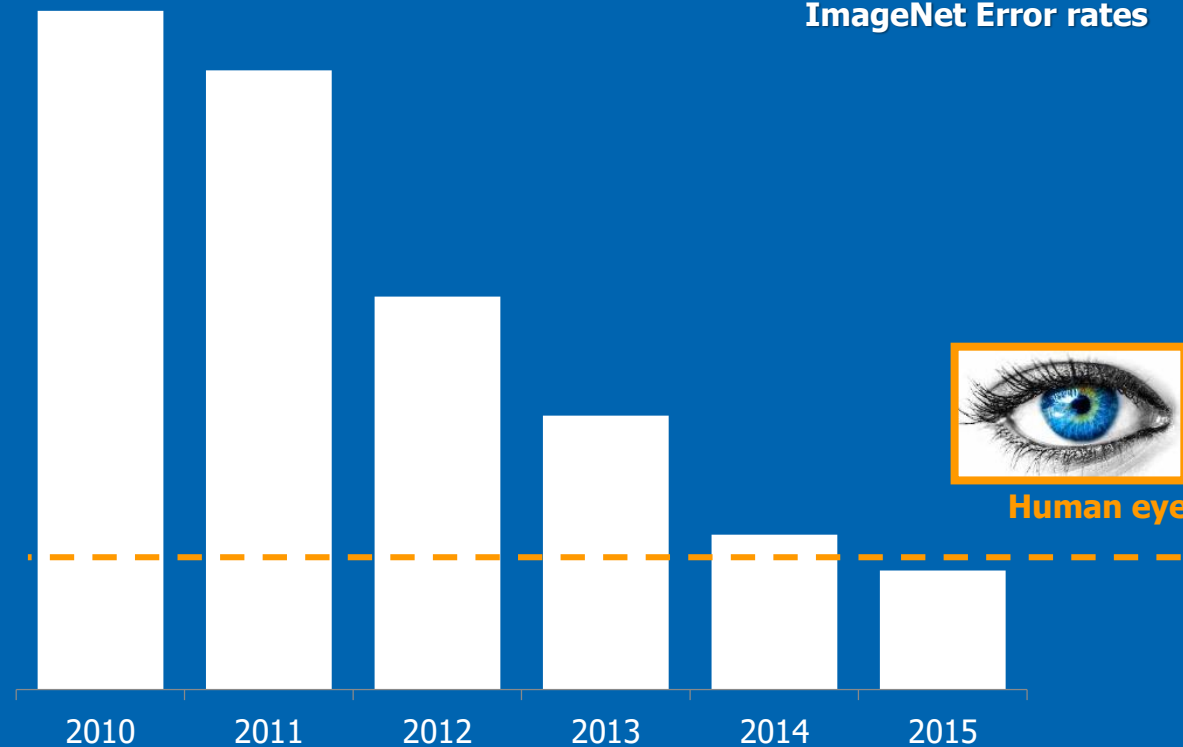


Computerized

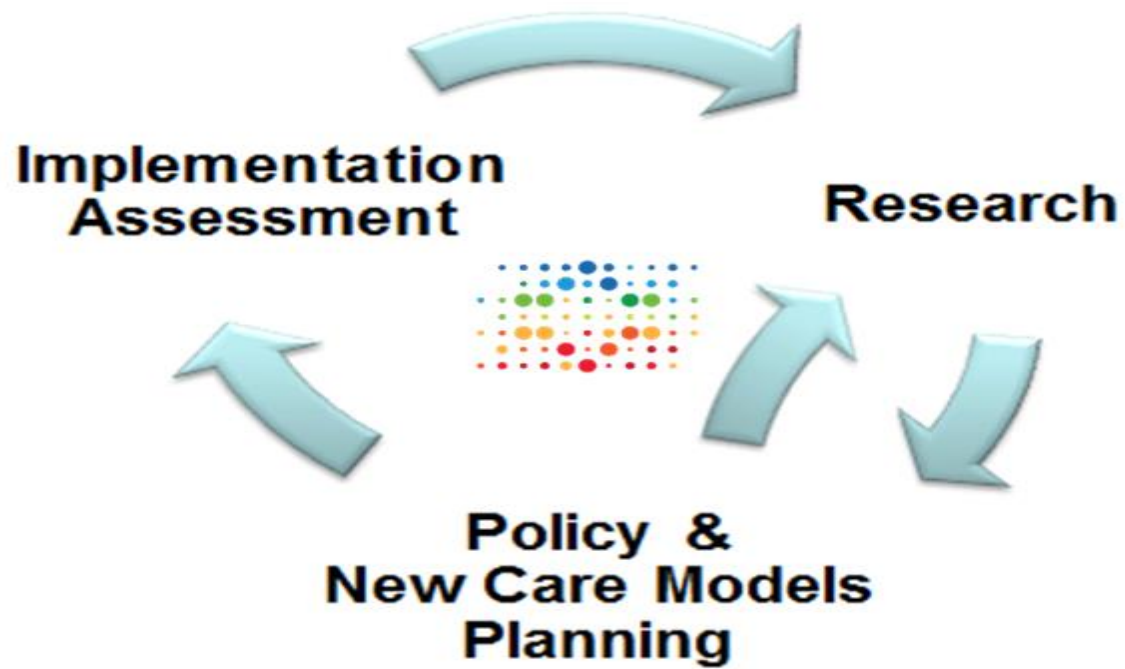
vision



ImageNet Error rates



Innovation in practice



START-UP NATION
The Story of Israel's Economic Miracle



Clalit
Research
Institute

Getting more out of available tests

YAHOO! FINANCE

Finance Home Originals Events Personal Finance Technology Markets Industries

Zebra Medical Vision And Clalit Health Services Announce Algorithm That Can Increase Osteoporosis Detection By 50%

Business Wire November 28, 2016



OSTEOPOROSIS

zebra MEDICAL VISION | CLALIT

- 1 of 3 female, 1 of 5 male
- \$18B annual cost in the US
- 20% mortality post first fracture

(Photo: Zebra Med) [Multimedia Gallery URL](#)

SHEFAYIM, Israel--(BUSINESS WIRE)--

Zebra Medical Vision (<https://www.zebra-med.com>) and Clalit Health Services are announcing the completion of a software algorithm which uses existing CT data to identify candidates for bone density screening, allowing earlier identification of patients



Precision medicine is not just omics



Age

Sex

Weight ()

Height ()

Black Race

Smoking Status

Systolic blood pressure (mmHg)

Blood pressure lowering medications (number)

Cardio-vascular disease (clinical or subclinical)

eGFR (mL/min/1.73 m²)

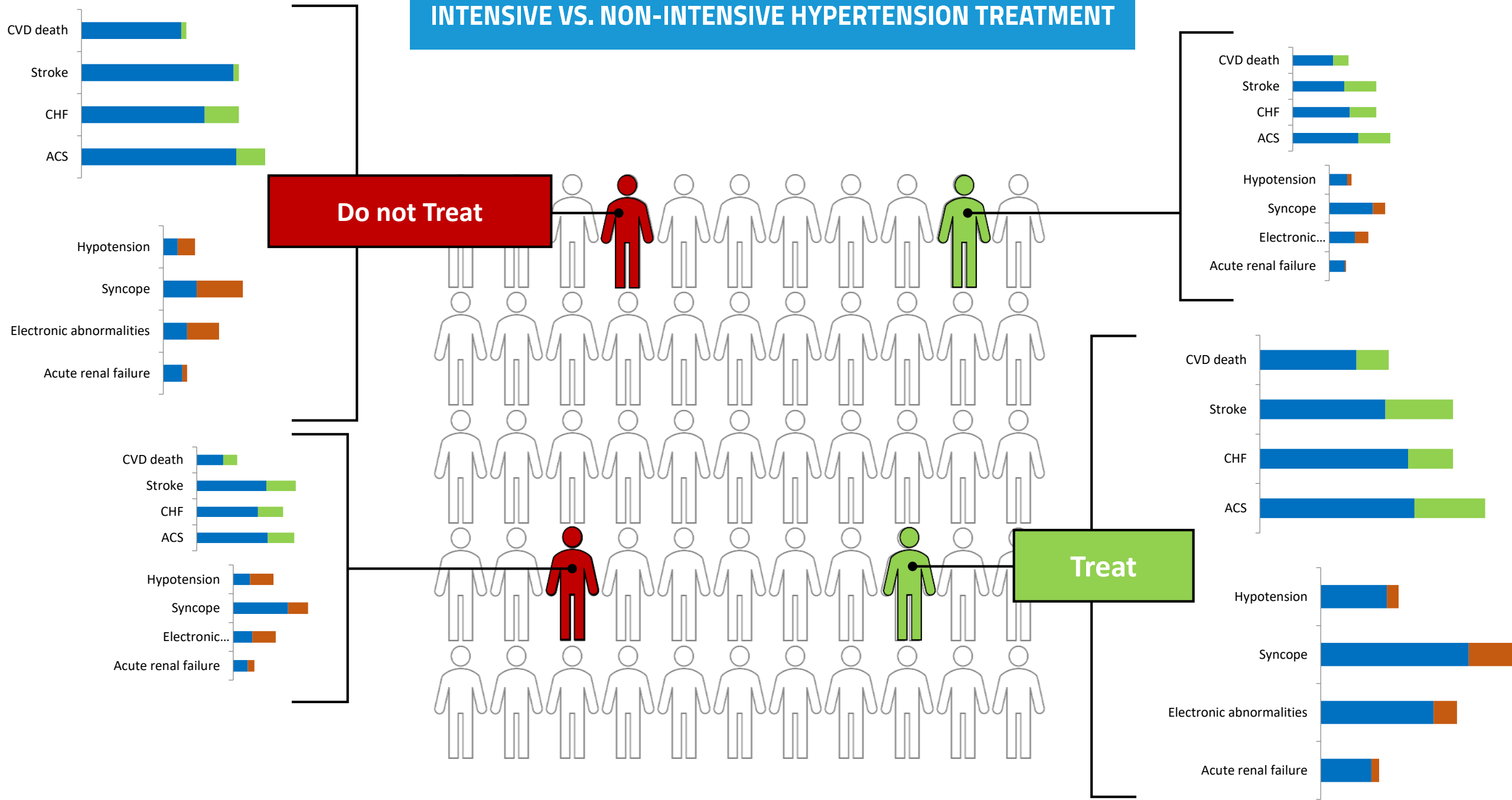
Total cholesterol ()

High density cholesterol (HDL) ()



I-PREDICT HTN Individualized Predictive Risk Evaluation & Decision Integration Clinical Tool for Hypertension

INTENSIVE VS. NON-INTENSIVE HYPERTENSION TREATMENT



ENTER PATIENT'S DATA

Age	<input type="text" value="78"/>	Black Race	<input type="text" value="No"/>	Cardio-vascular disease (clinical or subclinical)	<input type="text" value="No"/>
Sex	<input type="text" value="Female"/>	Smoking Status	<input type="text" value="Former Smoker"/>	eGFR (mL/min/1.73 m²)	<input type="text" value="47"/>
Weight (<input type="text" value="Kg"/>)	<input type="text" value="77"/>	Systolic blood pressure (mmHg)	<input type="text" value="155"/>	Total cholesterol (<input type="text" value="Mg/dL"/>)	<input type="text" value="212"/>
Height (<input type="text" value="M"/>)	<input type="text" value="1.63"/>	Blood pressure lowering medications (number)	<input type="text" value="0"/>	High density cholesterol (HDL) (<input type="text" value="Mg/dL"/>)	<input type="text" value="75"/>



CALCULATE RISK

* For a time period of 3 years

■ Initial risk ■ Individual Absolute risk reduction (iARR) ■ Individual Absolute risk increase (iARI) **iNNT/H:** individual Number Needed to Treat/Harm

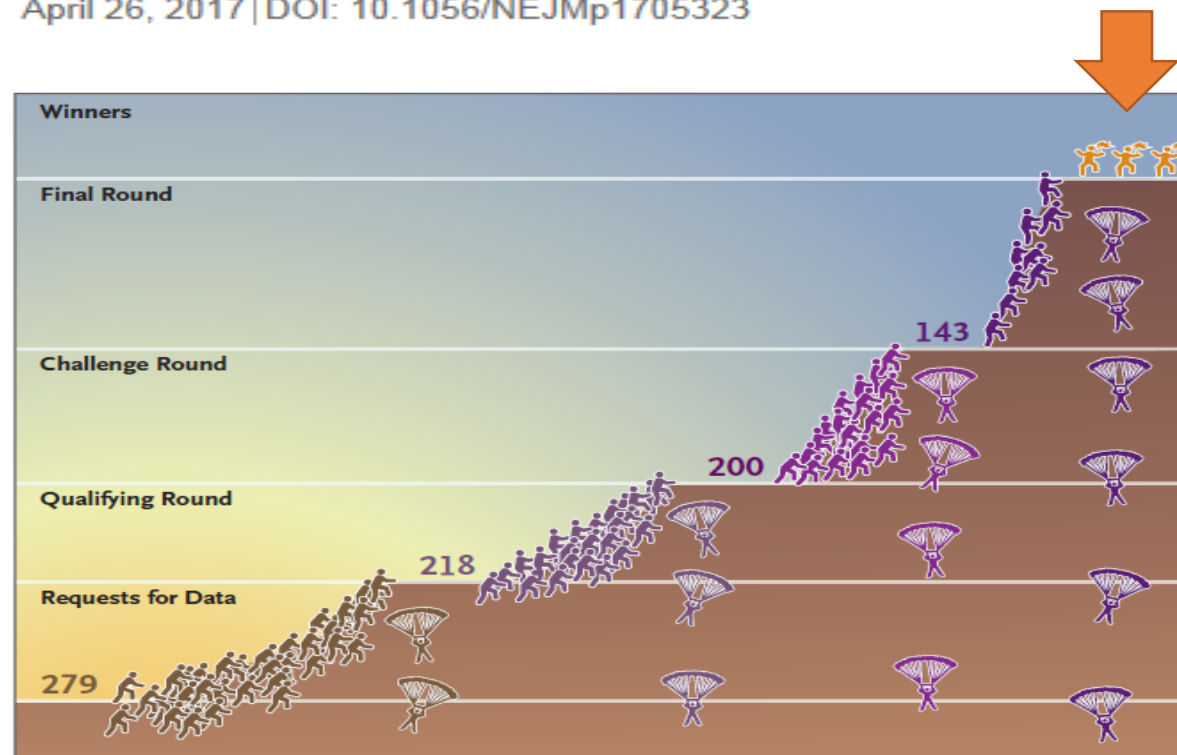


HOME ARTICLES & MULTIMEDIA ▾ ISSUES ▾ SPECIALTIES & TOPICS ▾ FOR AUTHORS ▾

Learning What We Didn't Know — The SPRINT Data Analysis Challenge

Nancy S. Burns and Pamela W. Miller

April 26, 2017 | DOI: 10.1056/NEJMp1705323



ognized experts who represented the three primary constituencies — clinical trialists, data analysts, and patients. In addition to being reviewed by one representative from each constituency, all entries were opened to the public for voting.

The team that won first place was made up of physicians and data analysts from the Clalit Research Institute in Tel Aviv, Israel. They developed a weighted risk-benefit calculator for examining the pluses and minuses of intensively treating an individual patient with hypertension. The second

SPRINTing to the Finish.

A total of 279 groups requested data from BioLINCC, 218 individuals and teams entered the qualifying round, 200 qualified, and 143 of the entries to the Challenge round were judged.

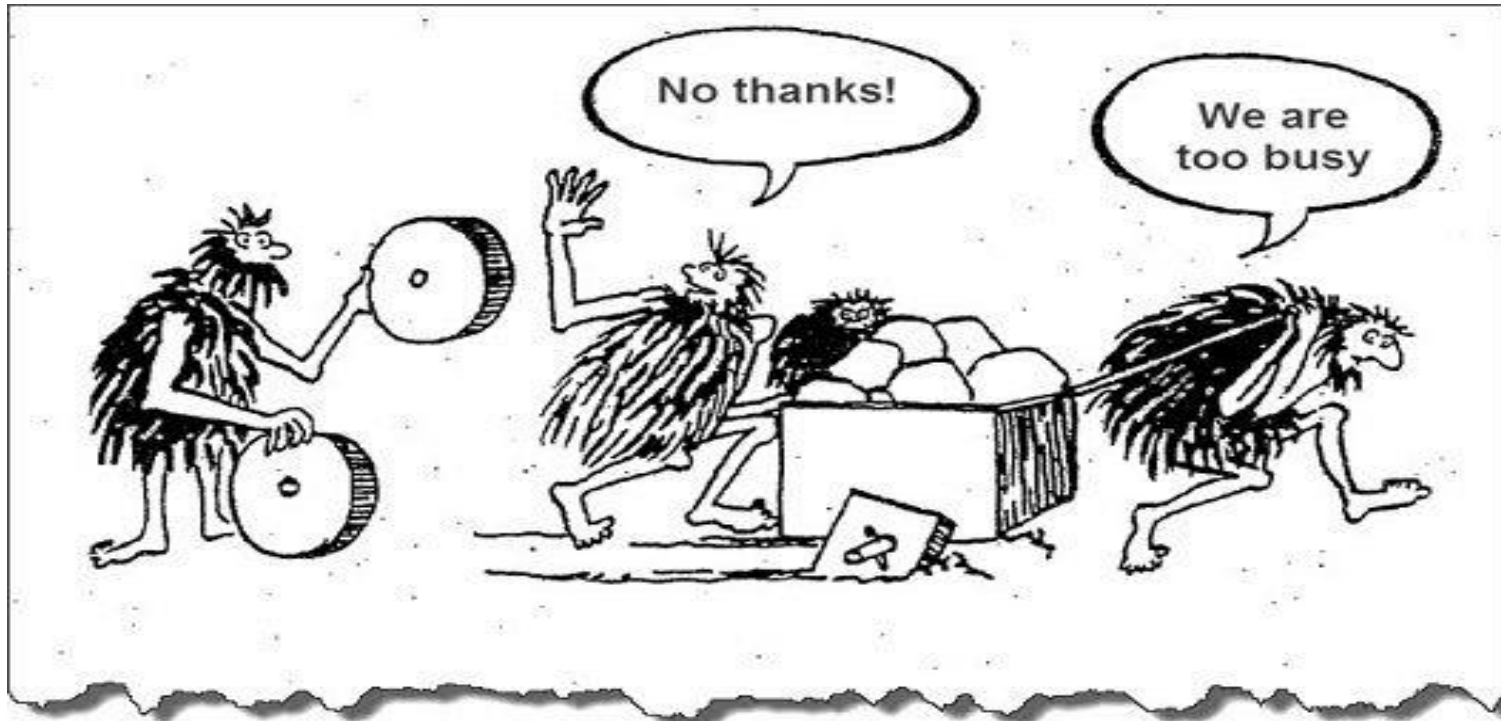


Innovation? Tackle workflow engineering first



- » Change guidelines
- » Validate new guideline
- » Assess workflow & impact
- » **Plan, address all scenarios**
- » Embed in EMRs / IT
- » Educate providers
- » **Support change**
- » Feedback loops
- » Monitoring / trial?

Practice: Clinician uptake



Ideation is easy, Transformation is hard

» Before brining solutions, ascertain the problem

- Who's problem? Who will likely view your solution as a problem?
 - « Was the problem not yet solved because of missing technology?
- Aim to start with “Quadruple Aim” win-wins

» AI is not a panacea

- The effectiveness shown is (still) quite limited to specific types of tasks
- Radiology and pathology will be disrupted first
- It may take more time than we think for other clinical domains

We have so much more to do, **together**

“It is not enough to do your best;
you must know what to do, and
then do your best.

W. Edwards Deming

Contact: rbalicer@clalit.org.il





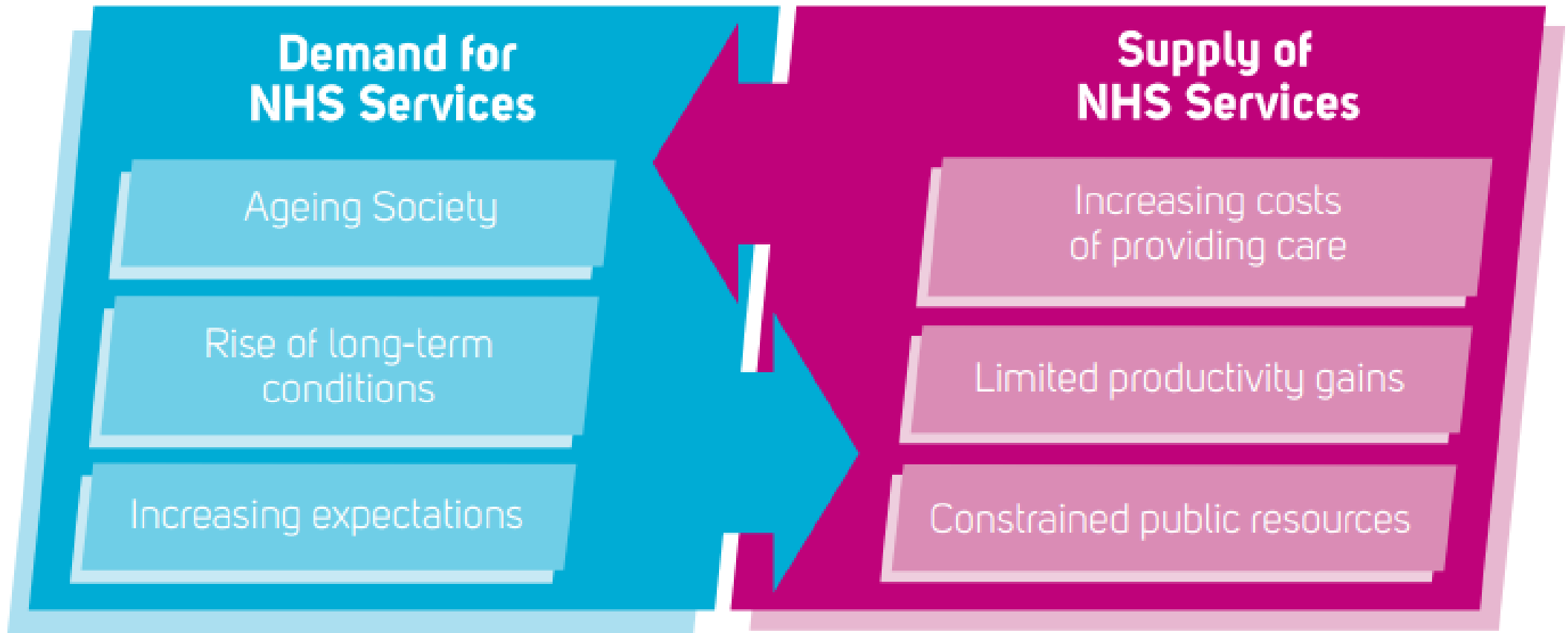
Our digital vision for patients, staff and citizens

Dr Harpreet S Sood, Associate Chief Clinical Information Officer
NHS England

@hssood

hsood@nhs.net

The NHS is facing both demand and supply side challenges



The future NHS

The Forward View identifies three 'gaps' that must be addressed:

1 'Health & wellbeing' gap

- Back national action on major health risks
- Targeted prevention initiatives e.g. diabetes
- Much greater patient control

2 'Care & quality' gap

- Neither 'one size fits all', nor 'thousand flowers'
- A menu of care models for local areas to consider

3 'Funding' gap

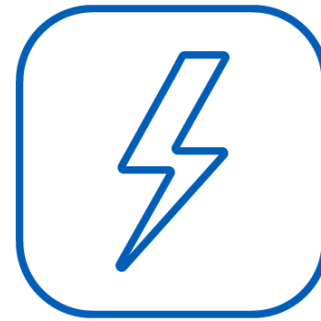
- Implementation of these care models and other actions could deliver significant efficiency gains
- An additional funding requirement for the next government

Our aim

To help achieve
the objectives set
out in the NHS
Five Year Forward
View:



**Improve
health
outcomes**



**Increase
efficiency**



**Improve
the patient
experience**

... the challenge

- To respond to this ***new disease paradigm*** we need to change our thinking...
 - Shift of focus from traditional acute episodic disease models
 - Engage & empower patients more effectively
 - Embrace disease prevention

The placemat

Better Health, Better Care, Lower Cost				
Empower People	Enable Clinicians	Integrate the Health and Care System	Better Management Information	Build the Future
NHS.UK	Global Digital Exemplars and Fast Followers	Regional Interoperability Hubs	Single Source of Truth	Life Sciences and Research Platform
Apps Library	Digital Academy and Workforce Education	Urgent and Emergency Care	Frictionless Performance Management	Genomics and Precision Medicine
Developers' Ecosystem	GPSoc refresh	Elective Care	Population Health Dashboard	Machine Learning and AI
WiFi and Home Page	Extended Summary Care Record	Mental Health	Analytics Capability	Bioinformatics Institute
NHS Online	e-Prescribing	Women and Children	SUS for Transactions	
	Decision Support	Chronic/Co-morbid disease		
	Integrated Care Plans	Social Care		
← Foundational Infrastructure Projects →				
Patient Identity				
Information Governance and Transparency				
Interoperability and Enterprise Architecture				
Personal Health Record and APIs for Apps				



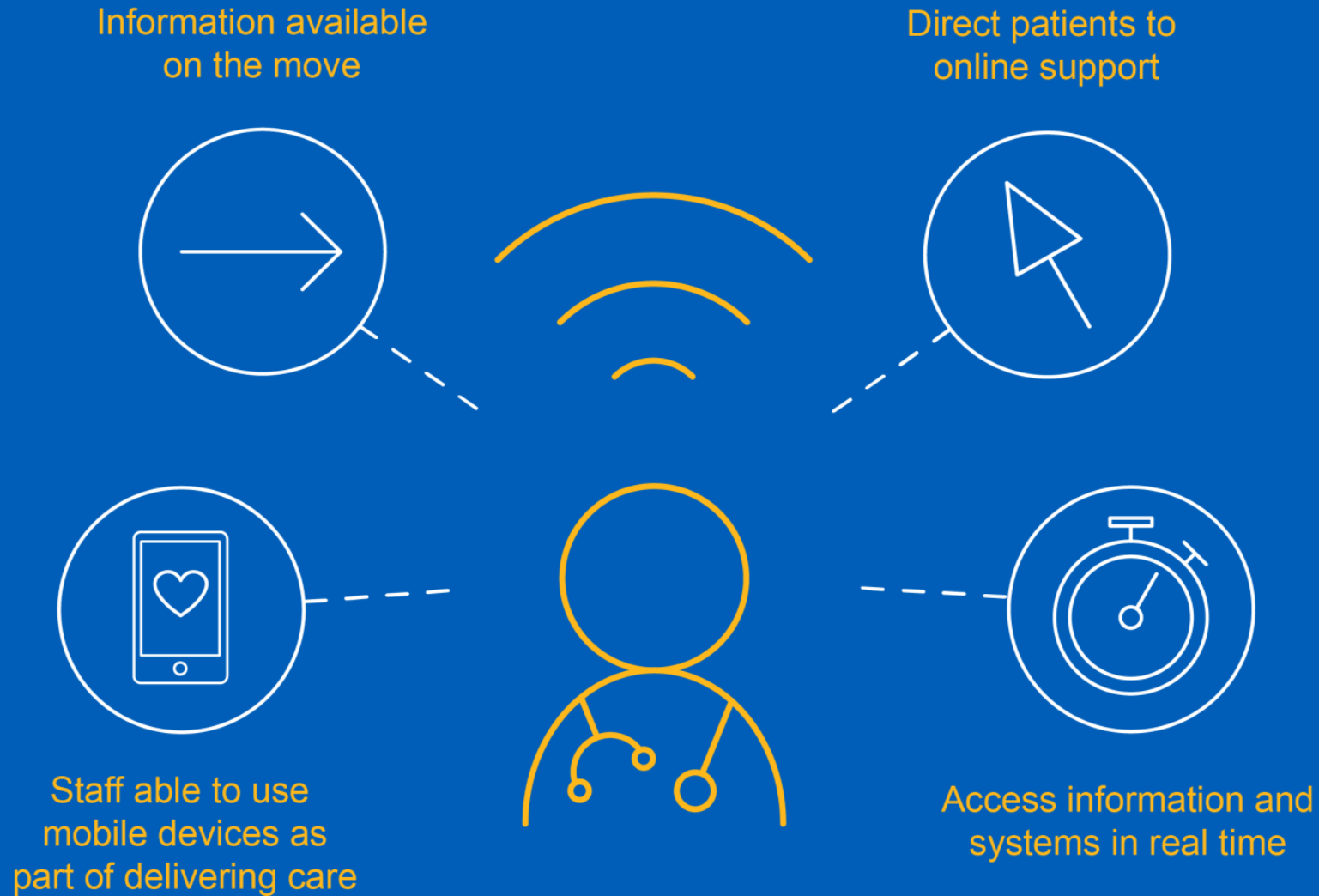
86% of adults in UK use the internet - only 2% report using it for healthcare

NHS Choices – nearly 50 million visits a month

£4.2 billion to spend on technology

However need to be inclusive...

Opening up digital opportunities for clinicians



Opening up digital opportunities for patients



Development of infrastructure in secondary care

- 23 'Global Digital Exemplar (GDEs)' sites:
 - Acute care
 - Mental health
 - Community health
- 18 Fast Followers – learn from GDEs

The Digital Academy

- Imperial College London, University of Edinburgh & Harvard Medical School
- Specialist IT training & development support to professionalise
 - Chief Clinical Information Officers & Chief Information Officers
 - Aspirant digital leaders
- Training and developing 300 digital leaders

NHS Online: Our digital vision for patients

We need a single point of entry that will provide the same digital experience for patients no matter which device or service they enter the system from



Website entry points

NHS.UK / 111 Online / Practice website



App on tablet

In ED/UCC (kiosk) or from home



App on mobile

In ED/UCC (wi-fi splash page) or from home



Transformational trends

Two transformational trends:



Pressure to
deliver high-value
care

**The Dominant Issue
Today**

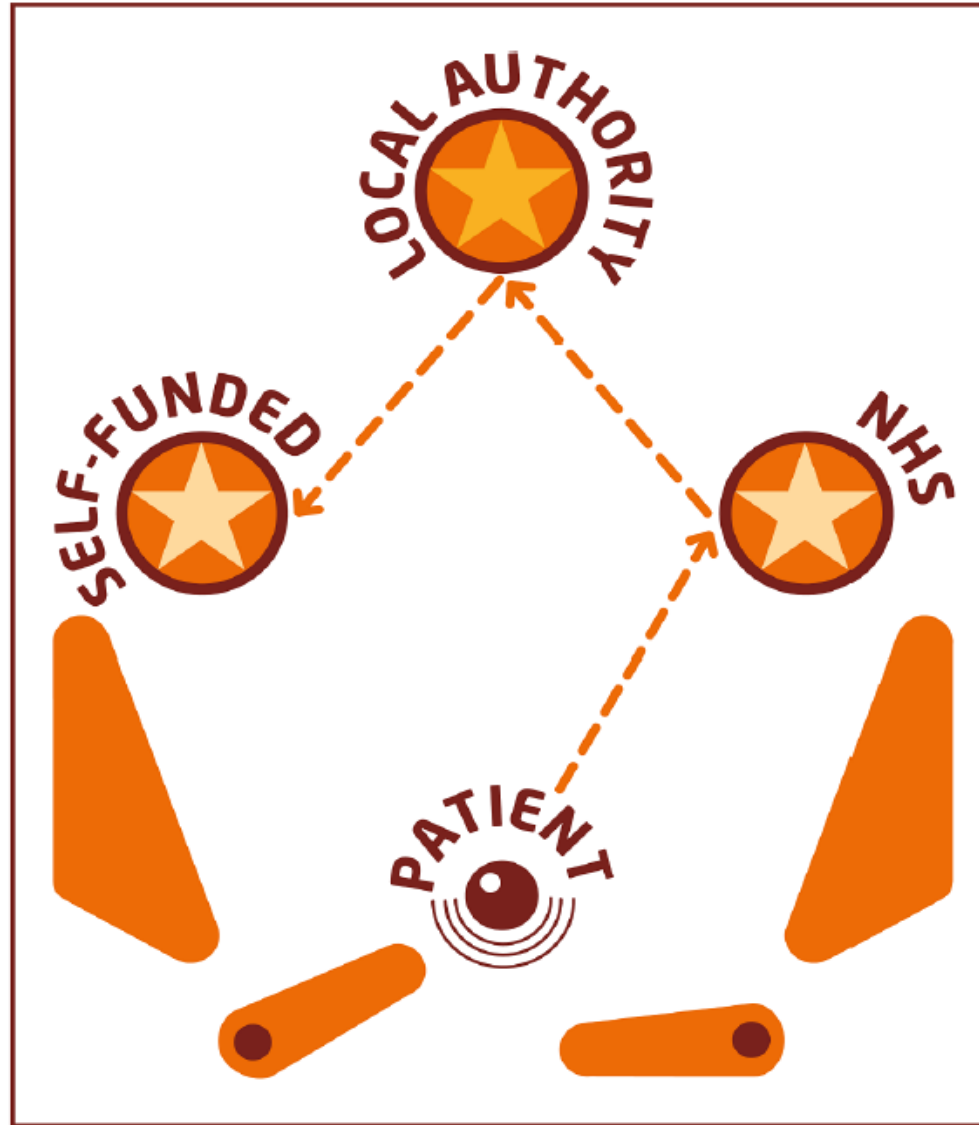
The digitisation of
the healthcare
system

**Prediction: Dominant
Issue in 2026**

Some take home messages

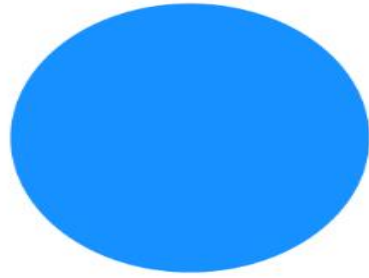
1. Be clear on values and purpose - digitisation is not to digitise
- improve quality/safety/efficiency/patient experience

Will patient experience be impacted?



**This is all about patient safety and outcomes
...not technology!**





EU2017.EE



Estonian Presidency
of the Council of the
European Union

Digital innovations as drivers for health and health care transformation – a view from a digital society

„Health & Tech for People – DIGITAL DISRUPTION“ | Paris, France

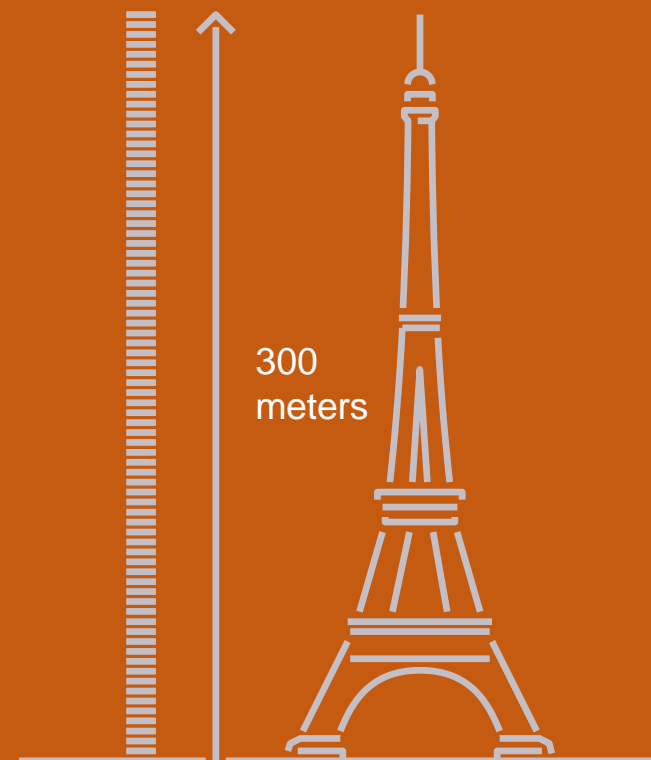
13.12.2017

Ain Aaviksoo, MD MPH

Deputy Secretary General for E-services and Innovation (CIO)

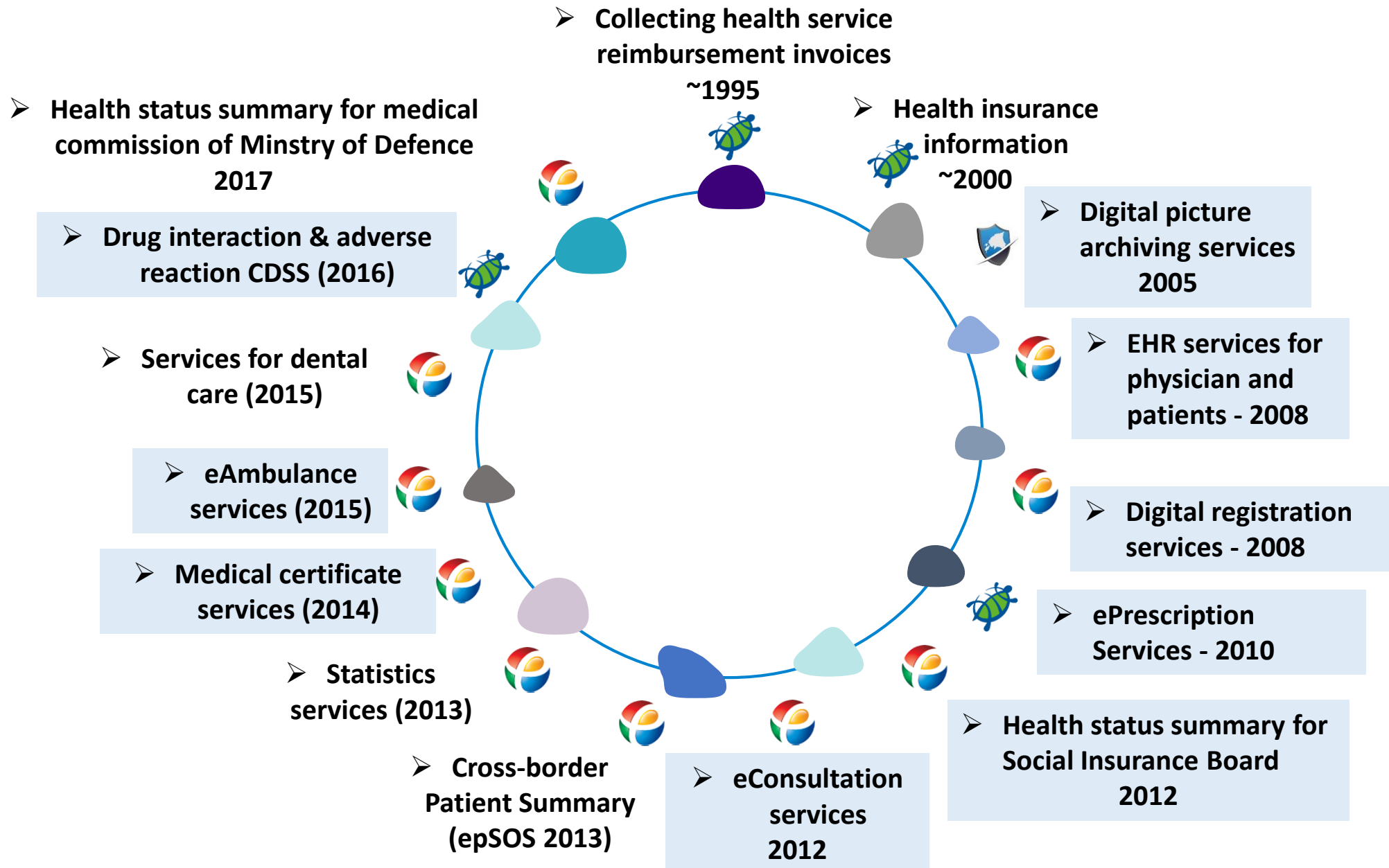
Estonia is a digital society

- 99% state services are online
- digital signature saves 5 days a year
- 100% providers are digital
- 100% of citizens have nationwide digital health record
- 99% of prescriptions are digital
- ...

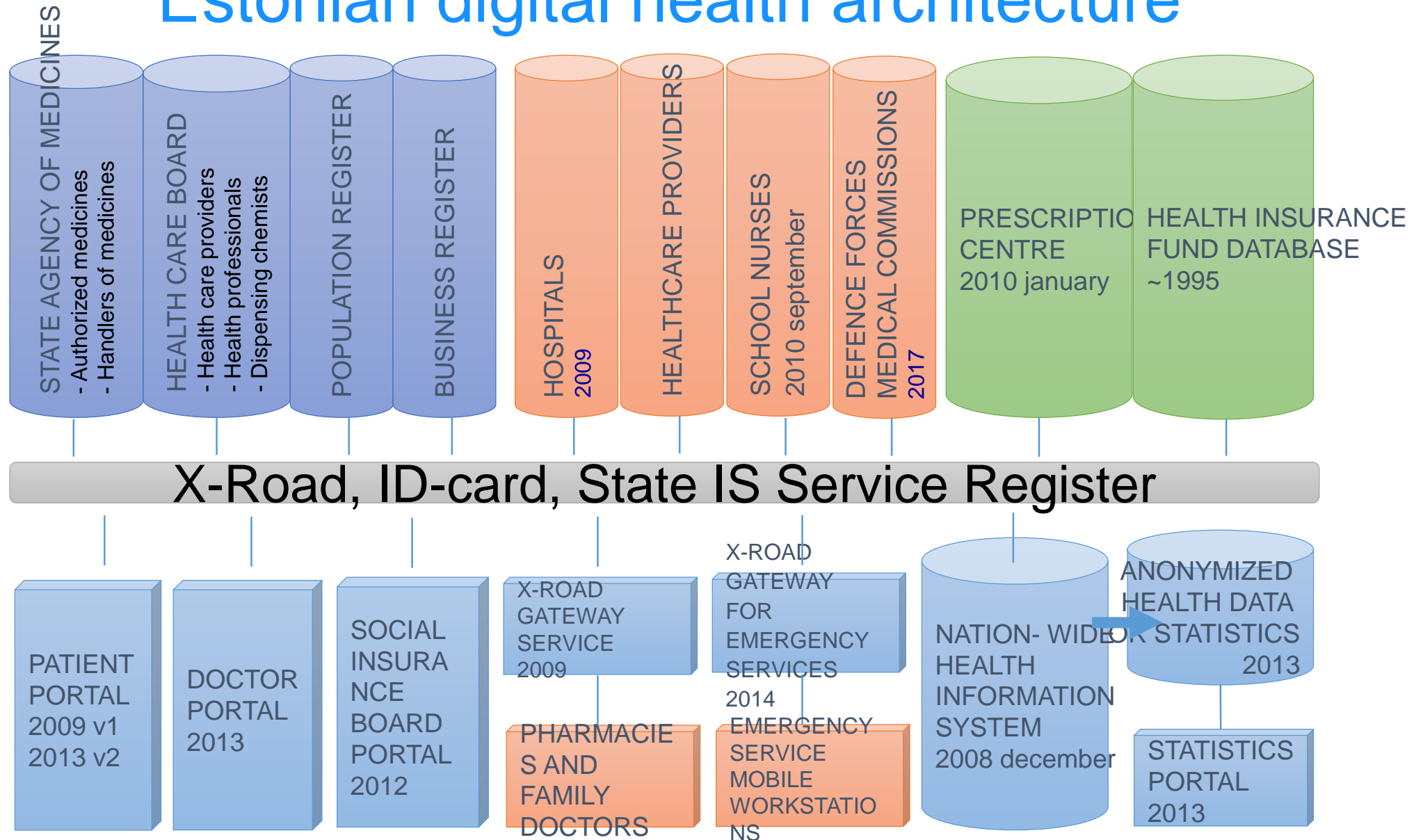


A stack of paper saved each month

Journey of eHealth services in Estonia



Secure exchange of health data – cornerstone of Estonian digital health architecture



Access and control of health data becomes crucial

Fundamental principle:

Health data belongs to the person ('data subject')

1. Access to my data
2. Control of my data use
3. Delegation of my access and control rights
4. Individual monitoring of requests for my data

Authentication

&

Authorisation

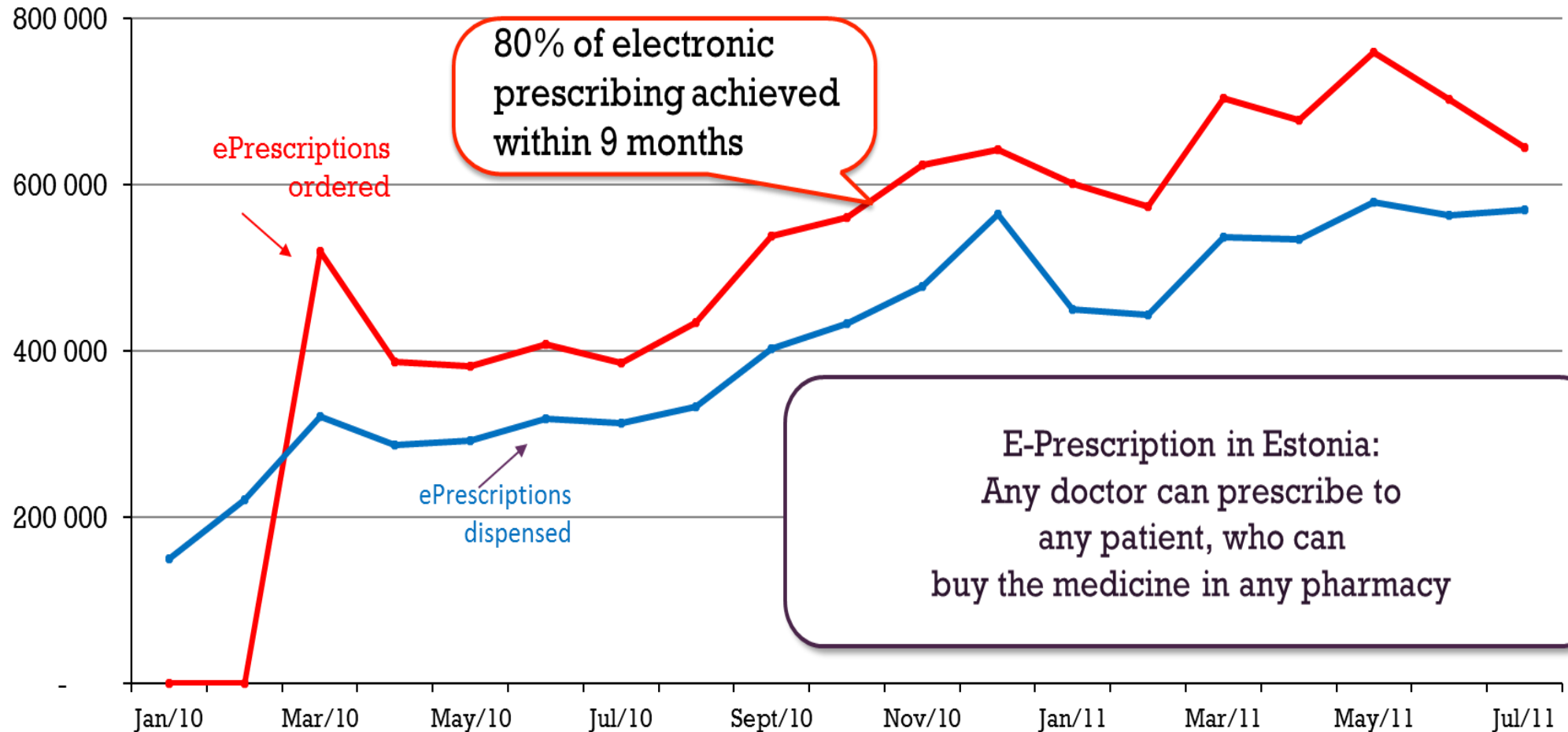
- **Who are you?**
- **Constant** anywhere & anytime
- Solution = **Unique ID**
(plus robust technology:
ID-card, mobile-ID)

What can you do?

(read, write, delete etc)

- **Dynamic** in space & time
(same individual can have
multiple roles)
- Solution = **classification or
roles** by profession, facility,
service etc

Very fast system-wide adoption of e-services: the case of ePrescription



E-Prescription in Estonia:
Any doctor can prescribe to
any patient, who can
buy the medicine in any pharmacy

Most of Europeans want to and can use digital health services if offered

76% Europeans have access to fast internet

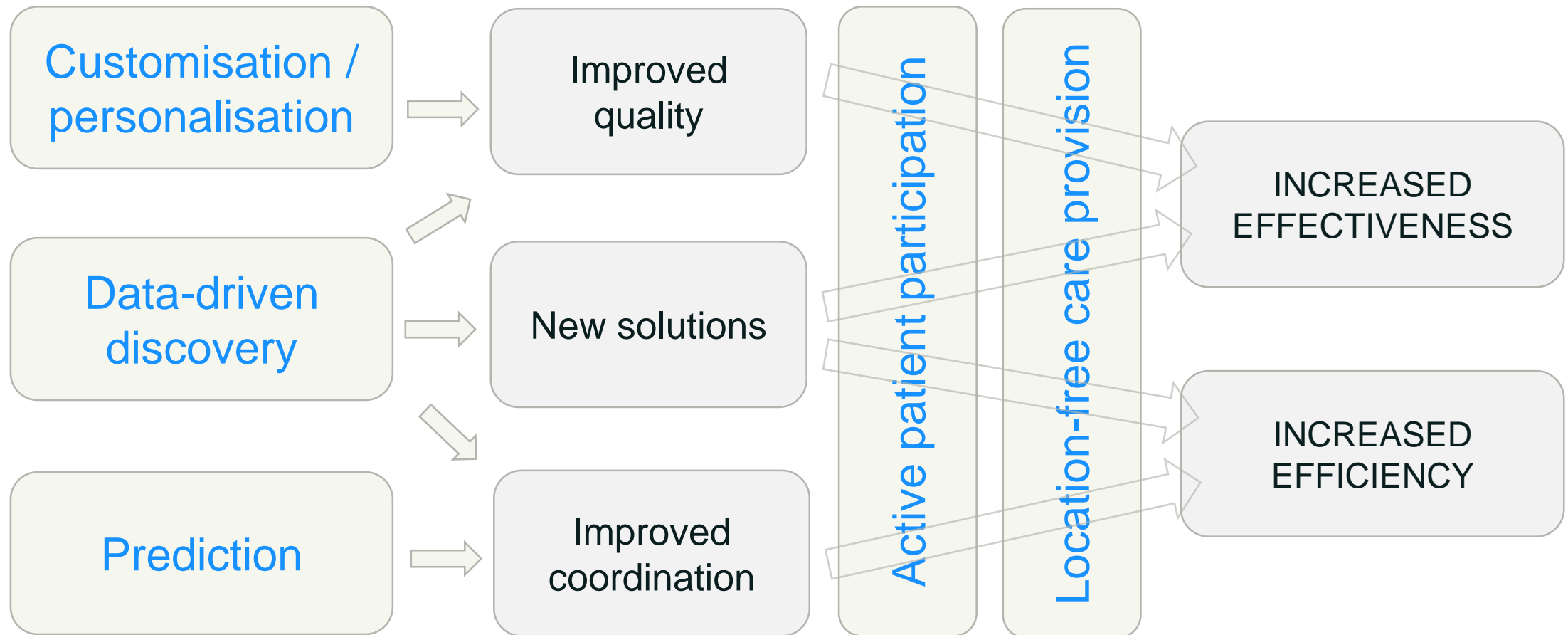
79% are using internet (of which 70% are using it every day or almost every day)

52% European citizens want access to their health data

70% ARE willing to share their data with others (incl 63% with their doctor)

23% ARE NOT willing to share their health data

Future health and care is strongly influenced by digital approach



EU General Data Protection Regulation facilitates better use of personal data



The screenshot shows the European Commission Justice website. The header includes the European Commission logo and the word 'JUSTICE' with the tagline 'Building a European Area of Justice'. The breadcrumb trail reads 'European Commission > Justice > Data protection > reform'. The navigation bar has 'HOME' and 'ALL TOPICS' links, and a search bar. The main content area is titled 'Reform of EU data protection rules' under the 'DATA PROTECTION' category. A sub-header reads 'Reform of the data protection legal framework'. Two callout boxes provide key details: one about data portability and another about privacy and secure use of personal data.

European Commission

JUSTICE
Building a European Area of Justice

European Commission > Justice > Data protection > reform

HOME ALL TOPICS Search

DATA PROTECTION

Reform of the data protection legal framework

Reform of EU data protection rules

The new Regulation will also guarantee **free and easy access to your personal data**, making it **easier** for you to see what personal information is held about you by companies and public authorities, and make it easier for you to **transfer your personal data** between service providers – the so-called principle of ‘data portability’.

Privacy means that **personal data** should **be used securely**, but not to be secured from being used

A precise and learning system with constant clinical/care knowledge creation

care flow

Health & social service encounters:
(health, treatment & care data, molecular data, sequencing/genotyping other individual data)

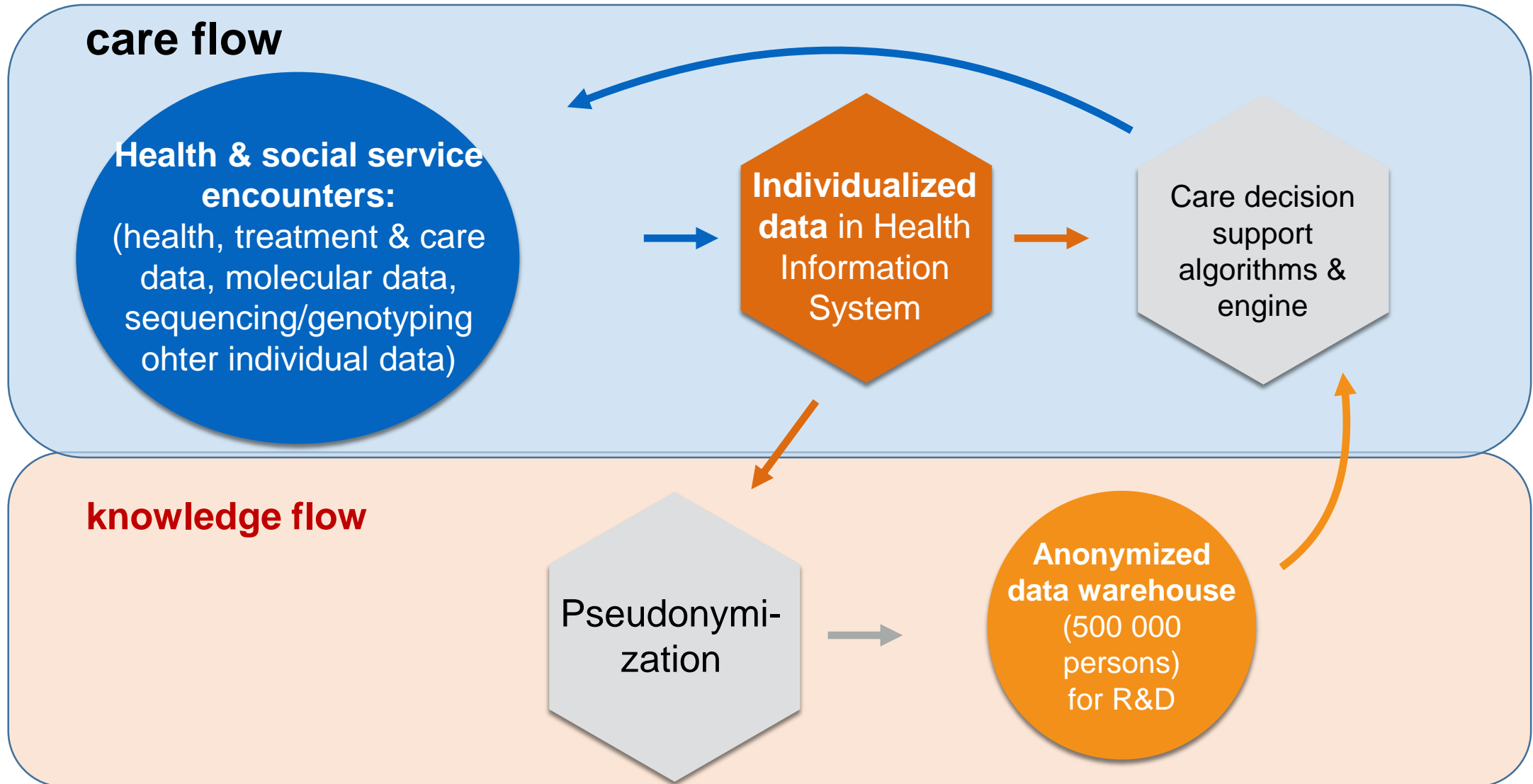
Individualized data in Health Information System

Care decision support algorithms & engine

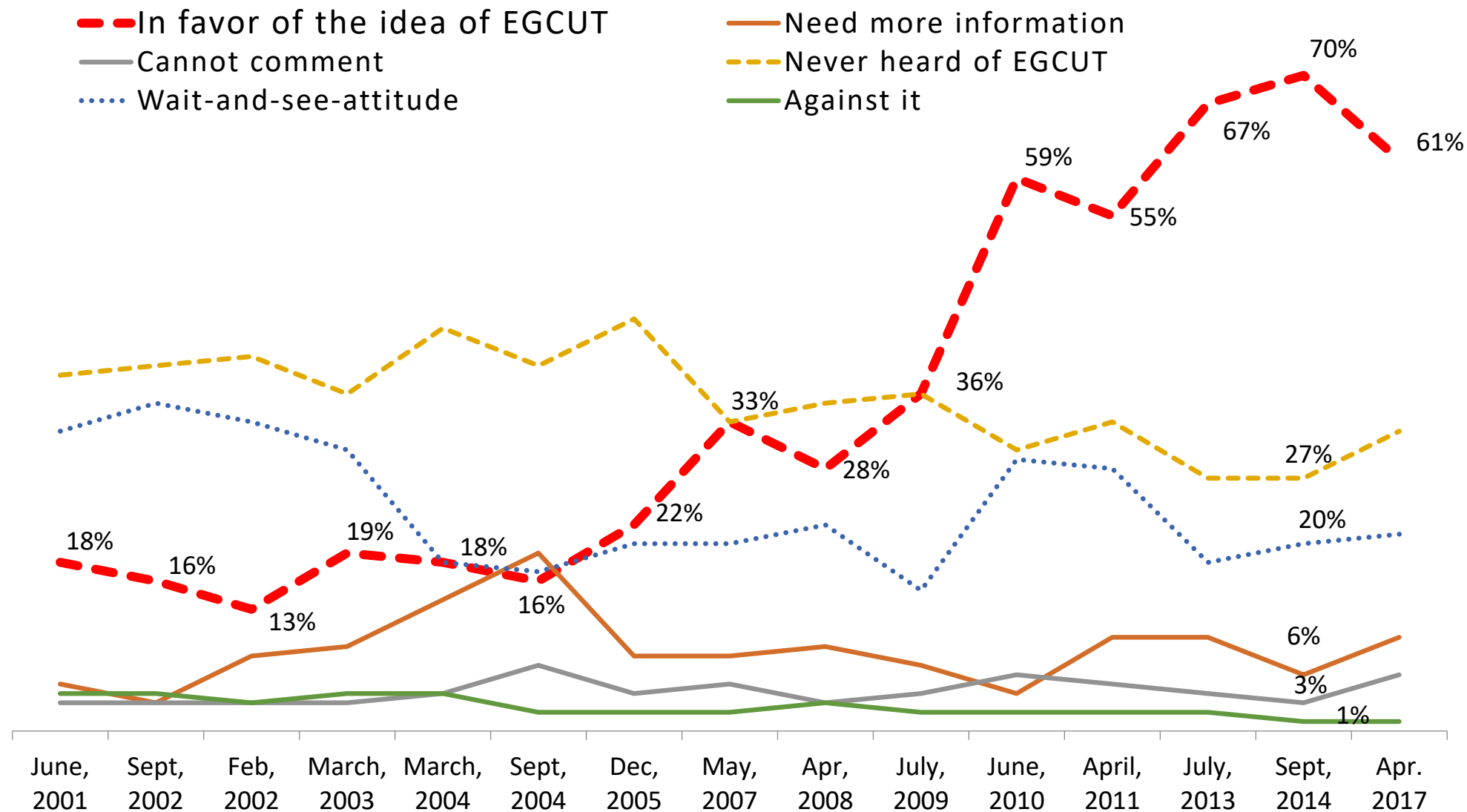
knowledge flow

Pseudonymization

Anonymized data warehouse
(500 000 persons)
for R&D



Public support to Estonian Genome Foundation rises over time





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estonishing –
dare to fulfill your desires safely!

further inquiries: ain.aaviksoo@sm.ee | @aaviksoo