healum

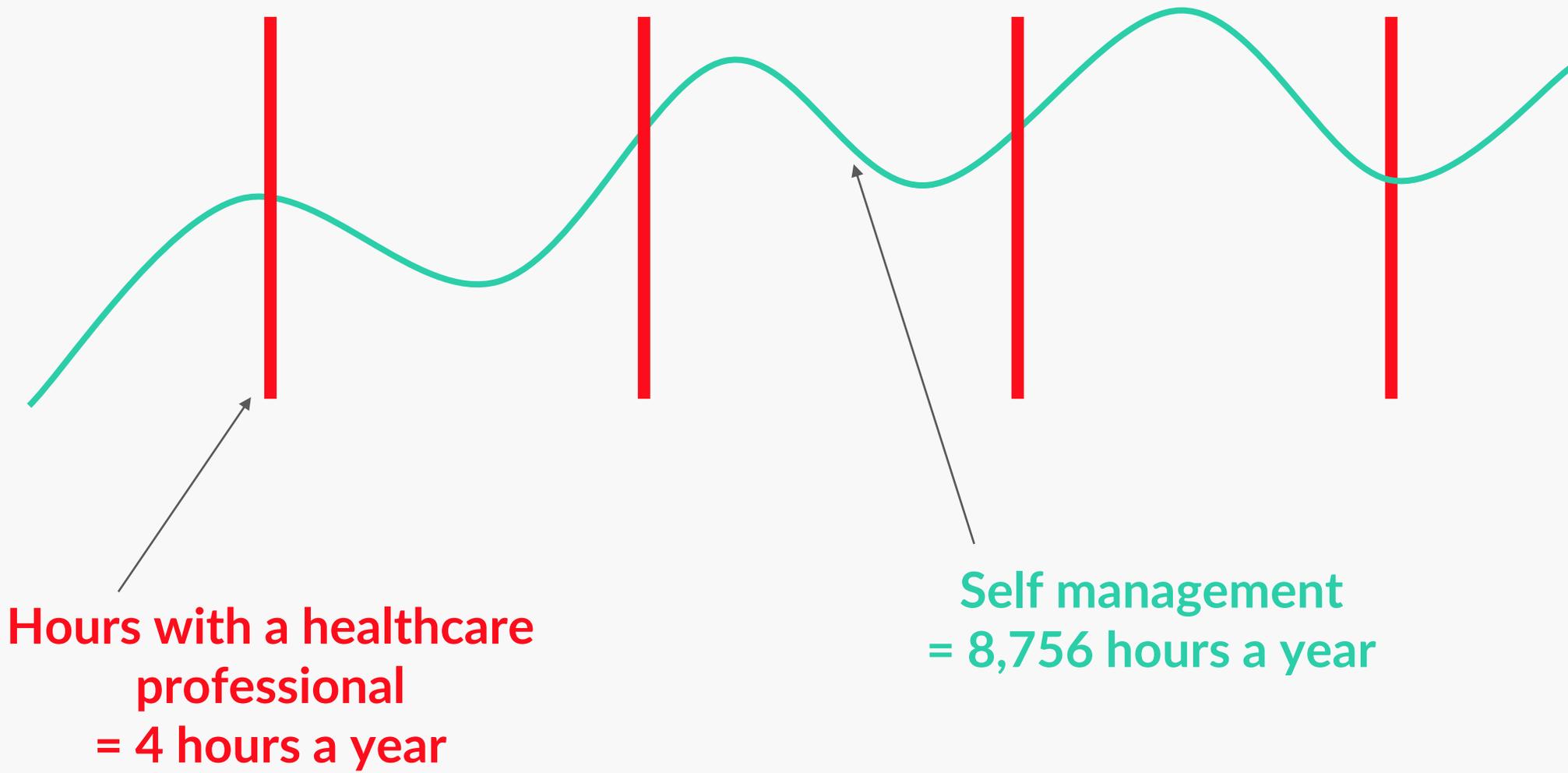# Digital health platform for managing patients with Long Term Conditions

AI powered digital health platform for proactive patient health management
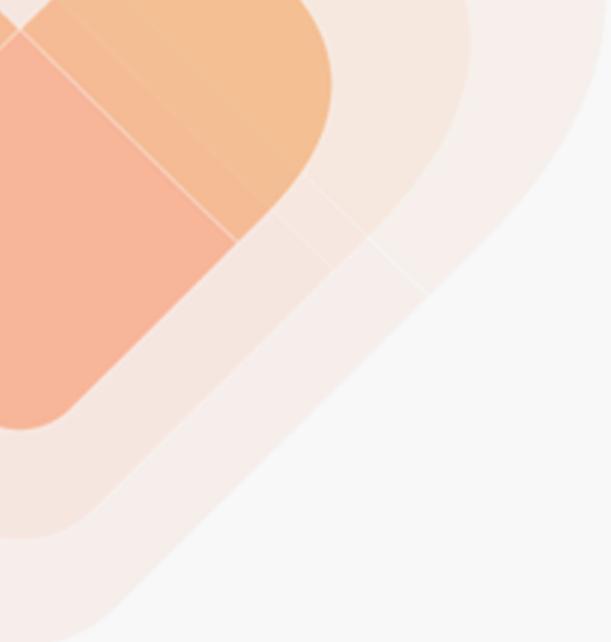
At what moments do we make health choices?

Hours with a healthcare professional = 4 hours a year

Self management = 8,756 hours a year

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The problem

The problem: For patients

Patients are not aware of the full range of options, including local support

Difficult to access advice and support when needed

Information that is available to patients may not be verified and appropriate for them

Patients are not given the support they need beyond a clinical setting

Patients don't have time or the means to make healthy choices

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The problem: For healthcare professionals in primary care

Stretched capacity with limited time to spend with each patient

HCPs in practices don't have a shared system that supports MDT care plans

Primary care being asked to support self-management without effective tools to do so

New roles e.g. Link Worker, Social Prescriber, have not been fully maximised

Lack of insight into how patients are managing their health and well-being

1 Poorer Health outcomes and quality of life

2 High care inequality

3 Poor patient experience
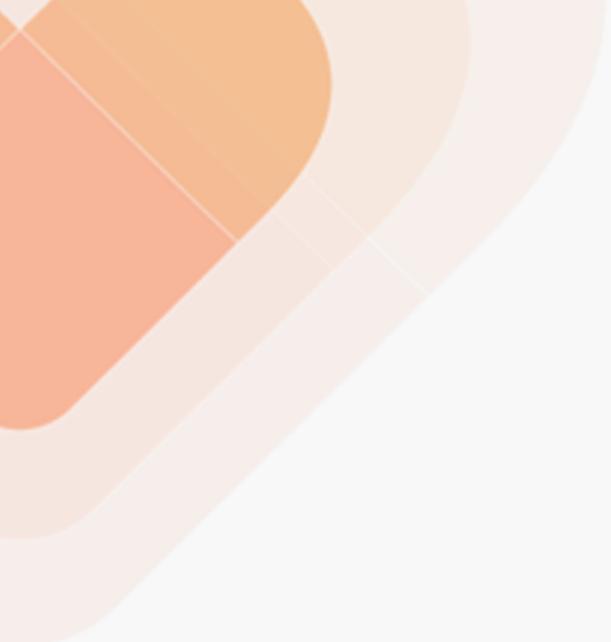
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Our product

The Healum solution
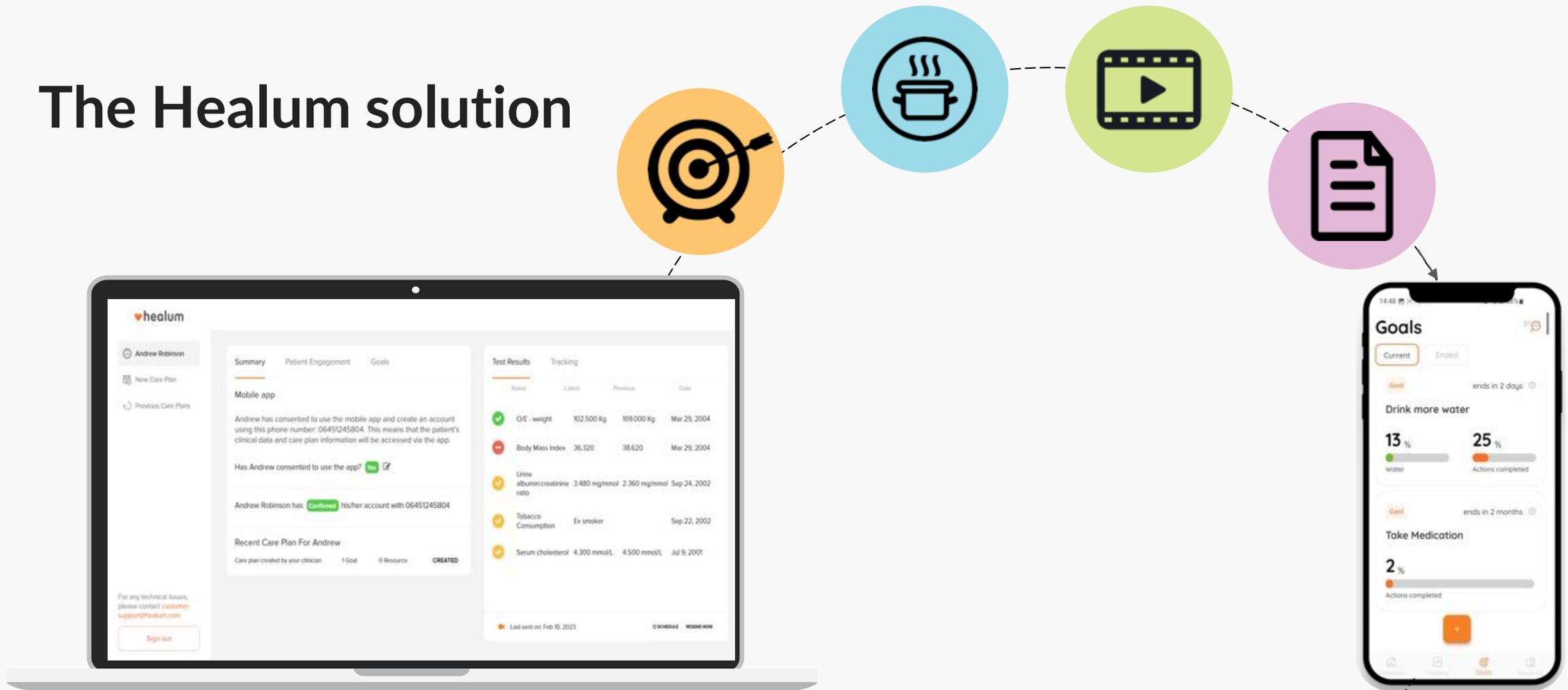
Personalised self-care support to empower patients diagnosed with Type 2 Diabetes and LTCs to proactively manage their health

When is the product used?
At times when there is an opportunity to provide fast, personalised, consistent, light-touch self-care support

During Diabetes annual reviews

After an NHS Health Check

After discovery of high HBA1C

Routine appointments for diabetes care

Link-worker or H&W coach appointments

Info sharing after medication review

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Five things a patient can do

Access health content recommended by the GP Practice

Trusted articles, recipes, videos, exercises from credible sources that staff at the practice recommend for improving health and managing CVD risk

Tick off personalised daily actions as part of health goals

Daily list to remember to eat healthily, rest properly, take medication, book services, exercise a little and whatever else they agreed with the practice team

Discover and access services around them

View and book services in the local community shared by their GP practice team that help them to improve physical health and mental wellbeing

See and understand their test results

Access and understand their most relevant recent and previous results for blood pressure, weight, cholesterol, HBA1c (if relevant)

Track health outcomes and progress

Track a range of different aspects of their health including steps, water intake, sleep, exercise, diet, habits, mood and whatever else they wish.

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Main Benefits that Healum delivers for ICBs
How does procuring Healum support ICB strategy?

Address health inequalities

Reduce variation in treatment across ICB

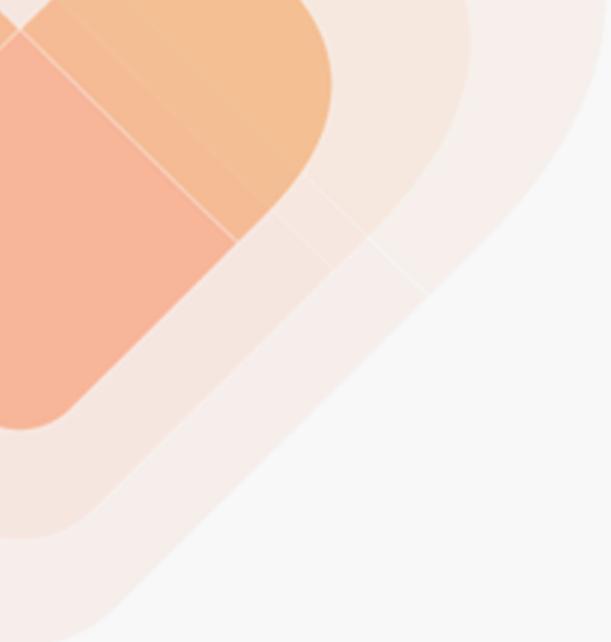**Improve clinical efficiency across PCN**

Promote engagement, self care and motivation

Understand health needs of people from diverse backgrounds and needs

Improve long term health outcomes and spending on hospital admissions.
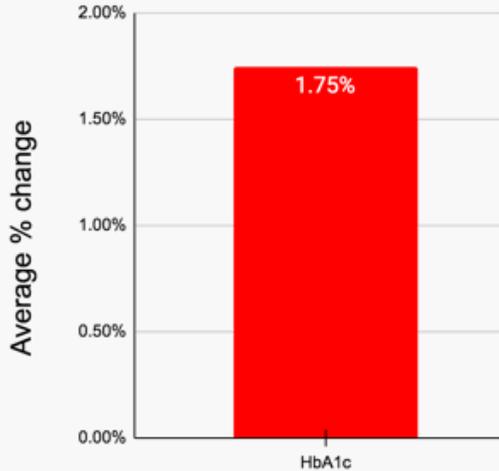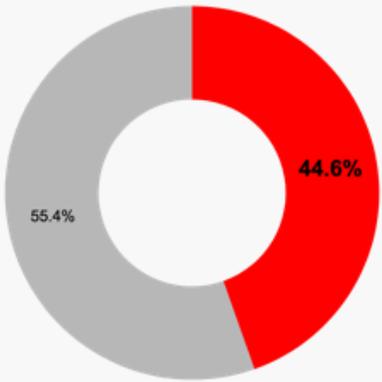
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Our evidence

that Healum's digital solution improves patient self-management & health outcomes

Patients that used the Healum app reduced their HbA1c
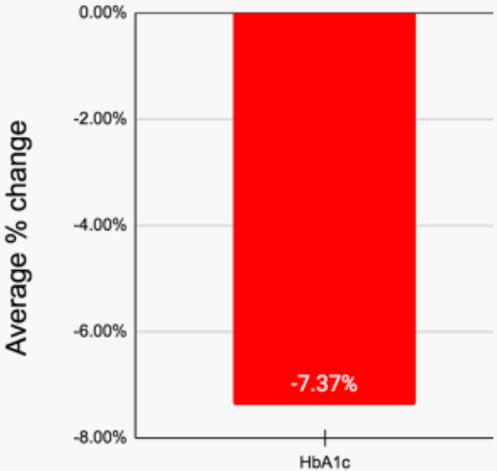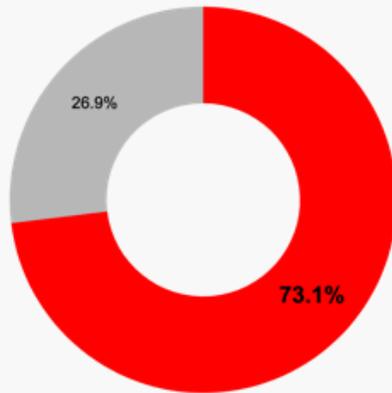
Control group (HbA1c n=65, BMI n=56)

Active treatment group (HbA1c n=87, BMI n=74)

Reduced HbA1c

Reduced HbA1c

44.6%

55.4%

73.1%

26.9%

1.75%

-7.37%

Average % change

Average % change

HbA1c

HbA1c

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What did patients have to say?

"The act of thinking of and capturing goals I think was really good. Before this, I didn't feel as if anyone had asked me those questions. I didn't really consciously think about them until the app presented the opportunity. So that was one big positive impact on me at the start."

"I think the app is a very useful tool - it has the right things on there to help and motivate you."

"Having the app has made me feel more motivated. Before, whenever I went to the GP, it was all about the drugs I must take and that was it. I was never really told about the things I could do myself to help my diabetes management. However, during the care plan appointment and having the app, I was informed about other things I could do. It's been a helpful reminder to do things myself to help my health."

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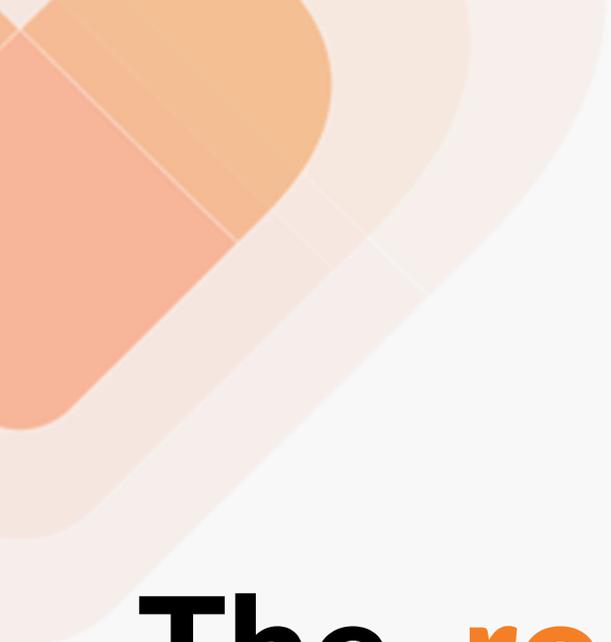
The role of AI in personalised care
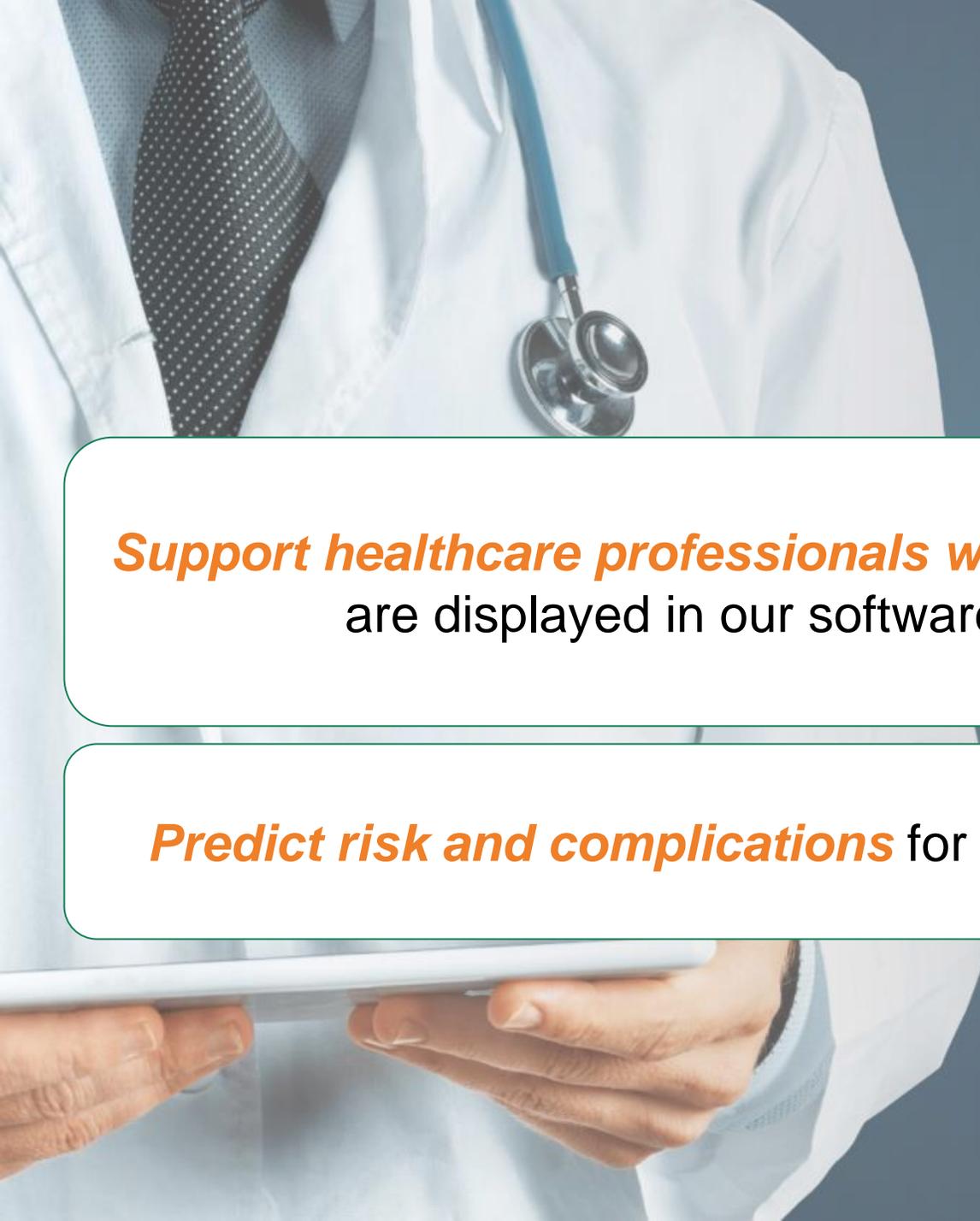
What do we want the AI to solve?

Support healthcare professionals with personalised care recommendations that are displayed in our software and can aid clinical decision making

Predict risk and complications for patients with one or more long term conditions

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Creating the possibility for AI delivered care
Barriers we are addressing to drive trust and adoption

CONTROL

Stakeholders do not feel that they have control over their data and how it is used

TRANSPARENCY

Current solutions do a poor job explaining the results they deliver and the data used
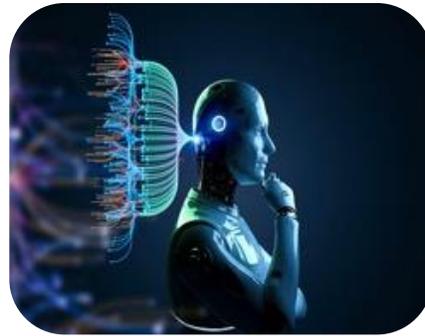
PERFORMANCE

It is frequently found that AI models do not perform as well as doctors and nurses

BIAS

Algorithms trained and validated on data sets that are biased ethnically and socially

ADOPTION

The solutions have not often been tailored to the pathway which limits adoption

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Live Learning network
Giving control back to clinicians

See what other HCPs have shared with similar types of patient: View what personalised strategies, including goals, actions, resources and services have worked for other patients

Better relevance of recommendations: learn which recommendations have generated the best health outcomes with similar patients across ethnic and social deprivation groups

View insights at PCN or practice level: understand different patient needs, behaviour, health activation and use of services

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Data partnership: NHS and the industry

| Trusted Research Environments | PPI (Patient & Public Involvement) | NHS Live learning environments |

Machine learning built using the live inputs of clinicians
with unique proprietary peer learning algorithm

Content

Classifier
SNOMED

Inference engine
Rules-based
Expert System

Recommendation
engine

Healthcare
professionals

People
With long term
conditions

247818001
102931001
363714003
285854004
285845104
247855001
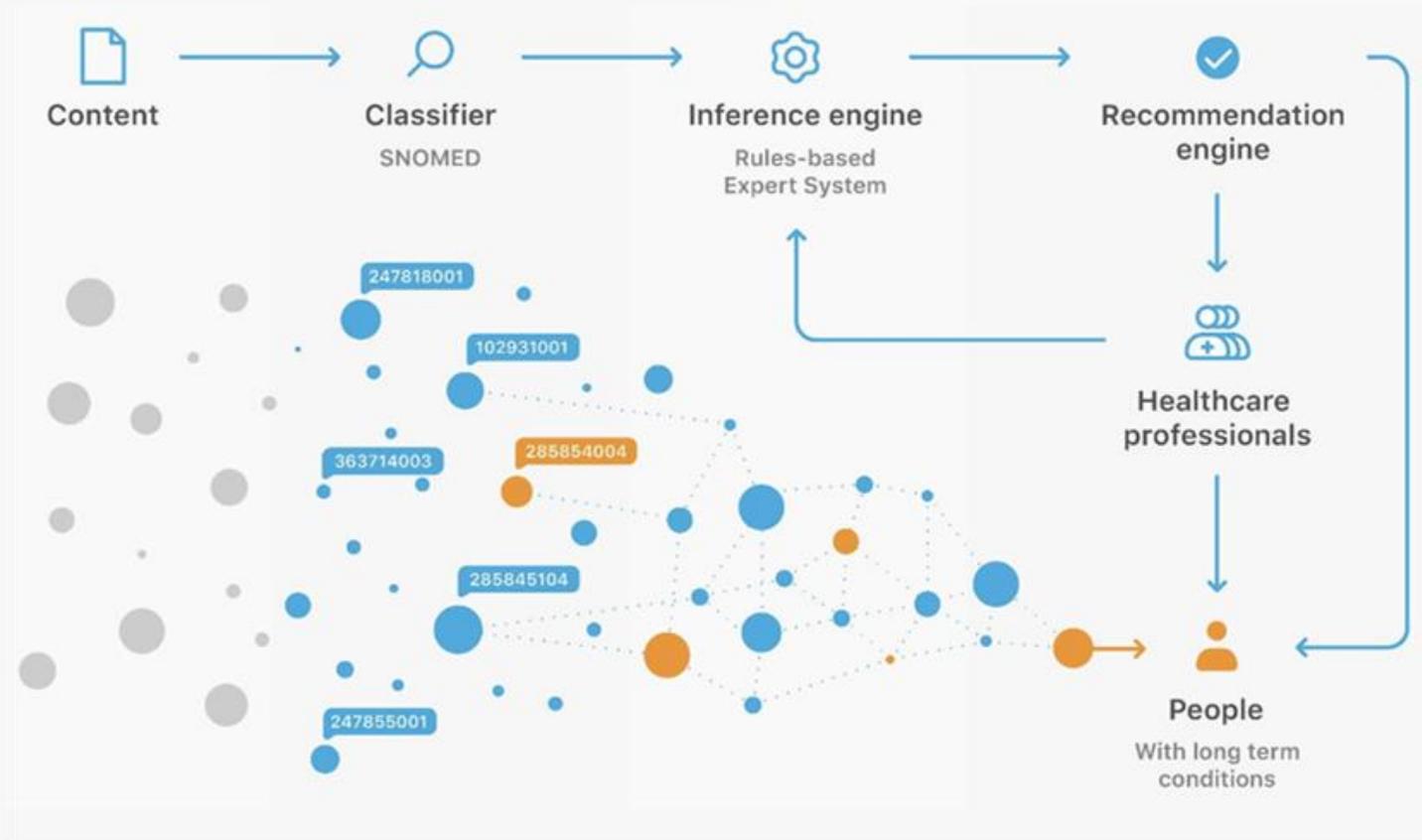
Healum harnesses the collective intelligence of healthcare professionals to supply the most appropriate support resources to each patient

92% accuracy in predicting complications

Classifiers: Types and their use

Condition Classifier
based on bio-measurements

Content classifier
based on predicted or known conditions

Medication classifier
based on SNOMED descriptions

**Statutory services classifier**
based on SNOMED descriptions

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Risk prediction Engine

System

System that predicts risks of condition(s) over time within 6 months, based on patient medical and non-medical profile

Modelling and risk predicting

- **Historical data from trusted research environment**

  (medical and non-medical data)

- **Patient Behavioural data from live environment**

  (app engagement, lifestyle and patient activity)
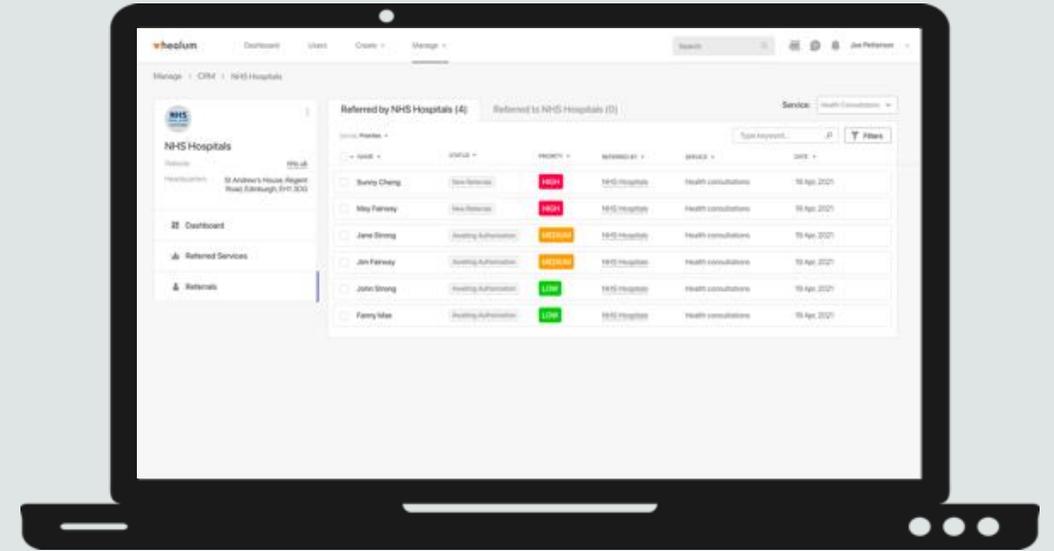
Challenges to the system

- **Design:** trusted research environment, ethics approval

- **Data:** access & extraction, data efficiency, filtering of data

- **Validating & testing** in real world

- **Algorithmic bias**

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Recommendation engine
Peer-learning: Research embedded in usual care

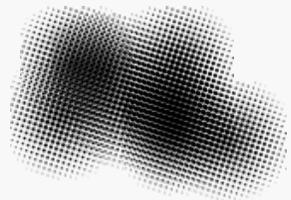|		
HCP similarity engine		Based on healthcare professionals' profile
Patient reinforcement		Based on patients' outcomes with similar profiles
Recommendation engine		Based on similarity engines

Where do we go from here?
Peer-learning aka **live-learning** embedded in usual care

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Peer learning network for real-time, real-world study

Thank You

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Population Health at Scale

Abtrace scans the entire medical record of 2.7 million patients daily

FOOTPRINT

30/42
Integrated Care Systems have Abtrace Presence

INTEGRATION

96%
NHS market access secured.
Full read/write integration with EHRs

SAFETY

UKCA | CE marked
Software as medical device

ABTRACE

Sick Care is too late

CURRENT SPENDING

PREVENTION	EARLY DETECTION	MONITORING	REACTIVE PRIMARY CARE	ACUTE SECONDARY CARE
At Risk	Hidden Disease	Deteriorating	Unwell	Sick
YEARS	MONTHS	WEEKS	DAYS	HOURS

POTENTIAL BENEFICIARIES

32
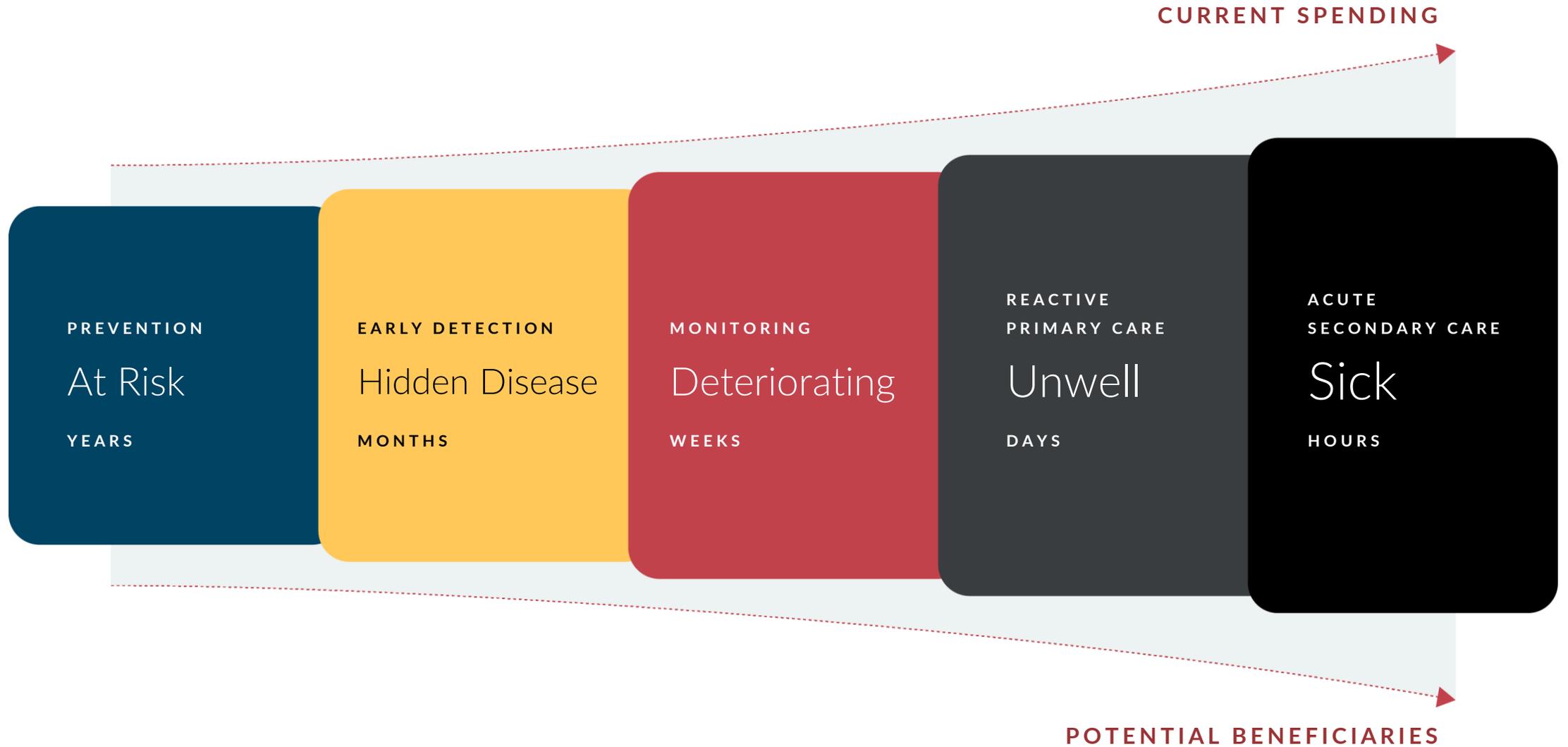
Personalised care requires delivery at Scale

EFFECTIVENESS

Move This Way

PREVENTION

At Risk

YEARS

3 IN 4 WILL DEVELOP PREVENTABLE LONG-TERM DISEASE

EARLY DETECTION

Hidden Disease

MONTHS

1 IN 4 WILL DEVELOP LATE-STAGE CANCER

MONITORING

Deteriorating

WEEKS

1 IN 9 NEED DISEASE MONITORING

REACTIVE PRIMARY CARE

Unwell

DAYS

ACUTE SECONDARY CARE

Sick

HOURS

COST

Automating and Improving Clinical Decisions

Know
Guidelines encoded
or learnt by software

See
Integrated into
EHRs allowing data
extraction

Act
Supported by
Automation

ABTRACE

Unlocking
Electronic Health Record Systems (EHRs)

Preventing New Disease
Evidence Based Interventions to stop or
slow onset of new disease based on
Machine Learning risk stratification

2025

Detecting Hidden Disease
Natural Language Processing and **LLMs** to
identify the early onset of disease

2024

Monitoring Existing Disease
Encoding thousands of Clinical Guidelines to
identify deterioration and coordinate care

2022

34

Digital Preventative, Proactive Care
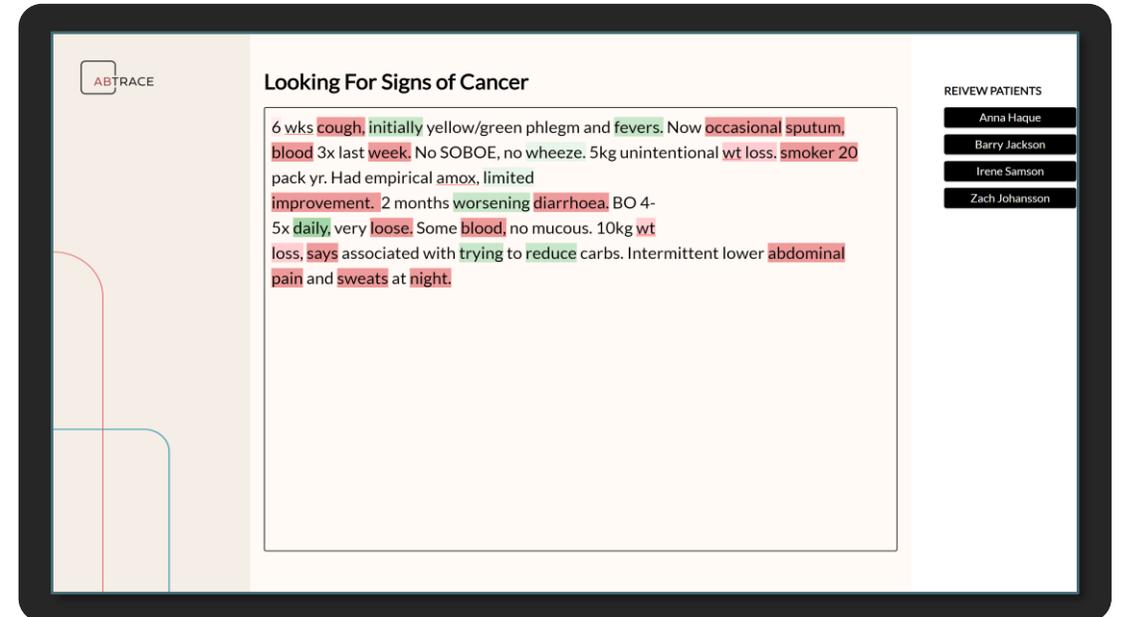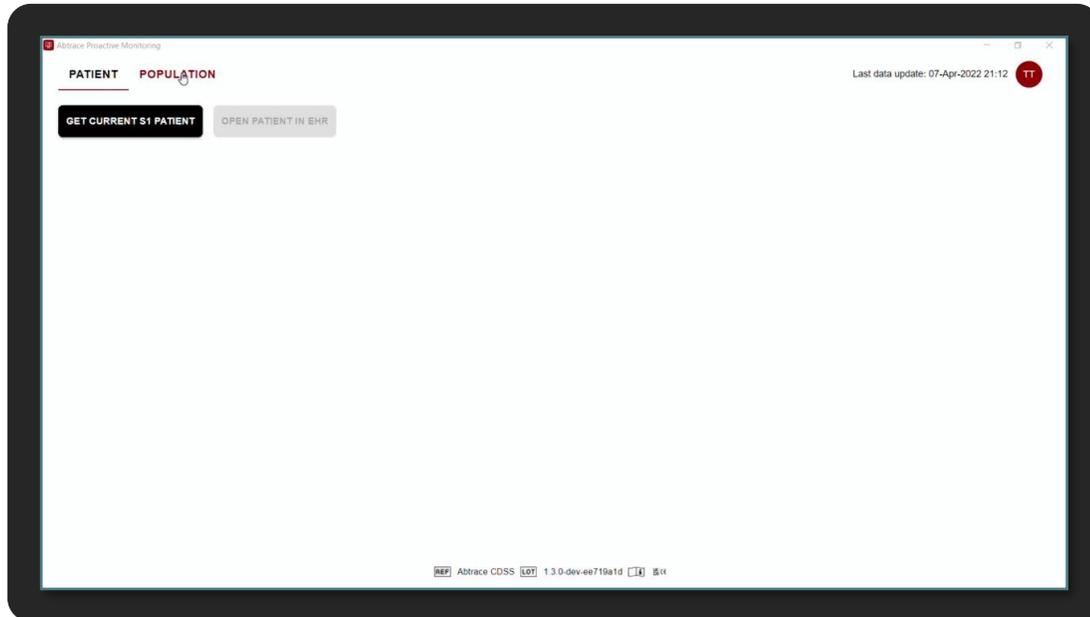
*Starting clinical trials Q4 2023

Real time automated disease monitoring and care coordination

Finding patients with undiagnosed cancer

Proactive Monitoring Needs to Improve

BACKLOG

6 Million
patients overdue

WASTAGE

2 / 3
of all visits suboptimal

POTENTIAL SAVING

30 million
appointments each year

IMPACT IN THE UK ALONE

Abtrace is covering 4% of the UK

Care centered around the ~~disease~~ patient

Peter is Hypertensive, Diabetic, Asthmatic
Last year, he visited the practice 5 times …

Blood pressure Weight	Nurse

Blood analysis	Doctor, Nurse
Foot check	HCA

Disease review	Doctor

Abtrace Data Management

Today, he should have it all done in 1 appointment…

Blood pressure, weight
Blood analysis
Foot check
Disease Review

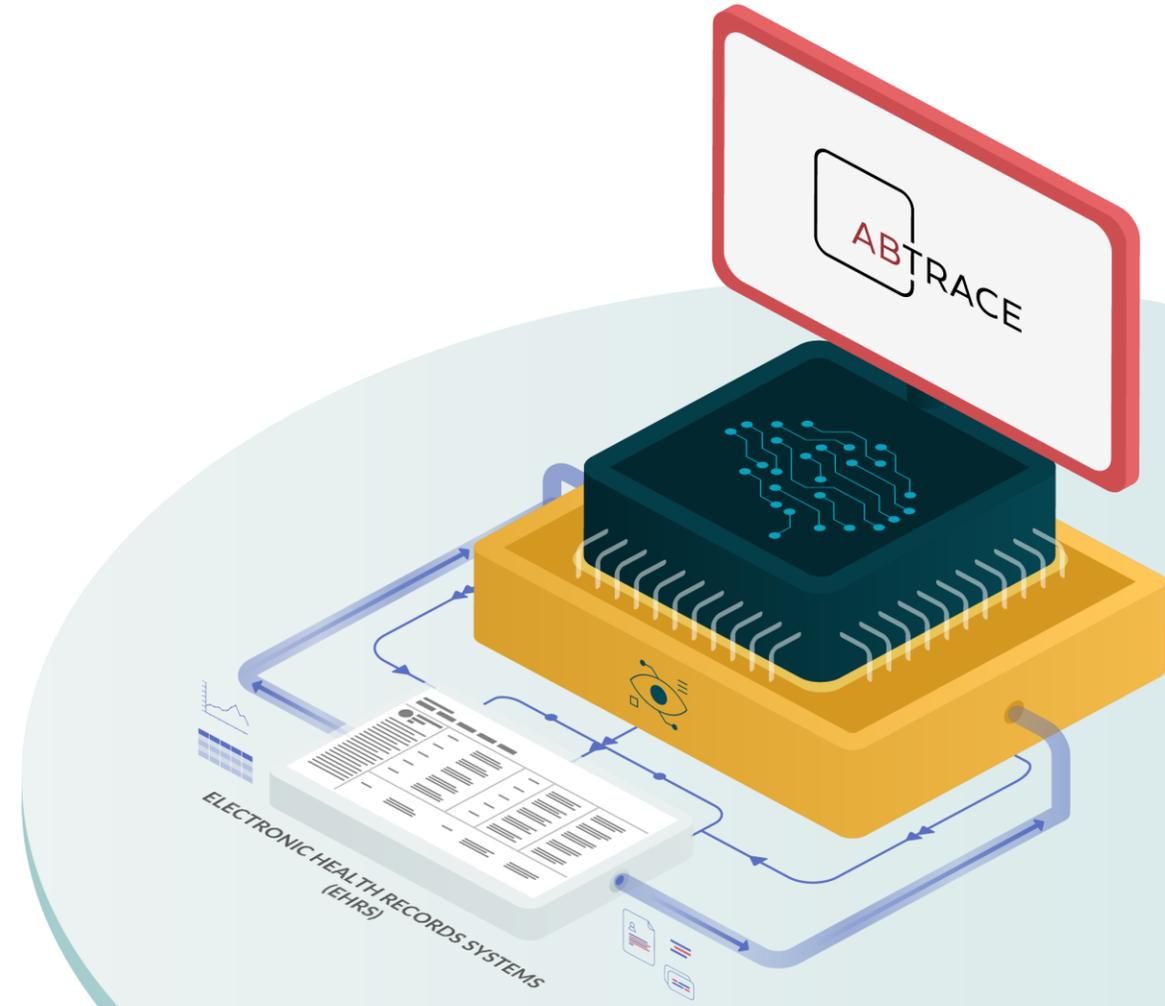# Automated disease monitoring and coordination of care
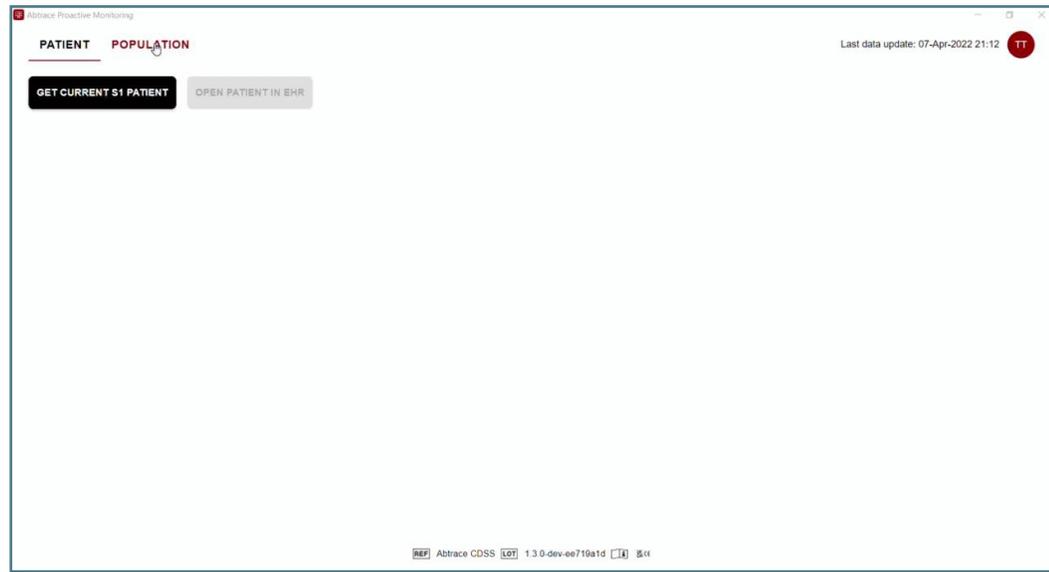
Continuous assessment
of disease monitoring
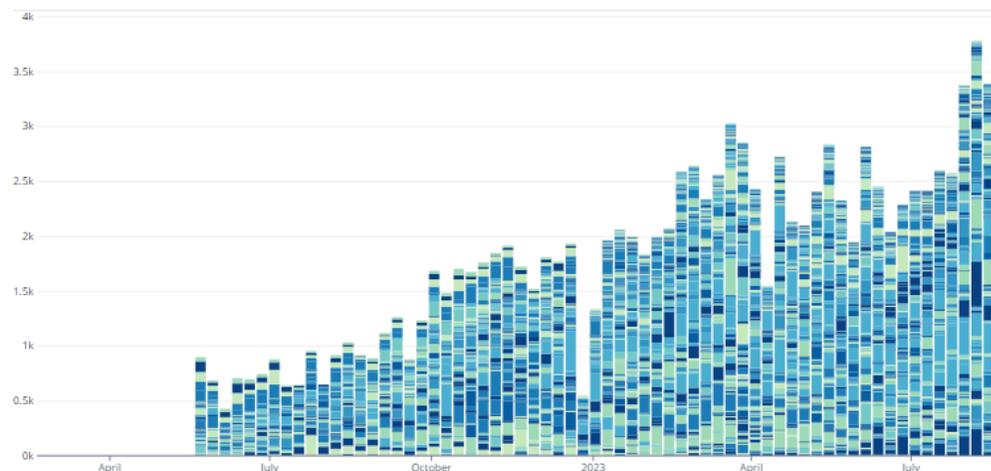needs

Live activity metrics
of care delivery

Full Automation of
recall and booking

Effective and loved by GP practice staff

Patients loaded / wk

312,327
Patients had their overdue monitoring resolved

60,355
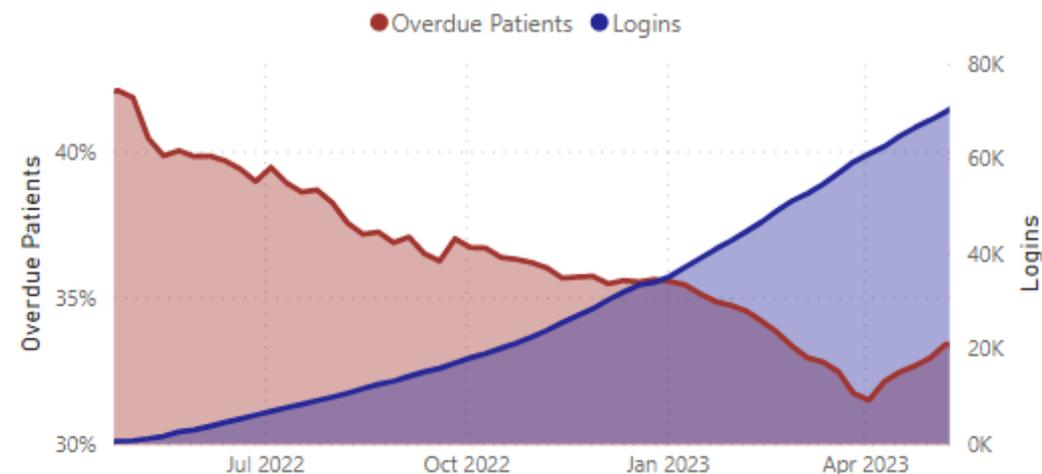Patients with undocumented Chronic Disease Identified

"The UI is excellent; I could use this without you teaching me"

"Real gap in primary care that is being met by this tool"

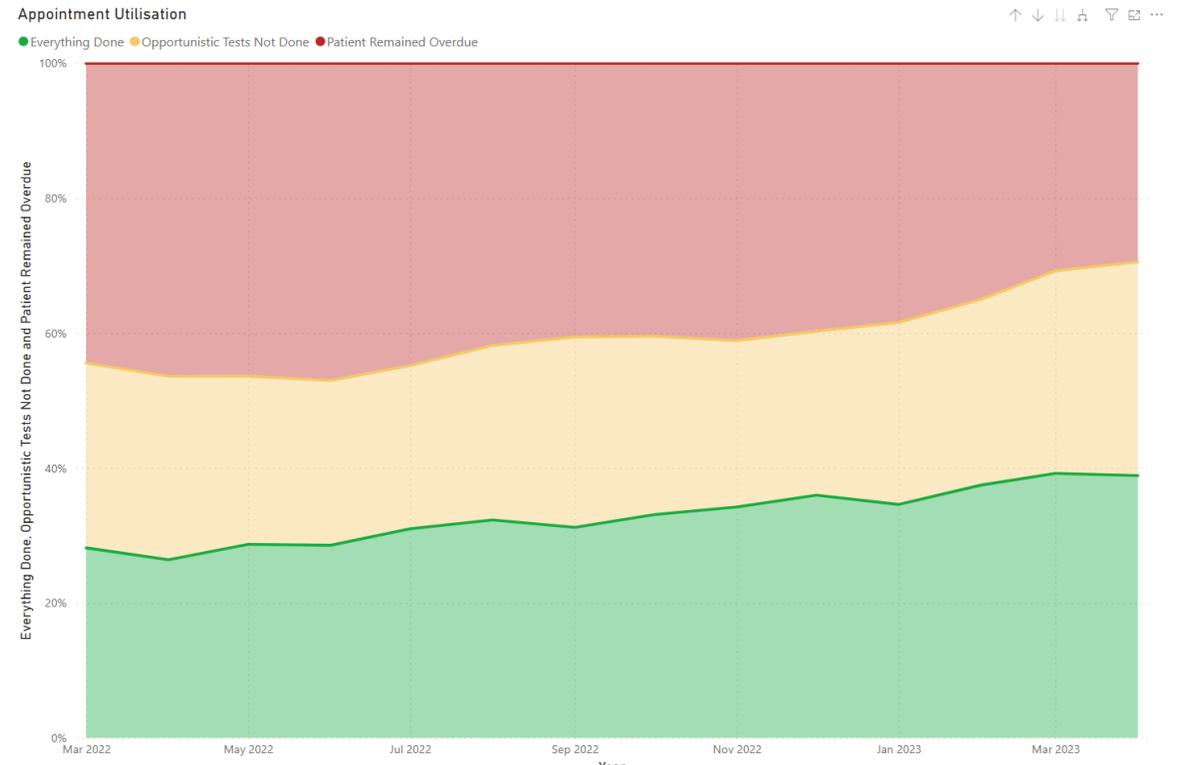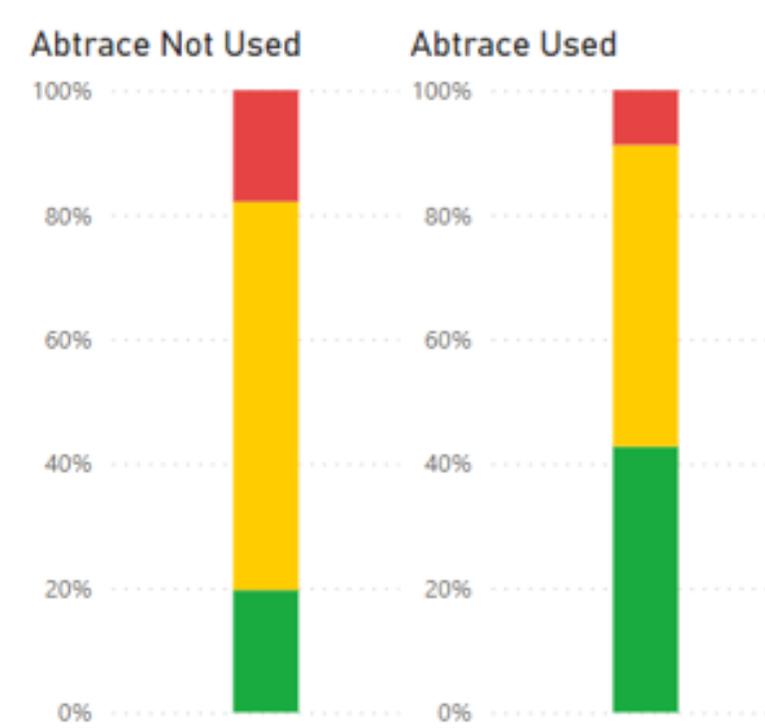"No reports, No Uploading of data, No spreadsheets, it's all already done!"
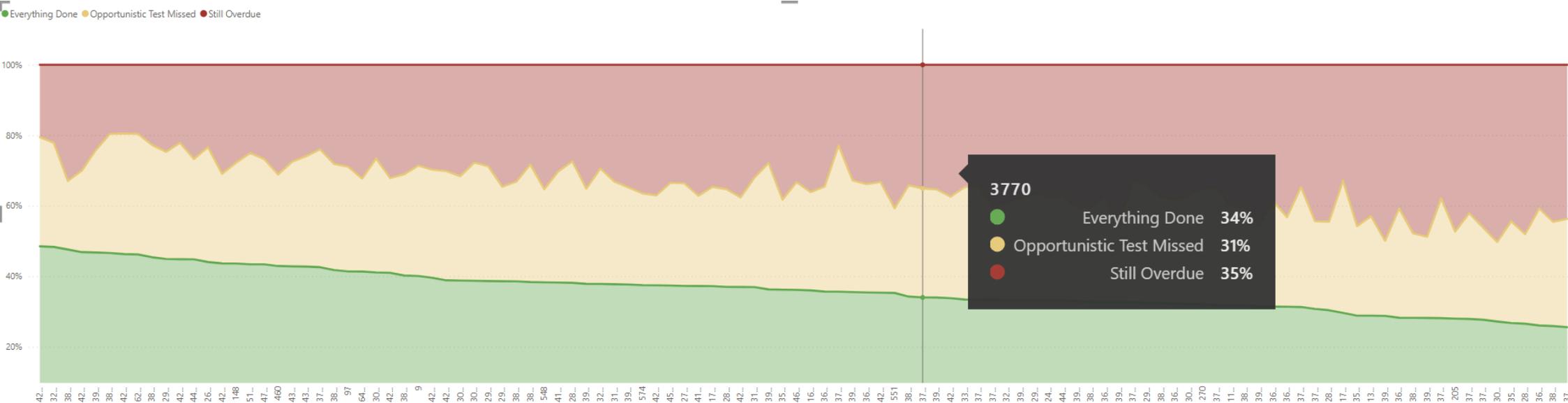
Overdue Patients vs Logins

Automated Feedback loops to drive Utilisation

An average 10,000 patient GP Practice ...

EFFICIENCY OVER TIME

System Level Analysis of Frontline Impact

Everything Done · Opportunistic Test Missed · Still Overdue

3770
- Everything Done **34%**
- Opportunistic Test Missed **31%**
- Still Overdue **35%**

2.5 x
Improvement in Monitoring when Abtrace is Used

60,355
Patients with undocumented Chronic Disease Identified

4,942
Patients with undocumented AF identified

910
Patients with uncoded Heart Failure identified
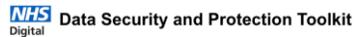
Regulatory | Compliance by Design

SECURE DATA INFRASTRUCTURE

ISO 27001 Certified
Information Security Management System

Cyber Essentials and CE Plus Certified
Organizational cybersecurity protection - UK scheme

NHS DS&P Toolkit compliant
NHS data security standards

GDPR compliant
ICO registered

HSCN Connected

Penetration Tested

QUALITY ASSURED SOFTWARE

ISO 13485 Certified
Quality Management System – Medical Devices

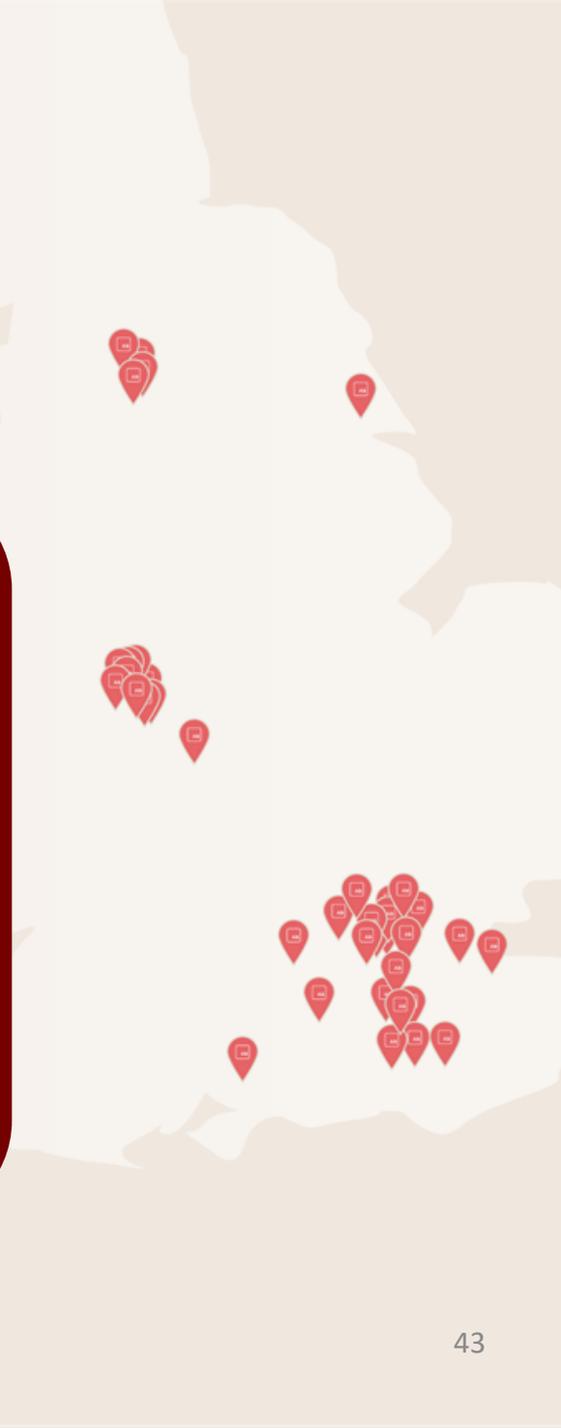**UKCA| CE Software as Medical Device**
Allowing commercialization in UK and EU

NHS DCB0129 compliant
Clinical Risk Management: Manufacture of Health IT Systems

ABTRACE

Partnerships that create value

PATIENTS COVERED

15,000

↓

2,700,000

Team

Dr Umar Naeem Ahmad
CEO

10y Clinician, Hospital management
Global Health Policy & Research
Inventor Clinical Algorithms

UNIVERSITY OF CAMBRIDGE   UCL

Helder Tao Soares, PhD(c)
COO

Product lead at pharma start up
Managed Research Grants > €10M

UNIVERSIDADE D COIMBRA   Luzitin

Cristina Correia, PhD
CCO

10y Medtech industry
RDI director for class III Medical Device

COLUMBIA   Stemmatters

Kerim Suruliz, PhD
CTO

PhD Supersymmetry in String Theory
Wrote core ML code for Atlas experiment
Expertise multivariate optimisation, CNNs

UNIVERSITY OF CAMBRIDGE   CERN   ATLAS

Doctors building and selling the product

Dr Harry Wyatt
Product Lead
GP Partner

UNIVERSITY OF CAMBRIDGE

Dr Aya Kuwabara
Clinical Lead
Evidence based healthcare

UNIVERSITY OF OXFORD

Dr David McGregor
Research Lead
Fulbright Scholar

HARVARD UNIVERSITY

Experienced Tech team x 5

Theodore Kallergis
Security and Devops
Cyber security, Web developer

Linked in

Luis Pureza
Software Architect
Scaling Data Software

feedzai

Jee Hyub Kim
Senior Data Scientist
Natural Language Processing specialist

accenture   Benevolent AI

ABTRACE

Reshaping
Primary Care
Through
Data