

Realising the Promise of Precision Oncology



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**In the United Kingdom of
Great Britain and Northern Ireland**

Every Year...

**165,000 people with Cancer run out of
options...**

...and die.

Every Year...

**Less than 2 of 100 will access new
treatments or clinical trials.**

Every Year...

**Almost all clinical trials fail to reach
recruitment targets, and most never
complete**

Every Year.

**Most potential treatments
are never tested**

Sit on a shelf

Lost.

And nothing changes.

Year after Year.

Trillions of tears.

**Tamoxifen, the treatment that has helped
dying cancer patients more than all other
drug treatments combined.**

Was recovered from a dusty shelf

Almost by accident.

**We have all the drugs we need to double
survival for cancer**

**We test only a small fraction of them,
In a fraction of cancer types**

So what is the problem...

We are the Problem.

A combination of total luck, a great oncologist and determination to live has enabled me to access my current trial and get an extra 4 years of life I didn't expect to have.

As a result I've seen my eldest go to uni, the other three all grow up, and we have had some amazing holiday experiences together. I've been well enough to get back running, I've cycled the Golden Gate Bridge, sailed down the coast of Croatia and hiked in Yosemite.

All because I chanced upon a drug that precisely targeted my cancer.

*Lesley Stephen
Cancer Patient
Edinburgh, 2019*



Professor Robert Sutherland
FAA, AO (1947 – 2012)

Democratising Precision Oncology

Access to the latest cancer tests and treatments for all patients around the World



***We know each cancer is different,
yet we treat all of them the same !?***

The questions every patient asks:

What sort of Cancer do I have?

Which treatment do I choose?

Will the treatment work?

How long have I got?



How do we answer these for the individual, not the average

Precision Oncology

The RIGHT treatment for the RIGHT person at the RIGHT time.

How do we use current treatments better?

Which cancers kill?

How do they evade treatment?

How do we learn from every patient?

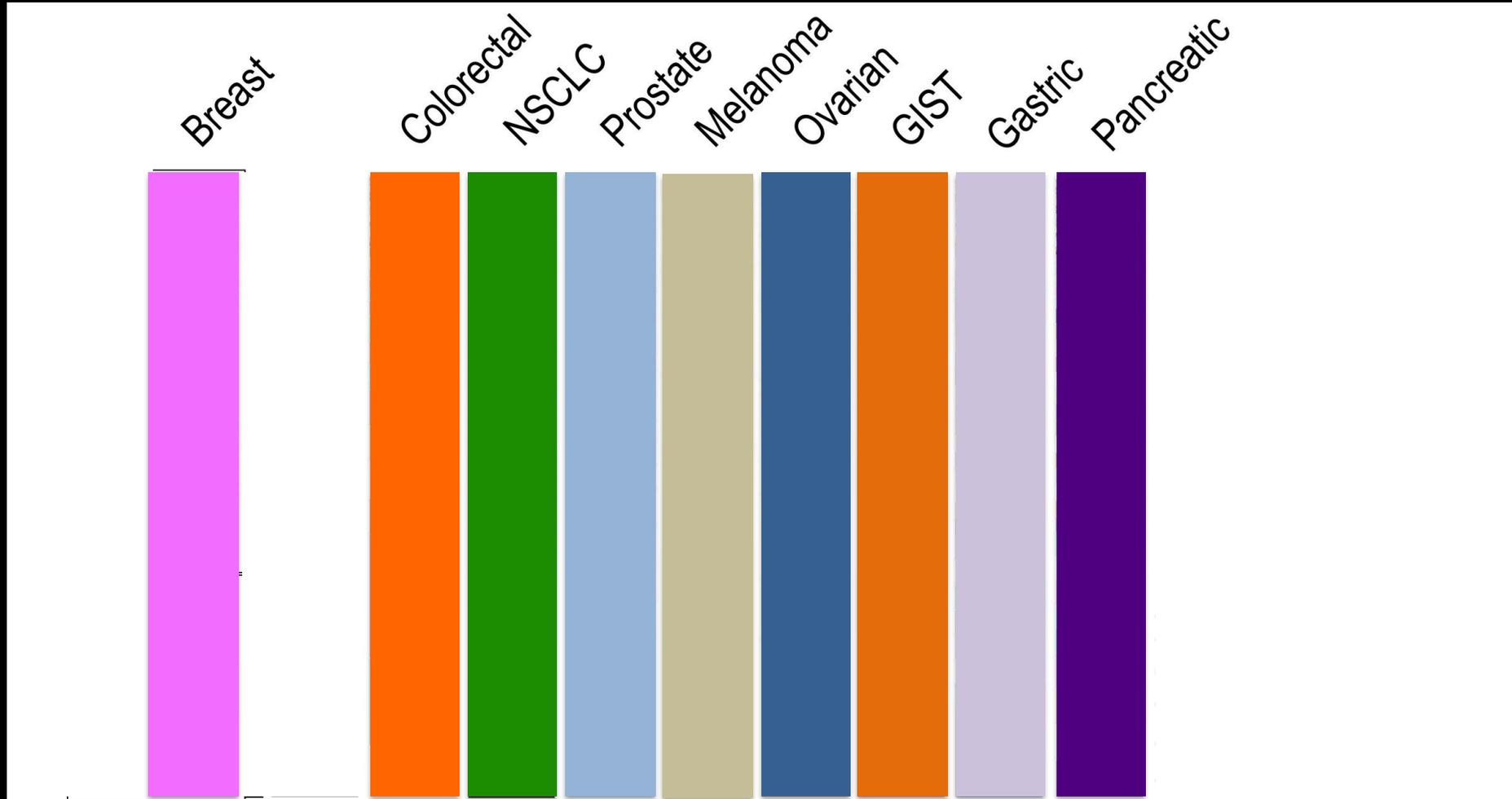
How do we advance early detection and ultimately prevention?

We know Precision Medicine works

- Most life years saved by any cancer drug, if not all the others combined.
- Tamoxifen (and its derivatives) that target the Oestrogen Receptor
- Developed in the 1970's



Why did we find that Tamoxifen worked 50 years ago? But now we struggle



What do we need to do?

1. **Every patient has a molecular test (The Glasgow Cancer Test)**
2. **Acquire and assemble robust data for every patient (Embedded in Healthcare)**
3. **Share Data Globally and learn from each and every patient (ICGC; MEGA)**

We need an affordable and fit for purpose genomic test that will work seamlessly and efficiently within the healthcare system.

Cancer Genomic Testing: the Current Situation

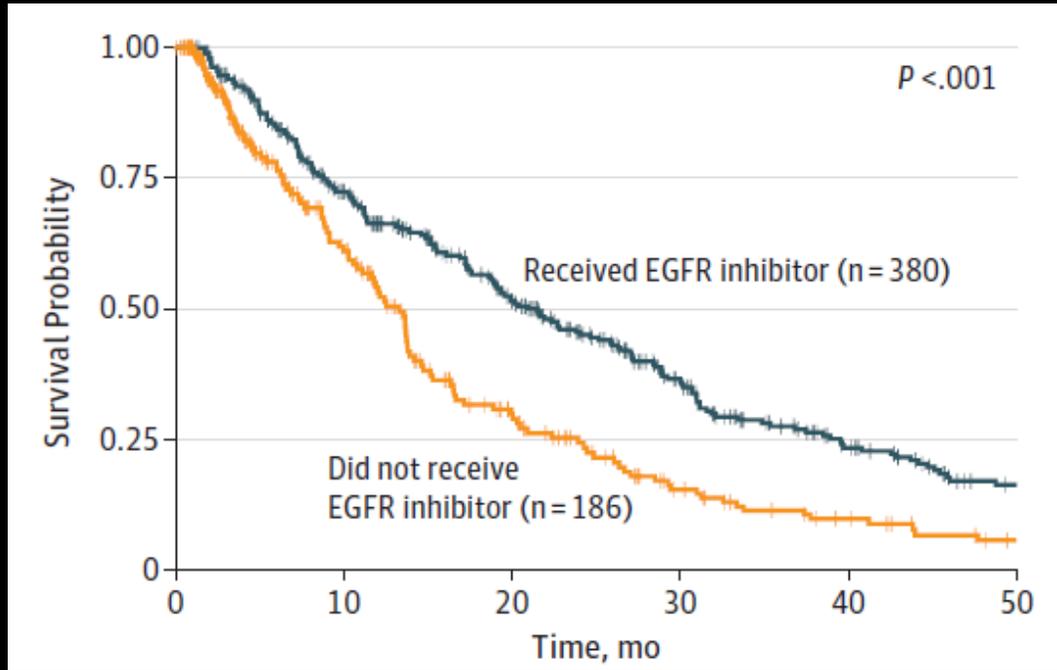
Poor access

Poor quality tests

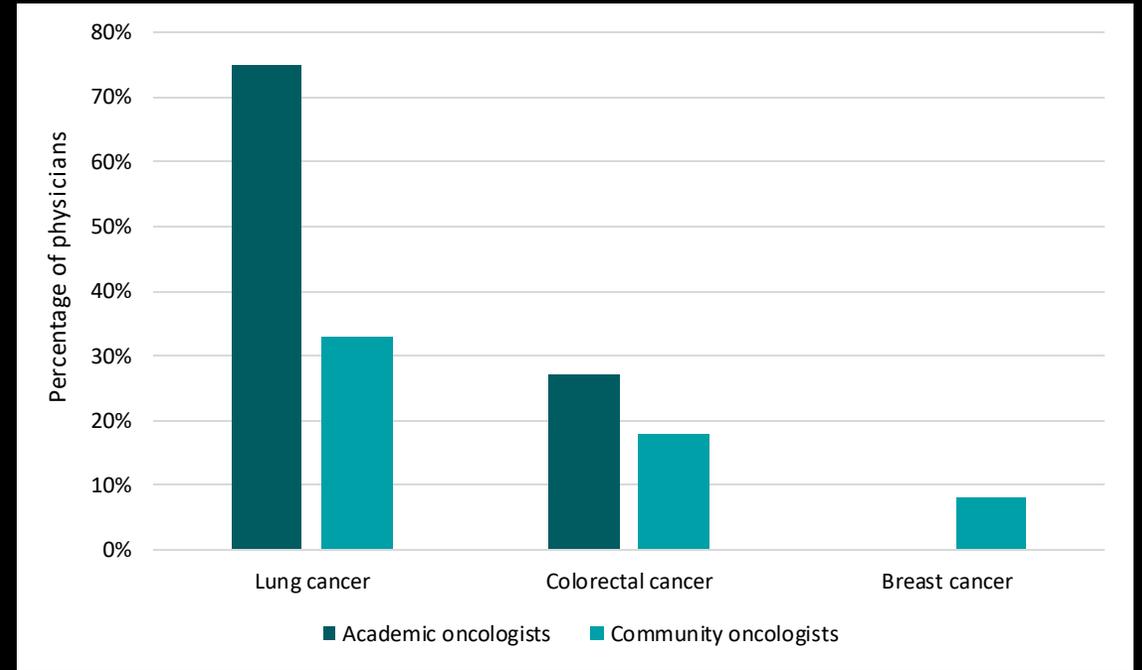
Poor model - made to make money, not save lives

Current Solutions

Poor access to genomic testing



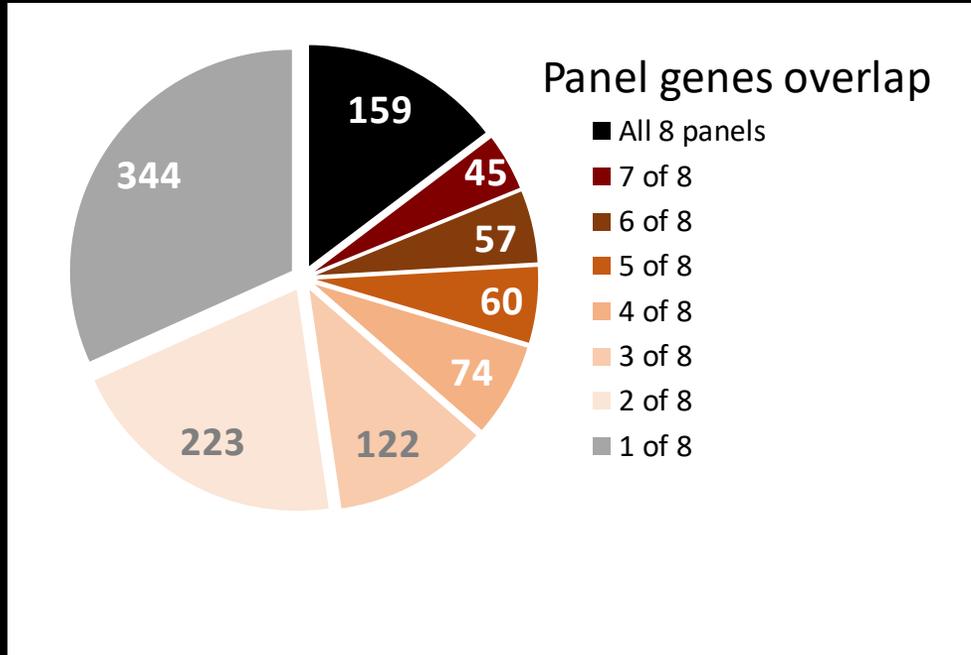
Testing improves outcomes



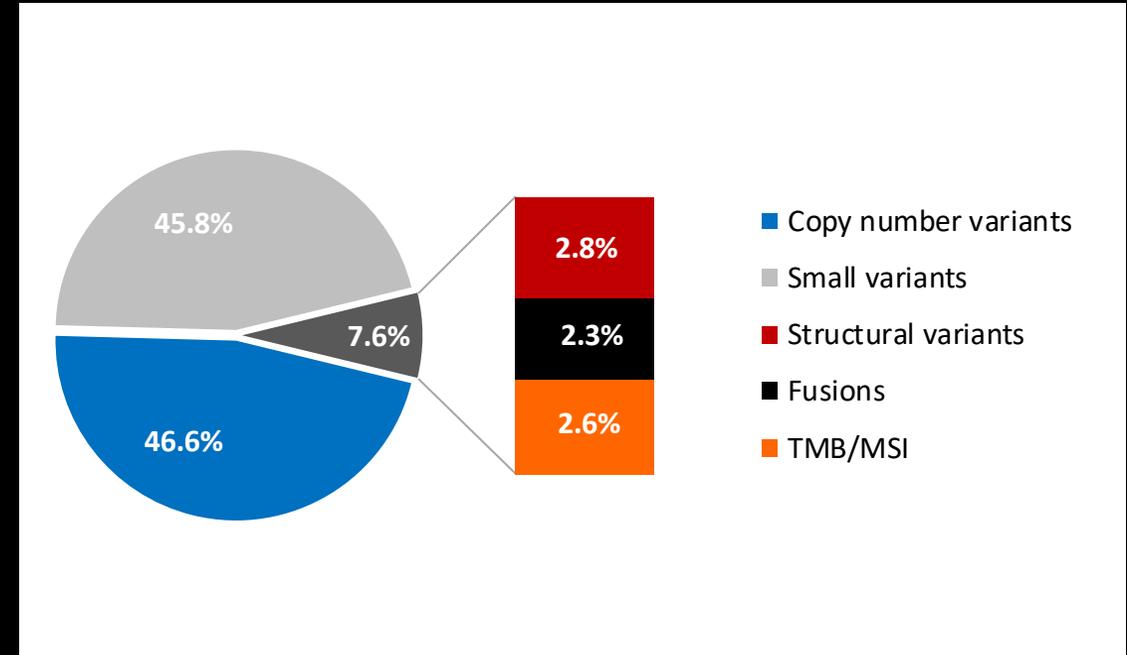
Most still not tested

Current Solutions

Poor quality tests

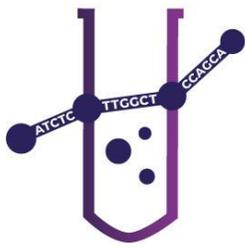


Current tests inconsistent



Current tests outdated

and circa £3000 per test – ouch !



GPOL

GLASGOW PRECISION ONCOLOGY LABORATORY

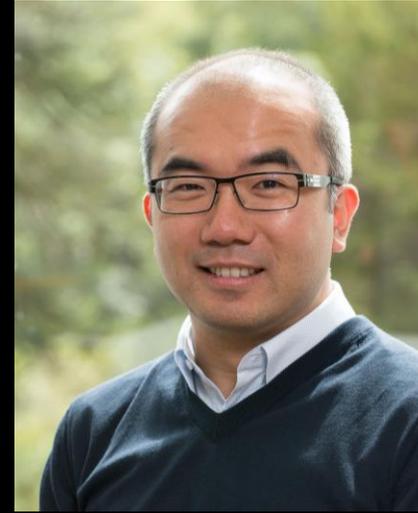
The next generation of cancer tests *The Glasgow Cancer Test*



Susie Cooke
Medical Genomics
and Informatics



Andrew Biankin
Therapeutic and Diagnostic
Development



David Chang
Therapeutic and Biomarker
Development



Philip Beer
Clinical Cancer Genomics



University
of Glasgow



International Cancer Genome Consortium

Accelerating
Research in
Genomic Oncology



wellcome
sanger
institute

+ £10 Million investment

What did we do?

We defined the “REAL” cancer genes

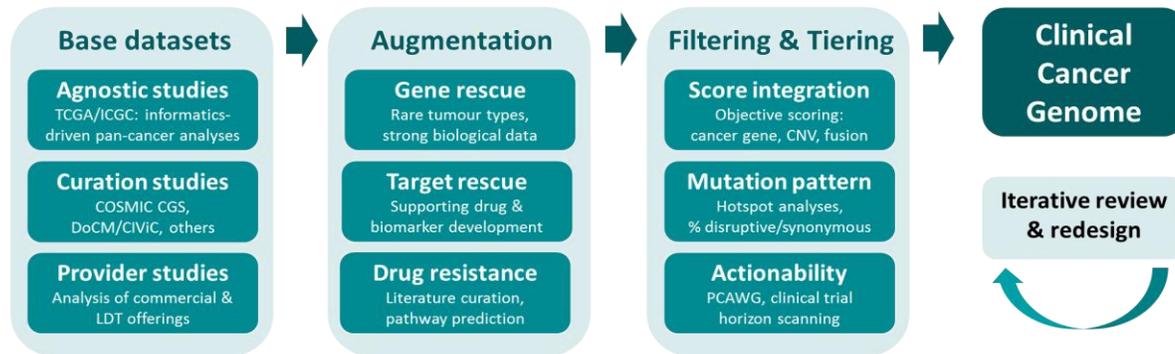
It had to work for all cancers

It had to be affordable

It had to be usable in the real world

We had to define the “REAL” cancer genes

Objective assessment of **2,000** proposed cancer genes



CORE: clinically relevant biomarkers

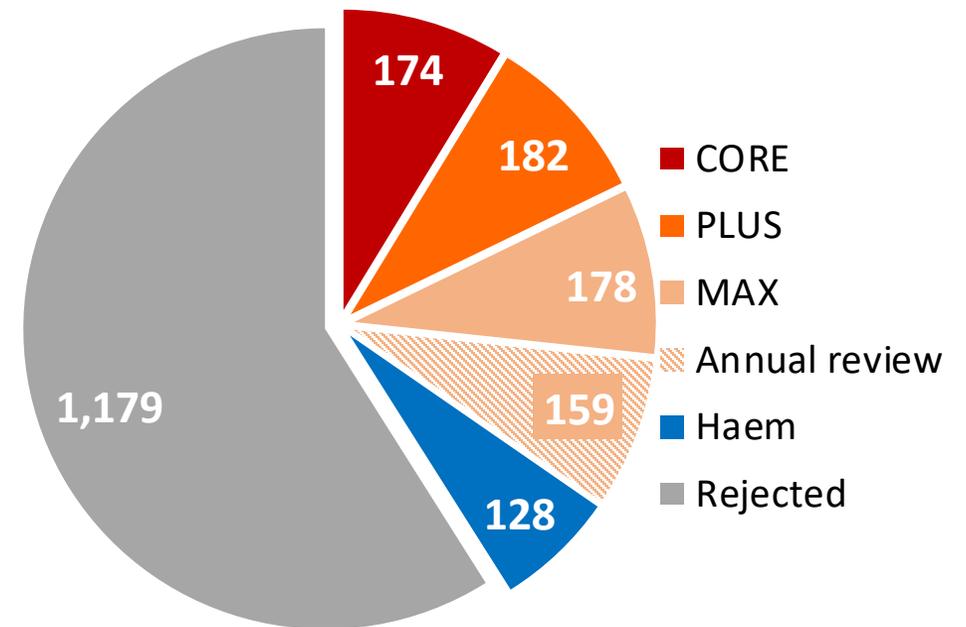
PLUS: high confidence cancer genes, not currently clinically actionable

MAX: intermediate confidence cancer genes

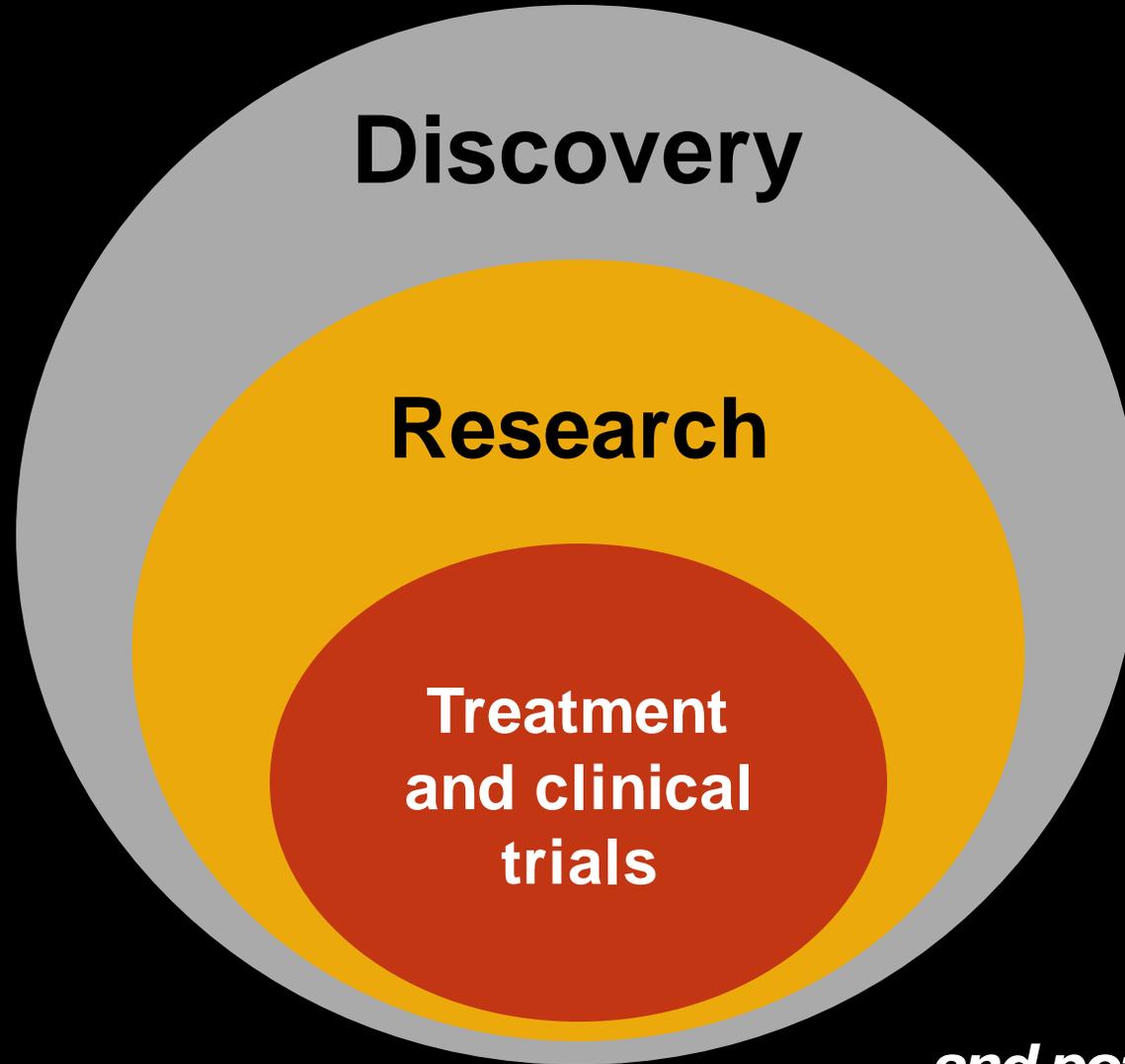
Annual review: low confidence cancer genes (not currently tested)

Haem-specific: cancer genes specific to haematological tumours

Rejected: no objective evidence for a role in cancer



The Glasgow Cancer Test: Embedding Research in the NHS



and potential revenue for the NHS

It's ready for patients anywhere in the World

All Solid Cancer (except Sarcoma)

Works with routine small biopsies

Global launch November 4 at NCRI conference in Glasgow by Agilent

Pilot completed in Scotland and England, Italy in process

International Cancer Genome Consortium adoption in process

Cloud based analytics in development to enable Australia and other countries

In discussion with China, Japan, Korea, Germany



Why is this important?

Patient benefits

Health economic benefits

Revenue generation

Builds comparable datasets

Hospital keeps the biopsy

**Patient owns and hospital
keeps the data**

**Result in weeks rather than
months**

Opens door to clinical trials

**Enhances external
investment**

Identifies double the treatment opportunities compared to what is found now !!!

What is the cost ?

Substantial price drop

Reagent costs less than \$ 200 USD (Much cheaper than Tony's phone)

Cheaper than *KRAS* testing in Italy

Will replace older tests -> saving more costs

Economic models show decrease costs overall

But - different budgets eg: Drug costs

We need to learn from every patient



*Transforming
treatment paradigms
for people with
Pancreatic Cancer*

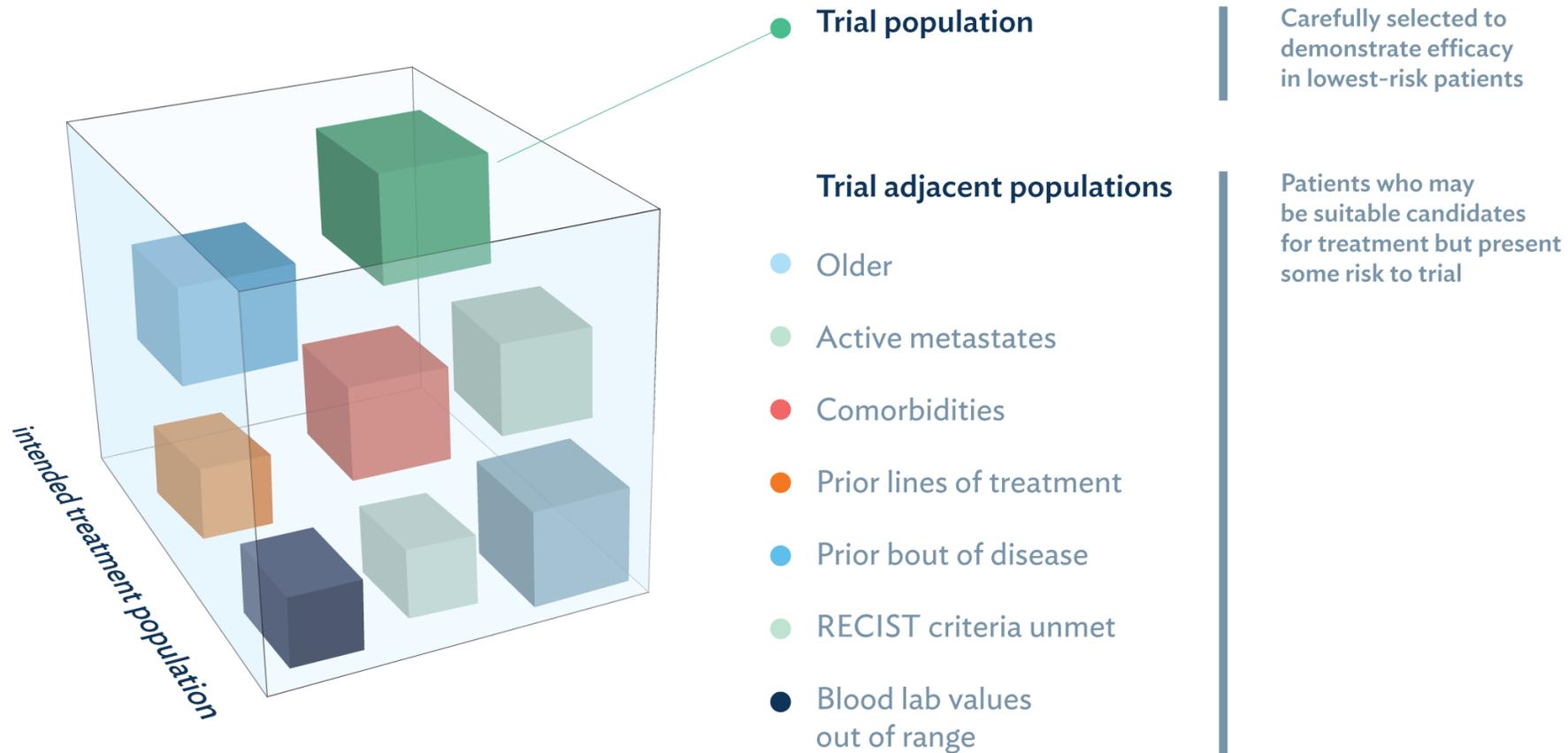


CANCER
RESEARCH
UK

PRECISION
PANC 

*Improving outcomes through
a dynamic research & development
platform for
Precision Medicine*

Real World Therapeutic Testing: Trial adjacent populations - Expanded Access Programmes



Learning health system

For more effective action by patients, providers, and researchers

Patient
and family

Feed forward
patient
generated data

Partnership for
co-production

Feed forward
clinical
data

Provider and
care team

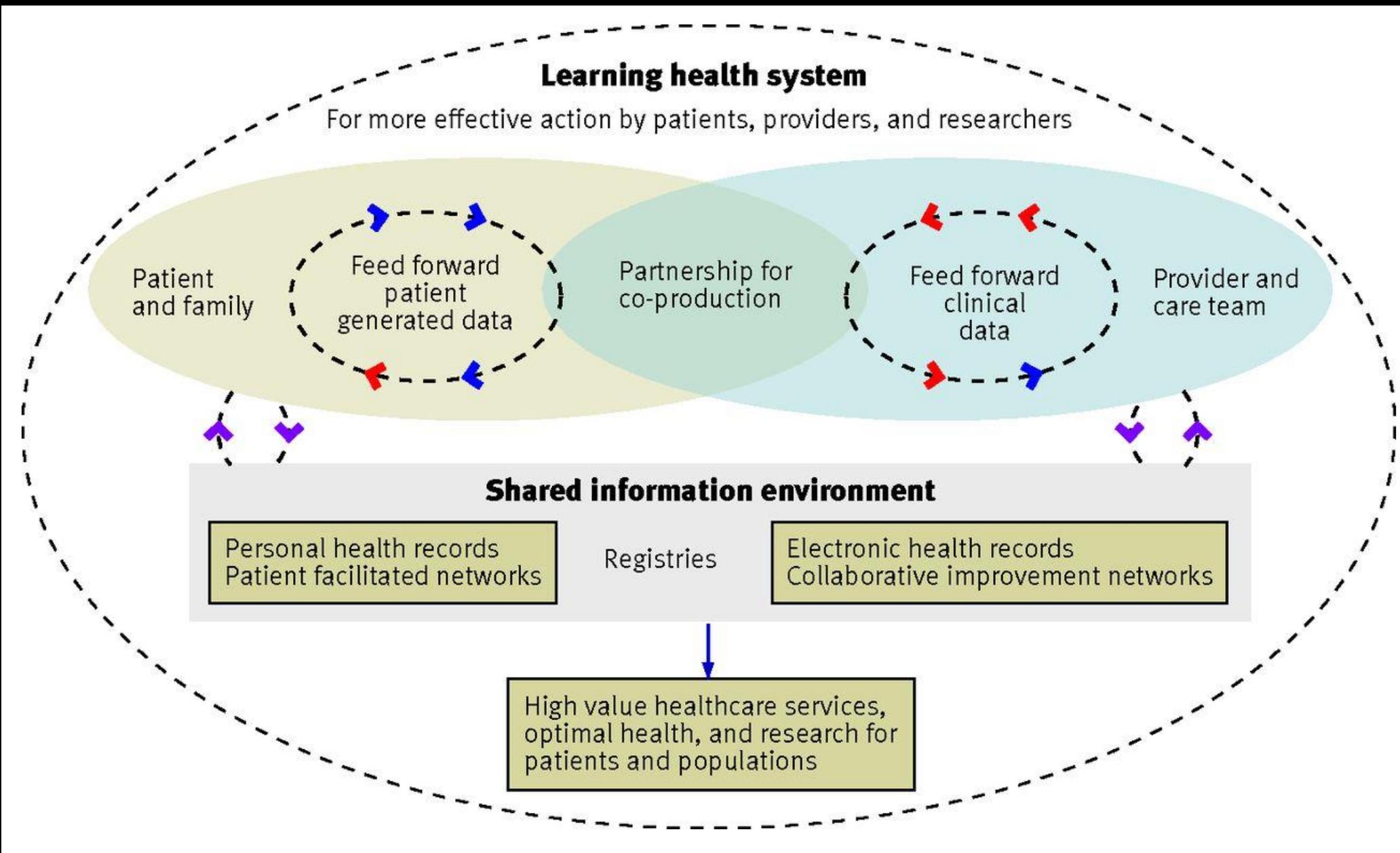
Shared information environment

Personal health records
Patient facilitated networks

Registries

Electronic health records
Collaborative improvement networks

High value healthcare services,
optimal health, and research for
patients and populations



We need huge numbers

Accelerating Research in Genomic Oncology

Global Data Sharing

*“A million patient years of
Precision Oncology
knowledge for the World”*



- Well Cornell Precision Medicine Program (USA, multiple cancers)
- Swiss Oncology and Cancer Immunology Breakthrough Platform (Switzerland, multiple cancers)
- Personalized Genomic Characterisation of Korean Lung Cancers (Korea)
- Precision Medicine for esophageal Cancer (UK)
- Personalised Breast Cancer Program (United Kingdom)
- Korean Myeloma Project (Korea)
- Pan Prostate Cancer Group (United Kingdom)
- Korean Rare Cancers Project (Korea)
- Enhanced Pancreatic Cancer Profiling for Individualised Care (Canada)
- BC Cancer personalised OncoGenomics Program (Canada, multiple cancers)
- Papillary Thyroid Cancer Project (Saudi Arabia)
- Chinese Cancer Genome Consortium (China, colorectal cancer)
- Mutographs Study (UK, France, multiple cancers)
- Precision Panc (UK, pancreatic cancer)
- 1000 Polyethnic Study (USA, multiple cancers)
- European Peripheral T Cell Lymphoma Study (Germany)
- China Diffuse Gastric Cancer Study (China)
- TRACERx Study (UK, lung cancer)
- Oesophageal Squamous Cell Carcinoma Study (China)
- Genomic Medicine for Asia Prevalent Cancers (Japan, multiple cancers)
- Profiling Orphan Neoplasms for Treatment (Italy, multiple cancers)



To date: 13 Countries + 4 in Discussion)
24 programmes

Discussions with: *MEGA*; AACR-Genie,

19 tumour types, 90,000 Participants +
5 years follow up = 450,000 patient years



**What sort of Cancer do I have?
Do I need treatment?
Can I access the treatment?
Which treatment do I choose?
Will the treatment work?
What are the side-effects?
How long have I got?**



Dame Tessa Jowell

The path to Precision Oncology

How do we use current treatments better?

How cancer changes with time, and with treatment?

How do we embed therapeutic development in healthcare?

How do we advance early detection and ultimately prevention?

ICGC-ARGO will compile the data required to address these questions on a path to a time when every patient journey builds knowledge to accelerate new treatments and cures .



PRECISION
PANCO

Thank You

Precision-Panc
is supported by:



CAMBRIDGE
CENTRE



Barts CTU

