Supplementary Appendix

Appendix 1. Sample attrition in the OPAL cohort study

Loss to follow-up and incomplete data is a frequent problem in longitudinal studies among older individuals. Losses from the sample can be traced to two main sources—mortality and sample attrition (individuals who withdrew from the study or were unreachable).

In the following analysis we defined individuals as having 'attrited' if they did not respond the follow up questionnaires, but were not dead according to the mortality data, so it allowed us to distinguish between those who dropped out of the study voluntarily (despite still being alive) from those who simply died.

We divided individuals who returned the baseline questionnaire into four mutually exclusive groups (same groups used by Banks [1]): (1) those who responded to all three time follow up points (baseline, Year1 and Year2); (2) those who responded in baseline but did not respond in Year 2 (having dropped out (withdrawal/unreachable) of the study either in Year 1 or Year 2) - we refer to these individuals as 'attriters'; (3) those who responded in baseline, did not respond in Year1, but returned the follow up questionnaire in Year2 - we refer to these individuals as 'returners'; and (4) those who responded in baseline, but subsequently died.

Table 1a and 1b show the characteristics of OPAL participants according to the four categories of retention, attrition, and mortality. A total of 75.5% (n=4,081/5,409) of OPAL cohort study responded to all three waves. Drop out in the study was the main cause of attrition (19.9%; n=1,075/5,409), follow by death (3.4%; n=181/5,409). The returners who did not have information in Year 1 but respond the questionnaire in Year 2, comprise 1.3% of the whole OPAL sample (n=72/5,409). Larger difference between responders and lost to follow up appears to be driven by mortality, rather than different rates of sample attrition (Appendix 1. Table 1a and 1b).

Appendix 1. Table 1a. Sample attrition and mortality among participants in the OPAL study (n=5,409), among all three waves.

Candidate predictors for mobility decline at baseline	**All responders at Y0**	**Responders in all three waves (Y0, Y1 and Y2)**	**Attrited Y0-Y2***	**Returned (In Y0, attrited Y1, returned Y2)**	**Died Y0-Y2**
	N=5,409	N=4,081 (75.5%)	N=1,075 (19.9%)	N=72 (1.3%)	N=181 (3.4%)
Age, mean (SD)	74.9 (6.8)	74.3 (6.3)	76.4 (7.3)	72.5 (6.0)	81.5 (7.9)
Gender*					
Women	2,783 (51.5)	2,096 (51.4)	576 (53.6)	37 (51.4)	74 (40.9)
Men	2,626 (48.5)	1,985 (48.6)	499 (46.4)	35 (48.6)	107 (59.1)
Living arrangement					
Living alone	1,555 (28.8)	1,112 (27.3)	349 (32.5)	22 (30.6)	72 (39.8)
Education					
Higher education	1,912 (35.4)	1,597 (39.1)	246 (22.9)	24 (33.3)	45 (24.9)
Secondary education	3,051 (56.4)	2,229 (54.6)	678 (63.1)	36 (50.0)	108 (59.7)
None or primary	408 (7.5)	237 (5.8)	133 (12.4)	10 (13.9)	28 (15.5)
Adequacy of income					
Quite comfortably off	1,763 (32.6)	1,511 (37.0)	207 (19.3)	10 (13.9)	35 (19.3)
Able to manage without much difficulty	2,035 (37.6)	1,502 (36.8)	432 (40.2)	30 (41.7)	71 (39.2)
To be careful with money	1,225 (22.7)	803 (19.7)	336 (31.3)	28 (38.9)	58 (32.0)
Occupational physical demands					
Very light	467 (8.6)	383 (9.4)	64 (6.0)	5 (6.9)	15 (8.3)
Light	979 (18.1)	801 (19.6)	152 (14.1)	6 (8.3)	20 (11.1)
Moderate	2,533 (46.8)	1,906 (46.7)	515 (47.9)	30 (41.7)	82 (45.3)
Strenuous	1,017 (18.8)	732 (17.9)	225 (20.9)	20 (27.8)	40 (22.1)
Very strenuous	368 (6.8)	236 (5.8)	100 (9.3)	11 (15.3)	21 (11.6)
Receive enough support (No)	498 (9.2)	342 (8.4)	129 (12.0)	7 (9.7)	20 (11.1)
Miss other people around					
No	3,365 (62.2)	2,661 (65.2)	573 (53.3)	42 (58.3)	89 (49.2)
Sometimes	1,050 (19.4)	766 (18.8)	235 (21.9)	13 (18.1)	36 (19.9)

Candidate predictors for mobility decline at baseline	All responders at Y0	Responders in all three waves (Y0, Y1 and Y2)	Attrited Y0-Y2*	Returned (In Y0, attrited Y1, returned Y2)	Died Y0-Y2
	N=5,409	N=4,081 (75.5%)	N=1,075 (19.9%)	N=72 (1.3%)	N=181 (3.4%)
Yes	946 (17.5)	623 (15.3)	252 (23.4)	17 (23.6)	54 (29.8)
No of organisations/clubs/societies, median (IRQ)	1 (0-2)	1 (0-2)	1 (0-2)	1 (0-2)	1 (0-2)
Hours/day moving around					
7 hours/day or more	1,201 (22.2)	953 (23.4)	216 (20.1)	15 (20.8)	17 (9.4)
5-7 hours/day	1,442 (26.7)	1,121 (27.5)	271 (25.2)	19 (26.4)	31 (17.1)
3-5 hours/day	1,627 (30.1)	1,252 (30.7)	311 (28.9)	20 (27.8)	44 (24.3)
Less than 3 hrs/day moving	1,099 (20.3)	734 (18.0)	264 (24.6)	18 (25.0)	83 (45.9)
BMI, mean (SD)	26.6 (4.8)	26.6 (4.8)	26.7 (4.9)	26.4 (4.8)	26.3 (5.2)
Mobility problems					
No	3,193 (59.0)	2,611 (64.0)	490 (45.6)	45 (62.5)	47 (26.0)
Slight	1,152 (21.3)	832 (20.4)	265 (24.7)	11 (15.3)	44 (24.3)
Moderate	697 (12.9)	445 (10.9)	194 (18.1)	11 (15.3)	47 (26.0)
Severe	316 (5.8)	174 (5.4)	102 (9.5)	4 (5.6)	36 (19.9)
Unable to walk	21 (0.4)	8 (0.2)	9 (0.8)	1 (1.4)	3 (1.7)
Usual walking pace					
Fast/Fairly brisk	1,290 (23.9)	1,078 (26.4)	181 (16.8)	19 (26.4)	12 (6.6)
Normal	1,952 (36.1)	1,587 (38.9)	314 (29.2)	27 (37.5)	24 (13.3)
Stroll at any easy pace	1,373 (25.4)	974 (23.9)	326 (30.3)	17 (23.6)	56 (30.9)
Very slow/Unable to walk	767 (14.2)	427 (10.5)	245 (22.8)	8 (11.1)	87 (48.1)
Difficulties maintaining balance (Yes)	914 (16.9)	536 (13.1)	284 (26.4)	14 (19.4)	80 (44.2)
Confidence to walk, median (IQR)	1 (1-3)	1 (1-2)	2 (1-7)	1 (1-2)	7 (1-10)
Use of walking aid inside (Yes)	480 (8.9)	261 (6.4)	161 (15.0)	3 (4.2)	55 (30.4)
Use of walking aid outside					
No	4,211 (77.9)	3,317 (81.3)	746 (69.4)	59 (81.9)	89 (49.2)

Candidate predictors for mobility decline at baseline	All responders at Y0	Responders in all three waves (Y0, Y1 and Y2)	Attrited Y0-Y2*	Returned (In Y0, attrited Y1, returned Y2)	Died Y0-Y2
	N=5,409	N=4,081 (75.5%)	N=1,075 (19.9%)	N=72 (1.3%)	N=181 (3.4%)
Sometimes	423 (7.8)	307 (7.5)	96 (8.9)	5 (6.9)	15 (8.3)
Yes	741 (13.7)	436 (10.7)	223 (20.7)	7 (9.7)	75 (41.4)
Change in walking ability compared to last year					
Better	351 (6.5)	281 (6.9)	62 (7.8)	4 (5.6)	4 (2.2)
About the same	3,653 (67.5)	2,873 (70.4)	656 (61.0)	52 (72.2)	72 (39.8)
Worse	1,375 (25.4)	911 (22.3)	347 (32.3)	15 (20.8)	102 (56.4)
Falls last year					
None	3,806 (70.4)	2,922 (71.6)	724 (67.4)	54 (75.0)	106 (58.6)
Once	1,098 (20.3)	824 (20.2)	225 (20.9)	13 (18.1)	36 (19.9)
More than one	471 (8.7)	317 (7.8)	113 (10.5)	4 (5.6)	37 (20.4)
Fractures last year (Yes)	163 (3.0)	105 (2.6)	51 (4.7)	3 (4.2)	4 (2.2)
Back pain and leg symptoms					
No back pain	2,483 (45.9)	1,945 (47.7)	440 (40.9)	29 (40.3)	69 (38.1)
Back pain without leg symptoms	1,786 (33.0)	1,390 (34.1)	326 (30.3)	21 (29.2)	49 (27.1)
Back pain with leg symptoms	1,035 (19.1)	691 (16.9)	267 (24.8)	19 (26.4)	58 (32.0)
Pain distribution					
No pain	866 (16.0)	648 (15.9)	180 (16.7)	16 (22.2)	22 (12.2)
One site pain	1,316 (24.3)	1,021 (25.0)	244 (22.7)	13 (18.1)	38 (21.0)
Multisite pain	1,834 (33.9)	1,402 (34.4)	339 (31.5)	19 (26.4)	74 (40.9)
Widespread pain	1,393 (25.8)	1,010 (24.8)	312 (29.0)	24 (33.3)	47 (26.0)
Lower limb pain in the last 6 weeks (Yes)	3,163 (58.5)	2,379 (58.3)	627 (58.3)	42 (58.3)	115 (63.5)
Current pain/discomfort severity					
No	1,594 (29.5)	1,271 (31.1)	273 (25.4)	20 (27.8)	30 (16.6)
Slight	2,269 (42.0)	1,814 (44.5)	367 (34.1)	22 (30.6)	66 (36.5)
Moderate	1,146 (21.2)	771 (18.9)	299 (27.8)	23 (31.9)	53 (29.3)

Candidate predictors for mobility decline at baseline	All responders at Y0	Responders in all three waves (Y0, Y1 and Y2)	Attrited Y0-Y2*	Returned (In Y0, attrited Y1, returned Y2)	Died Y0-Y2
	N=5,409	N=4,081 (75.5%)	N=1,075 (19.9%)	N=72 (1.3%)	N=181 (3.4%)
Severe/Extreme	373 (6.9)	210 (5.1)	127 (11.8)	7 (9.7)	29 (16.0)
Number of health conditions					
None	1,149 (21.2)	937 (23.0)	178 (16.6)	16 (22.2)	18 (9.9)
1	1,886 (34.9)	1,466 (35.9)	353 (32.8)	23 (31.9)	44 (24.3)
2	1,480 (27.4)	1,091 (26.7)	314 (29.2)	19 (26.4)	56 (30.9)
3	652 (12.1)	441 (10.8)	158 (14.7)	14 (19.4)	39 (21.6)
4 or more	242 (5.5)	146 (3.6)	72 (6.7)	0 (0.0)	24 (13.3)
Physical tiredness (Yes)	1,550 (28.7)	1,013 (24.8)	410 (38.1)	27 (37.5)	100 (55.3)
Anxiety/depression					
No	3,772 (69.7)	2,944 (72.1)	665 (61.9)	50 (69.4)	113 (62.4)
Slightly	1,163 (21.5)	840 (20.6)	261 (24.3)	17 (23.6)	45 (24.9)
Moderately	353 (6.5)	226 (5.5)	111 (10.3)	4 (5.6)	12 (6.6)
Severely/Extremely	68 (1.3)	38 (0.9)	22 (2.0)	1 (1.4)	7 (3.9)
Poor hearing (Yes)	1,322 (24.4)	927 (22.7)	318 (29.6)	12 (16.7)	65 (35.9)
Poor vision (Yes)	704 (13.0)	445 (10.9)	204 (19.0)	15 (20.8)	40 (22.1)
Problems in daily life due to lack of strength in hands (Yes)	1,236 (22.9)	822 (20.1)	326 (30.3)	22 (30.6)	66 (36.5)
Unintentional loss of weight (Yes)	223 (4.1)	116 (2.8)	79 (7.4)	5 (6.9)	23 (12.7)
Self-reported general health, mean (SD)	78.4 (17.2)	80.3 (15.8)	73.6 (19.6)	78.5 (16.0)	64.5 (22.2)

Appendix 1. Table 1b. Attrition and mortality among participants in the OPAL study (n=5,409)

Auxiliary variables	All responders at Y0	Responders in all three waves (Y0, Y1 and Y2)	Attrited Y0-Y2*	Returned (In Y0, attrited Y1, returned Y2)	Died Y0-Y2
	N=5,409	N=4,081 (75.5%)	N=1,075 (19.9%)	N=72 (1.3%)	N=181 (3.4%)
Ethnicity (Non-white)	273 (5.1)	151 (3.7)	103 (9.6)	11 (15.3)	8 (4.4)
Smoking					
Never	2,689 (49.7)	2,082 (51.0)	29 (40.3)	29 (40.3)	66 (36.5)
Former	2,441 (45.1)	1,822 (44.7)	36 (50.0)	36 (50.0)	100 (55.3)
Current	263 (4.9)	167 (4.1)	7 (9.7)	7 (9.7)	14 (7.7)
Place of residence					
Owner	4,534 (83.8)	3,537 (86.7)	816 (75.9)	51 (70.8)	130 (71.8)
Rented/Sheltered/Other	861 (15.9)	539 (13.2)	252 (23.4)	20 (27.8)	50 (27.6)
Cognitive function (1-6), mean (SD)	5.4 (0.9)	5.5 (0.9)	5.2 (1.1)	5.4 (1.1)	5.1 (1.2)

We defined individuals as having 'attrited' if they do not respond to the Year 2 questionnaire (either withdrew or unreachable), but are not dead according to the mortality data.

To identify associations between demographic, economic and health characteristics of the study participants and odds of sample attrition (withdraw/unreachable) two years later in the OPAL cohort study, stepwise logistic regression was used. A binary dependent variable ('attrited') was created, which is equal to one if an individual dropped out of the study between baseline and Year 2, and equal to zero if they remained in the study at Year 2 (responding to both the baseline and Year 2). Individuals who died during the study period were excluded from this analysis.

Multivariate results (data not shown) indicate that sample attrition was higher among older age, current smoker, and non-white ethnicity participants. The least-educated individuals were more likely to drop out of the study than their more educated peers. Also, participants who reported having a comfortable economic situation and that their usual place of resident was their own house/flat were less likely to attrite.

Participants who were less socially engaged and less confident walking a long distance (1/2 mile) were more likely to attrite.

Health-related characteristic associated with higher rate of attrition were poor cognitive function, current smoker, poor general health and have lost weight recently without wishing (surrogate of poor health).

Appendix 2. Candidate predictors for mobility decline after two years

Demographic factors included age, gender and living arrangement. Socioeconomic factors included highest education level, adequacy of income [2] and occupational physical demands during their life. Social factors included loneliness, perceived sufficiency of social support and social engagement. Loneliness and perceived sufficiency of social support were assessed using two questions within the social domain of the Tilburg Frailty Indicator (TFI) [3, 4]: "Do you miss having other people around you?" and "Do you receive enough support from other people?", respectively. Social engagement was assessed as the total of number of organisations, clubs or societies participants claimed membership of, and the eight response options were: political parties, trade unions or environmental groups; tenants or residents' groups or Neighbourhood Watch; church or other religious groups; charitable associations; education, arts or music groups or evening classes; social clubs; sports clubs, gyms, exercise classes, or any other organizations, clubs or societies.

Physical activity was measured using questions from the Rapid Assessment Disuse Index [5], and summarised as the number of hours a day typically spent moving around on foot in the last week. Body Mass Index (BMI) was calculated by dividing weight in kilograms by height in metres squared and included as a continuous variable.

Mobility-related factors included self-assessed usual outdoor walking pace (give response categories in brackets). Balance problems were assessed using a question within the Tilburg Frailty indicator

(TFI) [3, 4] “Do you experience problems in your daily life due to difficulty maintaining your balance? ”. Confidence to walk a half a mile was assessed using the Modified Gait Self-efficacy scale, and rated 1 ‘not confident at all’ to 10 ”totally confident” [6]. Participants were asked if they used a walking aid (such as walking stick, walker) to walk around outdoors. Change in walking ability was measured using the question “Compared with one year ago, how would you rate your walking in general now?”, with five-response options from “Much worse than one year ago” to “Much better than one year ago”.

Falls data were collected as recommended by the Prevention of Falls Network Europe, using a single question , “In the last 12 months, have you had any fall including a slip or trip following which you have come to rest on the ground, floor or lower level?”[7].

Fractures/broken bones was assessed using the following question: “Have you had any broken bones or fractures in the last 12 months?”

We included back pain with leg symptoms, widespread pain, lower limb pain and severity of pain. Back pain and leg symptoms were defined as the presence of back pain or other symptoms over the last 6 weeks that travel from the back into the buttocks or legs. Self-reported areas of pain were collected using the Nordic Musculoskeletal Questionnaire [8] which asked participants if they had “experienced any trouble (ache, pain or discomfort)” in nine different body sites (knees, hands/wrists, neck, shoulders, hips, feet/ankles, elbows, lower and upper back) during the last six weeks. We classified participants into four categories: no pain, one site pain, multisite pain (but not meeting criteria for widespread pain), and widespread pain as pain reported in three bodily regions (upper limb: shoulder, elbow, wrist/hand); spinal (neck, upper back, lower back), lower limb (hips, knees ankles or feet). Lower limb pain (in the hips, knees ankles or feet) was also assessed as a potential predictor. Severity of pain was assessed using the pain / discomfort item of the EQ5-5D-5L [9].

Participants indicated if their doctor or nurse had told them that they had any of the following health conditions: self-reported arthritis, lung disease, diabetes, high blood pressure, osteoporosis, stroke and angina or heart troubles. The total number of chronic conditions was then calculated.

Physical tiredness, grip strength and unintentional weight loss were assessed from the TFI questionnaire items [3, 4]: "Do you experience problems in your daily life due to physical tiredness?", "Do you experience problems in your daily life due to lack of strength in your hands" and "Have you lost a lot of weight recently without wishing to do so? (6kg or more during the last 6 months or 3kg or more in the last month)", respectively. Hearing and eye condition were assessed using two questions from the TFI [3, 4]: "Do you experience problems in your daily life due to poor hearing?" and "Do you experience problems in your life due to poor vision?". We assessed anxiety and depression using the anxiety/depression item of the EQ5-5D-5L [9].

We assessed participant's current health status by the EuroQol-Visual Analog Scale (EQ-VAS).

Categories within each variable were collapsed to a lower number of categories if they contained too few participants when they were cross tabulated with the outcome ($n<10$).

If a predictor is categorical with three of more categories, or continuous and modelled as a nonlinear trend, then including the predictor will require two or more parameters being included in the model. Therefore, we will refer to predictor parameters here, rather than variables.

Appendix 3. Missing Data and Multiple Imputation

Missing data and attrition are an important concern for longitudinal studies, especially those on older adults. It has been argued that the imputation of missing covariates data in medical research is always better than the complete case [10]. Excluding subjects with missing values leads to a reduction in the sample study size, may result in incorrect estimates of specific predictors, and may diminish the

predictive power of the working statistical model.

After preliminary analysis [11] (Appendix 3. Table 1), the suitability of the missing at random (MAR) assumption was considered, ie missingness in a variable is independent of the missing values themselves after conditioning on the observed data.

Hence, in order to reduce potential biases arising from missing data, multiple imputations were used. MICE package in Stata was performed with 100 iterations to create 50 imputed datasets using the 50 predictor variables plus outcome and four auxiliary variables. Imputation methods were continuous variables: predictive mean matching or linear regression; 2-level factors: binary logistic regression; and >2-level factors: polytomous regression (ordered or unordered).

After multiple imputation was done, participants who died during the follow up were excluded before the analysis (n=174, 5.2% out of 5,358).

Appendix 3. Table 1. Univariate associations between missing data and rest of predictors. MAR assumption.

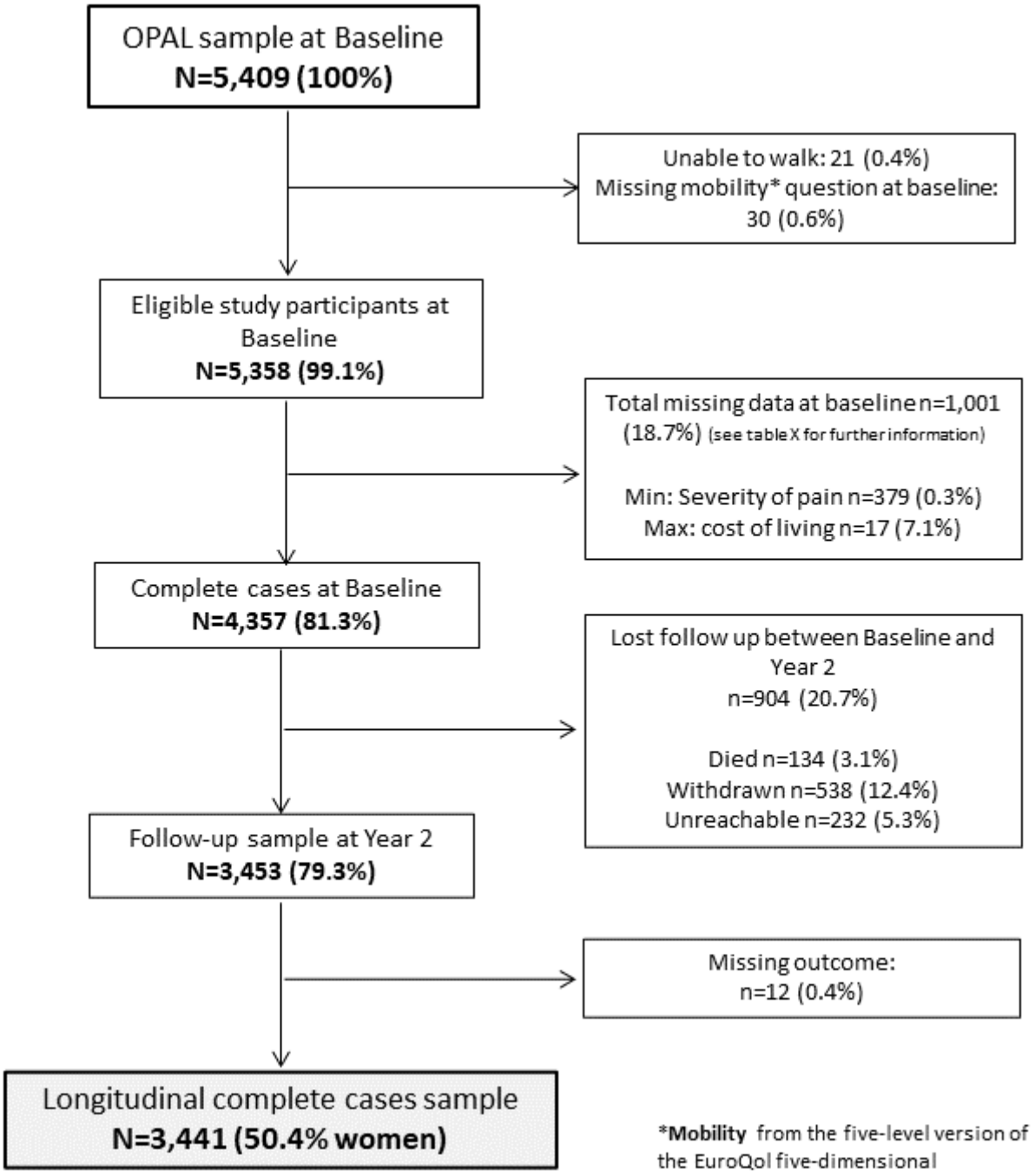
Predictors at baseline	**Association with missing data**
Living alone	Age, education, mobility, walking compared one year ago and depression.
Education	Age, living alone, cost of living, support received, social engagement, confidence walking, pain, fatigue, depression, poor vision and general health.
Cost of living	Sex, education, occupation, support received, social engagement, moving around and lower limb pain.
Support received	Age
Loneliness	Living alone, support received and poor vision.
Hours moving	Age, living alone, education, support received, loneliness, mobility, balance, confidence walking, use of walking aids and pain severity.
Body Mass Index	Age, living alone, education, occupation, cost of living, loneliness, moving around, mobility, walking pace, balance, confidence walking, use of walking aids, fatigue, depression, poor vision, general health and lack of strength in the hands.
Walking pace	Loneliness and use of walking aids.
Balance	Age, education, cost of living, support received, social engagement, mobility, walking pace, confidence walking, use of walking aids, falls, back pain, lower limb pain, health conditions, fatigue, poor vision, general health,
Confidence walking	Age, living alone, mobility, walking pace, balance, use of walking aids and loss of weight.
Walking aid outside	Education, cost of living, social engagement, walking pace, walking aid inside and pain severity.
Walking aid inside	Education, loneliness, BMI and walking aid outside.
Walking rate compared one year ago	Loneliness, confidence walking, use of walking aids and extreme depression.
Falls	Loneliness and extreme depression.
Fractures	Age, moving around, lower limb pain, pain distribution and health conditions.

Back pain	Age, living alone, education, cost of living, support received, social engagement, mobility, walking pace, use of walking aids and outcome.
Pain/discomfort severity	None, but only 17 participants had missing data at this variable.
Physical tiredness	Gender, cost of living, loneliness, depression, poor vision, and general health.
Depression	Living alone, education, cost of living, loneliness, social engagement, mobility, balance, confidence walking, use of walking aids, fractures, back pain, pain severity and poor vision.
Poor vision	Age, education, loneliness, social engagement, mobility, balance problems, confidence walking, use of walking aids, falls, depression, fatigue, general health and lack of strength in the hands.
General health	Age and loneliness.
Strength in the hands	Education, support received, social engagement, mobility problems, balance, confidence walking, use of walking aids, falls, back pain, severity of pain, comorbidity, fatigue, and general health.
Loss of weight	Age, loneliness, social engagement, mobility, walking pace, balance, confidence walking, use of walking aids, fractures, back pain, severity of pain, health conditions, fatigue, poor vision, general health, and strength of the hands.

Appendix 3. Table 2. Missing data for each candidate predictor

Candidate predictor	**N=5,358**
Age	0 (0.0)
Gender	0 (0.0)
Living arrangement	18 (0.3)
Education	36 (0.7)
Adequacy of income	379 (7.1)
Occupational physical demands	43 (0.8)
Receive enough support	92 (1.7)
Miss other people around	40 (0.7)
Social engagement	0 (0.0)
Hours/day moving	37 (0.7)
Body mass index	229 (4.3)
Walking pace	24 (0.4)
Balance problems	30 (0.6)
Confidence to walk long distances	19 (0.4)
Inside use of walking aids	32 (0.6)
Outside use of walking aids	37 (0.7)
Change in walking ability in the last year	25 (0.5)
Falls in the last 12 months	29 (0.5)
Fractures in the last 12 months	48 (0.9)
Back pain and leg symptoms	102 (1.9)
Pain distribution	0 (0.0)
Lower limb pain in the last 6 weeks	0 (0.0)
Severity of the pain/discomfort	17 (0.3)
Number of health conditions	0 (0.0)
Physical tiredness	34 (0.6)
Anxiety/depression	43 (0.8)
Hear condition	27 (0.5)
Eye condition	24 (0.4)
Unintentional weight loss	46 (0.9)
Grip strength	20 (0.4)
Perceived general health	40 (0.7)

Appendix 3. Figure 1. Flowchart of missing data



Appendix 4. Calibration plots

To correct for the over shrinkage [12], the parameter estimates were recalibrated by refitting the model via unpenalized maximum likelihood, based on the selected predictors from the lasso regression.

Figure 1. Calibration plot of the first imputed dataset for Model 2.

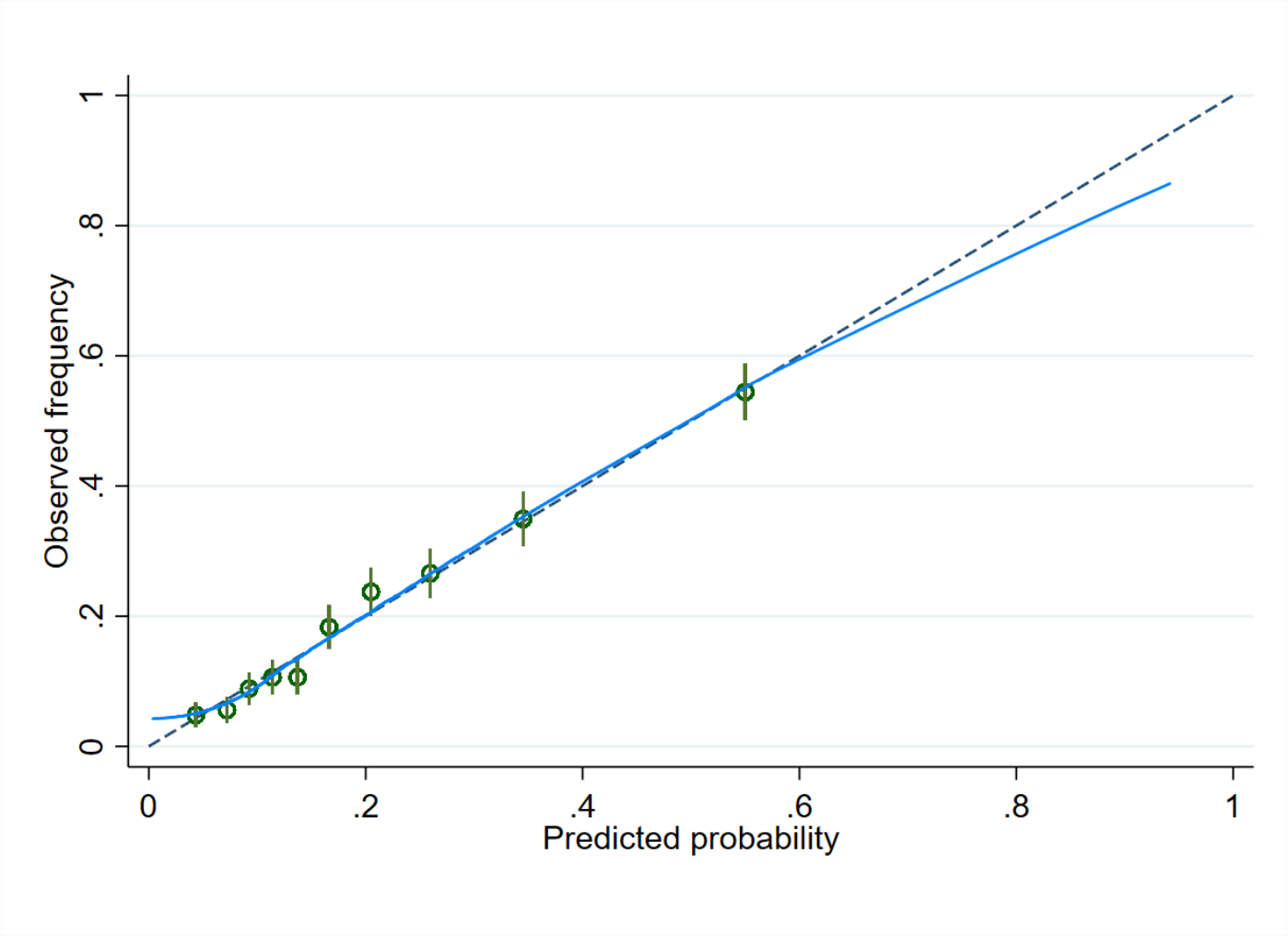
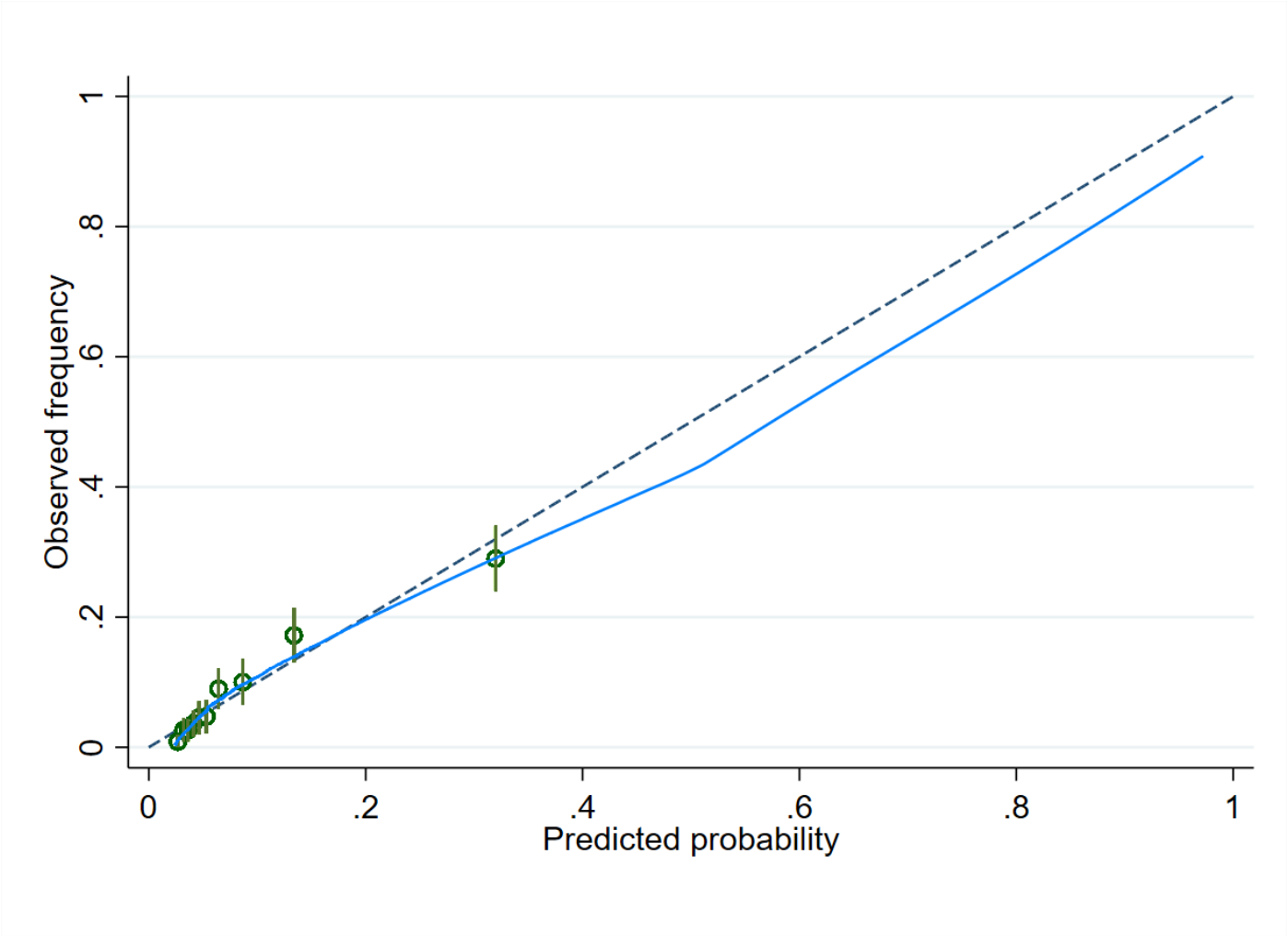


Figure 2. Calibration plot of the first imputed dataset for Model 2.



Appendix 5. Risk score

Appendix 5. Table 1. Risk score points system for the mobility decline at two years model, created using predictor variables identified in the model.

Baseline predictor	**β_i**	**Reference value (W_{ij})**	**$\beta_i(W_{ij}- W_{iREF})$**	**$Point_{ij}= \beta_i(W_{ij}- W_{iREF})/B^*$**
Intercept	-6.757			
Age, years	0.0353			
<75		69.5 (W_{1REF})	0	0
75-84		79.5	0.353	2
≥85		92.5	0.812	5
To be careful with money	0.239			
No		0 (W_{2REF})	0	0
Yes		1	1.962985	1
BMI (kg/m^2)	0.025			
<25 – Normal weight		21.5 (W_{3REF})	0	0
25-30 – Overweight		27.5	0.151	1
≥30 - Obese		35.5	0.351	2
Usual walking pace - Stroll at any easy pace	0.494			
No		0 (W_{4REF})	0	0
Yes		1	0.494	3
Usual walking pace - Slow	0.573			
No		0 (W_{5REF})	0	0
Yes		1	0.573	3
Difficulties maintaining balance	0.166			
No		0 (W_{6REF})	0	0
Yes		1	0.166	1
Confidence to walk	0.056			
1-2 - High confidence		1.5 (W_{7REF})	0	0
3-5		4	0.139	1
6-8		7	0.306	2
9-10 – Low confidence		9.5	0.446	3
Use sometimes walking aid outside	0.158			
No		0 (W_{8REF})	0	0
Yes		1	0.158	1
No change in walking ability compared to last year	-0.087			
No		0 (W_{9REF})	0	0
Yes		1	-0.087	0
Worse walking ability than last year	0.141			
No		0 (W_{10REF})	0	0
Yes		1	0.141	1
Lower limb pain in the last 6 weeks	0.226			
No		0 (W_{11REF})	0	0
Yes		1	0.226	1

Current pain/discomfort severity	0.070			
1-No pain		1 (W_{12REF})	0	0
2-3 – Slight/moderate pain		2.5	0.105	1
4-5 – Severe/extreme pain		4.5	0.245	1
Number of health conditions	0.117			
0-1		0.5 (W_{13REF})	0	0
1-2		1.5	0.176	1
3-4		3.5	0.410	2
5-7		6	0.702	4
Physical tiredness	0.092			
No		0 (W_{14REF})	0	0
Yes		1	0.092	1
Self-reported general health	-0.011			
<71 – Poor general health		50	0.520	3
72-80		76	0.223	1
81-90		85.5	0.114	1
91-100 – Good general health		95.5 (W_{15REF})	0	0
Slight mobility problems	1.963			
No		0 (W_{16REF})	0	0
Yes		1	1.963	11
No mobility problems	2.387			
No		0 (W_{17REF})	0	0
Yes		1	2.387	13

The base category is the category assigned 0 points in the scoring system. Less healthy risk factor states are assigned positive points so that a higher point total conveys more risk.

To determine the reference values for first and last categories of BMI, we use the 1st percentile (18) and the 99th percentile (49) to minimize the influence of extreme values.

To determine the reference values for first categories of VAS-EQ5D, we use the 1st percentile (29) to minimize the influence of extreme values.

B= 5(0.0353) = 0.177

Appendix 5. Table 2. Risks associated with point totals. Point scoring system for two-year risk of mobility decline

Point total	Risk estimate	Point total	Risk estimate	Point total	Risk estimate
0	0.00956	14	0.10313	28	0.57813
1	0.01139	15	0.12069	29	0.62060
2	0.01356	16	0.14077	30	0.66130
3	0.01614	17	0.16357	31	0.69975
4	0.01921	18	0.18925	32	0.73558
5	0.02285	19	0.21791	33	0.76854
6	0.02715	20	0.24957	34	0.79853
7	0.03224	21	0.28416	35	0.82551
8	0.03824	22	0.32150	36	0.84955
9	0.04531	23	0.36126	37	0.87081
10	0.05361	24	0.40302	38	0.88945
11	0.06333	25	0.44623	39	0.90569
12	0.07468	26	0.49028		
13	0.08787	27	0.53447		

B=0.177 (β_{age}*5)

Appendix 5. Table 3. Risk score points system for onset of persistent mobility decline over two years, created using predictor variables identified in the model.

Baseline predictor	**β_i**	**Reference value (W_{ij})**	**$\beta_i(W_{ij}- W_{iREF})$**	**$Point_{ij}= \beta_i(W_{ij}- W_{iREF})/B^*$**
Intercept	-1.844			
Usual walking pace - Slow	0.611			
No		0 (W_{1REF})	0	0
Yes		1	0.611	4
Difficulties maintaining balance	0.329			
No		0 (W_{2REF})	0	0
Yes		1	0.329	2
Confidence to walk	0.106			
1-2 - High confidence		1.5 (W_{3REF})	0	0
3-5		4	0.265	2
6-8		7	0.584	4
9-10 – Low confidence		9.5	0.849	6
Worse walking ability than last year	0.465			
No		0 (W_{4REF})	0	0
Yes		1	0.465	3
Number of health conditions	0.046			
0-1		0.5 (W_{5REF})	0	0
1-2		1.5	0.068	0
3-4		3.5	0.160	1
5-7		6	0.274	2
Self-reported general health	-0.015			
<71 – Poor general health		50	0.665	5
72-80		76	0.285	2
81-90		85.5	0.146	1
91-100 – Good general health		95.5 (W_{6REF})	0	0

The base category is the category assigned 0 points in the scoring system. Less healthy risk factor states are assigned positive points so that a higher point total conveys more risk.

To determine the reference values for first categories of VAS-EQ5D, we use the 1st percentile (29) to minimize the influence of extreme values.

B= 10(0.0146 ($\beta_{Self\text{-}reported\ health}$)) = 0.146

Appendix 5. Table 4. Risks associated with point totals. Point scoring system for two-year risk of new-onset persistent mobility decline

Point total	Risk estimate	Point total	Risk estimate	Point total	Risk estimate
0	0.04483	8	0.13113	16	0.32674
1	0.05152	9	0.14868	17	0.35963
2	0.05914	10	0.16813	18	0.39389
3	0.06780	11	0.18954	19	0.42923
4	0.07763	12	0.21299	20	0.46531
5	0.08875	13	0.23849	21	0.50176
6	0.10129	14	0.26601	22	0.53818
7	0.11538	15	0.29547		

B=0.146 ($\beta_{\text{Self-reported general health}}$*10)

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