Scotland's Community-acquired Retinal Image Repository
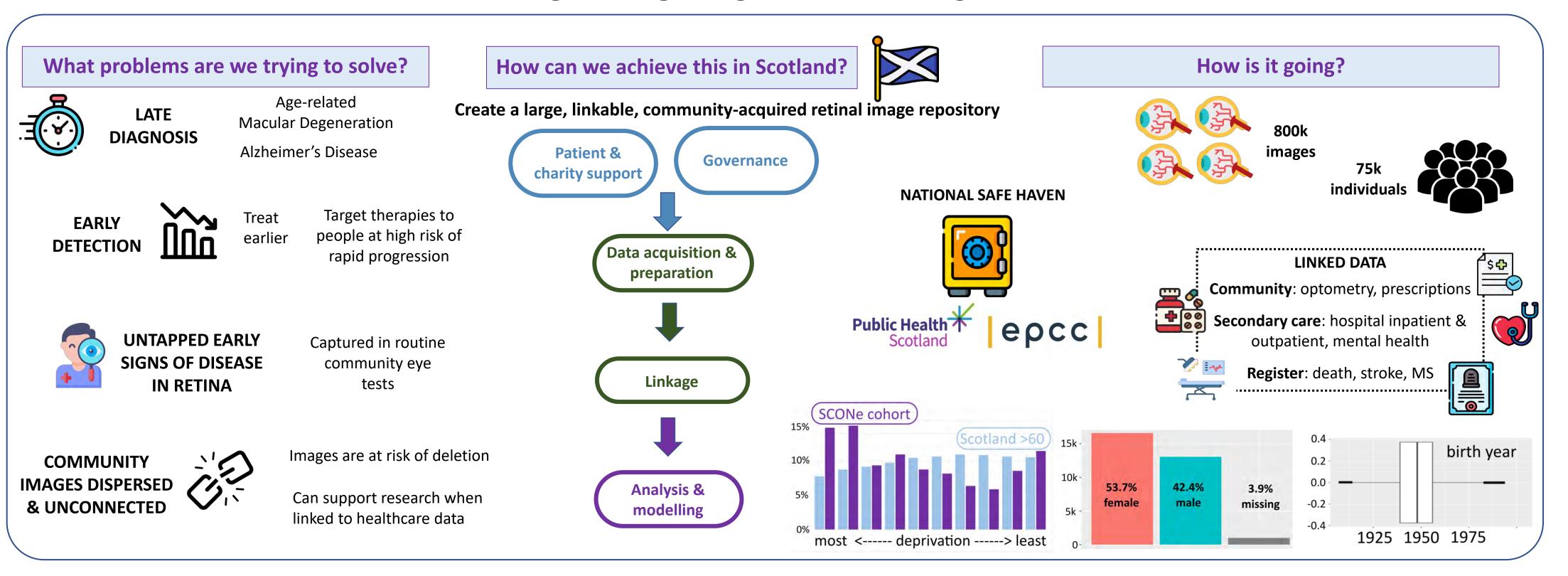## Scottish Collaborative Optometry-Ophthalmology Network e-research
SCONe

THE UNIVERSITY of EDINBURGH | usher institute

Safeguarding images & facilitating research

What problems are we trying to solve?

LATE DIAGNOSIS — Age-related Macular Degeneration, Alzheimer's Disease

EARLY DETECTION — Treat earlier — Target therapies to people at high risk of rapid progression

UNTAPPED EARLY SIGNS OF DISEASE IN RETINA — Captured in routine community eye tests

COMMUNITY IMAGES DISPERSED & UNCONNECTED — Images are at risk of deletion. Can support research when linked to healthcare data

How can we achieve this in Scotland?

Create a large, linkable, community-acquired retinal image repository

Patient & charity support — Governance

↓

Data acquisition & preparation

↓

Linkage

↓

Analysis & modelling

NATIONAL SAFE HAVEN

Public Health Scotland | epcc

SCONe cohort / Scotland >60
most <------ deprivation ------> least

53.7% female / 42.4% male / 3.9% missing

birth year
1925 1950 1975

How is it going?

800k images

75k individuals

LINKED DATA
Community: optometry, prescriptions
Secondary care: hospital inpatient & outpatient, mental health
Register: death, stroke, MS

Analysis & modelling

1. Train AI model to predict age directly from fundus image

Predicted Age vs. Chronological Age for low HUS Group
Low HUS (Healthcare Usage Score)
[Dataset refined to avoid disclosure risk]

2. Run AI model on "healthy" people to get normative values

Low Healthcare Use Score

Normative Percentiles for Age Gap
Percentile Score: 6.0th
5th Percentile / 25th Percentile / 50th Percentile / 75th Percentile / 95th Percentile / Current Subject

3. Apply AI model to disease groups

Distribution of Retinal Age Percentile Score for AMD Group - older than 60 years
AMD Group

Distribution of Retinal Age Percentile Score for the Neuro Group
Neuro Group

Patient & Public Involvement and Engagement

In June 2024, SCONe launched a PPI group of people with AMD and their carers to co-developed a three-tier PPIE strategy for SCONe.

Involvement — At the involvement tier, contributors act as partners in decision-making through the PPI steering group.

Engagement — Engagement activities make data science more transparent and accessible while strengthening public understanding.

1. Making an animated video on eye tests spotting early health signs.
2. Hosting Data Conversations about retinal images as health data in Aberdeen.
3. Joining science festivals to engage the public.

EDINBURGH SCIENCE

Consultation — Consultation is key when wide-scale participation isn't possible, especially to inform co-designed research

Together with the public, we're developing research to boost awareness and use of eye exams.

Eye exams are a great tool →
- reveal hidden problems
- inform about health issues beyond sight
- indicator of overall health

Prevention starts with an eye test. SCONe supports this through early diagnosis research and promoting public awareness of eye exams.