

# **UK Biobank: an update for our participants**

Prof Cathie Sudlow, Chief Scientist

500,000 participants

22 recruitment centres

89% England

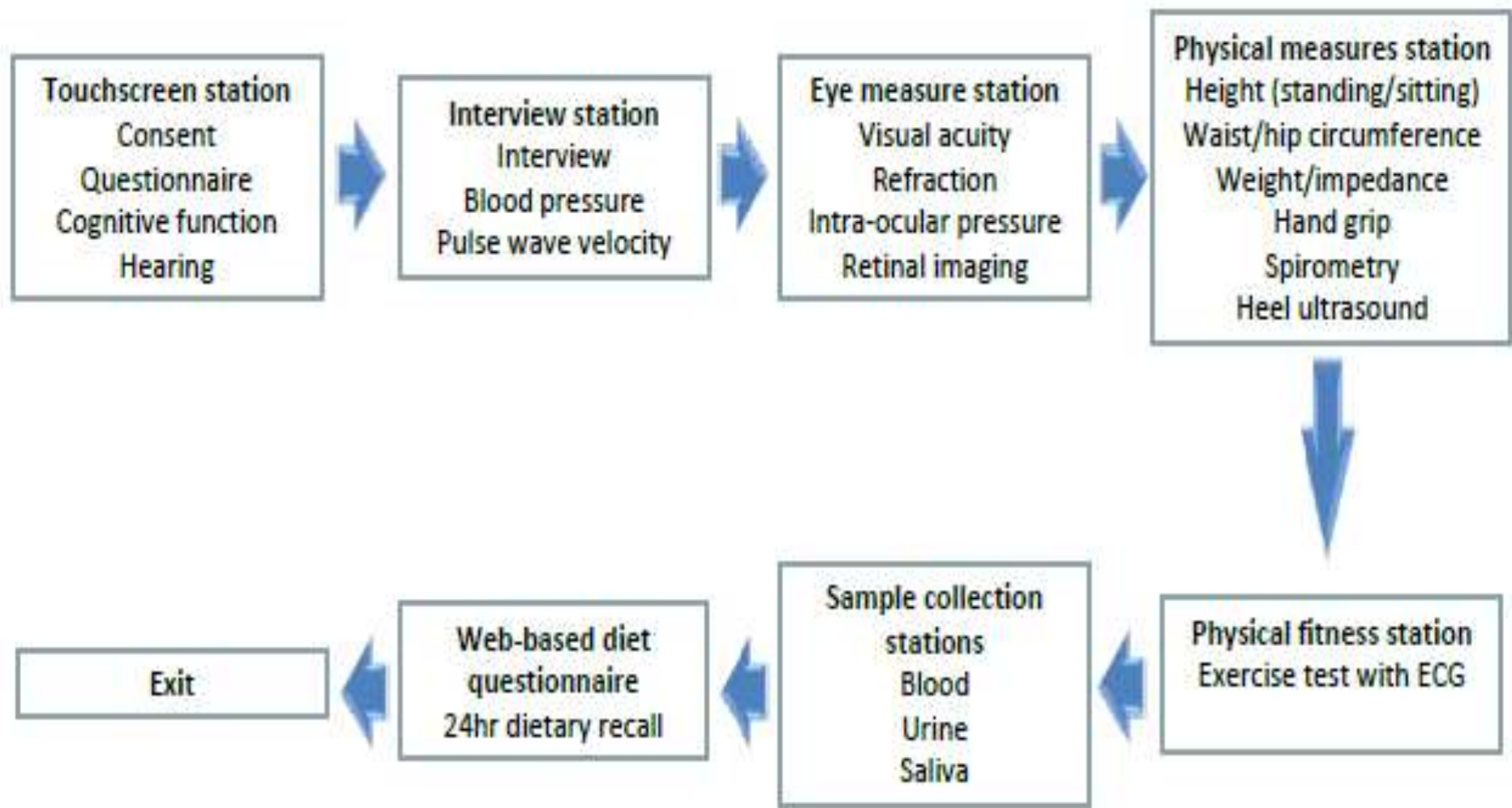
7% Scotland

4% Wales



# Participant characteristics

- 46% male
- 57% aged 40-59; 43% aged 60-69
- Less socioeconomically deprived than UK average but all strata represented
- 85% urban
- 94.5% white; 5.5% other ethnicities



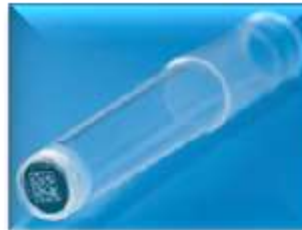
# UK Biobank samples



**700**  
Participants  
per day



**4,900**  
Vacutainers  
per day



**25,000**  
aliquots produced  
per day



**15 million**  
0.85ml aliquots

- Blood
  - whole blood
  - serum
  - plasma
  - red cells
  - buffy coat

- Urine

- Saliva

Total > 15 million aliquots





# Follow-up of half a million people....

COMPREHENSIVE

SCALABLE

COST EFFECTIVE

All participants:

- registered with a GP in the NHS

- consented to linkage to health-related records

NHS provides majority of healthcare in UK

National datasets about healthcare & health outcomes exist

....so link to these datasets.....

# Follow-up through health records

Key national sources :

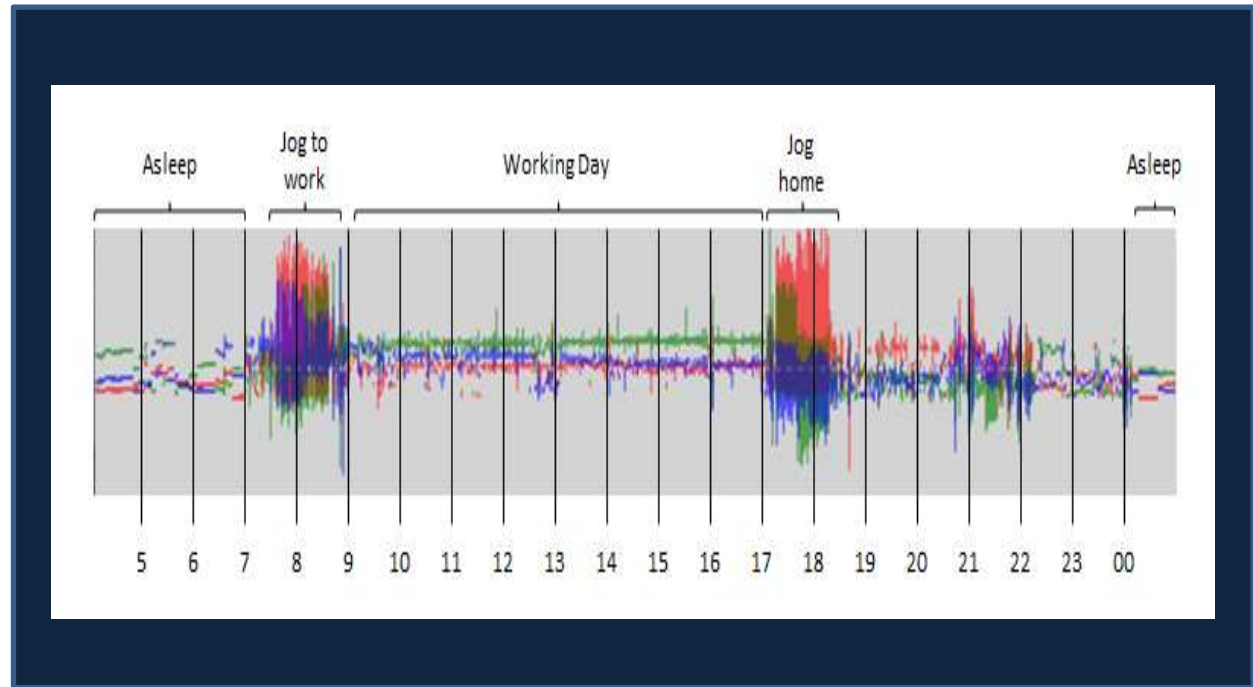
- Death registrations ✓
- Cancer registrations ✓
- Hospital episode data ✓
- Primary care data (✓)



# Follow-up through questionnaires

- Building on the success of the online dietary questionnaire
- To assess outcomes we can't find out about through linking to health records:
  - Cognitive function
  - Occupation
  - Mental health
  - Quality of life

# Collection of seven day physical activity data



Data obtained from 60,000 of a planned 100,000 participants

# Analyses of samples underway

- Genotyping of all 500,000 participants
  - To be completed during 2015
- Biomarker measures in all 500,000 participants
  - To be completed during 2016
- Planned panel of infectious biomarkers

# Biomarkers being measured

---

## Cardiovascular:

Cholesterol  
 Direct LDL-cholesterol  
 HDL-Cholesterol  
 Triglyceride  
 Apolipoprotein A  
 Apolipoprotein B  
 C-reactive Protein  
 Fibrinogen  
 D-dimer  
 Lipoprotein (a)

---

## Cancer:

SHBG  
 Testosterone  
 Oestradiol  
 IGF-I

---

## Bone and joint:

Vitamin D  
 Rheumatoid factor  
 Alkaline Phosphatase  
 Calcium

---

## Liver:

Albumin  
 Direct Bilirubin  
 Total Bilirubin  
 Gamma glutamyltransferase  
 Alanine aminotransferase  
 Aspartate aminotransferase

---

## Diabetes:

HbA1c  
 Glucose

---



---

## Renal:

Creatinine  
 Cystatin C  
 Total protein  
 Urea  
 Phosphate  
 Urate  
 Creatinine (urine)  
 Sodium (urine)  
 Potassium (urine)  
 Albumin (urine)

---

# UK Biobank imaging study underway

Magnetic resonance imaging (MRI) scans of the brain, heart and abdomen



# UK Biobank imaging study underway

Ultrasound scan  
of the neck to  
examine and  
measure blood  
vessels



# UK Biobank imaging study underway

Low dose X ray  
of the bones  
and joints





# UK Biobank imaging study underway

- Imaging centre constructed at coordinating centre in Stockport
- Imaging assessments progressing well
  - >2,000 participants scanned
  - Target of 18 participants per day achieved
  - ~25% of invited participants have attended
  - Imaging data quality excellent

# Access to UK Biobank for research

- Launched April 2012
- Over 1000 registered researchers
- Almost 300 research applications considered
- Over 80 projects underway/completed
  - investigating the causes of diseases in middle and old age
  - predominantly from UK academic institutions
- 23 research papers now published

Funding bodies:

Supported by:

**wellcome**trust



**DiABETES UK**  
CARE. CONNECT. CAMPAIGN.

