

## Supplemental Online Content

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This supplemental material has been provided by the authors to give readers additional information about their work.

eTable 1: General characteristics of participants stratified by sex: Overall, and by quintiles of HDL-C

	Overall	Q1	Q2-4	Q5	<i>P</i> Value
<b>Males</b>					
N	7319	1976	4188	1155	
Participants with at least 1 fracture, n (%)	450 (6)	107 (5)	247 (6)	96 (8)	<.001
Types of fracture, n (%)					.012
Minimal trauma fracture, n (%)	192 (3)	43 (2)	111 (3)	38 (3)	
Other trauma fracture, n (%)	258 (4)	64 (3)	136 (3)	58 (5)	
Age in years	75 (4)	75 (4)	75 (4)	76 (5)	<.001
Low activity, n (%)	389 (5)	141 (7)	207 (5)	41 (3)	<.001
BMI (kg/m <sup>2</sup> ), mean (SD)	28 (4)	29 (4)	28 (4)	26 (34)	<.001
Waist Circumference (cm), mean (SD)	102 (11)	105 (10)	102 (10)	98 (10)	<.001
Current/former smoking, n (%)	4164 (57)	1081 (55)	2371 (57)	712 (62)	<.001
Current alcohol use, n (%)	6254 (85)	1542 (78)	3643 (87)	1060 (92)	<.001
Education, n (%)					<.001
<12 years of schooling	4236 (58)	1239 (63)	2364 (57)	633 (55)	
≥12 years of schooling	3083 (42)	737 (37)	1824 (44)	522 (45)	
Hypertension, n (%)	5557 (76)	1560 (79)	3118 (75)	879 (76)	.001
Chronic kidney disease (eGFR <60ml/min), n (%)	1196 (17)	452 (24)	614 (15)	130 (12)	<.001
Diabetes, n (%)	869 (12)	389 (20)	402 (10)	78 (7)	<.001
Prefrail/Frail, n (%)	2708 (37)	783 (40)	1526 (36)	399 (35)	.009
On trial medication, n (%)	3656 (50)	982 (50)	2066 (49)	608 (53)	.13
Osteoporotic medication, n (%)	143 (2)	35 (2)	72 (2)	36 (3)	.008
Total Cholesterol (mg/dL), mean (SD)	195 (36)	182 (36)	197 (34)	208 (34)	<.001
HDL-C (mg/dL), mean (SD)	54 (15)	38 (5)	55 (6)	80 (10)	
Non-HDL-C (mg/dL), mean (SD)	141 (35)	144 (36)	142 (34)	128 (34)	<.001
Lipid lowering medications, n (%)	2124 (31)	642 (34)	1147 (29)	335 (31)	.002
<b>Females</b>					
N	8945	2548	4892	1505	
Participants with at least 1 fracture, n (%)	1209 (14)	305 (12)	660 (14)	244 (16)	.001
Types of fracture, n (%)					.004
Minimal trauma fracture, n (%)	519 (6)	124 (5)	290 (6)	105 (7)	
Other trauma fracture, n (%)	690 (8)	181 (7)	370 (8)	139 (9)	

	Overall	Q1	Q2-4	Q5	<i>P</i> Value
Age in years	75 (4)	75 (4)	75 (4)	76 (5)	.10
Low activity, n (%)	655 (7)	241 (10)	337 (7)	77 (5)	<.001
BMI (kg/m <sup>2</sup> ), mean (SD)	28 (5)	30 (5)	28 (5)	26 (5)	<.001
Waist Circumference (cm), mean (SD)	93 (13)	98 (13)	92 (12)	87 (12)	<.001
Current/former smoking, n (%)	3044 (34)	843 (33)	1612 (33)	589 (39)	<.001
Current alcohol use, n (%)	6590 (74)	1668 (66)	3674 (75)	1248 (83)	<.001
Education, n (%)					<.001
<12 years of schooling	5719 (64)	1721 (68)	3115 (64)	883 (59)	
≥12 years of schooling	3225 (36)	827 (33)	1777 (36)	621 (41)	
Hypertension, n (%)	6639 (74)	2042 (80)	3556 (73)	1041 (69)	<.001
Chronic kidney disease (eGFR <60ml/min), n (%)	1677 (19)	577 (23)	873 (18)	227 (15)	<.001
Diabetes, n (%)	719 (8)	373 (15)	288 (6)	58 (4)	<.001
Prefrail/Frail, n (%)	3521 (39)	1053 (41)	1873 (38)	595 (40)	.04
On trial medication, n (%)	4453 (50)	1266 (50)	2428 (50)	759 (50)	0.86
Osteoporosis medication, n (%)	953 (11)	210 (8)	534 (11)	209 (14)	<.001
Total Cholesterol (mg/dL), mean (SD)	211 (38)	199 (40)	213 (36)	227 (34)	<.001
HDL-C (mg/dL), mean (SD)	67 (18)	48 (6)	68 (7)	96 (13)	
Non-HDL-C (mg/dL), mean (SD)	144 (37.5)	151 (40)	145 (37)	131 (34)	<.001
Lipid lowering medications, n (%)	3244 (37)	1087 (44)	1697 (36)	460 (32)	<.001

Abbreviation: HDL-C, high density lipoprotein cholesterol; BMI, body mass index; GFR, glomerular filtration rate; SD, standard deviation

To convert cholesterol to mmol/L, multiply values by 0.0259.

eTable 2: Association between baseline non-HDL-C (mg/dL) and at least one fracture occurring after recruitment (HR, 95% CI)

	Non-HDL (mg/dL) continuous	Non-HDL-C quantiles		
		Q1 (reference)	Q2-Q4	Q5
All participants				
IR per 1000 PY (95% CI)	26 (24, 27)	28 (25, 31)	26 (24, 28)	23 (20, 26)
Model 1 <sup>a</sup>	0.92 (0.88, 0.97)	1	0.96, 0.85, 1.08)	0.85 (0.73, 0.99)
Model 2 <sup>b</sup>	0.92 (0.88, 0.97)	1	0.95 (0.85, 1.06)	0.85 (0.72, 0.99)
Model 3 <sup>c</sup>	0.92 (0.88, 0.97)	1	0.96 (0.85, 1.08)	0.85 (0.73, 0.99)
Model 4 <sup>d</sup>	0.92 (0.87, 0.97)	1	0.95 (0.83, 1.08)	0.85 (0.71, 1.00)
Analyses stratified by sex <sup>e</sup>				
Males				
IR per 1000 PY (95% CI)	15 (14, 17)	17 (14, 21)	16 (14, 18)	13 (10, 16)
Model 1	0.92 (0.83, 1.02)	1	0.89 (0.71, 1.12)	0.72 (0.53, 0.97)
Model 2	0.92 (0.83, 1.01)	1	0.89 (0.71, 1.12)	0.72 (0.53, 0.97)
Model 3	0.92 (0.84, 1.02)	1	0.89 (0.71, 1.12)	0.72 (0.53, 0.97)
Model 4	0.91 (0.82, 1.02)	1	0.87 (0.67, 1.11)	0.71 (0.51, 0.98)
Females				
IR per 1000 PY (95% CI)	34 (32, 36)	35 (31, 40)	35 (32, 37)	32 (28, 36)
Model 1	0.93 (0.88, 0.98)	1	0.98 (0.86, 1.13)	0.90 (0.75, 1.08)
Model 2	0.92 (0.87, 0.98)	1	0.98 (0.85, 1.12)	0.90 (0.75, 1.07)
Model 3	0.93 (0.87, 0.98)	1	0.98 (0.85, 1.13)	0.90 (0.75, 1.08)
Model 4	0.92 (0.86, 0.98)	1	0.98 (0.84, 1.15)	0.91 (0.74, 1.11)

Abbreviation: IR, Incidence Rate; PY, Person Year; BMI, body mass index;

<sup>a</sup> Model 1: adjusted for age, sex;

<sup>b</sup> Model 2: adjusted for age, sex, physical activity, alcohol use;

<sup>c</sup> Model 3: adjusted for age, sex, physical activity, alcohol use, prefrailty/frailty status; Model

<sup>d</sup> 4: adjusted for age, sex, physical activity, alcohol use, prefrailty, frailty status, education, BMI, smoking status, Aspirin, diabetes, chronic kidney disease, lipid lowering medication, OP medications;

<sup>e</sup> not adjusted for sex

eTable 3: Association between baseline HDL-C (mg/dL) and at least one fracture occurring after recruitment (HR, 95% CI)

	HDL (mg/dL) continuous	HDL quantiles		
		Q1 (reference)	Q2-Q4	Q5
Minimal traumatic fractures (N=14764)				
All	1.10 (1.02, 1.20)	1	1.22 (1.02, 1.48)	1.42 (1.11, 1.81)
Males <sup>a</sup>	1.11 (0.94, 1.33)	1	1.15 (0.80, 1.66)	1.31 (0.82, 2.09)
Females <sup>a</sup>	1.10 (1.00, 1.20)	1	1.24 (1.01, 1.55)	1.44 (1.09, 1.91)
Participants not on osteoporotic medications <sup>b</sup> (N=15168)				
All	1.15 (1.09, 1.22)	1	1.06 (0.93, 1.21)	1.32 (1.12, 1.58)
Males <sup>a</sup>	1.22 (1.08, 1.38)	1	1.04 (0.82, 1.32)	<b>1.41 (1.04, 1.91)</b>
Females <sup>a</sup>	1.13 (1.06, 1.21)	1	1.07 (0.92, 1.25)	1.30 (1.07, 1.58)
Who never-smoked and reported that they did not drink alcohol <sup>c</sup> (N=2445)				
All	1.22 (1.07, 1.40)	1	1.10 (0.83, 1.45)	1.59 (1.07, 2.35)
Males <sup>a</sup>	1.15 (0.75, 1.74)	1	0.60 (0.29, 1.21)	1.76 (0.72, 4.35)
Females <sup>a</sup>	1.24 (1.08, 1.43)	1	1.26 (0.92, 1.72)	1.60 (1.03, 2.49)
Who walked outside less than 30 minutes and reported no participation in moderate/vigorous physical activity <sup>d</sup> (N=5931)				
All	1.18 (1.09, 1.28)	1	1.09 (0.90, 1.31)	1.42 (1.11, 1.80)
Males <sup>a</sup>	1.13 (0.93, 1.39)	1	0.96 (0.65, 1.42)	1.31 (0.79, 2.18)
Females <sup>a</sup>	1.18 (1.08, 1.29)	1	1.12 (0.90, 1.34)	1.45 (1.10, 1.90)

Adjusted for age, sex, physical activity, alcohol use, prefrailty, frailty status, education, body mass index, smoking status, Aspirin, diabetes, chronic kidney disease, lipid lowering medication, osteoporosis medications;

<sup>a</sup> not adjusted for sex;

<sup>b</sup> not adjusted for osteoporosis medications;

<sup>c</sup> not adjusted for smoking and alcohol use status;

<sup>d</sup> not adjusted for physical activity

eTable 4: Association between baseline HDL-C (mg/dL) and at least one fracture occurring after recruitment based on statin use status (HR, 95% CI)

	HDL (mg/dL) continuous	HDL quantiles		
		Q1 (reference)	Q2-Q4	Q5
Participants not on statins (n=10,170)				
All	1.13 (1.06, 1.21)	1	1.05 (0.90, 1.22)	1.36 (1.11, 1.61)
Males <sup>a</sup>	1.22 (1.07, 1.39)	1	0.99 (0.74, 1.30)	1.49 (1.05, 2.10)
Females <sup>a</sup>	0.97 (0.81, 1.61)	1	1.07 (0.99, 1.29)	1.27 (1.02, 1.60)
Participants on statins (n=5368)				
All	1.16 (1.06, 1.27)	1	1.17 (0.95, 1.43)	1.27 (1.00, 1.67)
Males <sup>a</sup>	1.19 (0.98, 1.47)	1	1.27 (0.89, 1.95)	1.21 (0.70, 2.23)
Females <sup>a</sup>	1.15 (1.04, 1.27)	1	1.14 (0.90, 1.43)	1.29 (0.98, 1.77)

Adjusted for age, sex, physical activity, alcohol use, prefrailty, frailty status, education, body mass index, smoking status, Aspirin, diabetes, chronic kidney disease, osteoporosis medications;

<sup>a</sup> not adjusted for sex;