

SUPPLEMENTARY DATA

**Supplementary Table 1.** Deficits included in the frailty index and their coding, and counts and percentages of individual deficits with scores of 1 in diabetic and non-diabetic groups

Deficit variables	Coding	Participants with diabetes (n = 3149)	
		Yes (n =138)*	No (n =3011)*
Osteoarthritis	No=0, Yes=1	35 (25.9)	592 (19.9)
Rheumatoid arthritis	No=0, Yes=1	3 (2.2)	63 (2.1)
Thyroid disease	No=0, Yes=1	8 (5.8)	110 (3.7)
Breast cancer	No=0, Yes=1	3 (2.2)	58 (1.9)
Uterine cancer/prostate cancer	No=0, Yes=1	2 (1.5)	21 (1.0)
Inflammatory bowel disease	No=0, Yes=1	5 (3.6)	98 (3.3)
Hypertension	No=0, Yes=1	50 (36.2) <sup>#</sup>	540 (18.0) <sup>#</sup>
Heart attack	No=0, Yes=1	18 (13.0) <sup>#</sup>	131 (4.4) <sup>#</sup>
Stroke	No=0, Yes=1	8 (5.8)	88 (2.9)
Neuromuscular disease	No=0, Yes=1	3 (2.2)	39 (1.3)
Kidney disease	No=0, Yes=1	3 (2.2)	28 (0.9)
Phlebitis/thrombophlebitis	No=0, Yes=1	17 (12.3) <sup>#</sup>	94 (3.1) <sup>#</sup>
Vision	Six levels (0, 0.2, 0.4, 0.6, 0.8, 1); descriptive range: able to see well enough to read ordinary newsprint and recognize a friend on the other side of the street, without glasses or contact lenses=0 to unable to see at all=1	18 (13.0) <sup>#</sup>	186 (6.2) <sup>#</sup>
Hearing	Six levels (0, 0.2, 0.4, 0.6, 0.8, 1); descriptive range: able to hear what is said in a group conversation with at least three other people, without a hearing aid=0 to unable to hear at all=1	19 (13.8)	318 (10.6)
Walking	Six levels (0, 0.2, 0.4, 0.6, 0.8, 1); descriptive range: able to walk around the neighborhood without difficulty, and without walking equipment=0 to cannot walk at all=1	26 (18.8)	468 (15.7)
Dexterity	Six levels (0, 0.2, 0.4, 0.6, 0.8, 1); descriptive range: full use of two hands and ten fingers=0 to limitations in use of hands or fingers to requires the help of another person for all tasks, not independent even with use of special tools=1	7 (5.1)	126 (4.2)
Cognition	Six levels (0, 0.2, 0.4, 0.6, 0.8, 1); descriptive range: able to remember most things, think clearly and solve day to day problems=0 to unable to remember anything at all and unable to think or solve day to day problems=1	30 (21.7) <sup>#</sup>	418 (13.9) <sup>#</sup>
Pain	Five levels (0, 0.25, 0.5, 0.75, 1); descriptive range: free of pain and	7 (5.1) <sup>#</sup>	41 (1.4) <sup>#</sup>

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	discomfort=0 to severe pain that prevents most activities=1		
General health	Excellent=0; Very Good=0.25; Good=0.5; Fair=0.75; Poor=1	2 (1.5)	19 (0.6)
Change in general health (past 1 year)	Same/somewhat better/better=0; Somewhat worse/worse=1	16 (11.6)	355 (11.8)
Reduced daily work/other activities (last 4 weeks)	No=0, Yes=1	29 (21.0)	453 (15.1)
Interference with social activities due to physical/emotional health (last 4 weeks)	Not at all/slightly=0; Moderately=0.5; Quite a bit/extremely=1	8 (5.8)	106 (3.5)
Limitation in moderate activities (e.g., moving table, vacuuming, golf, bowling)	Not limited=0; Limited a little=0.5; Limited a lot=1	18 (13.0) <sup>#</sup>	225 (7.5) <sup>#</sup>
Limitation in lifting/carrying groceries	Not limited=0; Limited a little=0.5; Limited a lot=1	15 (10.9) <sup>#</sup>	158 (5.3) <sup>#</sup>
Limitation in climbing a flight of stairs	Not limited=0; Limited a little=0.5; Limited a lot=1	11 (8.0) <sup>#</sup>	116 (3.9) <sup>#</sup>
Limitation in bending, kneeling, and stooping	Not limited=0; Limited a little=0.5; Limited a lot=1	30 (21.7) <sup>#</sup>	302 (10.0) <sup>#</sup>
Limitation in bathing/dressing	Not limited=0; Limited a little=0.5; Limited a lot=1	5 (3.6) <sup>#</sup>	40 (1.3) <sup>#</sup>
Energy	Have a lot energy all/most/a good bit=0; Some of the time=0.5; Have a lot energy a little/none of the time=1	45 (33.0)	794 (26.5)
Feel tired	Feel tired a little/none of the time=0; Some of the time=0.5; Feel tired all/most/a good bit=1	31 (22.6)	475 (15.8)

\*Results expressed as the counts (and percentages) for participants who had a score of 1 in individual deficits

<sup>#</sup> Statistically significant differences reported based on crude comparisons between diabetic and non-diabetic groups

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**Supplementary Table 2.** Results from subgroup and sensitivity analyses\*

	All fragility fracture (n= 611)	
	HR (95% CI)	P-value
<b>Subgroup analysis by sex<sup>1</sup></b>		
<i>Male sex</i>		
Frailty index (per-0.01 increase)	1.01 (1.00 – 1.03)	0.21
Frailty index (per-0.10 increase)	1.14 (0.93 – 1.40)	
T2DM	0.39 (0.06 – 2.32)	0.35
Interaction term (per-0.01 increase)	1.05 (0.97 – 1.15)	0.092
Interaction term (per-0.10 increase)	1.67 (0.92 – 2.99)	
<i>Female sex</i>		
Frailty index (per-0.01 increase)	1.02 (1.01 – 1.03)	< 0.001
Frailty index (per-0.10 increase)	1.21 (1.10 – 1.34)	
T2DM	0.83 (0.29 – 2.32)	0.79
Interaction term (per-0.01 increase)	1.01 (1.00 – 1.02)	0.025
Interaction term (per-0.10 increase)	1.11 (1.01- 1.21)	
<b>Sensitivity analysis of competing risk analysis<sup>2</sup></b>		
Frailty index (per-0.01 increase)	1.02 (1.01 – 1.03)	< 0.001
Frailty index (per-0.10 increase)	1.18 (1.08 – 1.29)	
T2DM	0.91 (0.35 – 2.32)	0.92
Interaction term (per-0.01 increase)	1.01 (1.00 – 1.02)	0.029
Interaction term (per-0.10 increase)	1.12 (1.01 – 1.24)	

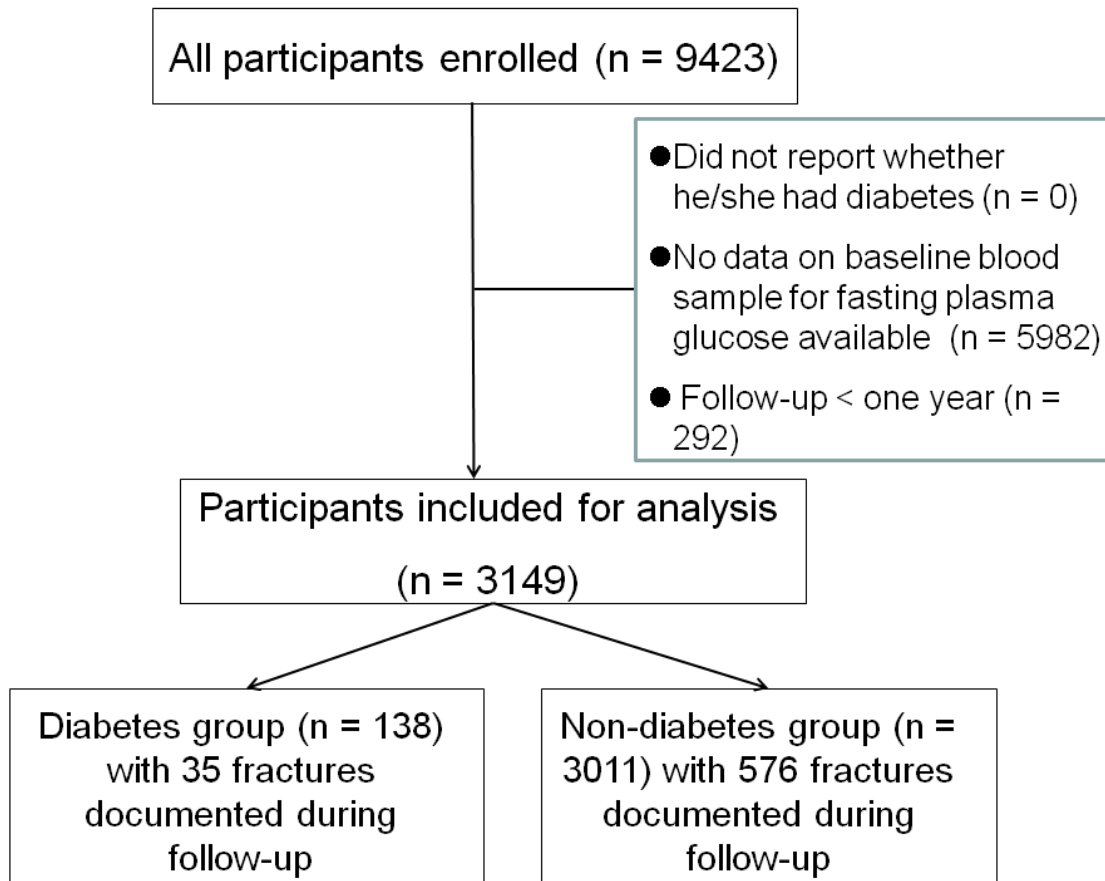
\* No multiple imputations were conducted because missing data were less than 10%

<sup>1</sup> Models were adjusted for age, study center, diagnosis of diabetes, fasting insulin level, BMI, family history of fractures, previous falls, use of osteoporosis medication, use of pioglitazone or rosiglitazone, smoking, alcohol intake, and BMD femoral neck T-scores; there were 134 fragility fractures in males and 477 in females respectively.

<sup>2</sup> Models were adjusted for age, sex, study center, diagnosis of diabetes, fasting insulin level, BMI, family history of fractures, previous falls, use of osteoporosis medication, use of pioglitazone or rosiglitazone, smoking, alcohol intake, and BMD femoral neck T-scores

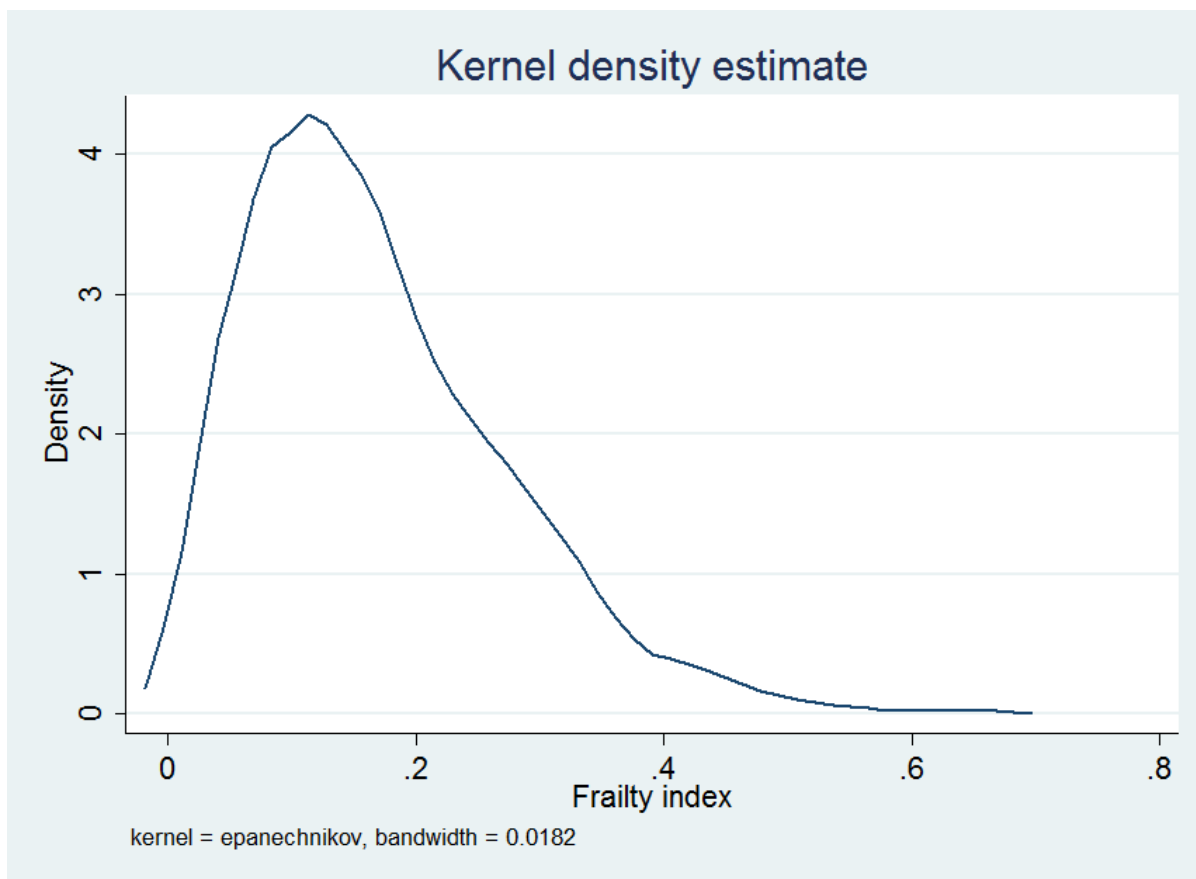
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**Supplementary Figure 1.** Flow diagram showing the selection process of study participants



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**Supplementary Figure 2.** Density distribution of the frailty index



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**Supplementary Figure 3.** Comparisons between robust and frail groups in diabetic and non-diabetic individuals regarding the cumulative fracture risk

