



## A case study in collaboration: OIA and Club Vita.

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# Overview of today's talk

- What is the Oxford Institute of Ageing?
- What is Club Vita?
- Experience in the Collaboration
- Some results of a particular project in socio-geographic variations in mortality.

The **Oxford Institute of Population Ageing** was established in 1998 with funding from the US National Institute on Aging. We are an Institute in the University of Oxford, and our aim is to undertake multi-disciplinary research into the implications of population change.

> Two **Research Centres**:

- The Centre for Migration and Ageing Populations - **the MAP Centre**
- The James Martin Centre for Policy Challenges of Population Ageing - **PCAP**

> Six thematic **Research Programmes** in the area of Demography and Population Change:

- Understanding Demographic Change
- Demography and Economy
- Demography and Society
- Bio-Demography and Health
- Demography, Science and Innovation
- Demography and Environment

> Research in these Programmes is carried out in four **Regions of the World**:

- Asia
- Europe
- Africa
- Latin America

> Institute research is underpinned by the **Global Ageing Survey (GLAS)**.

## More about OIA and its attitude to collaboration

- Several DPhil students, but not an ‘admitting’ department for DPhils
- Heavily reliant on research funding
- Keenly aware benefits of collaboration and always looking for collaborators; **a lot** of time & effort invested into nurturing collaboration
- ...but also wary of potential costs of collaboration
- Collaboration with (i) other units or departments in Oxford (ii) other universities (iii) other non-academic organizations: ‘third sector’; private sector etc

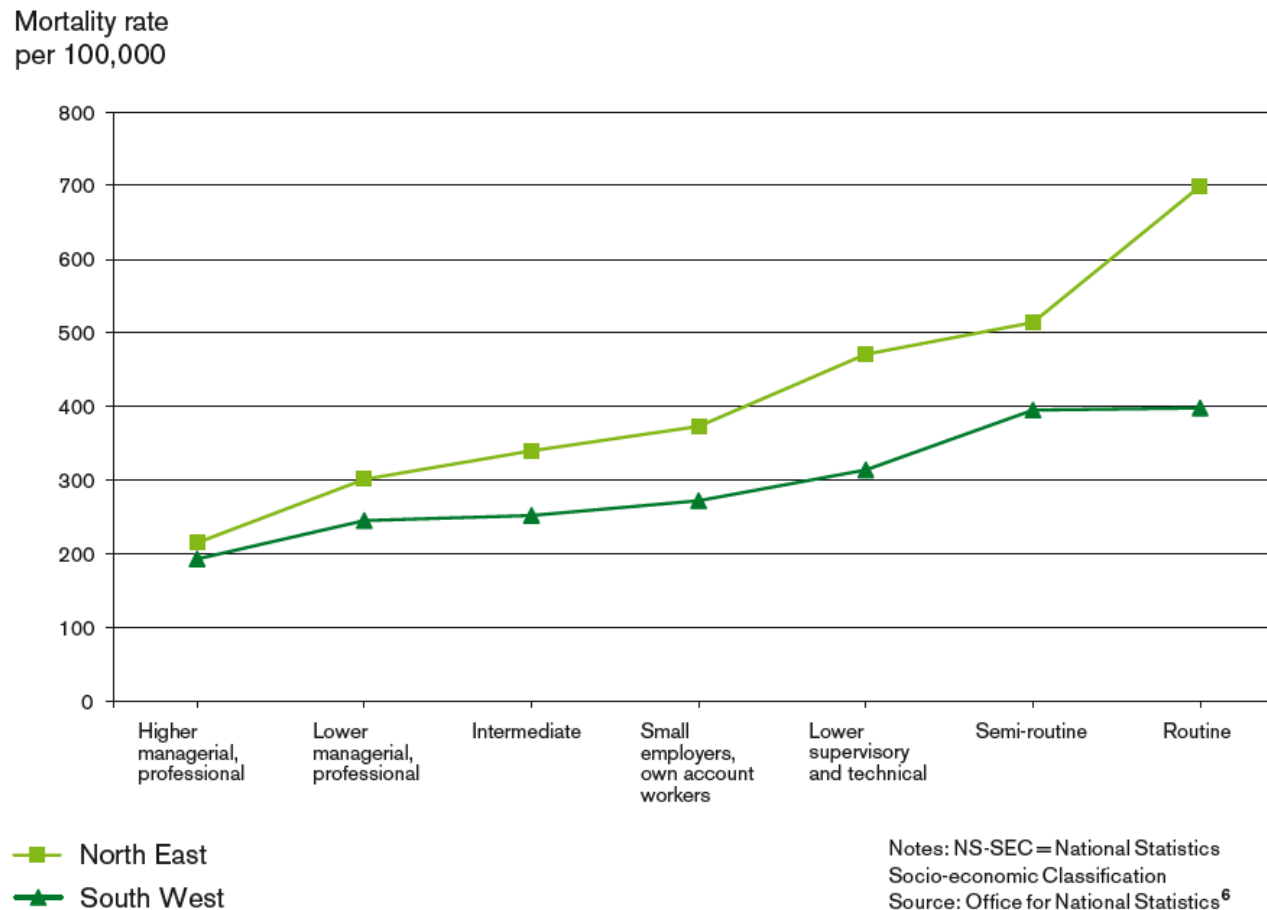
## Inequalities in health as challenge for health care systems in the rich world

- The persistence of large social inequalities in health in most rich countries has been highlighted as an ***underlying*** challenge by the OECD. The extent of inequalities in life expectancy varies across the OECD (though it is hard to measure between-country variation in social inequalities in life expectancy).
- Enormous amount of research on this topic in many OECD countries.
- The persistence of large inequalities in opportunities for an extended period of retirement after work are assuming increasing prominence in ageing societies

# Mapping, tracking and explaining inequalities in life expectancy in the UK

- Occupational class: ONS Longitudinal Survey
- Analyses based on area of residence enriched with measures of deprivation: ONS
- Continuous Mortality Survey
- Various cohort & panel studies, e.g. British Regional Heart Study, Whitehall Study, British Household Panel Survey (now expanded into British Household Longitudinal Survey), English Longitudinal Study of Ageing, 1946 National Birth Cohort....etc

## Age-standardised mortality rates by socioeconomic classification (NS-SEC) for men aged 25-64 in North East and South West England, 2001-03





- ◆ Started in 2007 - Launch in 2008
- ◆ Create a pool of data of occupational pension schemes to create a big and rich database.

- ◆ It includes 130 schemes from a wide range of industries.
- ◆ All UK regions are represented.

- ◆ We currently have 5.6 million member records, including over 1.8 million pensioner records stretching back 20 years.

- ◆ Our subscribers update their data annually.



DMGT



DIAGEO

Pension Protection Fund



West Yorkshire Pension Fund



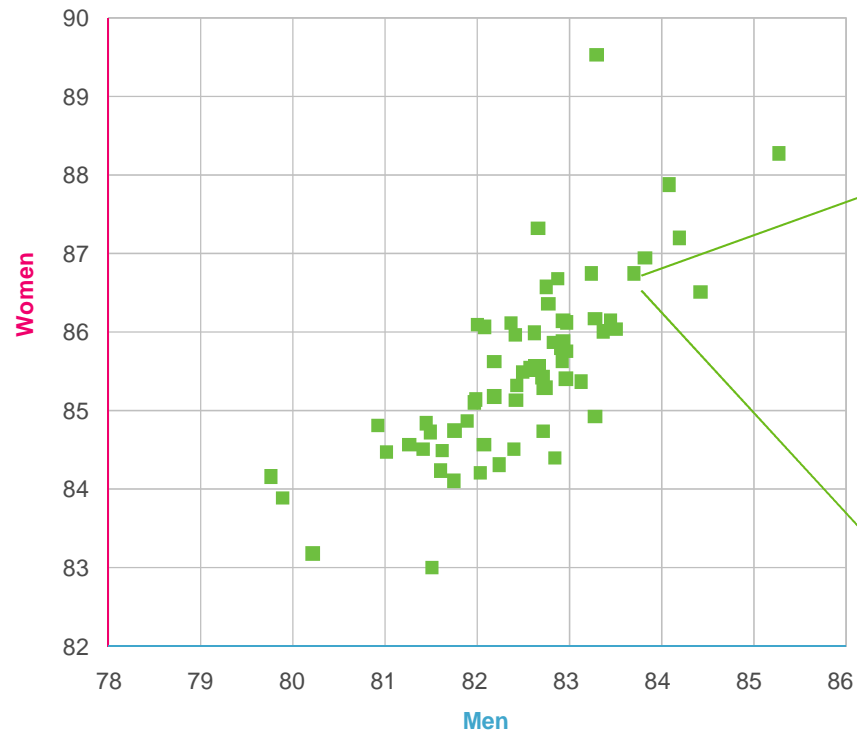
...and over 120 other schemes

# More of Club Vita

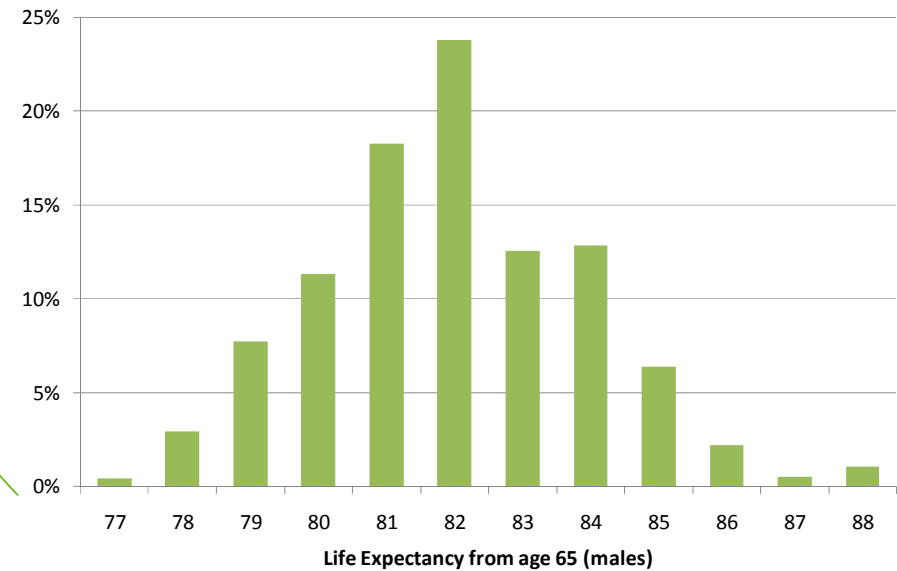
- Club Vita is the market leader in longevity analysis and monitoring
  - clean up data and benchmark each scheme against the rest;
  - look at individuals in a scheme;
  - show the financial impact on the pension scheme.
  - provide statistical analysis for schemes to use with their actuaries on:
    - predictors of longevity
    - trends in mortality
- Commitment to research / product innovation
  - team of 18 working full time on longevity
  - techniques subject to academic peer review / published and scrutinised by actuarial profession
- Why is longevity important?
  - rapidly increasing: uncertainty and unmanaged risk
  - Life expectancy differences found by social groups



## Period life expectancy by scheme



## Diversity within a scheme



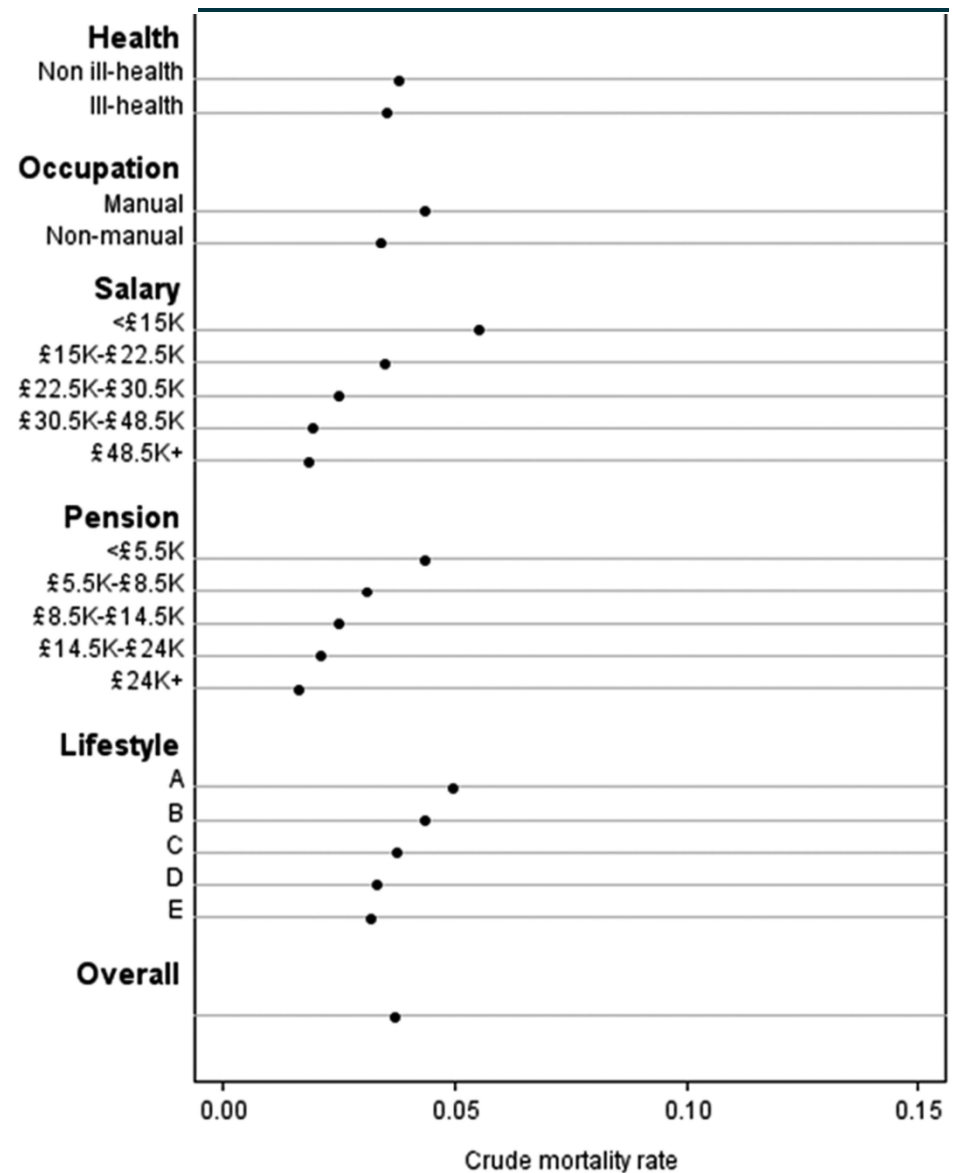
Do differences between and within scheme can be related to known mortality factors?



# Differential mortality

## Higher mortality

- Ill health
- Manual
- Low salary
- Low pension
- Lifestyle group



# Diversity between individuals

Life Expectancy at 65 years old

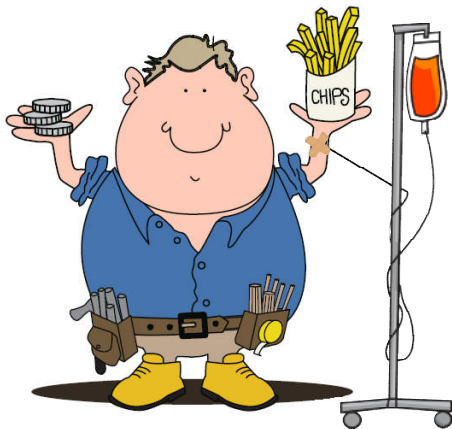
Manual employee, low earner,  
unhealthy lifestyle, retired in ill-health

Health

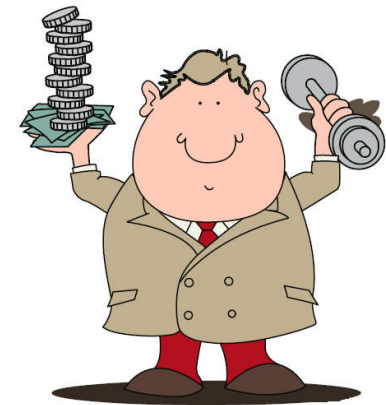
Lifestyle

Affluence

Manual /  
Non-manual



12.0 years



23.0 years

## Vita relations with Academia:

- Oxford Institute of Ageing Collaboration:
  - Joint research / publications / talks
- Dr. Fiona Matthews – MRC Cambridge
  - Peer-reviewing / publications/ talks
- MSc student projects Oxford / Warwick
  - Co-supervising.
  - Business results within academic deadlines

# Collaboration? (1)

- **Terms of collaborations:**
  - Data restrictions, confidentiality, commercially sensitive.  
[[e.g. OIA no access to individual data]]
- **Outputs needed / Timings / Work dynamics are different for academics and for industry business.**
  - Industry needs fast results with commercial value and short term deadlines
  - Academia usually thinks longer term with publishing value and deeper level of detail.
- **Financial requirements:**
  - Grants vs. profits.

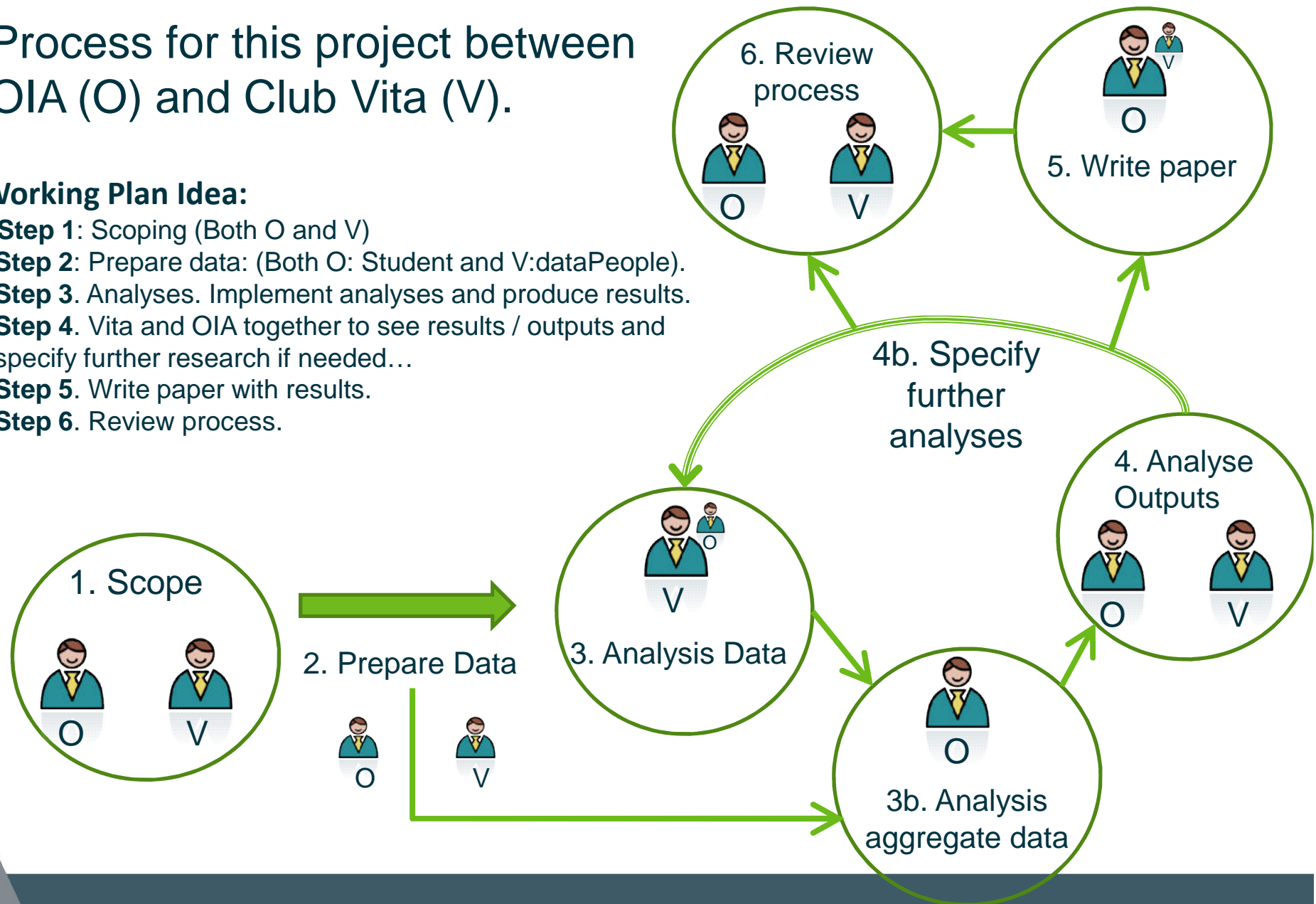
## Collaboration? (2)

- CV dataset is different to other public database.
  - This is an asset commercially,
  - To be able to publish and compare in literature, need to find a way to make it comparable with other sources. (e.g. use of Carstairs Index)
- Lot of time spent honing questions with which to interrogate CV data – a work programme – not just one question [[Start of collaboration]]
- K?
- We also collaborated on a report on sustainable public pensions in advance of white paper

## Process for this project between OIA (O) and Club Vita (V).

### Working Plan Idea:

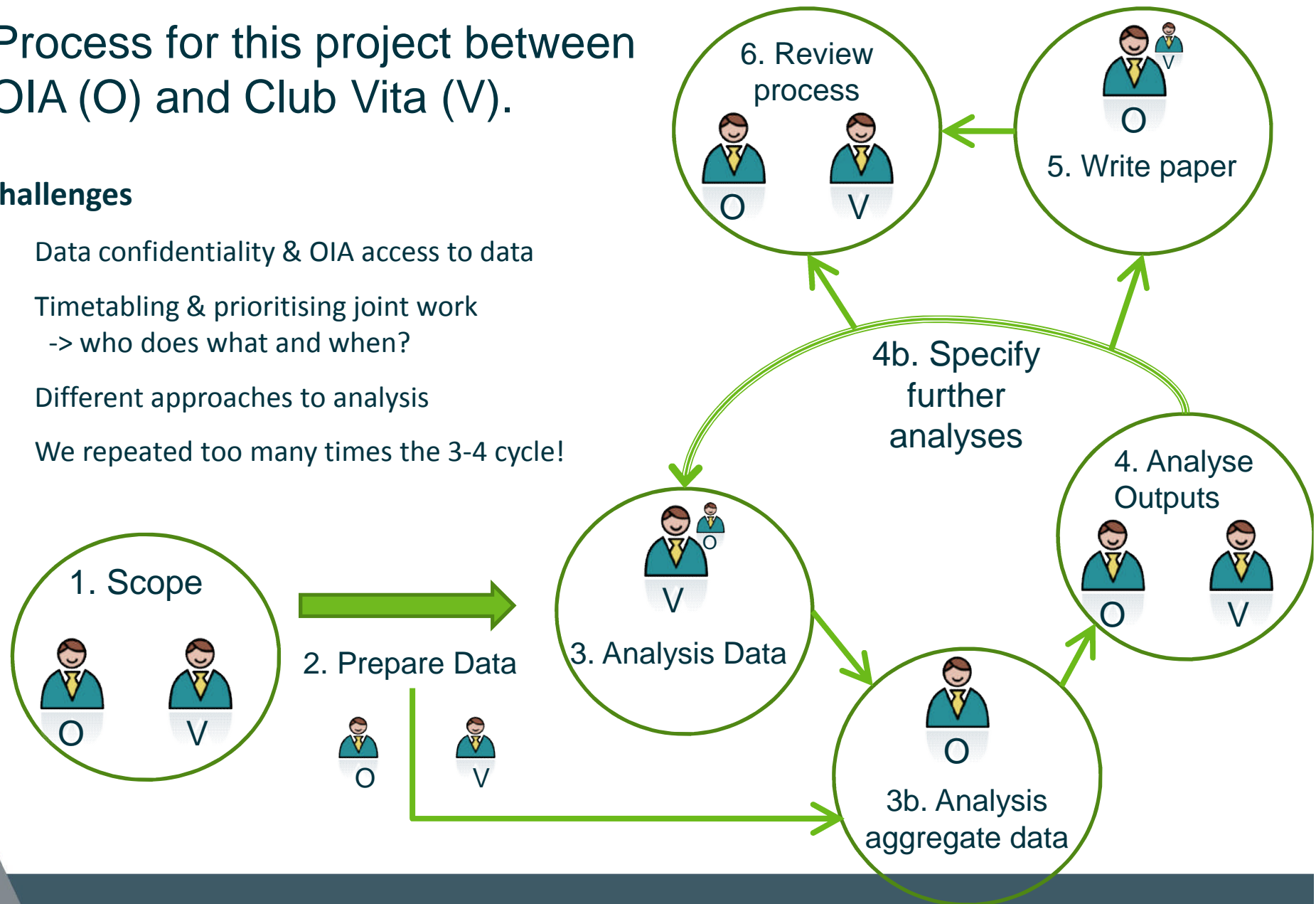
- **Step 1:** Scoping (Both O and V)
- **Step 2:** Prepare data: (Both O: Student and V: dataPeople).
- **Step 3:** Analyses. Implement analyses and produce results.
- **Step 4:** Vita and OIA together to see results / outputs and specify further research if needed...
- **Step 5:** Write paper with results.
- **Step 6:** Review process.



## Process for this project between OIA (O) and Club Vita (V).

### Challenges

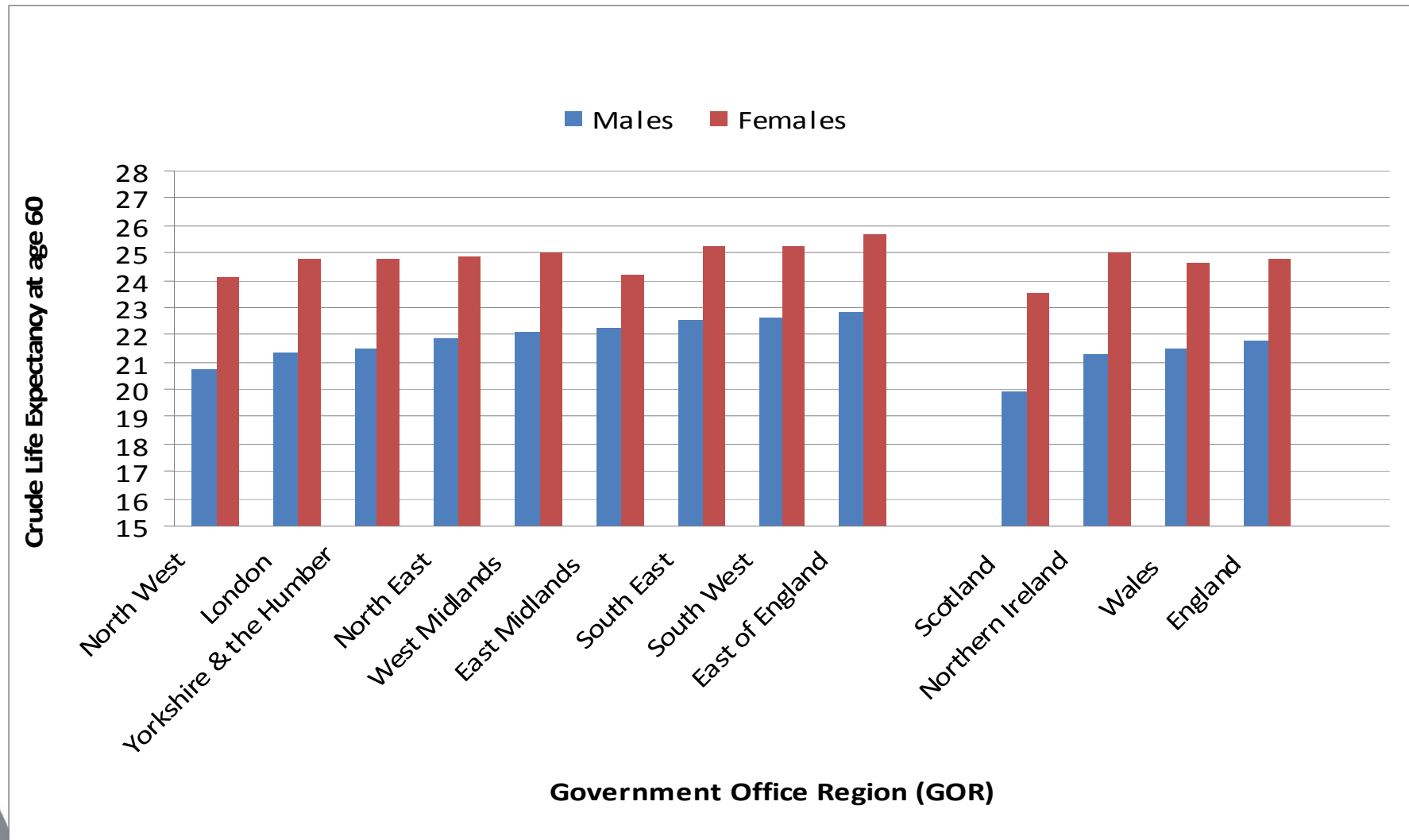
- Data confidentiality & OIA access to data
- Timetabling & prioritising joint work  
-> who does what and when?
- Different approaches to analysis
- We repeated too many times the 3-4 cycle!



## Socio-geographic variations in mortality in a large retired UK population

- Close look at interaction between socioeconomic resources and geography among older retired population
- Occupational class and (current) income are relatively weak predictors of post-retirement mortality
- Are regional variations in mortality same for higher and lower socio-economic groups?

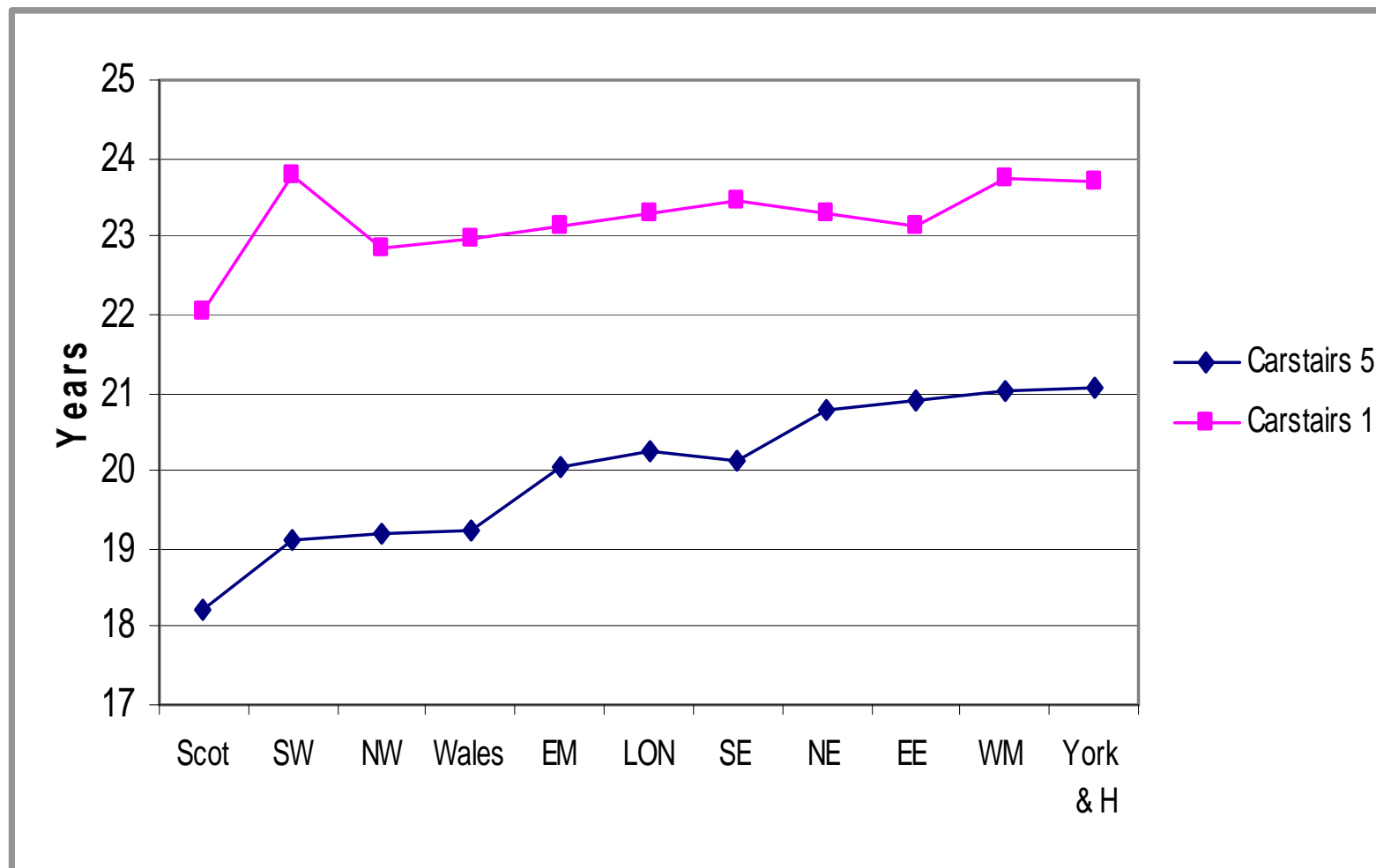
# Regional variation



## Regional distribution of factors associated with high mortality in men

	BOTTOM QUINTILE CARTSAIRS %	LOWEST SALARY QUINTILE %	MANUAL WORKER %	ILL-HEALTH RETIREMENT %
NE	36 (1)	20 (26)	48 (73)	12 (8)
NW	25 (1)	24 (25)	48 (34)	28 (11)
Yorkshire & Humber	24 (2)	26 (9)	51 (22)	26 (7)
E Midlands	10 (4)	15 (35)	35 (66)	13 (29)
W Midlands	21 (3)	9 (41)	33 (82)	9 (47)
E England	4 (5)	12 (32)	33 (45)	12 (19)
London	28 (1)	14 (32)	42 (35)	14 (15)
SE	3 (2)	12 (32)	31 (45)	12 (17)
SW	3 (3)	10 (42)	26 (72)	10 (27)
Scotland	31 (0)	27 (15)	53 (21)	27 (7)
Wales	12 (2)	18 (43)	32 (72)	18 (43)
N Ireland	n/a	34 (14)	64 (12)	34 (6)

## Life expectancy at 60 by region for men in top and bottom Carstairs quintiles



# Is region important after individual and neighbourhood effects?

## Analysis of Deviance Table

Model: binomial, link: logit

Response: Dead in Year of Exposure

Terms added sequentially (first to last)

	Males Pensioners			Females Pensioners		
	Df	Deviance	P(> Chi )	Df	Deviance	P(> Chi )
Age	3	18852	0	3	12534	0
Year Of Exposure	1	36	2.26E-09	1	4	5.15E-02
Salary (Quintile)	5	458	1.01E-96	5	79	1.46E-15
Occupation	2	77	1.70E-17	2	90	2.58E-20
Carstairs (Quintile)	5	110	3.76E-22	5	60	1.08E-11
GOR	12	120	5.93E-20	12	99	1.02E-15

**Thank you**

◆ Any Questions?



# Key questions

- Do the possible differentials manifest themselves within pension scheme data?
- Are routine pension data sufficient for investigating differentials?
- Do differentials between schemes and within schemes have common causes that can be identified?
- Are potential models robust to enable estimation of differences that are larger than the error estimates?

## Data - ClubVita

- 91 schemes
- Over one million living pensioners and dependants
- 15+ years covered
- National data (all regions represented)
- Wide range of industries
  
- Last three years used here (2005-2007)

## Scheme size

	Number	%
<5000	38	(42%)
5000-9000	18	(20%)
10,000-29,999	25	(27%)
30,000 or above	10	(11%)

(Table 2)

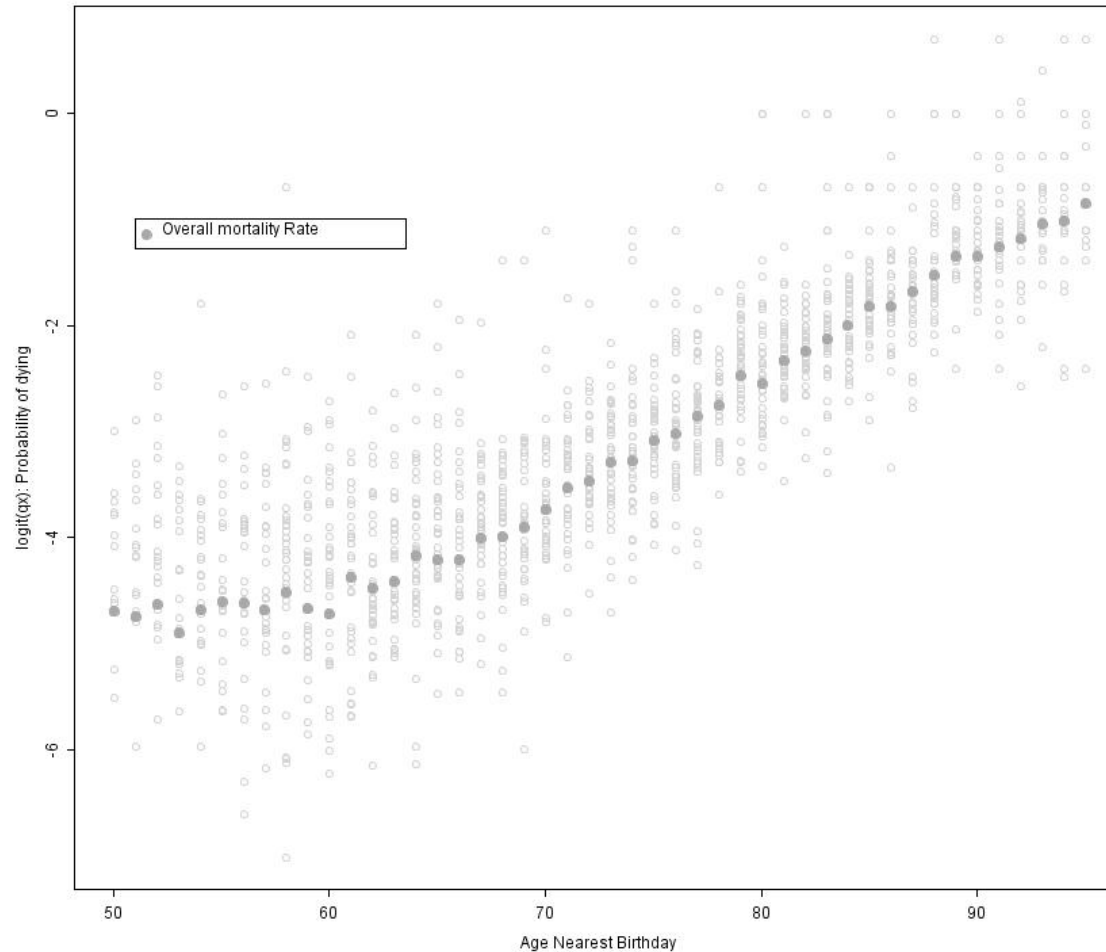
## Data available (2005-2007)

	Exposure	Deaths
Male pensioners	1,284,000	45,000
Female pensioners	1,056,000	23,500
Widows	492,000	24,000
Widowers	61,000	1,800

(Table 1)

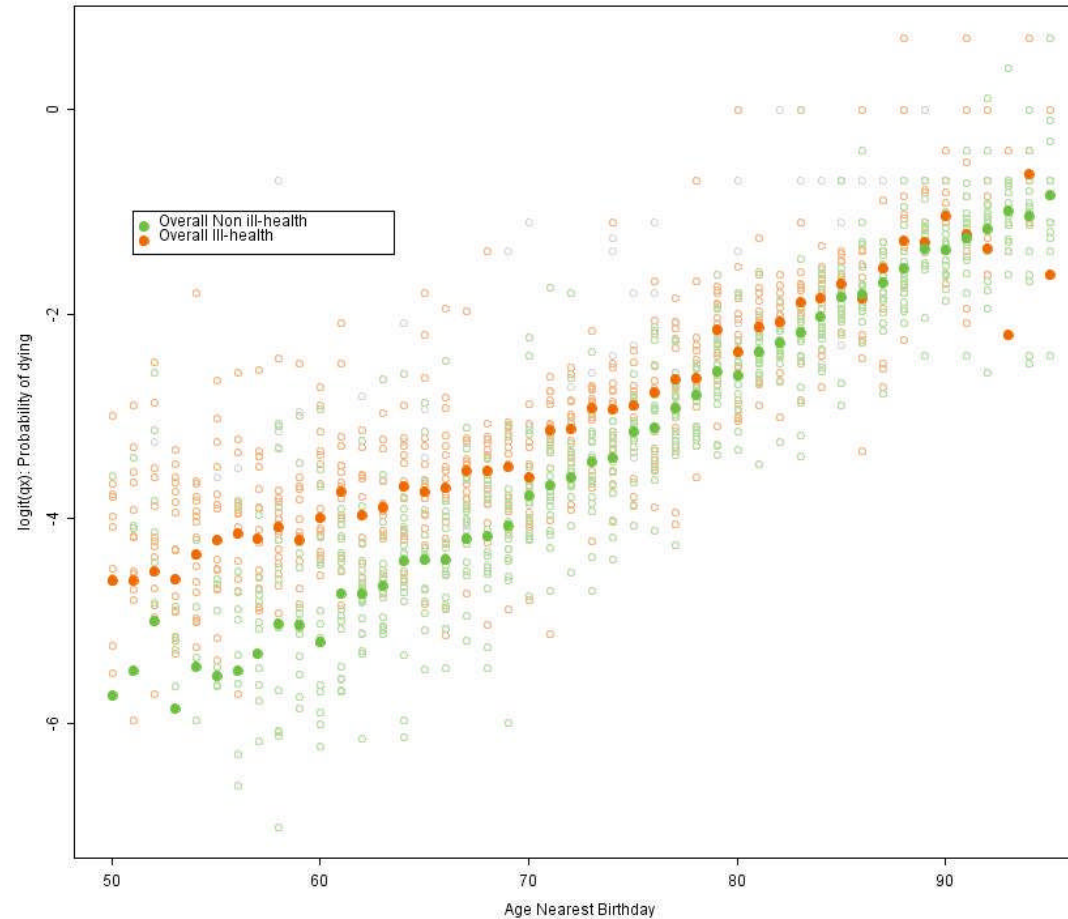
# Variability in Crude Mortality Rates

Crude mortality rates for different DNAs:  
RetirementType, Longevity Group, Salary Band

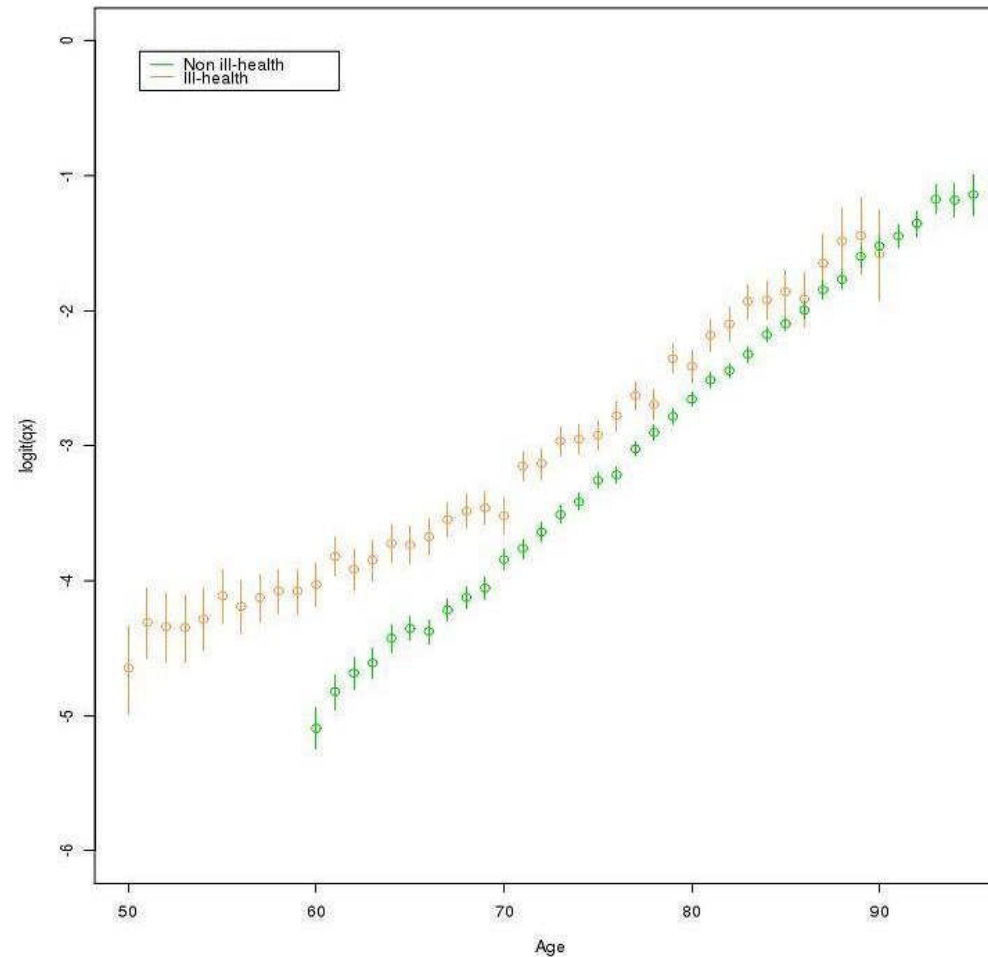


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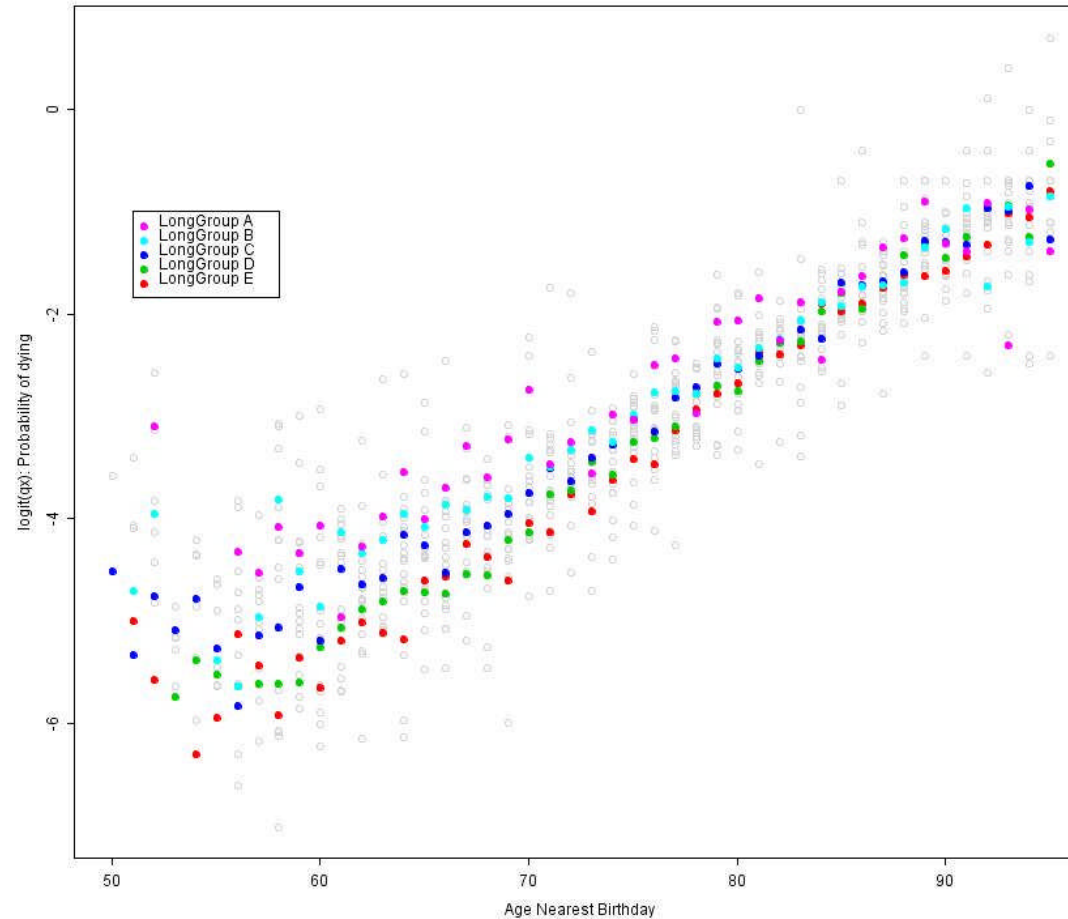


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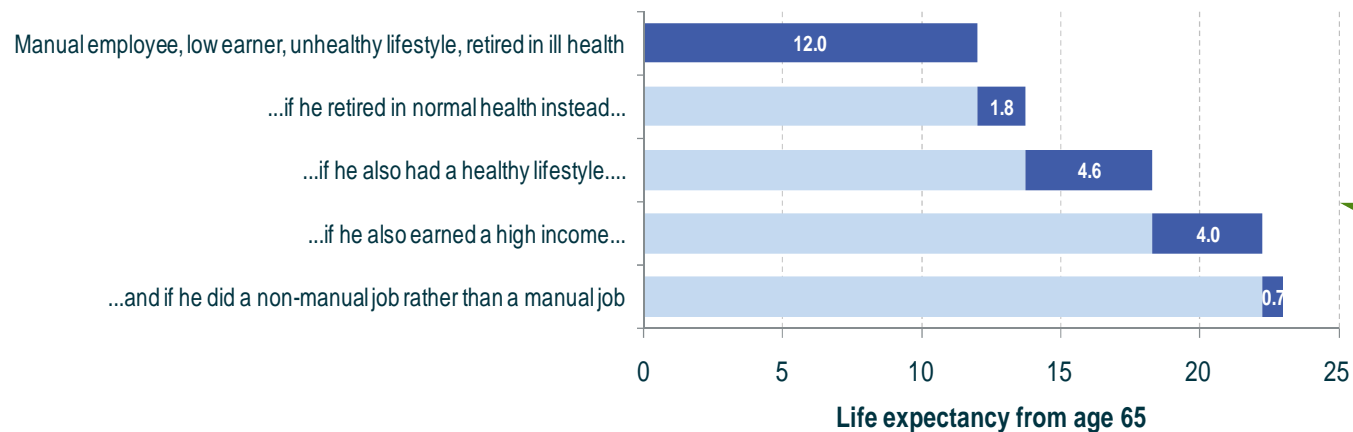
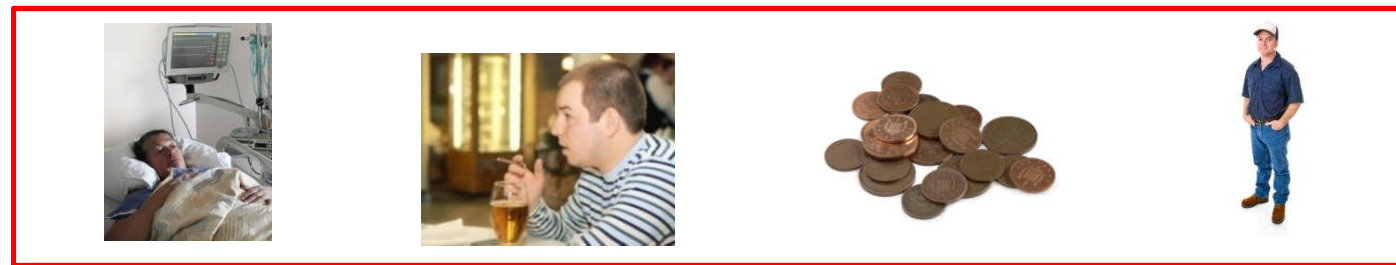
# Variability in Crude Mortality Rates

Crude mortality rates for different DNAs:  
Non ill-healths, Longevity Group, Salary Band

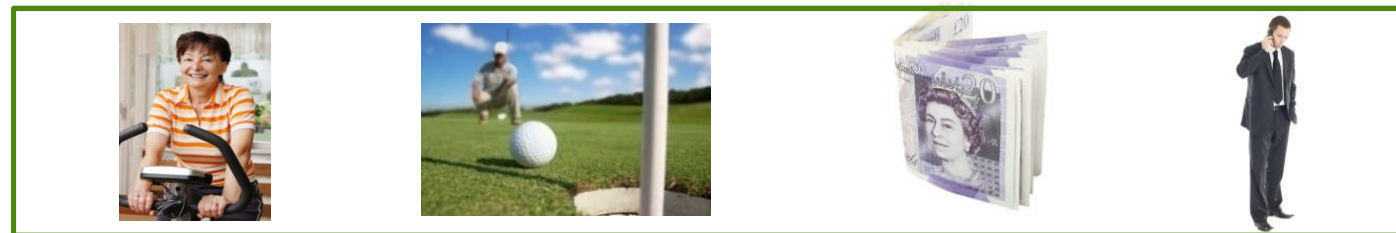


# Variation within members / schemes

## Member A



## Member B



## Age-standardised mortality rates for SES variables

	All males	Males:normal retirement	Males:ill-health retirement	All females	Females:normal retirement	Females: ill-health retirement
Manual	3966	3554	4735	2514	2287	3133
Non-manual	2847	2663	3923	1972	1807	2573
Carstairs 1	2726	2655	3787	1992	1864	2784
Carstairs 2	2938	2784	4075	2079	1884	2764
Carstairs 3	3212	3047	4046	2096	1927	2708
Carstairs 4	3542	3209	4867	2348	2139	3048
Carstairs 5	4047	3683	5086	2539	2371	2970
Salary 1	3929	3495	5190	2426	2195	3040
Salary 2	3577	3280	4729	2151	1919	2941
Salary 3	3437	3146	4273	1977	1786	2534
Salary 4	2770	2556	4219	1865	1699	2618
Salary 5	2343	2226	3313	1911	1752	2560
Normal retirement	2984			1954		
Ill-health	4436			2891		

- **Step 1:** Scoping (Both O and V; KH&AMM + others)
  - How to map the index?
  - How are we testing?
  - What are we producing? (form/expected outputs)
  - Which data needed? (aggregates?) (Subpopulation?, Years? )
  - Define how we are going to review how well this has worked (e.g. KH and AMM get together?)
- **Step 2:** Prepare data: (Both O: Student and V:dataPeople; supervised by KH&AMM).
  - Postcode-> Ward-> Carstairs index
- **Step 3:** Analyses. Implement analyses and produce results.
  - For full data: analyses through Vita hands with OIA's input.
  - **Step 3b:** Aggregated data could be provided to OIA, so student can analyse data independently.
- **Step 4:** Vita and OIA together to see results / outputs and specify further research if needed... (back to step 3 or forward to step 5)
- **Step 5:** Write paper with results. Mainly OIA, with input/review from Vita
- **Step 6:** Review process.
  - How easy was it? How to improve for next topic?
  - What next steps?

