Supplementary Table 1. Prognostic accuracy of the one-legged balance test and recurrent (2+) falls: comparison of a sex only model (A); a balance and sex-adjusted model (B); a sex and past falls model (C) and a sex, balance and past falls model (D) using area under receiver operating characteristics curves (AUC)

Independent variable:	Sample	Model A: sex	Mode	el B: sex and	Test of	Model C: sex	Test of	Model D:	balance,	Test of	Test of
Temporal association	size	only <sup>a</sup>	k	balance	comp <sup>bc</sup>	and fall history	comp <sup>bd</sup>	sex and fa	ll history	comp <sup>be</sup>	comp <sup>bf</sup>
1. Balance with eyes open											
Age 53 → Falls age 60-64	2061	0.596 (0.557, 0.634)	0.642 (	(0.599, 0.685)	< 0.001	0.673 (0.632, 0.714)	< 0.001	0.692 (0.6	51 0.734)	< 0.005	0.04
Age 53 → Falls age 68	2123	0.548 (0.513, 0.583)	0.594 (	(0.553, 0.635)	< 0.005	0.597 (0.558, 0.635)	< 0.001	0.621 (0.5	81 0.662)	0.04	0.05
Age 60-64 → Falls age 68	1852	0.525 (0.486, 0.563)	0.597 (	(0.553, 0.640)	< 0.005	0.613 (0.568, 0.658)	< 0.001	0.651 (0.6	06 0.696)	0.01	0.09
Age 53 & 60-64 → Falls age 68	1748	0.536 (0.496, 0.576)	0.610 (	(0.565, 0.656)	< 0.005	0.634 (0.587, 0.681)	< 0.001	0.660 (0.6	13, 0.706)	0.01	0.11
2. Balance with eyes closed											
Age 53 → Falls age 60-64	2010	0.588 (0.548, 0.627)	0.598 (	(0.552, 0.643)	0.44	0.66 (0.617, 0.702)	< 0.001	0.669 (0.6	25 0.713)	< 0.001	0.27
Age 53 → Falls age 68	2067	0.547 (0.511, 0.582)	0.579 (	(0.538, 0.620)	0.02	0.593 (0.554, 0.632)	< 0.001	0.611 (0.5	7 0.652)	0.04	0.10
Age 60-64 → Falls age 68	1846	0.523 (0.485, 0.562)	0.561 (	(0.517, 0.606)	0.07	0.611 (0.566, 0.656)	< 0.001	0.648 (0.6	03 0.693)	< 0.001	0.07
Age 53 & 60-64 → Falls age 68	1696	0.533 (0.493, 0.574)	0.567 (	(0.520, 0.613)	0.10	0.624 (0.576, 0.672)	< 0.001	0.637 (0.5	88, 0.686)	< 0.005	0.42

<sup>a</sup> AUC fluctuates due to minor variations in sample size; sample size is identical for the three models in each row

<sup>b</sup> p < 0.05 signifies that the model with the higher AUC is a significantly better prognostic model. <sup>c</sup> tests equality of the AUC of the sex and balance model with the AUC of sex only model within the same sample.

<sup>d</sup> tests equality of the AUC of the sex and balance model with the AUC of sex only model within the same sample.

<sup>e</sup> tests the equality of AUC of sex, balance and past falls model with the AUC of the sex and balance model within the same sample.

<sup>f</sup> tests the equality of AUC of sex, balance and past falls model with the AUC of the <u>sex and fall history model</u> within the same sample.

Recall: An AUC greater than 0.9 is considered excellent, greater than 0.8 to 0.9 very good, 0.7 to 0.8 good, 0.6 to 0.7 average, <0.6 poor and ~0.5 indicating no discriminatory ability [25].

**Supplementary Table 2.** Prognostic accuracy of the one-legged balance test and  $\underline{any(1+)}$  falls: comparison of a sex only model (A); a balance and sex-adjusted model (B); a sex and past falls model (C) and a sex, balance and past falls model (D) using area under receiver operating characteristics curves (AUC)

Independent variable:	Sample	Model A: sex	Model	B: sex and	Test of	Model C: sex	Test of	Mode	el D: balance,	Test of	Test of
Temporal association	size	only <sup>a</sup>	ba	alance	comp <sup>bc</sup>	and fall history	comp <sup>bd</sup>	sex ar	nd fall history	comp be	comp <sup>bf</sup>
1. Balance with eyes open											
Age 53 → Falls age 60-64	2066	0.580 (0.553, 0.607)	0.600 (0	0.570, 0.630)	< 0.005	0.625 (0.595, 0.654)	< 0.0001	0.634	(0.603, 0.665)	< 0.005	0.05
Age 53 → Falls age 68	2130	0.565 (0.540, 0.590)	0.580 (0	0.552, 0.608)	0.02	0.603 (0.576, 0.630)	< 0.001	0.607	(0.579, 0.636)	< 0.005	0.33
Age 60-64 → Falls age 68	1855	0.555 (0.528, 0.582)	0.577 (0	0.546, 0.608)	< 0.01	0.608 (0.578, 0.638)	< 0.001	0.616	(0.585, 0.648)	< 0.001	0.22
Age 53 & 60-64 → Falls age 68	1751	0.560 (0.532, 0.588)	0.580 (0	0.548, 0.612)	0.01	0.630 (0.599, 0.662)	< 0.001	0.632	(0.599, 0.665)	< 0.001	0.78
2. Balance with eyes closed											
Age 53 → Falls age 60-64	2015	0.579 (0.552, 0.606)	0.587 (0	0.556, 0.618)	0.34	0.619 (0.589, 0.649)	< 0.0001	0.627	(0.595, 0.658)	< 0.001	0.23
Age 53 → Falls age 68	2074	0.566 (0.541, 0.592)	0.573 (0	0.544, 0.603)	0.37	0.604 (0.577, 0.631)	< 0.0001	0.604	(0.574, 0.634)	< 0.005	0.98
Age 60-64 → Falls age 68	1849	0.555 (0.528, 0.582)	0.577 (0	0.546, 0.608)	0.01	0.608 (0.577, 0.638)	< 0.001	0.620	(0.589, 0.652)	< 0.001	0.05
Age 53 & 60-64 → Falls age 68	1699	0.559 (0.531, 0.587)	0.582 (0	0.550, 0.614)	0.01	0.628 (0.596, 0.659)	< 0.001	0.637	(0.605, 0.669)	< 0.001	0.08

<sup>*a*</sup> AUC fluctuates due to minor variations in sample size; sample size is identical for the three models in each row. Sample size differs from Supplementary Table 1 as some individuals who fell in the last year had missing data on the number of falls.

<sup>b</sup> p < 0.05 signifies that the model with the higher AUC is a significantly better prognostic model.

<sup>c</sup> tests equality of the AUC of the sex and balance model with the AUC of sex only model within the same sample.

<sup>*d*</sup> tests equality of the AUC of the sex and balance model with the AUC of sex only model within the same sample.

<sup>e</sup> tests the equality of AUC of sex, balance and past falls model with the AUC of the <u>sex and balance model</u> within the same sample.

<sup>*f*</sup> tests the equality of AUC of sex, balance and past falls model with the AUC of the <u>sex and fall history model</u> within the same sample.

Recall: An AUC greater than 0.9 is considered excellent, greater than 0.8 to 0.9 very good, 0.7 to 0.8 good, 0.6 to 0.7 average, <0.6 poor and ~0.5 indicating no discriminatory ability [25].

**Supplementary Table 3.** Prognostic accuracy of <u>inability to complete balance test (yes/no indicator)</u> and risk of recurrent (2+) or any (1+) falls: comparison of a balance and sex-adjusted model to A) a sex only model; B) a sex and past falls model and C) a sex, balance and past falls model using area under receiver operating characteristics curves (AUC)

Independent variable:	Sample	Model A: sex	Mod	lel B: sex and	Test of	Model C: sex	Test of	Model D: balance,	<b>Fest of</b>	Test of
Temporal association	size	only <sup>a</sup>		balance	comp <sup>bc</sup>	and fall history	comp <sup>bd</sup>	sex and fall history c	omp be	comp <sup>bf</sup>
1. Inability to complete balance t	est $\rightarrow$ R	ecurrent (2+) falls								
Age 53 → Falls age 60-64	2024	0.591 (0.553, 0.629)	0.611	(0.572, 0.652)	0.03	0.679 (0.638, 0.720)	< 0.001	0.680 (0.639, 0.722) <	< 0.001	0.65
Age 53 $\rightarrow$ Falls age 68	2080	0.544 (0.508, 0.579)	0.553	(0.517, 0.588)	0.18	0.600 (0.561, 0.638)	< 0.001	0.599 (0.560, 0.639) <	< 0.005	0.39
Age 60-64 $\rightarrow$ Falls age 68	1904	0.523 (0.486, 0.560)	0.553	(0.513, 0.593)	< 0.01	0.629 (0.586, 0.672)	< 0.001	0.635 (0.591, 0.678) <	< 0.001	0.19
Age 53 & 60-64 → Falls age 68	1749	0.532 (0.493, 0.570)	0.565	(0.523, 0.606)	< 0.01	0.648 (0.603, 0.693)	< 0.001	0.649 (0.603, 0.695) <	< 0.001	0.76
Inability to complete balance test	→ Any	(1+) fall								
Age 53 $\rightarrow$ Falls age 60-64	2029	0.580 (0.553, 0.607)	0.586	(0.558, 0.613)	0.23	0.627 (0.597, 0.657)	< 0.0001	0.626 (0.596, 0.656) <	< 0.001	0.49
Age 53 $\rightarrow$ Falls age 68	2087	0.564 (0.539, 0.589)	0.565	(0.539, 0.590)	0.54	0.607 (0.579, 0.634)	< 0.0001	0.606 (0.578, 0.633) <	< 0.001	0.21
Age 60-64 $\rightarrow$ Falls age 68	1909	0.552 (0.525, 0.578)	0.571	(0.544, 0.598)	< 0.005	0.613 (0.583, 0.642)	< 0.001	0.620 (0.590, 0.649) <	< 0.001	0.08
Age 53 & 60-64 → Falls age 68	1754	0.556 (0.528, 0.583)	0.577	(0.548, 0.605)	< 0.005	0.638 (0.607, 0.669)	< 0.001	0.640 (0.609, 0.671)<	< 0.001	0.47

<sup>*a*</sup> AUC fluctuates due to minor variations in sample size; sample size is identical for the three models in each row. Sample size differs from Supplementary Table 1 as some individuals who fell in the last year had missing data on the number of falls.

<sup>b</sup> p < 0.05 signifies that the model with the higher AUC is a significantly better prognostic model.

<sup>c</sup> tests equality of the AUC of the sex and balance model with the AUC of sex only model within the same sample.

<sup>*d*</sup> tests equality of the AUC of the sex and balance model with the AUC of sex only model within the same sample.

<sup>e</sup> tests the equality of AUC of sex, balance and past falls model with the AUC of the <u>sex and balance model</u> within the same sample.

<sup>*f*</sup> tests the equality of AUC of sex, balance and past falls model with the AUC of the <u>sex and fall history model</u> within the same sample.

Recall: An AUC greater than 0.9 is considered excellent, greater than 0.8 to 0.9 very good, 0.7 to 0.8 good, 0.6 to 0.7 average, <0.6 poor and ~0.5 indicating no discriminatory ability [25].

	Optimal cut- point (sec; 95% CI) <sup>a</sup>	AUC	Sensitivity	Specificity
<b>CLOSEST TO (0,1) METHOD</b>				
1. Balance with eyes open				
Age 53 $\rightarrow$ Falls age 60-64	28 (23.6, 30)	0.42	0.61	0.24
Age 53 $\rightarrow$ Falls age 68	27 (24.9, 29.1)	0.42	0.61	0.23
Age 60-64 $\rightarrow$ Falls age 68	29 (18.0, 30)	0.42	0.37	0.46
2. Balance with eyes closed				
Age 53 $\rightarrow$ Falls age 60-64	4 (1.7, 6.3)	0.47	0.49	0.46
Age 53 $\rightarrow$ Falls age 68	5 (3.7,6.3)	0.47	0.38	0.56
Age 60-64 → Falls age 68	3 (2.1, 3.9)	0.45	0.40	0.49
3. Number of previous falls <sup>b</sup>				
Age 53 $\rightarrow$ Falls age 60-64	0 (n/a)	0.62	0.39	0.86

**Supplementary Table 4.** Identifying optimal cut-points of the one-legged balance test (and number of previous falls) in predicting recurrent (0-1 vs 2+) falls using the Closet to (0,1) and Youden methods

Age 53 $\rightarrow$ Falls age 68	0 (n/a)	0.57	0.29	0.85
Age 60-64 $\rightarrow$ Falls age 68	0 (n/a)	0.63	0.41	0.85
YOUDEN METHOD				
1. Balance with eyes open				
Age 53 $\rightarrow$ Falls age 60-64	1 (0, 3.6)	0.5	1	0.01
Age 53 $\rightarrow$ Falls age 68	0 (0, 21.6)	0.50	1	0
Age 60-64 $\rightarrow$ Falls age 68	30	0.50	0	1
2. Balance with eyes closed				
Age 53 $\rightarrow$ Falls age 60-64	0 (0, 8.5)	0.5	1	0
Age 53 $\rightarrow$ Falls age 68	0 (0, 8.6)	0.5	1	0
Age 60-64 $\rightarrow$ Falls age 68	30 (5.0, 30)	0.5	0	1
3. Number of previous falls <sup>b</sup>				
Age 53 $\rightarrow$ Falls age 60-64	0 (n/a)	0.62	0.39	0.86
Age 53 $\rightarrow$ Falls age 68	0 (n/a)	0.57	0.29	0.85
Age 60-64 $\rightarrow$ Falls age 68	0 (n/a)	0.63	0.41	0.85

AUC= area under receiver operating characteristic curve <sup>a</sup>Lower limit of 95% CI was capped at 0, upper limit was capped at 30s due to the minimum and maximum scores of the test; however some estimations were below or above these times. <sup>b</sup>Fall history at age 53 was only available as a categorical variable (0,1-2,3-11,12+), but considered continuously at age 60-64

	Optimal cut- point (sec; 95% CI) <sup>a</sup>	AUC	Sensitivity	Specificity
LIU METHOD				
1. Balance with eyes open				
Age 53 $\rightarrow$ Falls age 60-64	28 (26.6, 29.4)	0.46	0.68	0.23
Age 53 $\rightarrow$ Falls age 68	29 (27.8, 30)	0.47	0.69	0.25
Age 60-64 $\rightarrow$ Falls age 68	29 (24.2, 30)	0.45	0.45	0.46
2. Balance with eyes closed				
Age 53 $\rightarrow$ Falls age 60-64	4 (2.5, 5.5)	0.47	0.49	0.45
Age 53 $\rightarrow$ Falls age 68	5 (4.5, 5.5)	0.50	0.43	0.57
Age 60-64 $\rightarrow$ Falls age 68	3 (2.4, 3.6)	0.46	0.43	0.48
3. Number of previous falls <sup>b</sup>				
Age 53 $\rightarrow$ Falls age 60-64	0	0.58	0.29	0.87
Age 53 $\rightarrow$ Falls age 68	0	0.56	0.26	0.86
Age 60-64 $\rightarrow$ Falls age 68	0	0.59	0.32	0.86
<b>CLOSEST TO (0,1) METHOD</b>				
1. Balance with eyes open				
Age 53 $\rightarrow$ Falls age 60-64	28 (25.8, 30)	0.50	0.68	0.23
Age 53 $\rightarrow$ Falls age 68	29 (27.5, 30)	0.47	0.69	0.25
Age 60-64 $\rightarrow$ Falls age 68	29 (23.6, 30)	0.45	0.45	0.46
2. Balance with eyes closed				
Age 53 $\rightarrow$ Falls age 60-64	4 (2.5, 5.5)	0.47	0.49	0.45
Age 53 $\rightarrow$ Falls age 68	5 (4.7, 5.3)	0.50	0.43	0.57
Age 60-64 $\rightarrow$ Falls age 68	3 (2.3, 3.7)	0.46	0.43	0.48
<b>3.</b> Number of previous falls <sup>1</sup>				
Age 53 $\rightarrow$ Falls age 60-64	0	0.58	0.29	0.87
Age 53 $\rightarrow$ Falls age 68	0	0.56	0.26	0.86
Age 60-64 $\rightarrow$ Falls age 68	0	0.59	0.32	0.86
YOUDEN METHOD	1			
1. Balance with eyes open				
Age 53 $\rightarrow$ Falls age 60-64	1 (0, 6.6)	0.50	1	0.01
Age 53 $\rightarrow$ Falls age 68	1 (0, 20.00)	0.50	0.99	0.01
Age 60-64 $\rightarrow$ Falls age 68	30	0.50	0.00	1
2. Balance with eyes closed				
Age 53 $\rightarrow$ Falls age 60-64	1 (0, 8.2)	0.50	0.97	0.04
Age 53 $\rightarrow$ Falls age 68	0 (0, 11.1)	0.50	1	0.00
Age 60-64 $\rightarrow$ Falls age 68	30 (6.3, 30)	0.50	0.00	1
3. Number of previous falls <sup>D</sup>	_			
Age 53 $\rightarrow$ Falls age 60-64	0	0.58	0.29	0.87
Age 53 $\rightarrow$ Falls age 68	0	0.56	0.26	0.86
Age 60-64 $\rightarrow$ Falls age 68	0	0.59	0.32	0.86

**Supplementary Table 5.** Identifying optimal cut-points of the one-legged balance test (and number of previous falls) in predicting **any** (1+) falls using the Liu, Youden and Closet to (0,1) methods

AUC= area under receiver operating characteristic curve

<sup>a</sup>Lower limit of 95% CI was capped at 0, upper limit was capped at 30s due to the minimum and maximum scores of the test; however some estimations were below or above these times. <sup>b</sup>Fall history at age 53 was only available as a categorical variable (0,1-2,3-11,12+), but considered continuously at age 60-64