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Text S1. Details of covariates

In the present study, ethnicity was categorized as white, south Asian, east Asian, black, mixed/other, and missing. Education was categorized as college or university degree, General Certificate of Education Advanced Level/Advanced Subsidiary level or equivalent, Singapore-Cambridge General Certificate of Education Ordinary Level/General Certificate of Secondary Education or equivalent, Certificate of Secondary Education or equivalent, National Vocational Qualifications or Higher National Certificates or Higher National Diplomas or equivalent, other professional qualifications (e.g., nursing, teaching), none of the above, and missing. Employment status was categorized as working (including in paid employment and self-employed), retired, other, and missing. Townsend deprivation index was derived from participants' postcodes as an area-specific measure of socio-economic deprivation based on preceding national census data (percentage unemployment, percentage car ownership, percentage home ownership, and household overcrowding) (Townsend P et al. London: Croom Helm Ltd. 1988). Smoking status was categorized as non-smoker, ex-smoker, current smoker, and missing. Alcohol consumption, based on self-reported frequency of alcohol intake, was categorized as never, weekly (including daily and one to four times per week), monthly (including one to three times per month and occasionally), and missing. The metabolic equivalent task (MET) score of the International Physical Activity Questionnaire (IPAQ) guidelines was used to calculate the sum of light, moderate, and vigorous activities per week to estimate the MET-minutes/week, which was used as a classification criterion for physical activity, which we categorized as low (MET-minutes/week<600), moderate (MET-minutes/week \geq 600 and MET-minutes/week<3000), high (MET-minutes/week \geq 3000), and missing. Body mass index (BMI) was calculated by height and weight, which were measured by trained staff. BMI was categorized as underweight (<18.5 kg/m²), normal weight (18.5 \leq BMI<25 kg/m²), overweight (25 \leq BMI<30 kg/m²), obesity (\geq 30 kg/m²), and missing.

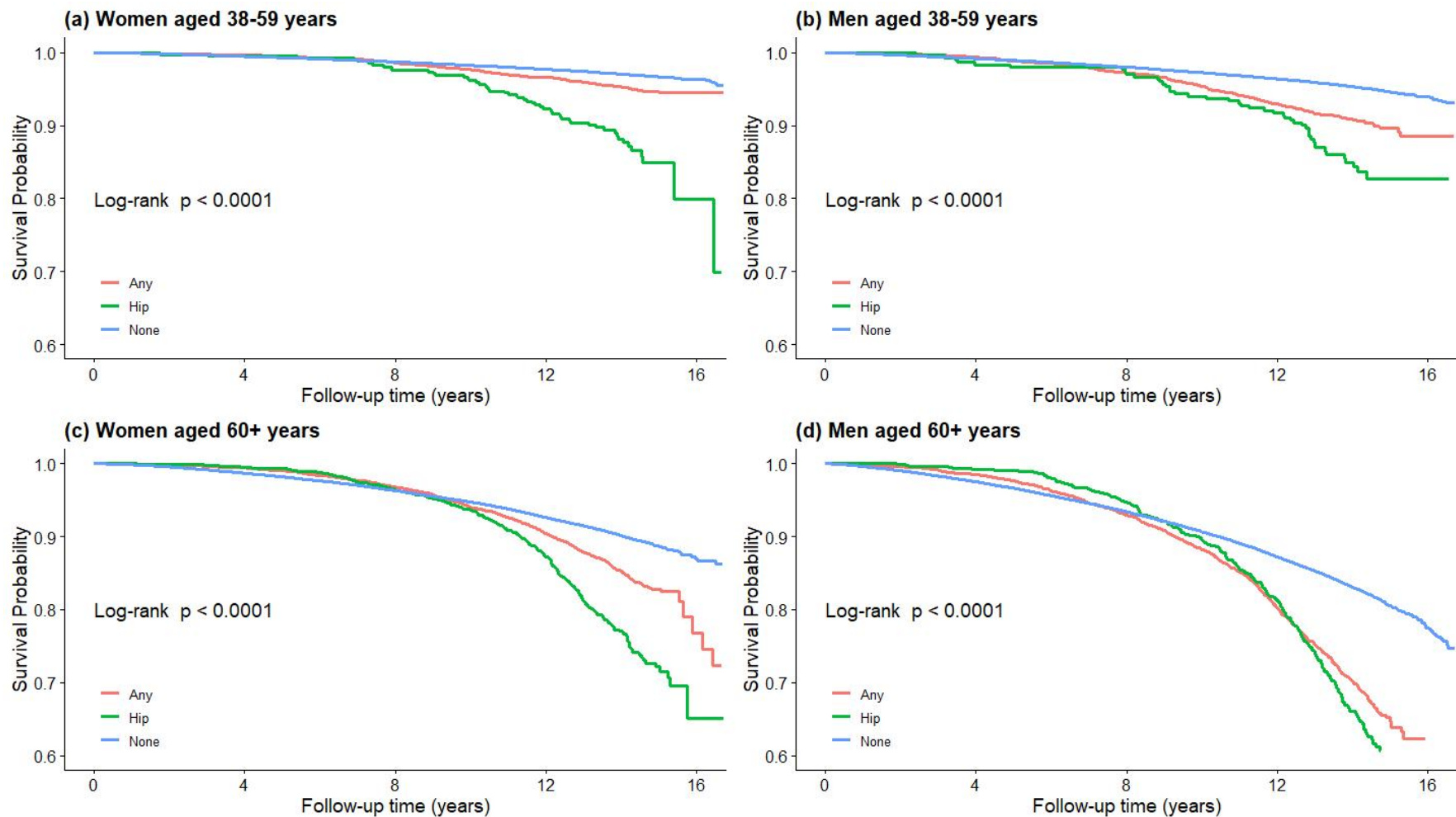


Fig S1. Kaplan-Meier curves for survival probability after different types of fracture according to age and sex group

Table S1. Sensitivity analyses for the association between any and hip fracture and mortality by replacing seed number with 2022688^a

Time interval after the index date	Adjusted HR (95% CI)	
	Any fracture	Hip fracture
0-30 d	19.58 (14.68-26.10)	23.54 (12.11-45.77)
31 d-90 d	15.38 (11.88-19.91)	16.46 (10.48-25.88)
91 d-1 y	4.49 (3.93-5.12)	5.39 (4.12-7.06)
(1-2] y	2.88 (2.52-3.29)	3.98 (3.08-5.13)
(2-3] y	2.54 (2.18-2.95)	3.55 (2.65-4.74)
(3-4] y	2.05 (1.74-2.42)	3.15 (2.28-4.35)
(4-5] y	2.11 (1.77-2.51)	3.25 (2.30-4.60)
(5-6] y	1.74 (1.43-2.12)	2.72 (1.79-4.12)
(6-7] y	1.72 (1.39-2.13)	2.05 (1.27-3.30)
(7-8] y	2.02 (1.60-2.56)	1.54 (0.86-2.77)
(8-9] y	1.92 (1.50-2.47)	2.57 (1.39-4.75)
(9-10] y	1.54 (1.16-2.06)	1.90 (1.03-3.50)

HR, hazard ratio; CI, confidence interval.

^a In the primary analyses, seed number used is 20005114.

Multivariable models were adjusted for age, sex, ethnicity, education, employment status, Townsend deprivation index, smoking status, alcohol consumption, physical activity and body mass index.

Table S2. Sensitivity analyses for the association between any and hip fracture and mortality by replacing matched controls with 15^a

Time interval after the index date	Adjusted HR (95% CI)	
	Any fracture	Hip fracture
0-30 d	23.58 (18.98-29.30)	20.86 (13.96-31.18)
31 d-90 d	14.57 (12.14-17.48)	13.25 (10.02-17.52)
91 d-1 y	4.74 (4.25-5.28)	5.04 (4.10-6.19)
(1-2] y	3.27 (2.91-3.67)	3.88 (3.15-4.76)
(2-3] y	2.48 (2.18-2.82)	3.28 (2.59-4.16)
(3-4] y	2.29 (1.98-2.65)	3.23 (2.46-4.23)
(4-5] y	2.39 (2.05-2.79)	3.82 (2.85-5.13)
(5-6] y	1.95 (1.63-2.32)	3.16 (2.20-4.54)
(6-7] y	1.90 (1.57-2.30)	2.53 (1.65-3.88)
(7-8] y	1.69 (1.37-2.07)	1.67 (0.98-2.84)
(8-9] y	1.88 (1.51-2.34)	2.34 (1.38-3.95)
(9-10] y	1.65 (1.28-2.14)	2.38 (1.38-4.10)

HR, hazard ratio; CI, confidence interval.

^a In the primary analyses, for each exposed individual, up to 4 matched controls were selected from the risk set.

Multivariable models were adjusted for age, sex, ethnicity, education, employment status, Townsend deprivation index, smoking status, alcohol consumption, physical activity and body mass index.

Table S3. Adjusted hazard ratios (95% CIs) for mortality by subgroups after any fracture

Subgroup	Time intervals after the index date				<i>P</i> interaction
	(0-1] y	(1-3] y	(3-6] y	(6-10] y	
Age at index date, year					0.7288
< 60	9.42 (6.41-13.84)	2.84 (1.99-4.05)	1.78 (1.29-2.44)	1.85 (1.35-2.54)	
≥ 60	8.05 (7.22-8.98)	2.88 (2.59-3.20)	2.32 (2.08-2.59)	1.74 (1.53-1.98)	
Sex					0.1684
Male	7.79 (6.80-8.91)	2.86 (2.49-3.28)	2.29 (1.98-2.65)	1.76 (1.49-2.09)	
Female	7.78 (6.59-9.20)	2.75 (2.37-3.19)	2.19 (1.88-2.54)	1.75 (1.48-2.08)	
Body mass index, kg/m²					0.1934
< 25	8.64 (7.08-10.55)	3.49 (2.91-4.17)	2.50 (2.07-3.02)	1.91 (1.53-2.40)	
≥ 25	7.87 (6.95-8.91)	2.62 (2.32-2.96)	2.21 (1.95-2.51)	1.72 (1.49-1.99)	
Frailty index					< 0.0001
< 0.25	8.05 (7.19-9.03)	2.94 (2.64-3.28)	2.29 (2.05-2.57)	1.74 (1.52-1.98)	
≥ 0.25	7.94 (6.07-10.39)	2.57 (2.00-3.29)	2.23 (1.72-2.90)	2.02 (1.50-2.72)	
Prevalent hypertension					0.0022
No	8.38 (7.31-9.61)	2.89 (2.54-3.30)	2.21 (1.93-2.53)	1.77 (1.50-2.08)	
Yes	7.52 (6.38-8.86)	2.78 (2.38-3.26)	2.31 (1.96-2.71)	1.76 (1.47-2.11)	
Prevalent diabetes					< 0.0001
No	8.20 (7.33-9.17)	2.80 (2.52-3.12)	2.22 (1.98-2.48)	1.77 (1.56-2.02)	
Yes	6.51 (4.80-8.82)	3.05 (2.29-4.08)	2.38 (1.78-3.19)	1.62 (1.15-2.27)	
Prevalent COPD					< 0.0001
No	7.95 (7.13-8.85)	2.85 (2.57-3.16)	2.24 (2.01-2.49)	1.75 (1.54-1.98)	
Yes	8.35 (5.24-13.31)	2.60 (1.72-3.92)	2.25 (1.45-3.50)	1.78 (0.98-3.24)	
Prevalent cancer					< 0.0001
No	7.86 (7.01-8.81)	2.87 (2.57-3.20)	2.19 (1.96-2.46)	1.80 (1.58-2.05)	
Yes	9.06 (6.93-11.85)	2.80 (2.16-3.63)	2.64 (2.04-3.43)	1.60 (1.17-2.18)	

CI, confidence interval; COPD, chronic obstructive pulmonary disease.

Multivariable models were adjusted for age, sex, ethnicity, education, employment status, Townsend deprivation index, smoking status, alcohol consumption, physical activity and body mass index where appropriate.

Table S4. Adjusted hazard ratios (95% CIs) for mortality by subgroups after hip fracture

Subgroup	Time intervals after the index date				<i>P</i> interaction
	(0-1] y	(1-3] y	(3-6] y	(6-10] y	
Age at index date, year					0.3981
< 60	13.80 (2.88-66.15)	5.31 (1.64-17.16)	2.75 (0.85-8.92)	6.45 (2.04-20.39)	
≥ 60	8.52 (6.92-10.48)	3.76 (3.10-4.57)	3.00 (2.43-3.69)	2.00 (1.48-2.70)	
Sex					0.0819
Male	8.88 (6.62-11.91)	3.28 (2.46-4.38)	2.18 (1.58-3.00)	2.00 (1.33-2.99)	
Female	8.01 (6.00-10.70)	4.18 (3.22-5.42)	3.87 (2.94-5.10)	2.50 (1.66-3.76)	
Body mass index, kg/m²					0.0746
< 25	8.14 (5.65-11.72)	4.94 (3.55-6.89)	4.04 (2.84-5.74)	2.48 (1.49-4.12)	
≥ 25	9.10 (7.09-11.68)	3.39 (2.66-4.32)	2.74 (2.11-3.56)	2.24 (1.57-3.19)	
Frailty index					0.0006
< 0.25	8.38 (6.71-10.46)	4.14 (3.35-5.12)	3.22 (2.58-4.03)	2.41 (1.76-3.30)	
≥ 0.25	11.04 (6.45-18.90)	2.97 (1.89-4.67)	2.79 (1.66-4.67)	1.78 (0.89-3.58)	
Prevalent hypertension					0.8581
No	8.74 (6.67-11.46)	4.53 (3.48-5.90)	3.70 (2.82-4.86)	2.19 (1.51-3.19)	
Yes	7.98 (5.81-10.96)	3.02 (2.28-4.00)	2.29 (1.67-3.15)	2.28 (1.46-3.57)	
Prevalent diabetes					0.2139
No	8.30 (6.68-10.33)	4.14 (3.36-5.09)	3.19 (2.56-3.98)	2.27 (1.67-3.09)	
Yes	8.26 (4.38-15.57)	1.77 (1.04-3.00)	1.74 (0.96-3.16)	1.62 (0.74-3.52)	
Prevalent COPD					0.0058
No	8.41 (6.80-10.40)	3.83 (3.14-4.66)	3.07 (2.49-3.79)	2.30 (1.71-3.10)	
Yes	7.41 (3.08-17.81)	2.49 (1.05-5.90)	2.21 (0.81-6.02)	1.30 (0.43-3.99)	
Prevalent cancer					0.0004
No	8.37 (6.71-10.44)	3.81 (3.10-4.69)	3.01 (2.41-3.77)	2.07 (1.52-2.81)	
Yes	9.40 (5.38-16.45)	3.68 (2.18-6.20)	3.30 (1.95-5.58)	4.19 (1.83-9.61)	

CI, confidence interval; COPD, chronic obstructive pulmonary disease.

Multivariable models were adjusted for age, sex, ethnicity, education, employment status, Townsend deprivation index, smoking status, alcohol consumption, physical activity and body mass index where appropriate.