• TILDA Overview
• Study Design
• Data Collected
• Biological Data and Plans
Where are we now

Wave 1 2009-2011
Wave 2 2012
Wave 3 2014-2015
Wave 4 2016
Wave 1: 2009-2011
Wave 2: 2012
Wave 4: 2016
Bio samples

Bio samples
Sampling design

- Established 2006, data collection commenced 2009
- No extant study to recruit from; 25,600 households screened to identify person aged 50+
- 62% of those eligible were recruited
- Nationally representative population sample; equal probability of selection
Follow up

Every 2 years
TILDA represents 1:140 aged 50+

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 50 (partners)</td>
<td>329</td>
</tr>
<tr>
<td>50 - 59</td>
<td>3,271</td>
</tr>
<tr>
<td>60 - 69</td>
<td>2,589</td>
</tr>
<tr>
<td>70 - 79</td>
<td>1,689</td>
</tr>
<tr>
<td>80 - 89</td>
<td>578</td>
</tr>
<tr>
<td>90 - 99</td>
<td>47</td>
</tr>
<tr>
<td>100 - 109</td>
<td>1</td>
</tr>
</tbody>
</table>
Three modes of data collection

- **Face-to-face personal interview** in the participant’s home, conducted by trained interviewers

- **Self-completion questionnaire** booklet given to participant by interviewer to complete in their own time and post back to TILDA

- **Health assessment** at dedicated centre on the campus of Trinity College Dublin, or a modified version in the participant's home, administered by trained nurses
Inclusion criteria

- At Wave 1, only those who were non-demented and capable of providing informed consent were invited to participate in the study.

- At subsequent waves all are followed up regardless of developing dementia or other conditions, moving to institution.

- Proxy interview is conducted with nominated proxy if participant is not able to do the interview.

- Proxy also asked to conduct End-of-Life interview.
CAPI: computer-assisted personal interview; SCQ: self-completion questionnaire; Health: TILDA health assessment
## TILDA CAPI (approx 1.5 hours)

### Economic
- Employment situation
- Job history
- Planning for retirement
- Sources of Income
- House ownership
- Other assets
- Healthcare utilisation
- Literacy (financial, health)

### Health
- Physical health
- Cognitive health
- Mental health
- Behavioural health
- Medications

### Social
- Household circumstances
- Demographics
- Transfers to Children
- Transfers to Parents
- Social connectedness
- Activities of daily living and helpers
- Expectations
- Transport
## Biomarker Measurements

### Cognitive
- Mini-Mental State Examination (MMSE)
- Montreal Cognitive Assessment (MOCA)
- Sustained Attention to Response Task (SART)
- Picture memory test
- National Adult Reading Test (NART)
- Visual reasoning
- Choice reaction time
- Colour trails test
- Depressive symptoms
- State anxiety

### Cardiovascular
- Pulse wave velocity
- Sitting & standing blood pressure
- Phasic blood pressure
- Heart rate variability
- Cerebral perfusion (NIRS)
- Respiration

### Mobility
- Timed Up-and-Go
- Repeated chair stands
- GAITRite assessment
  - Usual speed
  - Maximum speed
  - Dual task

### Vision
- Visual acuity
- Contrast sensitivity
- Macular pigment density
- **Retinal photograph**
- Multisensory integration (SHAMS)

### Anthropometric / other
- Height
- Weight
- Waist & hip circumference
- Grip strength
- Heel ultrasound
- Dental health
- Blood samples
- Hair samples
- Brain MRI
- Accelerometry
- Diet (SCQ)
Blood samples

- 25ml collected
- Wave 1: 5,800 samples
- Wave 3: 5,300 repeat samples

1 X Lithium Heparin Blood Tubes (5ml blood volume)

2 X EDTA Blood Tubes (10ml blood volume)
Blood samples

- Additionally in Wave 3

1 X PAXgene (RNA) Blood Tubes
(2ml blood volume)
1000 samples only
TILDA Blood Collection Model

COLLECTION

Trinity College Dublin
(~4,800 samples)

Homes
(~1,000 samples)
COLLECTION

Trinity College Dublin (~4,800 samples)

Homes (~1,000 samples)

TRANSPORTATION
(DX Ireland Ltd)

COURIER 1: TCD

COURIER 3: Countrywide

Ireland

DX drop off points
COLLECTION

Trinity College Dublin
(~4,800 samples)

Homes
(~1,000 samples)

TRANSPORTATION
(DX Ireland Ltd)

COURIER 1:
TCD

COURIER 3:
Countrywide

PROCESSING & ANALYSIS
(Trinity Biobank &
St. James Hospital)

CENTRAL LABORATORY

IMMEDIATE ANALYSIS
LIPID PROFILE

CENTRIFUGE AND ALIQUOT

DATA TRANSFER TO TILDA

SHORT-TERM STORAGE (-20°C)

Processed within 48 hours
COLLECTION
- Trinity College Dublin (~4,800 samples)
- Homes (~1,000 samples)

TRANSPORTATION
(DX Ireland Ltd)
- COURIER 1: TCD
- COURIER 3: Countrywide

PROCESSING & ANALYSIS
(Trinity Biobank & St. James’s Hospital)
- CENTRAL LABORATORY
  - CENTRIFUGE AND ALIQUOT
  - IMMEDIATE ANALYSIS
    - LIPID PROFILE
  - DATA TRANSFER TO TILDA
  - SHORT-TERM STORAGE (-20°C)

BIO-BANKING
(2 locations St. James’s Hospital and Trinity Campus)
- -80°C freezers at 2 locations
- Temp. Monitoring & Biobanking
| General function/Cardiovascular | • Lipid profile – cholesterol  
|                               | • Folate  
|                               | • Vitamin B12  
|                               | • Vitamin D  
|                               | • Vitamin E  
|                               | • CRP |
### Biomarkers Analysed to March 2016

| General function/ Cardiovascular | Lipid profile – cholesterol  
| Folate  
| Vitamin B12  
| Vitamin D  
| Vitamin E  
| CRP |
| Renal function | Creatinine  
<p>| Cystatin C |</p>
<table>
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<tr>
<th>Biomarkers Analysed to March 2016</th>
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</thead>
</table>
| **General function/Cardiovascular** | • Lipid profile – cholesterol  
• Folate  
• Vitamin B12  
• Vitamin D  
• Vitamin E  
• CRP |
| **Renal function** | • Creatinine  
• Cystatin C |
<p>| <strong>Kidney function</strong> | • HbA1c (frozen buffy coat) |</p>
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<td><strong>General function/Cardiovascular</strong></td>
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<td>• HbA1c (frozen buffy coat)</td>
</tr>
<tr>
<td><strong>Retinal function</strong></td>
</tr>
<tr>
<td>• Lutein</td>
</tr>
<tr>
<td>• Zeaxanthin</td>
</tr>
<tr>
<td>• Lycopene</td>
</tr>
<tr>
<td>• Alpha-carotene</td>
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<tr>
<td>• Beta-carotene</td>
</tr>
<tr>
<td>• Beta-cryptoxanthin</td>
</tr>
<tr>
<td>DNA</td>
</tr>
<tr>
<td>----------------------------------</td>
</tr>
<tr>
<td><strong>7 SNPs associated with age-related macular degeneration</strong></td>
</tr>
<tr>
<td>• CFH</td>
</tr>
<tr>
<td>• ARMS</td>
</tr>
<tr>
<td>• CFB</td>
</tr>
<tr>
<td>• SKIV2L</td>
</tr>
<tr>
<td>• C3</td>
</tr>
<tr>
<td>• TIRAP</td>
</tr>
<tr>
<td>• Claudin 5</td>
</tr>
<tr>
<td>Hair</td>
</tr>
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</tbody>
</table>
|      | • Cortisol,  
|      | • Cortisone  
|      | • Testosterone  
|      | • Beta-estradiol  
|      | • Progesterone  
|      | • Melatonin  |
MRI Scans 2014-2015

• 45 minute protocol, 7 different scans

• 3T MRI scanner equipped with a 32-channel head coil for optimal signal-to-noise characteristics.
<table>
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<tbody>
<tr>
<td><strong>a.</strong> High resolution 2D T2-weighted sequence</td>
</tr>
<tr>
<td><strong>b.</strong> High resolution 3D T1-weighted volumetric scan (IR-SPGR)</td>
</tr>
<tr>
<td><strong>c.</strong> Fluid Attenuation Inversion Recovery (FLAIR)</td>
</tr>
<tr>
<td><strong>d.</strong> Diffusion Weighted Imaging (DWI)</td>
</tr>
<tr>
<td>4 b-values acquisition for apparent diffusion coefficient (ADC)</td>
</tr>
<tr>
<td>quantification</td>
</tr>
<tr>
<td><strong>e.</strong> Diffusion Tensor Imaging (DTI)</td>
</tr>
<tr>
<td>61 directions, b-value 1200s/mm2</td>
</tr>
<tr>
<td><strong>f.</strong> Pseudo-Continuous Arterial Spin Labelling (pCASL)</td>
</tr>
<tr>
<td>Single shot echo-planar imaging (EPI) sequence with background</td>
</tr>
<tr>
<td>suppression</td>
</tr>
<tr>
<td><strong>g.</strong> fMRI Blood Oxygenation Level Dependent scan (BOLD)</td>
</tr>
</tbody>
</table>
Wave 5 Biological Samples (2018/19)

- Blood
- Hair
- RNA on full cohort
- Faecal samples on full cohort
- Urine?
- Repeat Brain MRI
Data access

• Publically available (biomarkers not yet deposited)

  • Wave 1 and wave 2 data currently available from:
    – Irish Social Science Data Archive (ISSDA):
      www.ucd.ie/issda/data/tilda/
    – Interuniversity Consortium for Political and Social Research (ICPSR):
      www.icpsr.umich.edu/icpsrweb/ICPSR/studies/34315

  • Wave 3 deposited 2016
Data access

• Full dataset (Wave 3 and biomarkers)
  
  – Access through TILDA servers on Trinity College Dublin campus

  – Restricted access to approved projects only

  – Application to TILDA for access
Thank you!

Dr. Ann Hever
hevera@tcd.ie