Sundhedspolitisk topmøde 2017

DET DIGITALE SUNDHEDSVÆSEN

DANSK ERHVERV

DANSKE REGIONER

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MEDICO INDUSTRIEN

SUNDHED DANMARK
Foreningen af danske sundhedsvirksomheder

LIF

Velkomst

- Jens Klarskov, adm. direktør, Dansk Erhverv

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Digital sundhed i international perspektiv

Digitalt transformation and healthcare

- Dr. Ben Bridgewater, Head of Healthcare Advisory & Consulting, DXC Technology
- Frank de Reij, CEO at Melander Medisch Centrum, Amersfoort, Holland (video-præsentation)

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Digital Transformation in Healthcare

‘The three digital truths’

Digital transformation in healthcare: the process by which technology is changing how products and services are delivered to citizens and patients

DXC Healthcare and Life Sciences offerings

Digital Operations

Improving efficiency by digitising processing and optimising infrastructure

Clinical

Improving operational efficiency, clinical effectiveness and patient engagement

Payment innovation

Moving to value based payments and improving *customer* interaction

Digital Life Sciences

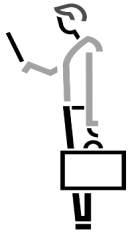
Improving outcomes by accelerating innovation and improving compliance

50+ YEARS OF SERVICE — Delivering healthcare and life sciences IT services	**1.3B** ANNUAL CLAIMS — Healthcare claims processed annually	**671M** MEDICARE CLAIMS — Medicare Part A and B claims processed annually (60% of all claims)
19K IT PROFESSIONALS — Dedicated to supporting health and life sciences clients worldwide	**100** MILLION RECORDS — Electronic medical records maintained	**24.5M** LIVES TOUCHED — As the largest provider of Medicaid process management services
1M+ SOFTWARE USERS — Users of software and integrated systems products	**15K** PHARMA PRODUCTS — Pharma product approvals supported	**84%+** TOP 50 GLOIBAL PHARMA COMPANIES — Use regulatory transformation solutions
6 of 10 TOP 10 FORTUNE 500 HEALTHCARE — Top 10 Global Fortune 500 healthcare companies are clients	**10 of 11** FORTUNE 500 PHARMA — Global Fortune 500 Pharma companies are clients	**11 of 11** U.S. FORTUNE 500 PHARMA — U.S. Fortune 500 Pharma companies are clients

Healthcare: what are the problems?

Increasing complexity and burden of patients with chronic disease
Hospital, primary and social care system struggling to cope with demand.

People access the most convenient services
Not necessarily the ‘right’ or the cheapest. Healthcare services recognize organization boundaries: diseases do not..



Complex cases have very high resource utilization
Treatment is varied and doesn’t give optimal outcomes. Requires shared information and joined up approach.

Hospitals are expensive places to deliver care
Need for shared data and approach to give citizen-defined, rather than service-defined care supported by value based payment models

Understand, empower and actively manage the population

Manage patient flow to right resources

Manage complex cases through MDTs with standardized decision support and audit

Deliver efficient and effective care in the most appropriate setting

Creating unsustainable pressure on the wider economy and challenges supporting consumer requirements

Cross industry experience - the three Digital Truths

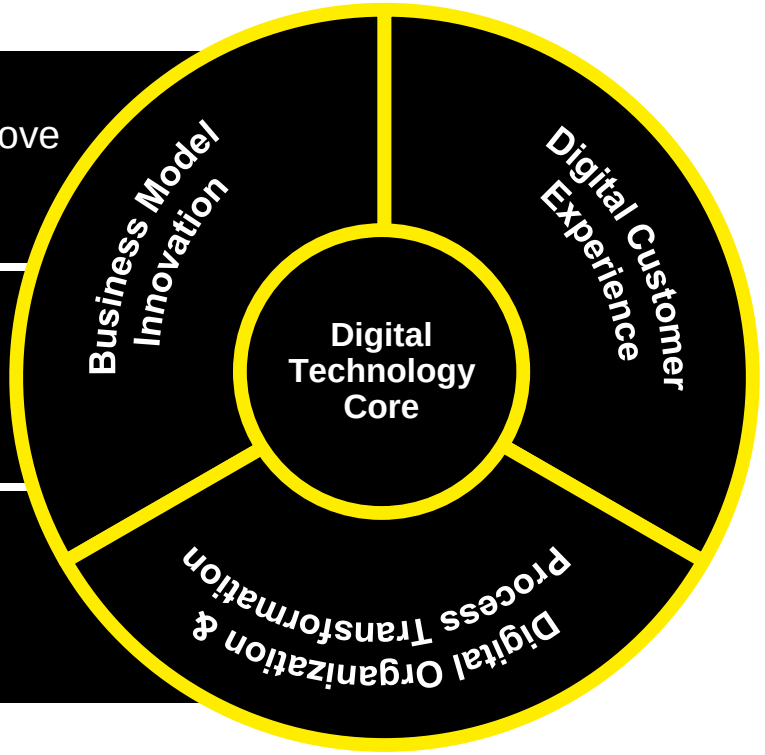
The ingredients for shaping a **powerful Transformation Journey**

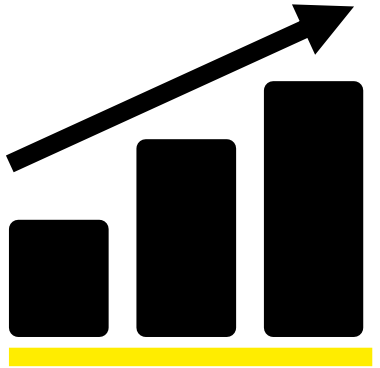
three truths of the digital era → enabling digital value creation → .. maximizing EVA, ROIC

Consumers control - define next move
Digital Lifestyle - the new normal

Platforms disrupt value chains, expect Asymmetric competition

Winners exploit platform effects, control interactions, can exploit and work at the speed of digital





Measured by:

Economic Value Added (EVA)

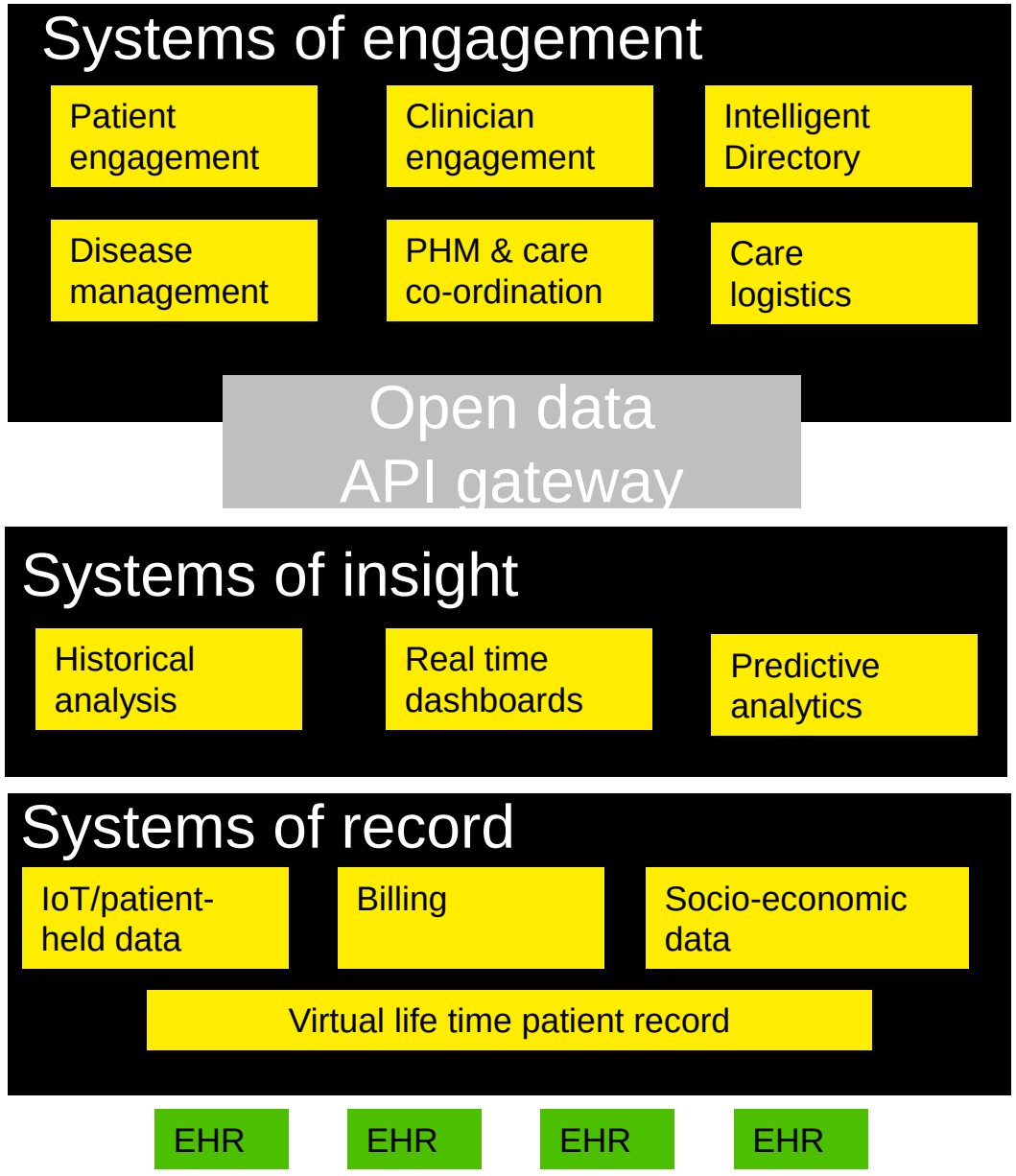
Return on Invested Capital (ROIC)

The next generation digital platform

Systems of Engagement: Portfolio of Clinical and business process services that support patients, providers, care coordinators via integrated and collaboration platform services

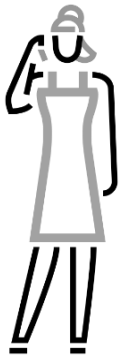
Systems of Insight: Surveillance capability that recognizes patterns in EMR, population data and care management characteristics and exposes missed opportunities and impending high risk clinical events

Systems of Record: Integrated structured and unstructured datasets from multiple sources but semantically linked and curated for upstream value; and augmented with API marketplace



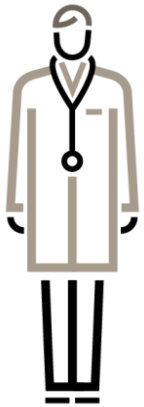
Connect → Care → Collaborate → Transform

The Trafford care coordination centre?



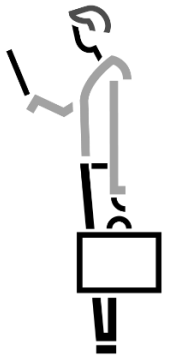
Trafford borough
Population of 240,000 citizens
Mixed socio-demographic
Trafford General Hospital the birthplace of NHS. The hospital was failing to deliver its targets.
Intense political scrutiny
.

Mixed urban population



Increasing burden of patients with chronic disease
Hospital system struggling to cope with demand of aging population.
Increased community services not delivering benefits

Challenged hospital system



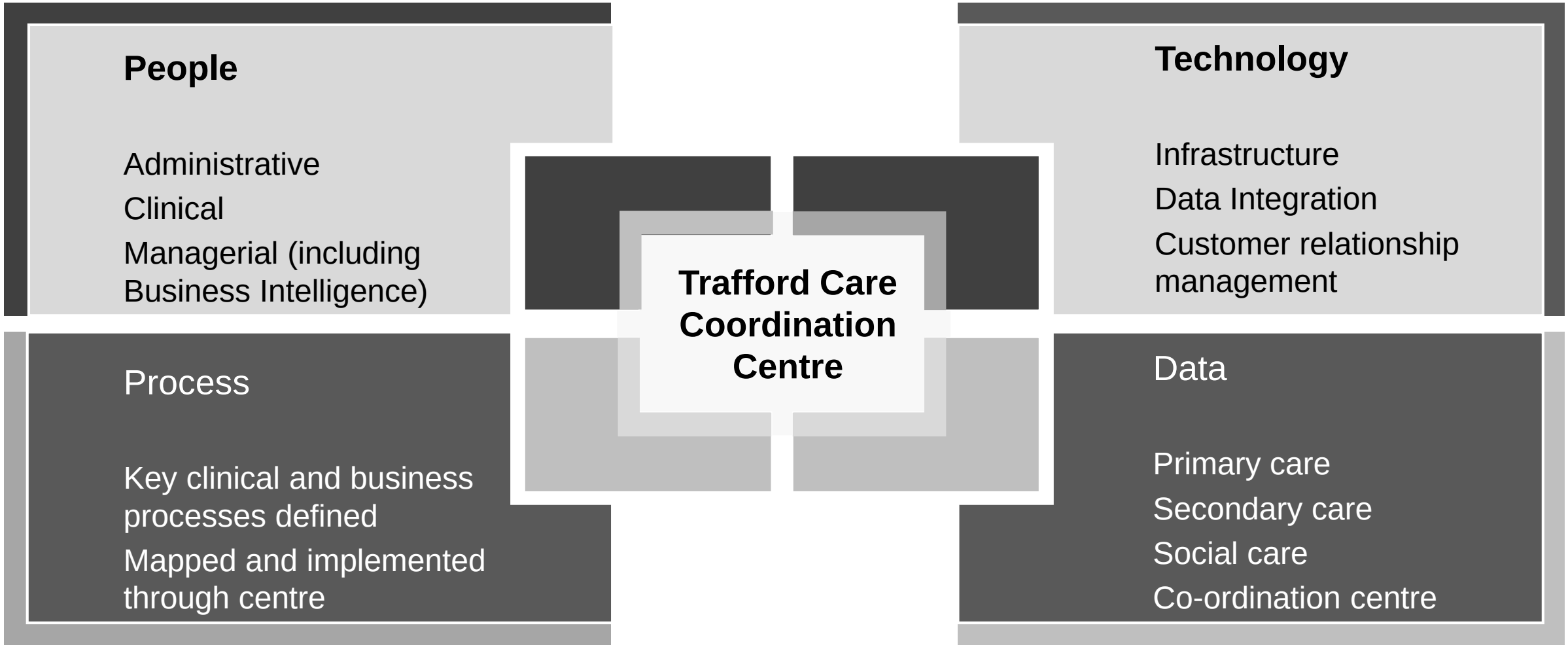
Solution
The leadership of the CCG looked for inspiration from leading international healthcare organisations such as Intermountain Health, as well as looking outside health to retail and transport

Next generation digital approach

Care coordination centre
CCG went to market for care coordination solution
Contract awarded to CSC (now DXC.technology) in March 2015

Trafford coordination centre

What is the Trafford Coordination Center?

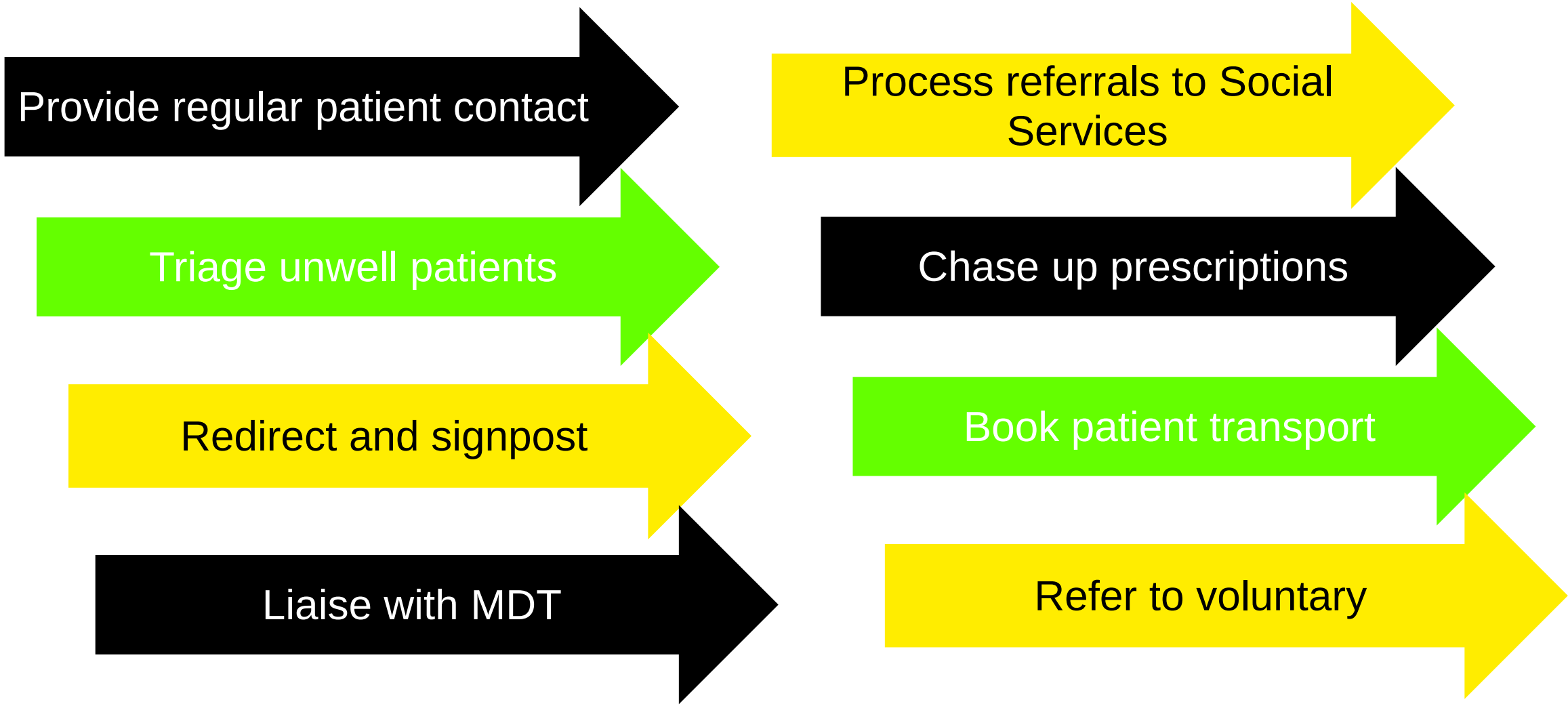


What benefits were targeted?

1. **Quantitative and qualitative**
2. **Direct and indirect**
3. **To Trafford CCG and the *Trafford £***

Reduction in expensive out-patient activity	Fewer A&E unnecessary attendance and paramedic journeys	Reduction in elective admissions
Reduction in non-elective admissions	Shorter length of hospital stay	Improved outcomes and more personalised care for citizens

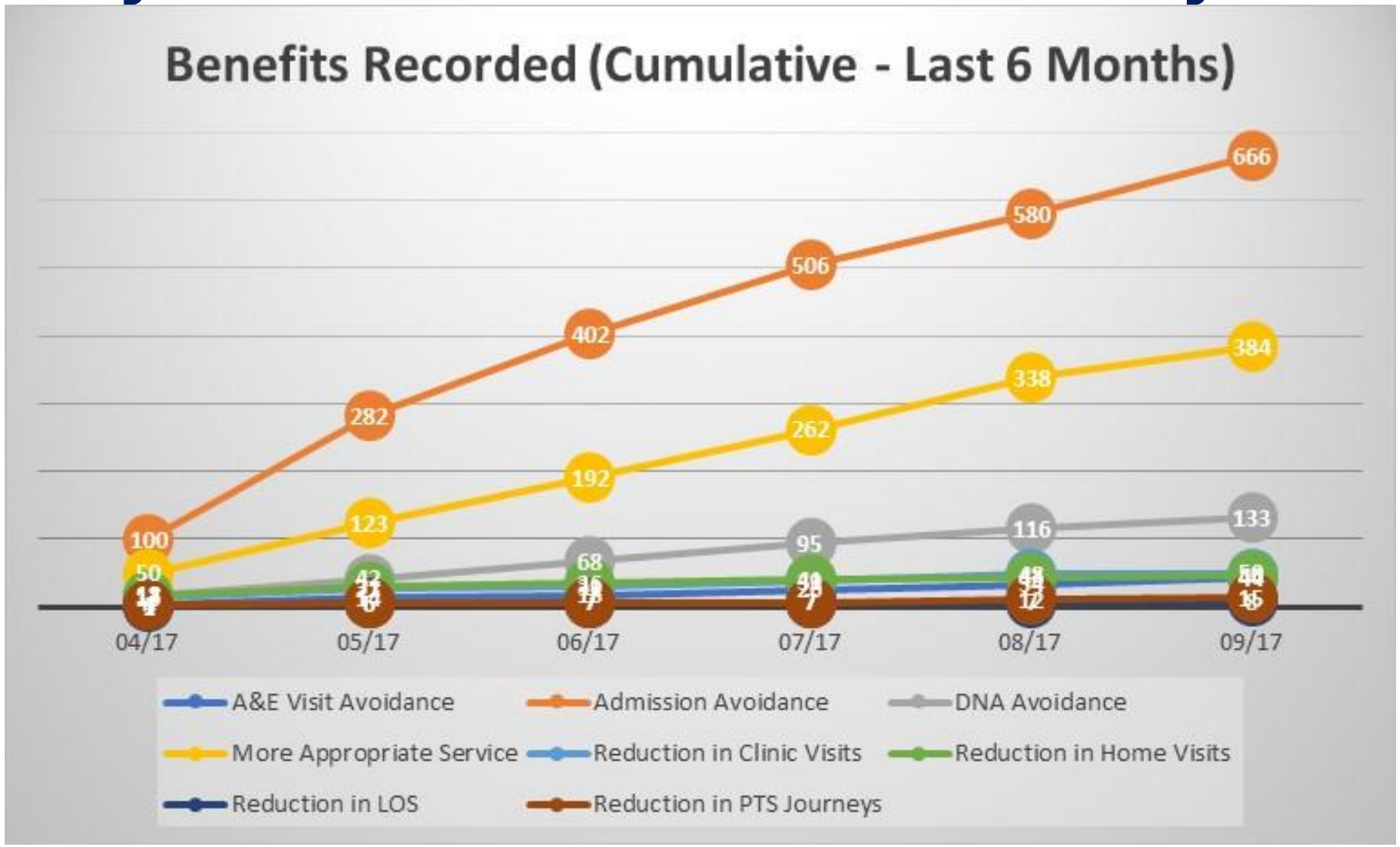
What do the team actually do? Some things we planned



What do the team actually do? Some things we discovered by doing

- Point of contact for wellbeing
- Link into Fire and Police
- Provide bereavement support
- relieve pressure of other services, especially 111, 999 and GPs
- Offer support and care for family members and carers
- Provide listening service to support mental health patients

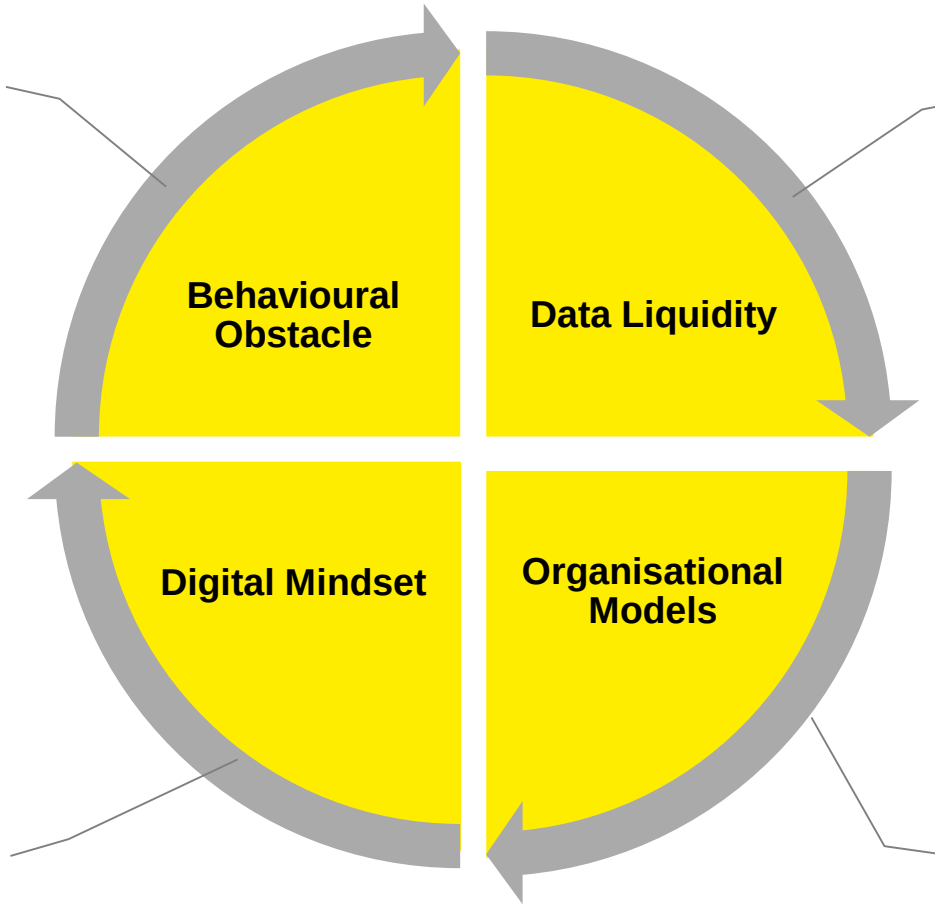
What system benefits are we actually seeing?



Healthcare provider perspective: some challenges

In-depth understanding of the behavioural obstacles and the demand on leaders, both within the hospitals, primary care and among stakeholders in the local health economy

Embedding a digital mindset – where all care participants are equipped and motivated to capture data accurately, only once and at source; then trust the systems, re-use it and make data-led decisions to improve care and services



Fully exploiting the data in their systems in new ways ('data liquidity') to improve clinical outcomes, operational efficiency and patient experience

The ability for fully digital ecosystems to deliver benefits is more dependent on the organisational operating model than it is on the digital assets

Thank you

Digital sundhed i international perspektiv

Winning with data

- Anthony Sigrest, Director, Head og Patient Innovation, AbbVie

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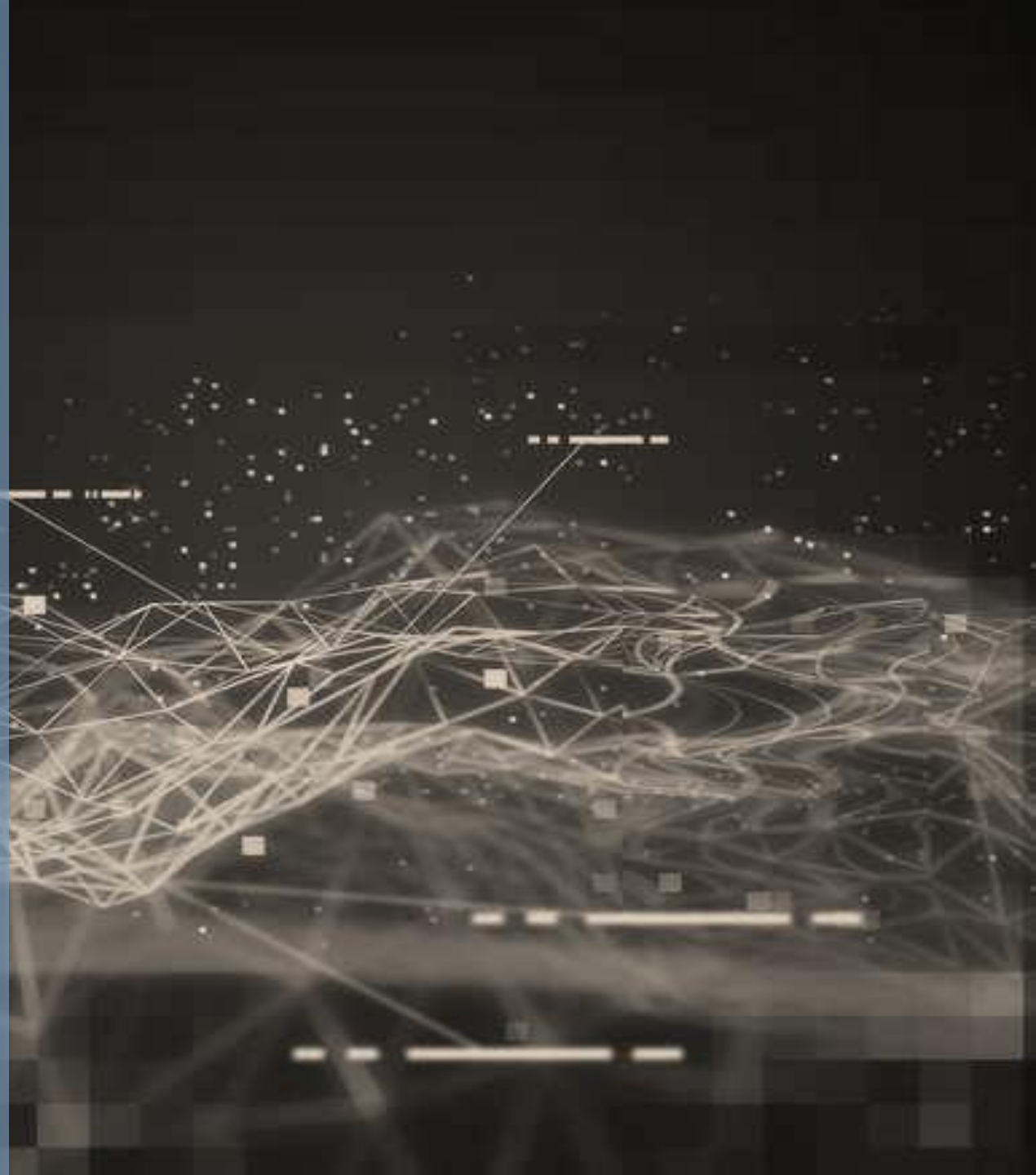
The Great Opportunity: Big Data

Anthony Sigrest
Director, Head of Patient Innovation

7 December, 2017



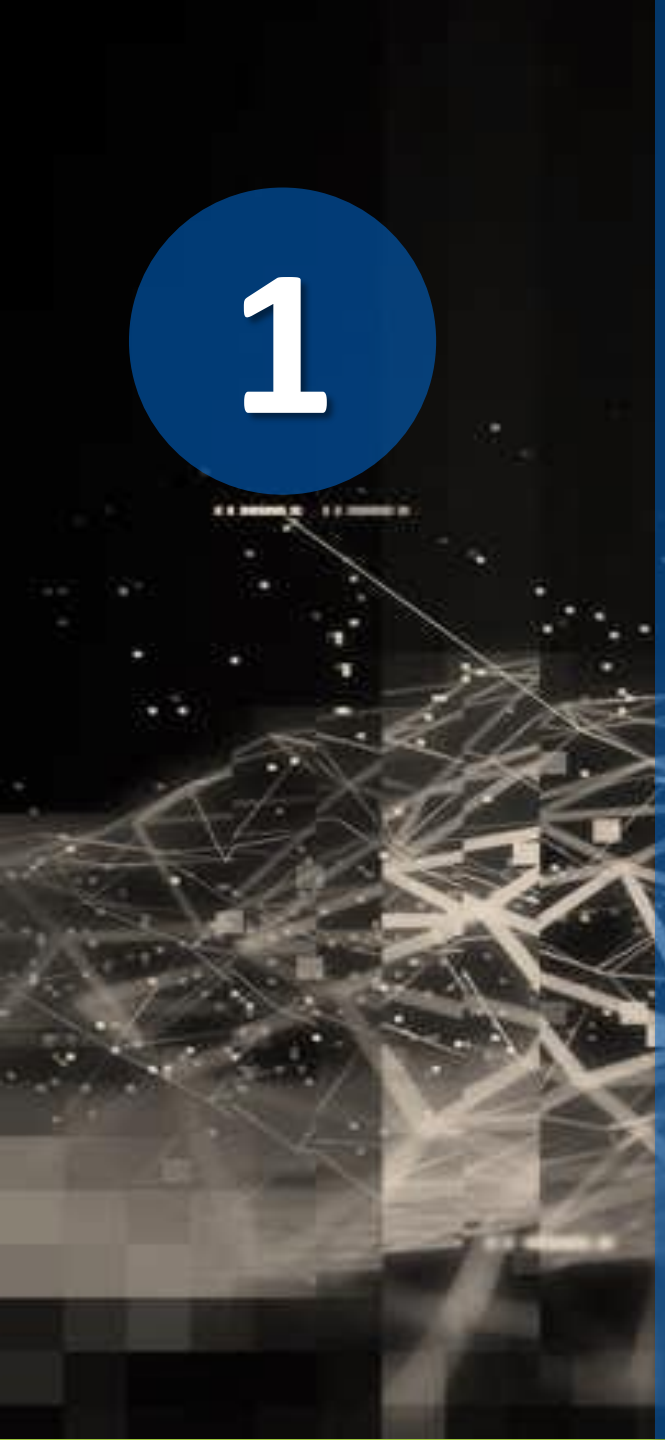
Harness the power of the data evolution.

abbvie

Harness the power of the data evolution.

Vast Expansion | Decipher Meaning | A Framework

abbvie



1

The exponential growth of digitalization and vast expansion of data create great challenges.

abbvie

2

Deciphering the meaning of big data can provide great insights.

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A big data framework is needed to properly harness the vision of digitalization.

3

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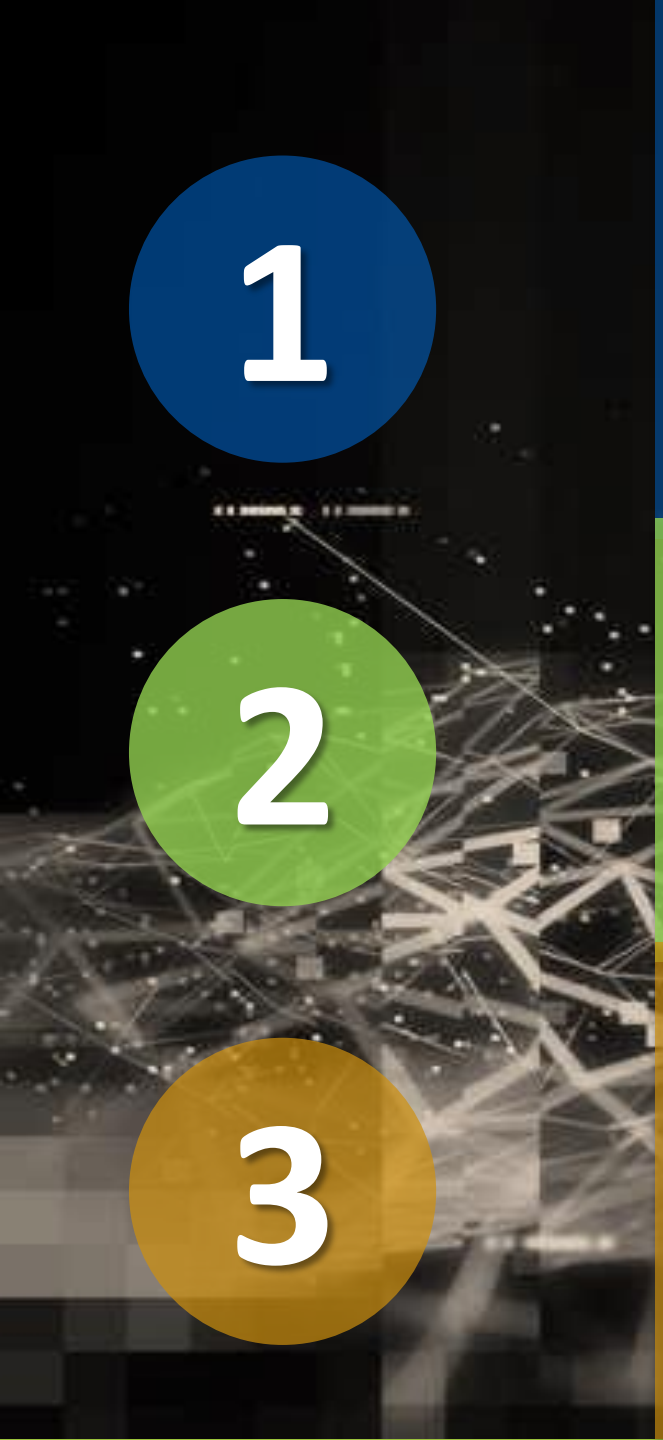

1

Vast Data Expansion

2

Decipher the Meaning

3

A Framework

abbvie

“The world of great opportunity is available now, as it has always been for those with great vision.”

- Andrew Carnegie

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The big data evolution will unleash the power of digitalization.

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Thank you
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Digital sundhed i international perspektiv

The Near Future of Health

- Kristian Hart-Hansen, CEO, Leo Innovation Lab

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THE *NEAR* FUTURE OF HEALTH

By Kristian Hart-Hansen, CEO LEO Innovation Lab

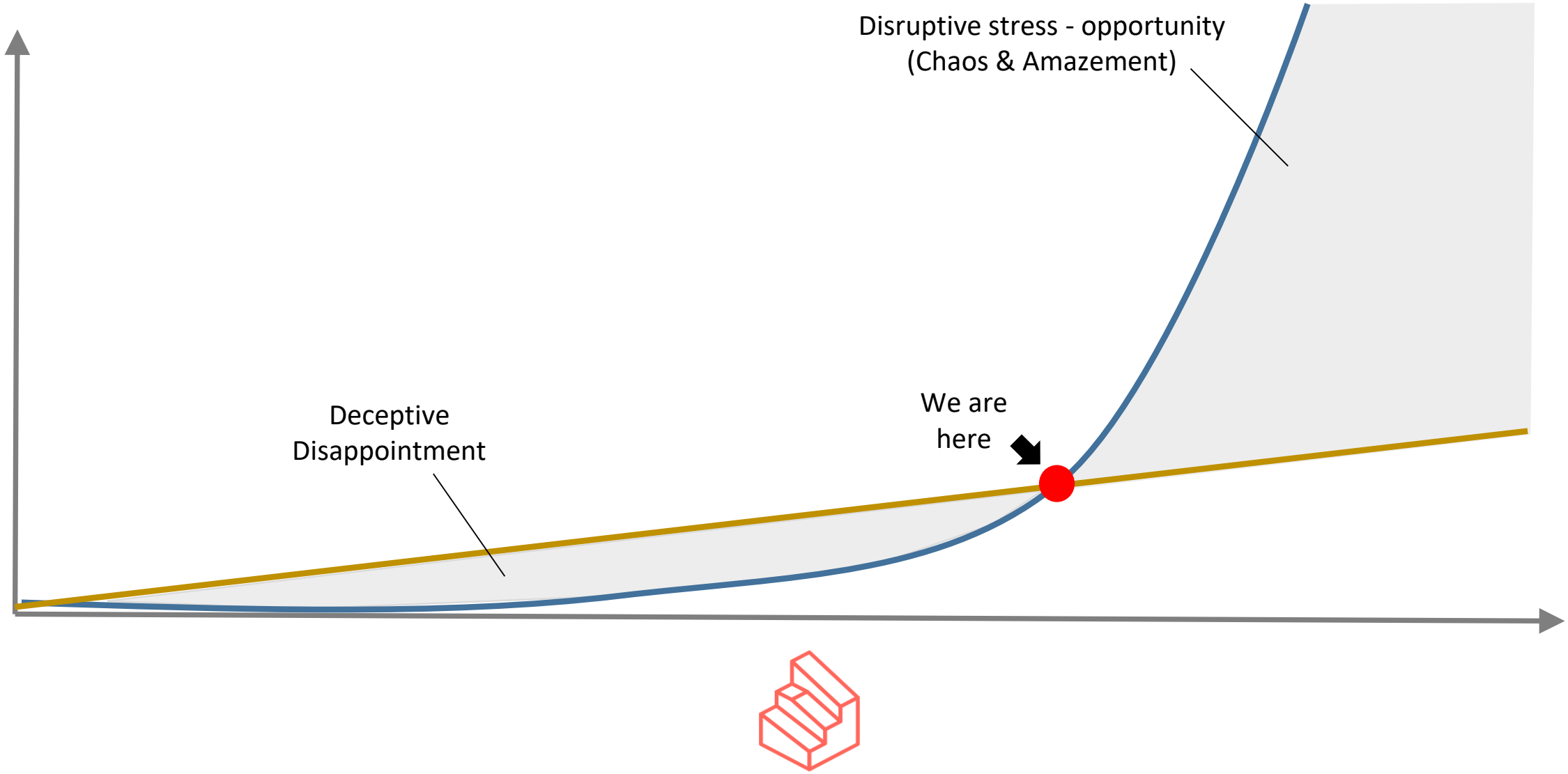
Three generations have witnessed amazing changes in health in the last years

- Child vaccination programs
- Biobanks
- Democratisation and digitalisation of information
- Non-invasive technologies
- New generation of GPs
- Biotech

- Pharmaceutical treatments explosion
- Health systems structures
- Diagnostics

But her reality is an exponential world with changes that are hard to predict but with impact beyond anything we can process

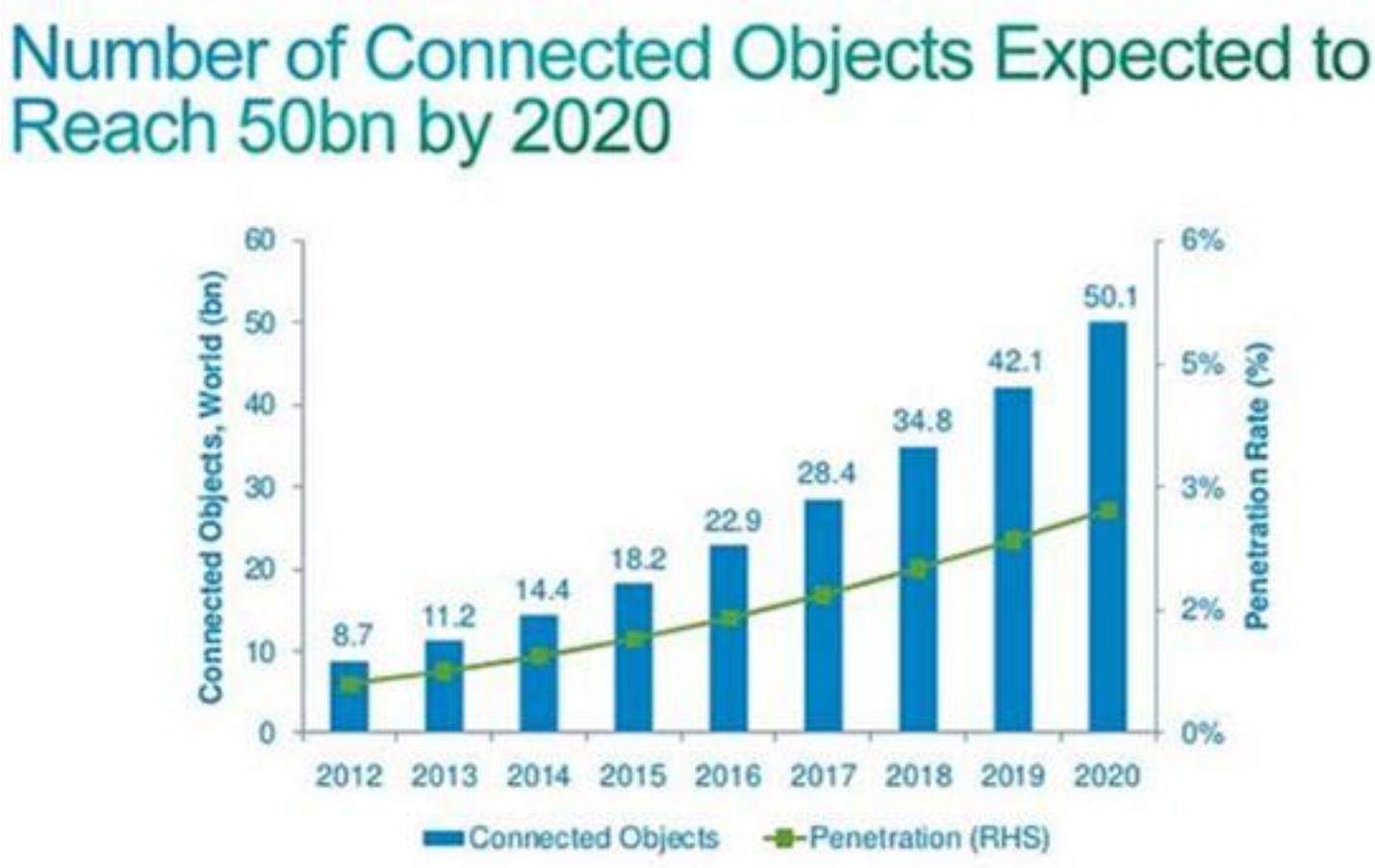
How exponential changes work



Some facts accelerating the exponential change

The usual health care players are not alone anymore

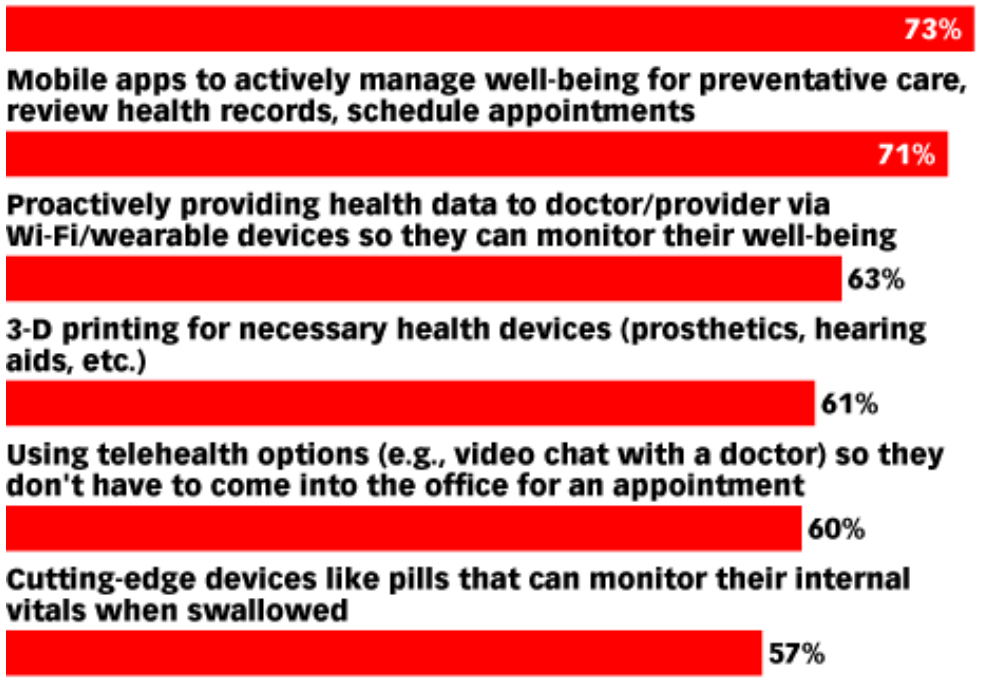
There are more connected objects than humans in the world today



New generations are embracing new technologies for their health

Health Technologies that US Millennial Patients* Are Interested in Using, Jan 2015

% of respondents



*Note: ages 18-34; *internet users who have health insurance and a primary care physician*

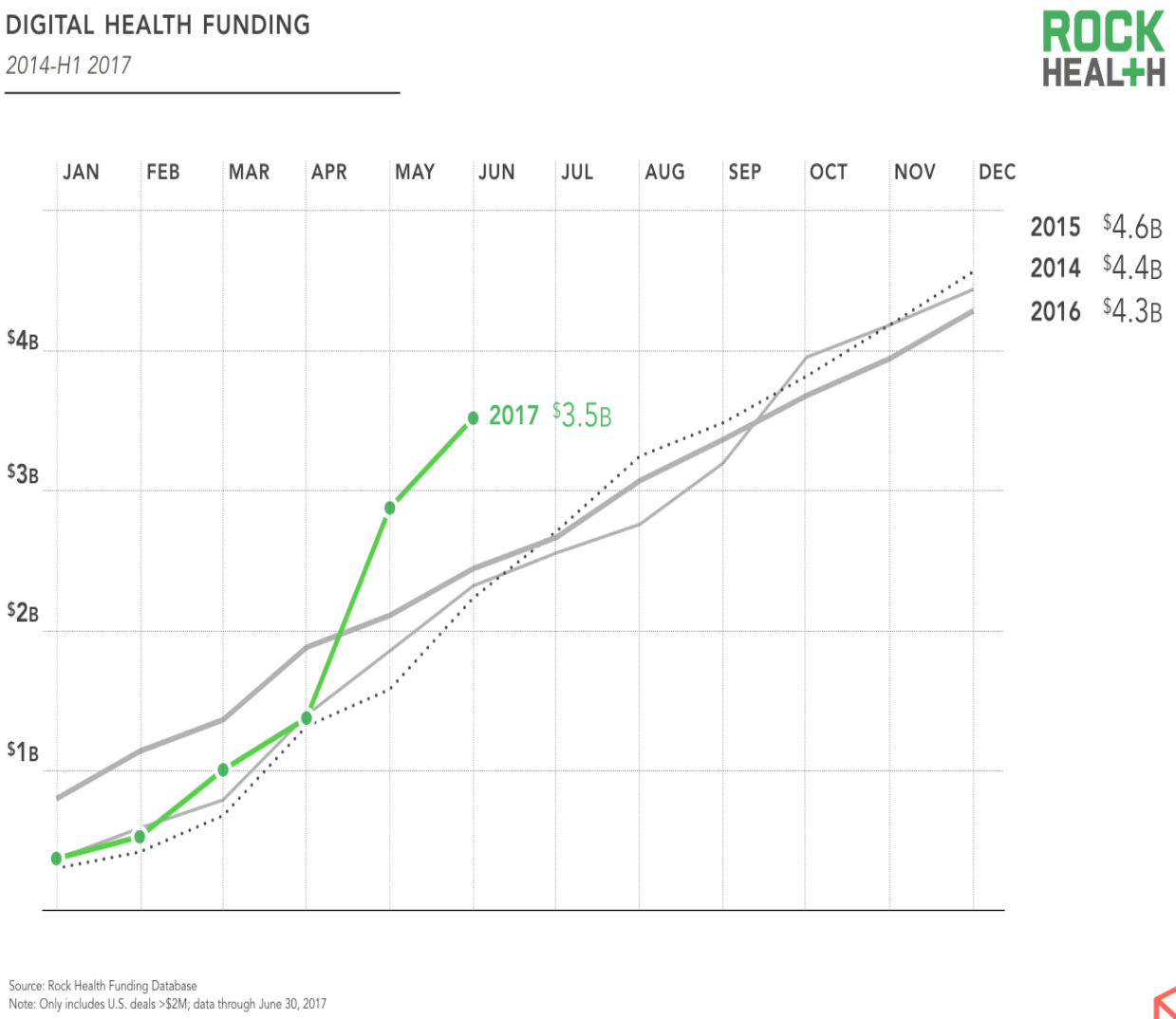
Source: Salesforce, "2015 State of the Connected Patient" conducted by Harris Poll, Feb 12, 2015

185691 www.eMarketer.com

2017 This Is What Happens In An Internet Minute

LEO Innovation Lab

Investment in new technologies for health applications growing steady and accelerating



Source: Rock Health Funding Database
Note: Only includes U.S. deals >$2M; data through June 30, 2017

Top 5 Health Tech categories

1. Genomics
2. Analytics & Big Data
3. Wearables & Biosensors
4. Telemedicine
5. Digital Medical Devices

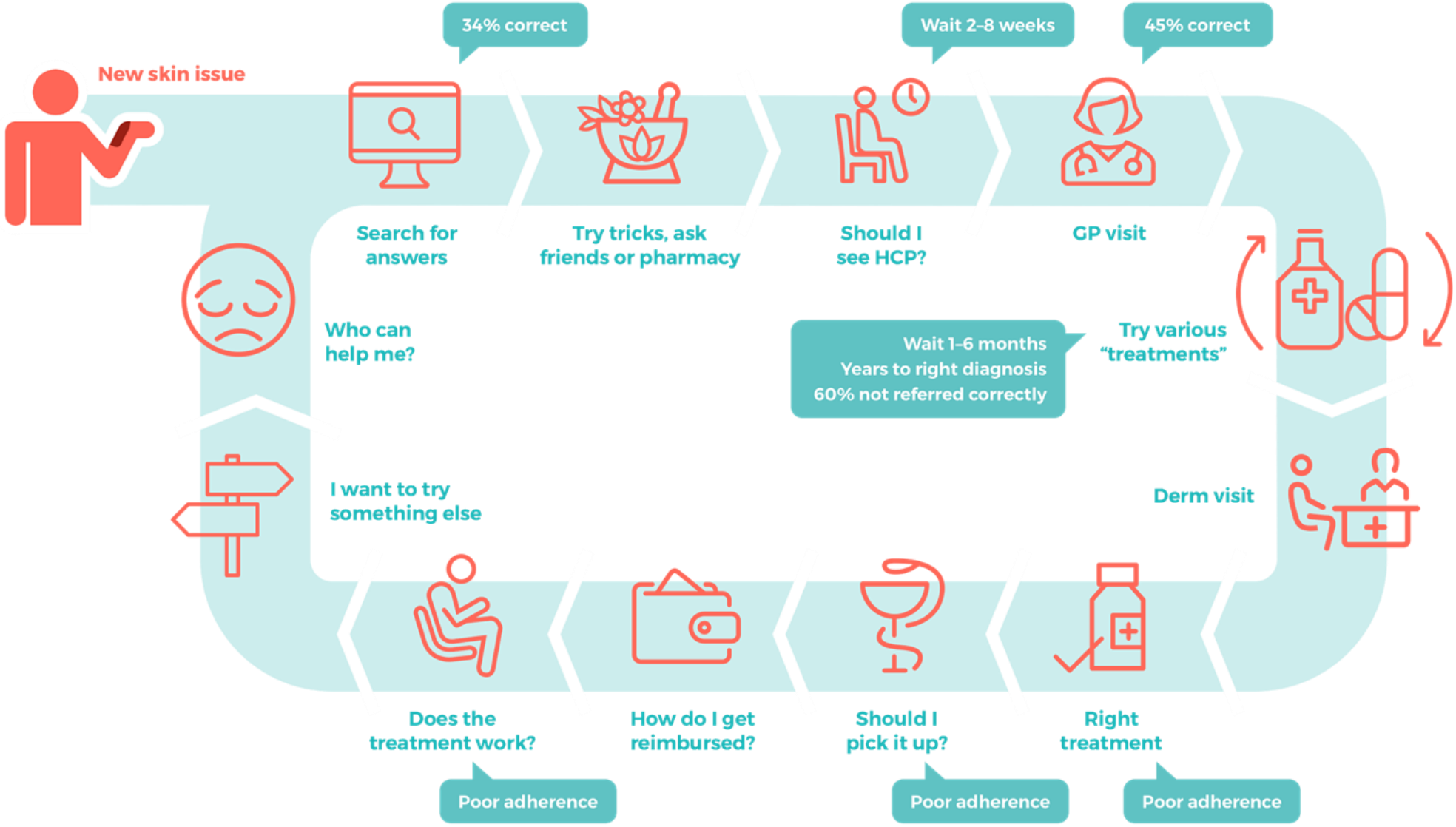
We have become data generators

The average person is likely to generate more than one million gigabytes of health-related data in their lifetime. Equivalent to 300 million books.

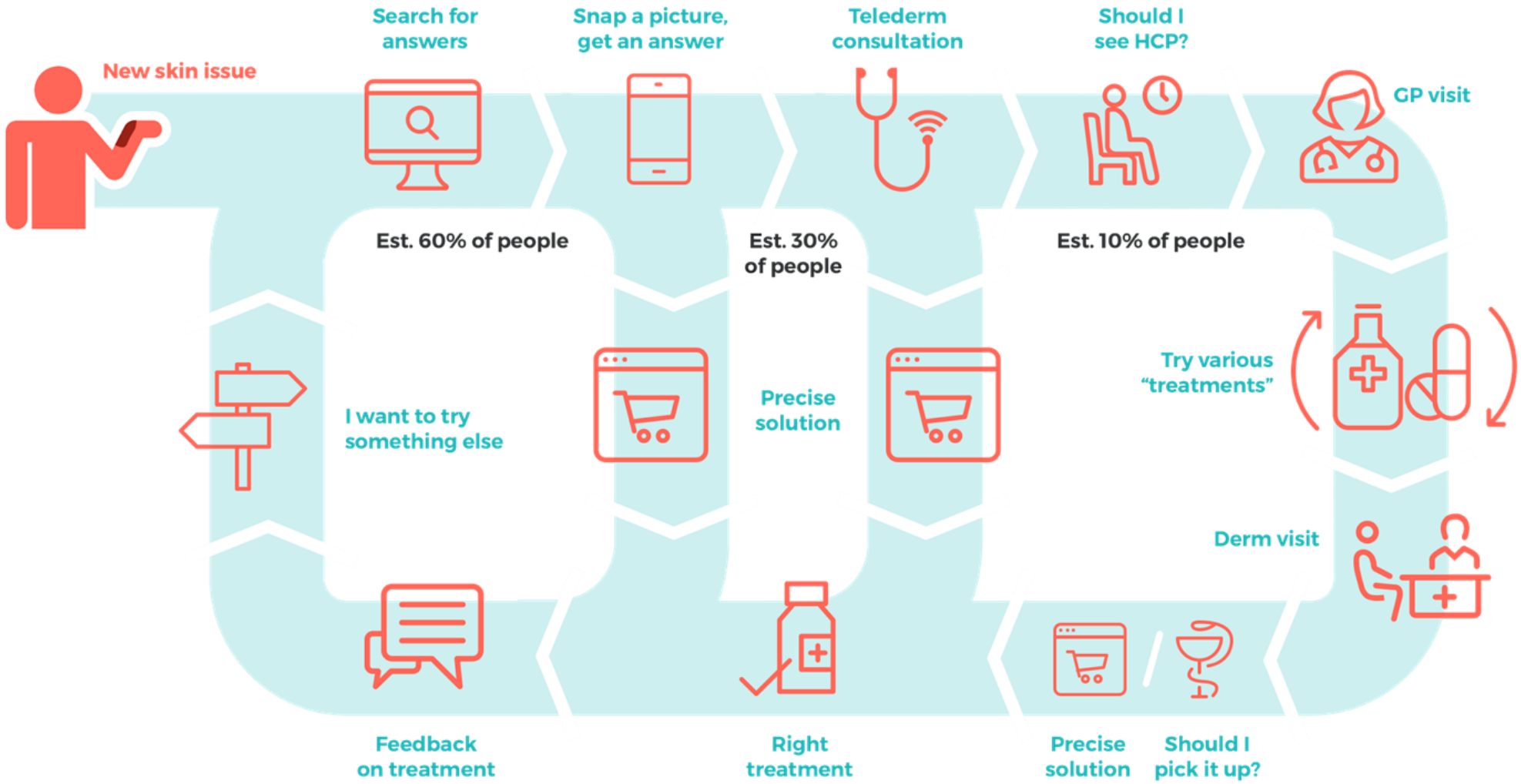
IBM **Watson Health**

Early signs of the new reality

Digitisation of patient journeys...



...leading to transformation



Consumer hardware pieces becoming the main hubs of medical devices

Medicine becoming ultra-personalized

DNA

Microbiome

Biometrics

Lifestyle

Topics

3D Printed Blood Vessels Offer New Possibilities for Testing Drugs

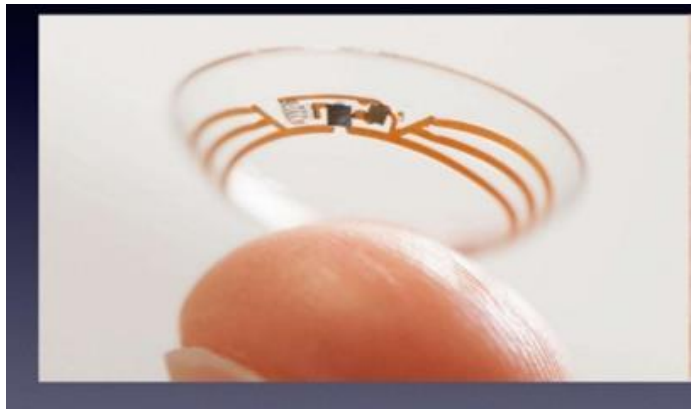
By **Vanessa Bates Ramirez** - Aug 10, 2017 2,819

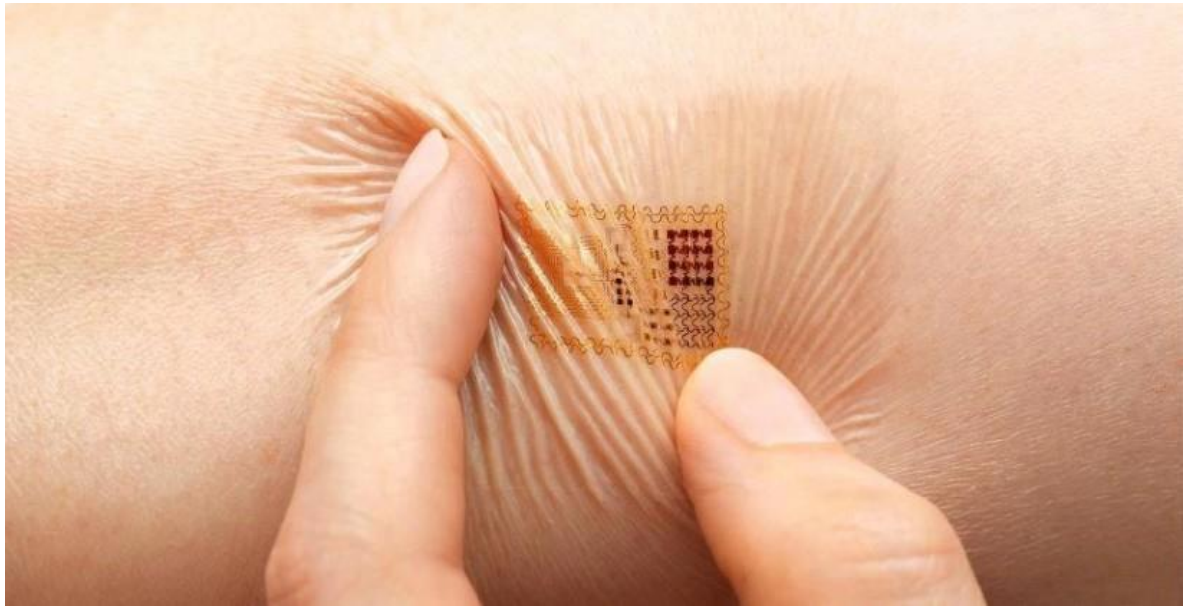
Wearables on and inside us

Hosain Rahman, co-founder and CEO of Jawbone. Photo: Johannes Simon/Getty Images

JAWBONE

Jawbone is building a health tracker you can swallow





Full digital immersion accelerating HCP’s capabilities

UK cancer surgery to be live-streamed via virtual reality technology

Surgeon Shafi Ahmed will carry out procedure for viewers to watch using mobile phone and VR headset

Massive increase of access to health care enabled by technology

zipline

Service Impact Careers Gallery

Lifesaving Deliveries by Drone

Zipline operates the world's only drone delivery system at national scale to send urgent medicines like blood to patients, no matter where they live.

Watch the video

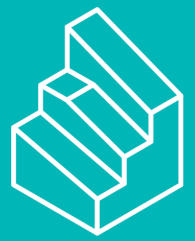
3 key takeaways...

IT'S ALL ABOUT THE INDIVIDUAL

IT'S ALL ABOUT DATA

TECHNOLOGY IS READY, REGULATION IS NOT

Thank You



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Kaffepause

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Det digitale sundhedsvæsen

- Ellen Trane Nørby, Sundhedsminister (V)

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Når digitalisering og data skaber værdi i et offentlig-privat perspektiv

- Bent Hansen, regionsrådsformand (S), Region Midtjylland og formand, Danske Regioner

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Det digitale patientforløb i praksis. Muligheder og udfordringer

Digitale løsninger og innovationssamarbejder tæt på patienten i Region Syddanmark

- Peder Jest, lægelig direktør, Svendborg Sygehus og næstformand Welfare Tech Denmark

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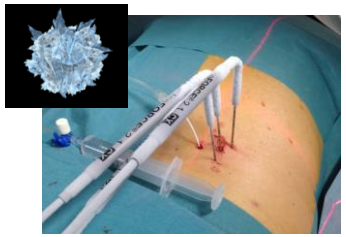
Strategisk Innovation på OUH -

Fra "one size fits all" til "precision technology"

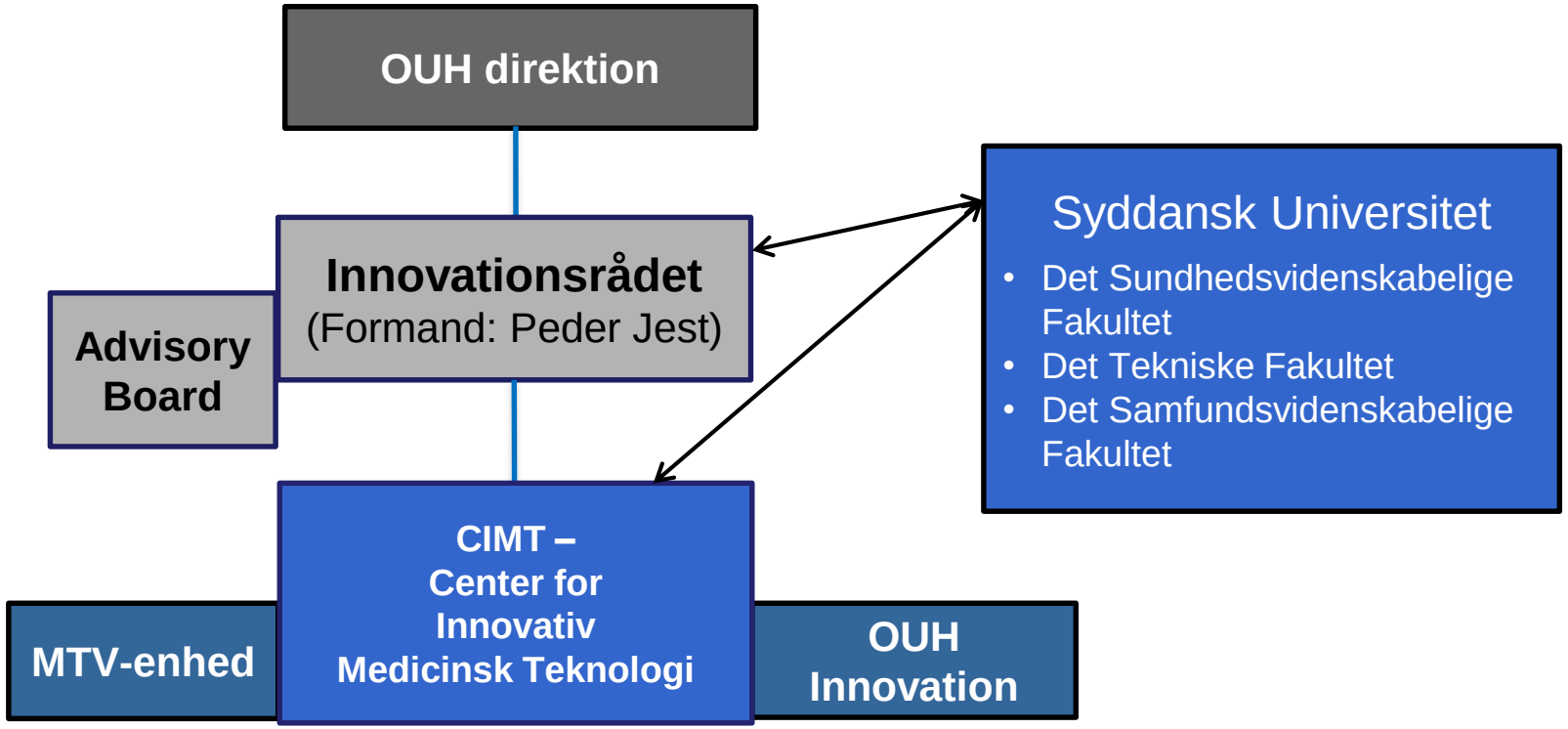


Region Syddanmark

CIMT
Center for Innovativ Medicinsk Teknologi

OUH
Odense Universitetshospital
Svendborg Sygehus

Strategisk Innovation på OUH - Organisering



Strategiske initiativer på OUH:
- Innovationsstrategi 2016-2018
- Intern innovationspulje på 2 mio. kr.
- OUH Innovationsdag til spredning af ideer og løsninger

- Forskningsleder/innovationsprofessor
- Teknisk, samfundsvidenskabelig og kliniske forskningsgruppe
- Internationale forskere og eksperter
- CIMT Academy sikrer formidling

Samarbejde med virksomheder og uddannelsesinstitutioner
- InnoEvent
- InnoRace
- Healthtech Innovator

Region Syddanma

sitetshospital
ehus

Strategisk Innovation på OUH

- Innovation og forskning hånd i hånd - "Patienten Først"
- Første innovationsstrategi på hospital
  (forankret hos forsknings- og innovationscentret CIMT)
- Strategiens fokusområder:
  - Den aktive patient
  - Det innovative hospital
  - Det samarbejdende sundhedsvæsen
  - Forskning i og evaluering af innovation
- Intern innovationspulje sikrer strategisk retning

Fokusområder for ny teknologi på OUH

- Fortsat udvikling af apps og mobile løsninger til forbedring af arbejdsflows og kommunikation mellem personale
- Virtuelle konsultationer skal udbredes til standard-drift for flere patientgrupper – infrastrukturen findes, nu skal vi ud over stepperne
- Sensorer/IOT
- Robotter og droner
- Behandlingsmæssige teknologier, fx kamerapille- og cryo-teknologi

Paradigmeskift skyldes fremtidens patienter

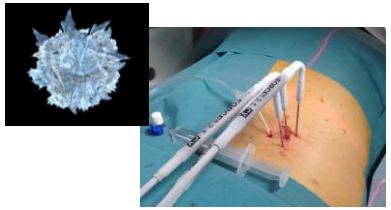
Precision technology – one size does **not** fit all

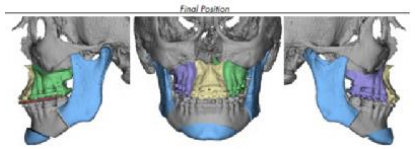
- Den rigtige teknologi skal være tilgængelig til den rigtige patient: Til behandling, omsorg, kommunikation, selv-monitorering, livsstil, etc.
- Vi overvejer og udvælger den passende medicinske behandling for hver patient, men ikke den rigtige teknologi - hvorfor ikke?

Healthcare on-the-go

- Vi skal tilbyde fleksible løsninger som mobil kommunikation, selv-monitorering, virtuelle besøg/videosamtaler – patienter skal kunne vælge, om de ønsker fysisk fremmøde, videokonsultation, foretage egne målinger, elektroniske spørgeskemaer fremfor fysiske kontroller – så længe vi kan garantere den behandlingsmæssige kvalitet!

Care across the continuum





Vi skal evne både det højt specialiserede på hospitalerne
og det fleksible og nemme i borgernes nærmiljø

Region Syddanmark

CIMT
Center for Innovativ Medicinsk Teknologi

OUH
Odense Universitetshospital
Svendborg Sygehus

Tak for opmærksomheden ☺

Direktør
Peder Jest

Tlf. 40 82 73 41
peder.jest@rsyd.dk

Læs mere om innovationsprojekter på OUH på www.cimt.dk

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Det digitale patientforløb i praksis. Muligheder og udfordringer

Sygdomsregistre og kunstig intelligens i diabetesforskning
- hvordan får vi data ind i konsultationen?

- Marit Eika Jørgensen, Professor MD, ph.d., cand.med. Steno Diabetes Center

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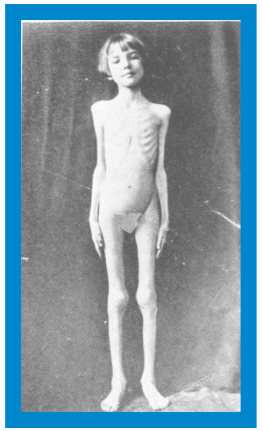
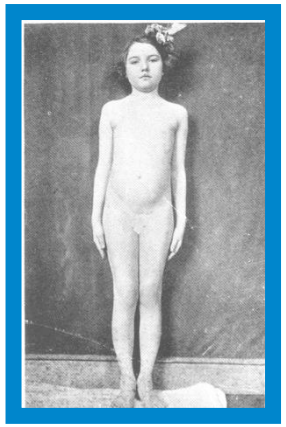
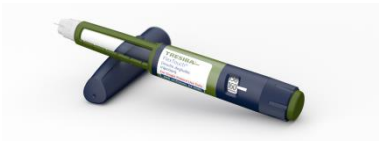
Sygdomsregistre og kunstig intelligens i diabetesforskning

- hvordan får vi data ind i konsultationen?

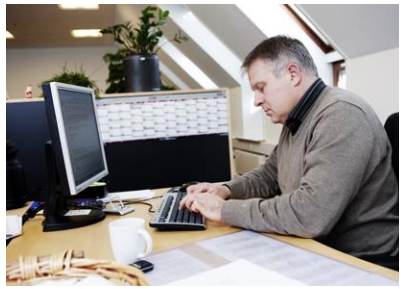
Hvad er diabetes?

Type 1 diabetes (Ca. 30.000 i DK)



Type 2 diabetes (Ca. 250.000 i DK)

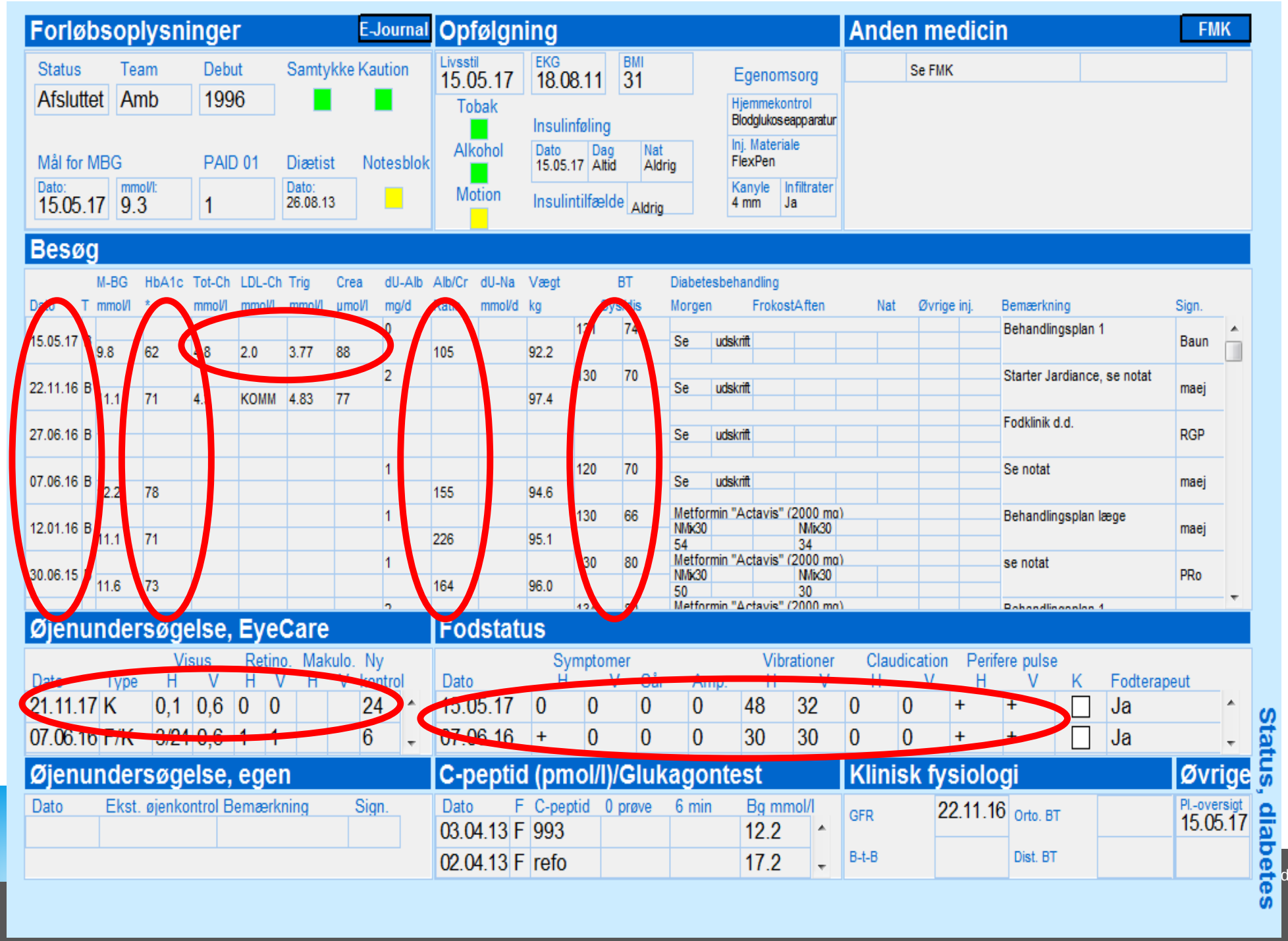


Diabetes er en alvorlig sygdom

- 5 millioner årlige dødsfald globalt
- 2-4 gange forøget risiko for hjertekarsygdom
- Den vigtigste årsag til
  - Amputationer
  - Blindhed
  - Nyresvigt

Diabeteskomplikationer kan undgås

- Med god diabetesbehandling
- Behandling af forhøjet blodtryk og kolesterol
- Regelmæssig undersøgelse af
  - Øjne
  - Fødder
  - Nyrer (urin)
  - Kolesterol, blodtryk


Forløbsoplysninger
E-Journal
Status
Team
Debut
Samtykke
Kaution
Afsluttet
Amb
1996
Mål for MBG
PAID 01
Diætist
Notesblok
Dato:
mmol/l:
15.05.17
9.3
1
Dato:
26.08.13
Opfølgning
Livsstil
15.05.17
EKG
18.08.11
BMI
31
Tobak
Alkohol
Motion
Insulinføling
Dato
Dag
Nat
15.05.17
Altid
Aldrig
Insulintilfælde
Aldrig
Egenomsorg
Hjemmekontrol
Blodglukoseapparatur
Inj. Materiale
FlexPen
Kanyle
4 mm
Infiltrater
Ja
Anden medicin
FMK
Se FMK
Besøg
M-BG
HbA1c
Tot-Ch
LDL-Ch
Trig
Crea
dU-Alb
Alb/Cr
dU-Na
Vægt
BT
Diabetesbehandling
Dato
T
mmol/l
mg/d
mmol/d
kg
Morgen
Frokost
Aften
Nat
Øvrige inj.
Bemærkning
Sign.
15.05.17
9.8
62
2.0
3.77
88
105
92.2
74
Se udskrift
Behandlingsplan 1
Baun
22.11.16
B
1.1
71
KOMM
4.83
77
97.4
70
Se udskrift
Starter Jardiance, se notat
maej
27.06.16
B
Se udskrift
Fodklinik d.d.
RGP
07.06.16
B
2.2
78
155
94.6
120
70
Se udskrift
Se notat
maej
12.01.16
B
11.1
71
226
95.1
130
66
Metformin "Actavis" (2000 mg)
NMix30
54
NMix30
34
Behandlingsplan læge
maej
30.06.15
11.6
73
164
96.0
30
80
Metformin "Actavis" (2000 mg)
NMix30
50
NMix30
30
se notat
PRo
Øjenundersøgelse, EyeCare
Visus
Retino.
Makulo.
Ny kontrol
Dato
Type
H
V
H
V
H
V
21.11.17
K
0,1
0,6
0
0
24
07.06.16
F/K
0,6
1
1
6
Fodstatus
Symptomer
Vibrationer
Claudication
Perifere pulse
Dato
H
V
Sår
Amp.
H
V
H
V
H
V
K
Fodterapeut
15.05.17
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0
0
0
48
32
0
0
+
+
Ja
07.06.16
+
0
0
0
30
30
0
0
+
+
Ja
Øjenundersøgelse, egen
Dato
Ekst. øjenkontrol
Bemærkning
Sign.
C-peptid (pmol/l)/Glukagontest
Dato
F
C-peptid
0 prøve
6 min
Bg mmol/l
03.04.13
F
993
12.2
02.04.13
F
refo
17.2
Klinisk fysiologi
GFR
22.11.16
Orto. BT
B-t-B
Dist. BT
Øvrige
Pl.-oversigt
15.05.17
Status, diabetes

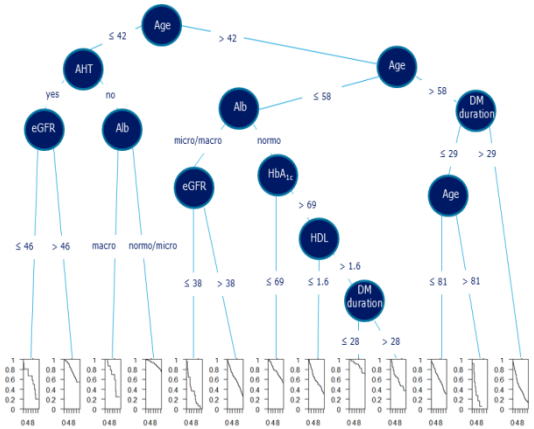
Eksempel 1:

Type 1 diabetes: risikoscore for hjertekarsygdom

Poisson regressionsanalyse

$$\text{5-year cardiovascular disease risk} = \Big(1 - S_0(5)^{\exp[\beta 1 \times (\text{duration} - 28.014) + \beta 2 \times (\text{age} - \text{duration} - 16.601) + \beta 3 \times (\log(\text{TC:HDL}) - 1.1470) + \beta 4 \times (\log(\text{HbA1c(DCCT)}) - 2.0605) + \beta 5 \times (\log(\text{systolicBP}) - 4.8598) + \beta 6 \times (\text{smoker} - 0.1483) + \beta 7 \times (\text{macroalbuminuria} - 0.1237) + \beta 8 \times (\text{previousCVD} - 0.0612)]}\Big) \times 100$$

Survival curve analyse



Metode

Elektroniske patientjournaler (2001-2013)

- Alder, køn og etnicitet
- Højde og vægt
- Diabetes varighed
- HbA_{1c}
- Albumin/creatinine ratio & eGFR
- Kolesterol og blodtryk
- Kalium og Natrium
- Medicinering
- Rygning, alkohol og fysisk aktivitet

CPR

Landspatientregistret (1977+)

- Indlæggelse for hjertekarsygdom

Dødsårsagsregistret (1943+)

- Død pga. hjertekarsygdom

Circulation. 2016 Mar 15;133(11):1058-66

https://sdcc.dk/T1RiskEngine

Patient characteristics

Please enter the clinical characteristics of your type 1 diabetes patient.

Age (years): 50

Systolic blood pressure (mmHg): 130

Albuminuria: Normal

Sex: Female

LDL cholesterol*: 2

eGFR (ml/min/1.73m^2): 100

Risk profile

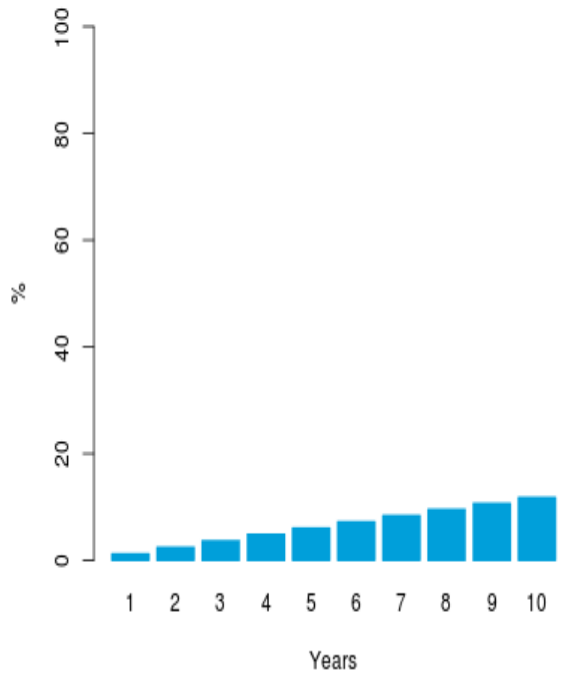
Patient's 10-year risk is:

MEDIUM

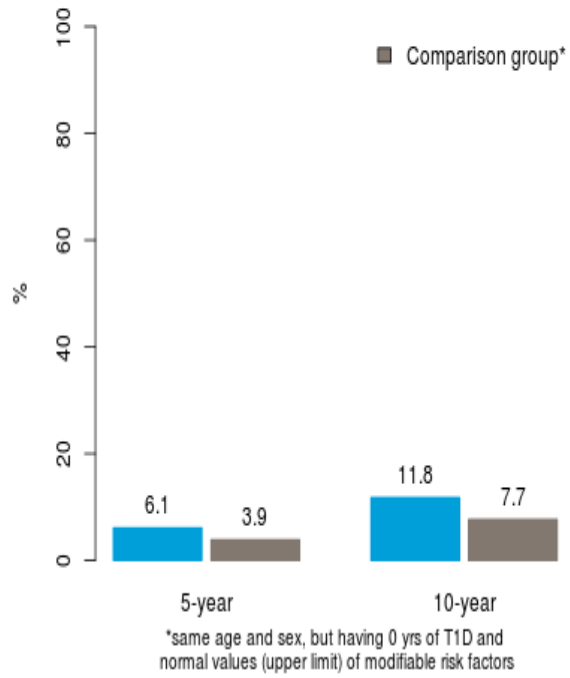
Categorisation of risk is defined as low: <10%, medium: 10-20%, high: ≥ 20% based on UK guidelines.

See European guidelines for CVD prevention.

Patient estimated CVD risk

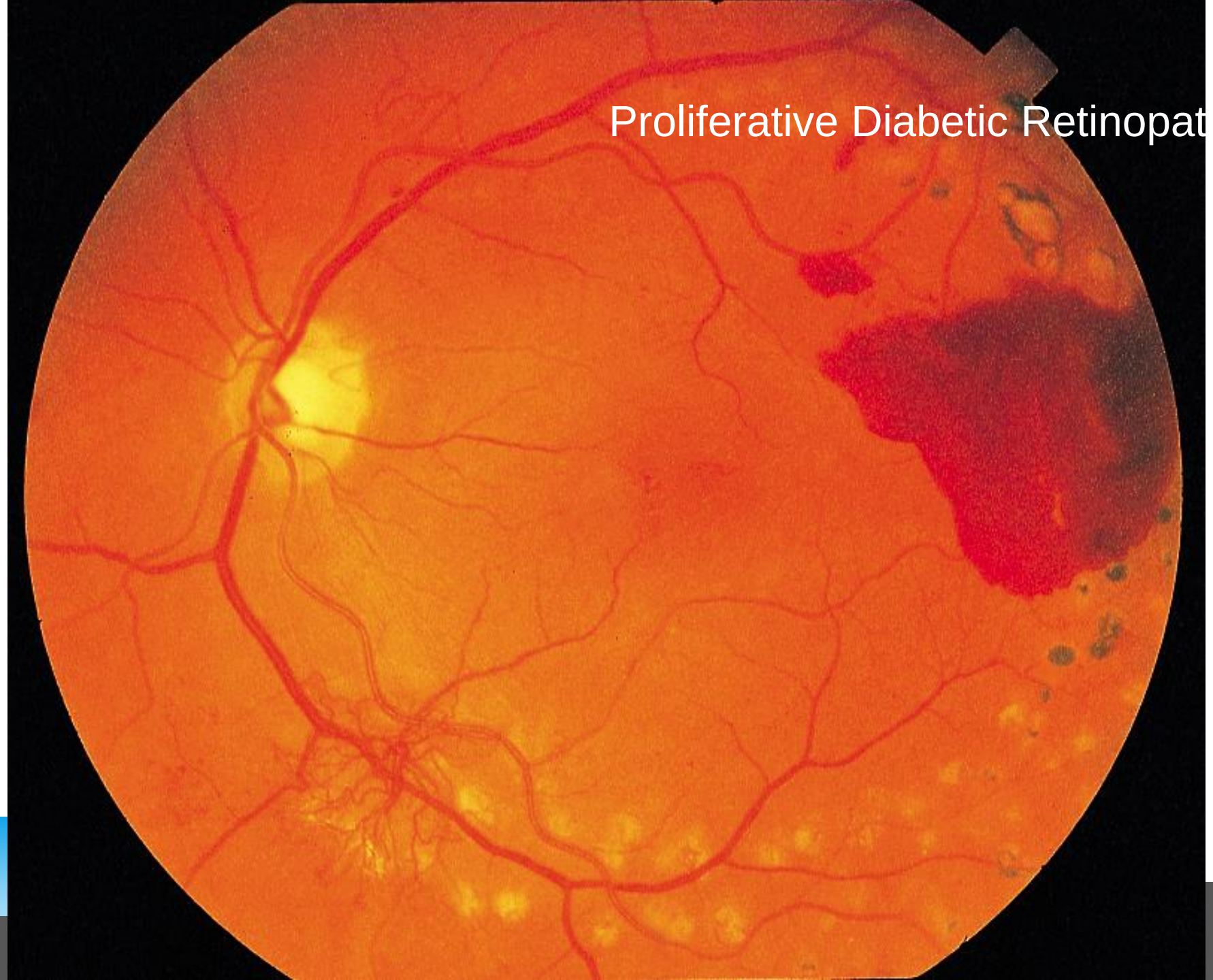


Risk comparison



Circulation. 2016 Mar 15;133(11):1058-66

Steno Diabetes Center Copenhagen


Proliferative Diabetic Retinopat

REGION

Dansk Voksendiabetes database
Procesindikatorer - Diabetes

HbA1c, Undersøgt indenfor et år	95%
Blodtryk, Undersøgt indenfor et år	95%
Nyresygdom, Undersøgt indenfor to år	95%
Kolesterol, Undersøgt indenfor to år	95%
Øjne, Undersøgt indenfor to år	90%
Øjne, Undersøgt indenfor fire år	95%
Fødder, Undersøgt indenfor et år	95%

Voksne, diabetesambulatorier

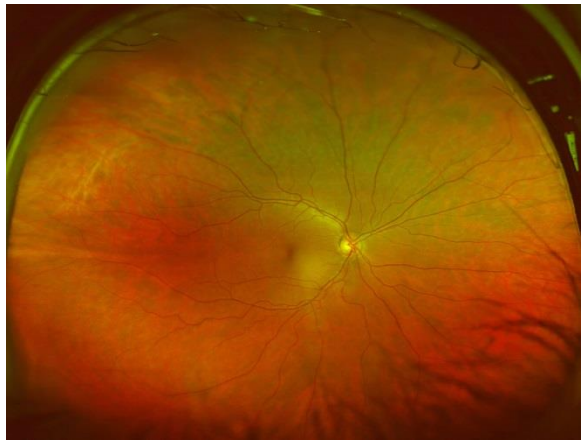
4f (tidl. 5a). Andelen af patienter, som mindst hvert 2. år har fået foretaget øjenundersøgelse	Std. 90% opfyldt	Tæller/ nævner	Uoplyst (pct.)	Aktuelle år 1.3.14-28.2.15 Andel	95% CI	Tidligere år 2013/14 Andel	2012/13 Andel
Danmark	ja	35041 / 38170	0 (0)	**92**	(92-92)	91	92
Hovedstaden	ja	12947 / 14007	0 (0)	**92**	(92-93)	91	92
Sjælland	ja	4255 / 4383	0 (0)	**97**	(97-98)	98	96
Syddanmark	nej	9207 / 10329	0 (0)	**89**	(89-90)	88	89
Midtjylland	ja	5716 / 6228	0 (0)	**92**	(91-92)	90	92
Nordjylland	ja	2916 / 3223	0 (0)	**90**	(89-91)	91	94

Voksne - almen praksis

Indikator 4f (tidl. 5a)	Std. 90% opfyldt	Tæller/ nævner	Uoplyst (pct.)	Aktuelle år 1.3.14-28.2.15 Andel	95% CI	Tidligere år 2013/14 Andel	2012/13 Andel
Danmark	nej	23956 / 32128	0 (0)	**75**	(74-75)		
Hovedstaden	nej	6707 / 9210	0 (0)	**73**	(72-74)		
Sjælland	nej	4196 / 5436	0 (0)	**77**	(76-78)		
Syddanmark	nej	5036 / 6697	0 (0)	**75**	(74-76)		
Midtjylland	nej	5765 / 7769	0 (0)	**74**	(73-75)		
Nordjylland	nej	2252 / 3016	0 (0)	**75**	(73-76)		

Nye metoder til undersøgelse og gradering af nethindefotos ved diabetes

Widefield Retina Camera



- Ikke specialistkrævende (sygeplejerske eller øjenlæge)
- Kræver ikke udvidelse af pupillen
- 200° foto vs. ~60°
- Ikke endnu optimalt til *makulopati*

Automatiseret gradering af nethindefotos

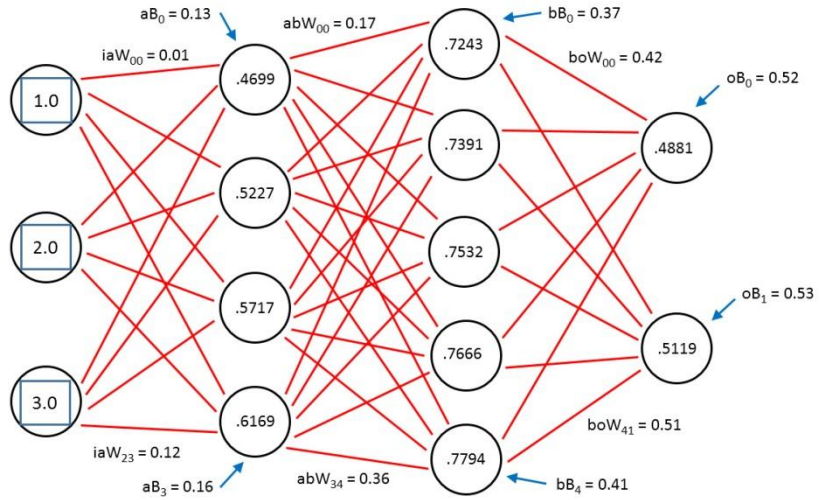
Research

JAMA | Original Investigation | INNOVATIONS IN HEALTH CARE DELIVERY

Development and Validation of a Deep Learning Algorithm for Detection of Diabetic Retinopathy in Retinal Fundus Photographs

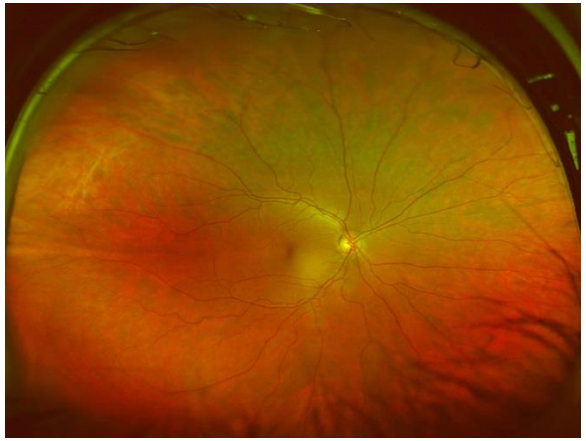
Varun Gulshan, PhD; Lily Peng, MD, PhD; Marc Coram, PhD; Martin C. Stumpe, PhD; Derek Wu, BS; Arunachalam Narayanaswamy, PhD; Subhashini Venugopalan, MS; Kasumi Widner, MS; Tom Madams, MEng; Jorge Cuadros, OD, PhD; Ramasamy Kim, OD, DNB; Rajiv Raman, MS, DNB; Philip C. Nelson, BS; Jessica L. Mega, MD, MPH; Dale R. Webster, PhD

Neural network optimized for image classification



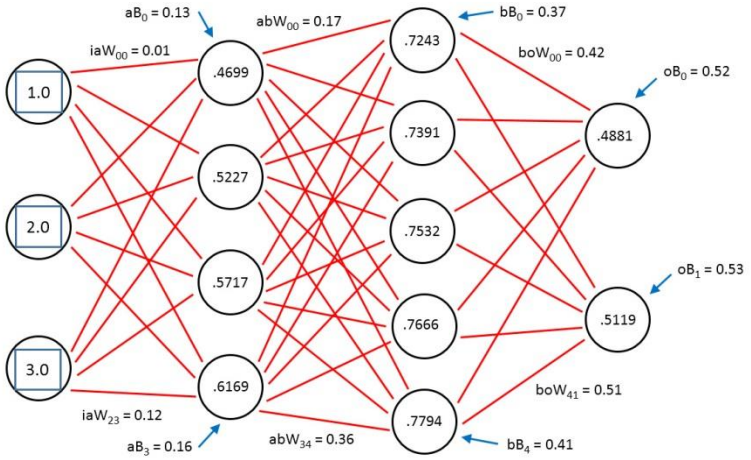
REGION

Widefield Nethindekamera



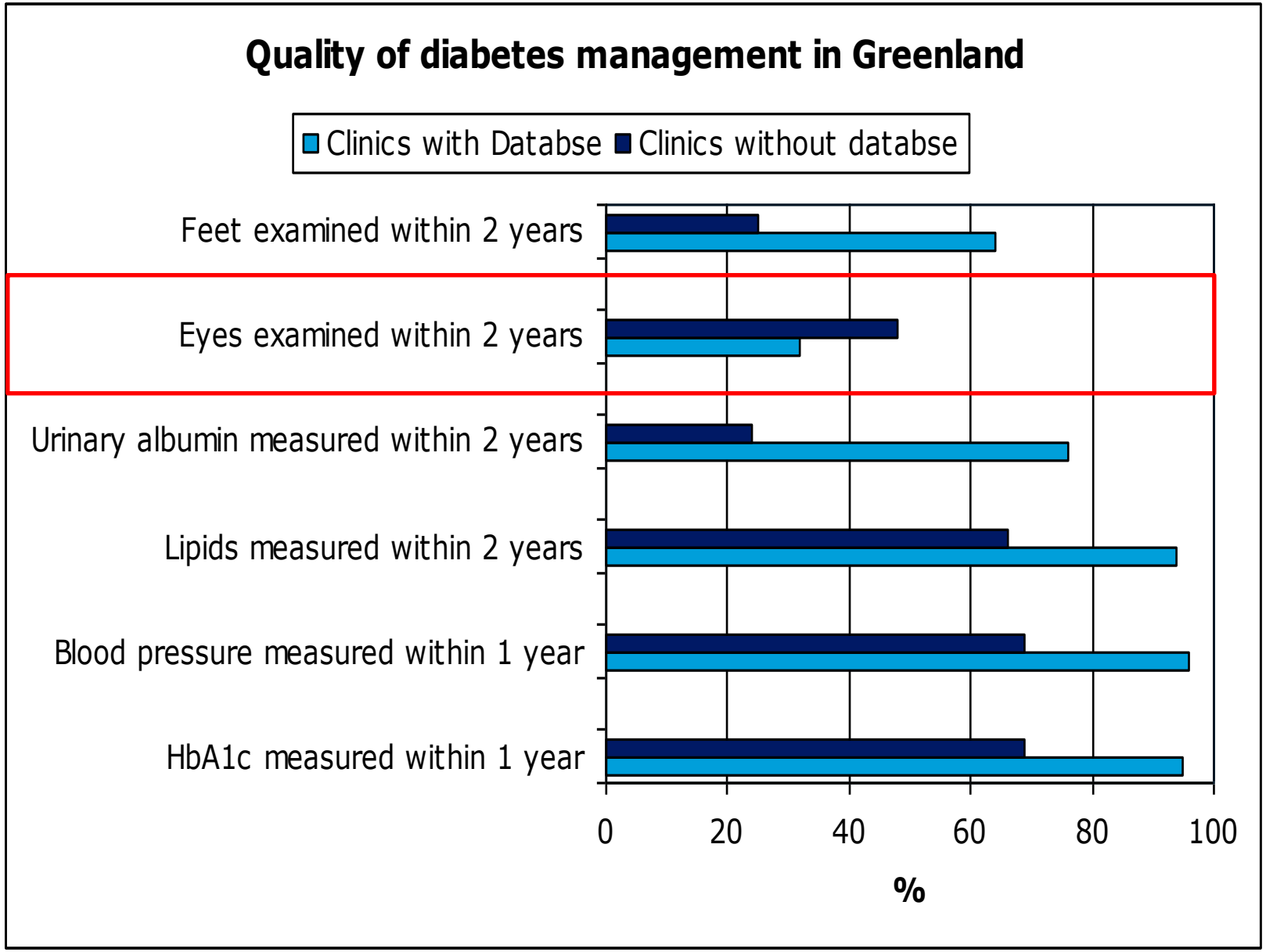
+

Automatisk gradering

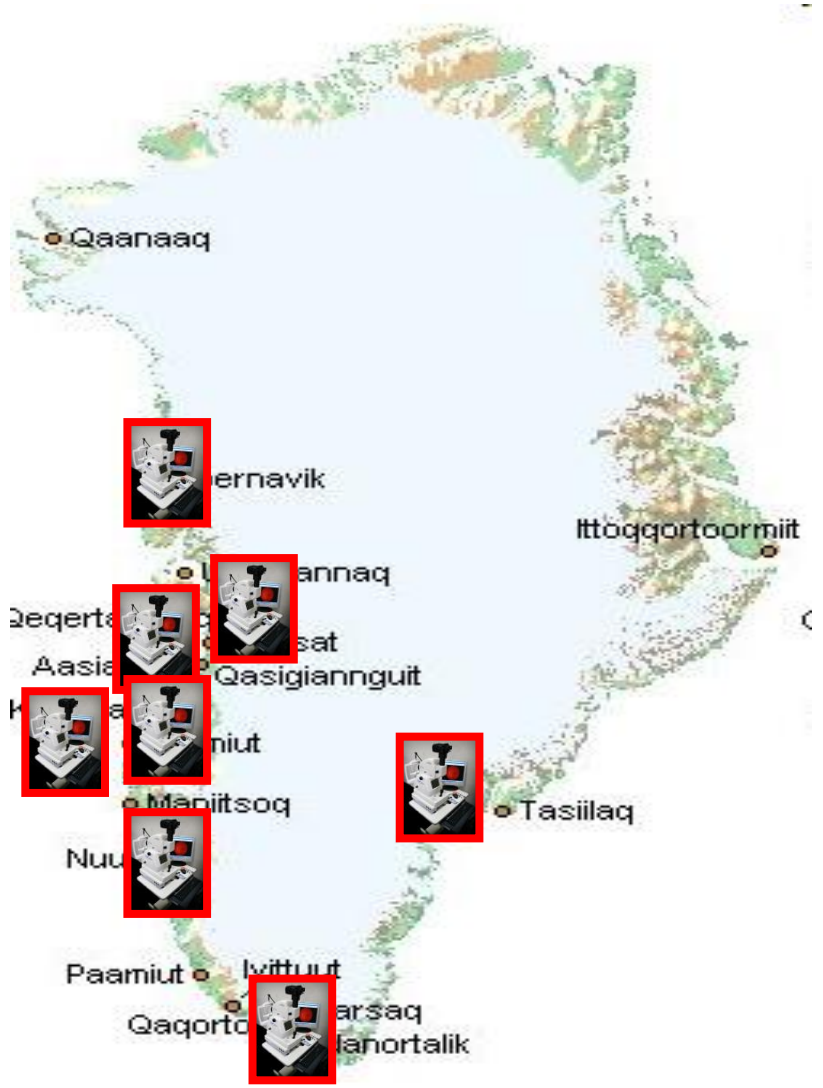


=

- Let adgang til screening for diabetisk øjensygdom
- Identifikation af (få) individer med behov for højt specialiseret undersøgelse og behandling



Pedersen ML et al. IJCH 2016


Qaanaaq
Ittoqqortoormiit
Tasiilaq
Paamiut

Grønland 2017!

Danmark 2017!

Pause

#sundpol17

DANSK ERHVERV

DANSKE REGIONER

IT-Branchen

MEDICO INDUSTRIEN

SUNDHED DANMARK
Foreningen af danske sundhedsvirksomheder

LIF

Politisk debat

- Camilla Hersom, Formand, Danske Patienter
- Claus Rehfeld, Partner, Health Innovation Institute
- Ulla Astman (S), regionsrådsformand Region Nordjylland og medlem af Danske Regioners bestyrelse
- Ida Auken, MF (RV), Formand Siri-Kommission

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Afslutning

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Frokost

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