

**Supplementary Table 1.** ICD-9-CM codes for identifying comorbidities

	<b>Diagnostic codes</b>
<b>Acute coronary syndrome</b>	410.x, 411.x, 414.x
<b>Ankylosing spondylitis</b>	720.0x
<b>Atrial fibrillation</b>	427.x
<b>Cerebrovascular disease</b>	430.x ~ 438.0x
<b>Chronic liver disease</b>	570.x ~ 573.x
<b>Chronic obstructive pulmonary disease</b>	491.x
<b>Gout</b>	274.x
<b>Heart failure</b>	428.x
<b>Hyperlipidemia</b>	272.x
<b>Hypertension</b>	401.x, 402.x, 403.x, 404.x, 405.x
<b>Malignancy</b>	140.x ~ 208.x
<b>Obesity</b>	278.0x, V85.2, V85.3, V85.4
<b>Osteoarthritis</b>	715.x
<b>Parkinsonism</b>	332.x
<b>Peripheral vascular disease</b>	441.x, 443.9x, 785.4x, V43.4
<b>Rheumatoid arthritis</b>	714.x
<b>Systemic lupus erythematosus</b>	710.0x
<b>Systemic sclerosis</b>	710.1x

**Supplementary Table 2.** Comparison of enrolled participants without and with different degrees of frailty

	Number of FRAIL items				<i>p</i> -value
	Non-frail (n = 338,121)	1 item (n = 149,748)	2 items (n = 34,463)	≥ 3 items (n = 3,036)	
<i>Demographic profile</i>					
<b>Age (years)</b>	53.1 ± 13	62.6 ± 14.2	68.3 ± 13.1	74.0 ± 12.4	< 0.001
<b>Sex (Female)</b>	151,375 (44.8)	76,588 (51.1)	19,212 (55.8)	1,651 (54.4)	< 0.001
<i>Lifestyle factors</i>					
<b>Smoking (%)</b>	1,597 (0.5)	971 (0.7)	241 (0.7)	22 (0.7)	< 0.001
<b>Alcoholism (%)</b>	3,288 (1.0)	1,866 (1.3)	513 (1.5)	81 (2.7)	< 0.001
<b>Obesity (%)</b>	5,398 (1.6)	2,538 (1.7)	518 (1.5)	40 (1.3)	0.01
<i>Comorbidities</i>					
CCI	1.6 ± 1.3	3.2 ± 2	4.2 ± 2.2	5.1 ± 2.4	< 0.001
aDCSI	0.16 ± 0.5	0.62 ± 1.1	0.97 ± 1.3	1.35 ± 1.5	< 0.001
<b>Hypertension (%)</b>	141,128 (41.7)	111,363 (74.4)	30,411 (88.2)	2,717 (89.5)	< 0.001
<b>Hyperlipidemia (%)</b>	123,708 (36.6)	71,280 (47.6)	17,442 (50.6)	1,256 (41.4)	< 0.001
<b>CLD (%)</b>	82,742 (24.5)	53,140 (35.5)	14,817 (43.0)	1,367 (45.0)	< 0.001
<b>COPD (%)</b>	10,759 (3.2)	36,320 (24.3)	13,515 (39.2)	1,560 (51.4)	< 0.001
<b>CKD (%)</b>	18,622 (5.5)	38,522 (25.7)	12,798 (37.1)	1,338 (44.1)	< 0.001
Stage 5 CKD (%)	490 (0.1)	1,588 (1.1)	475 (1.4)	31 (1.0)	< 0.001
<b>Atrial fibrillation (%)</b>	17,274 (5.1)	26,327 (17.6)	9,476 (27.5)	1,095 (36.1)	< 0.001
<b>CHF (%)</b>	3,496 (1.0)	20,822 (13.9)	7,593 (22.0)	913 (30.1)	< 0.001

<b>ACS (%)</b>	30,443 (9.0)	48,047 (32.1)	16,289 (47.3)	1,696 (55.9)	< 0.001
<b>CeVD (%)</b>	16,544 (4.9)	41,749 (27.9)	14,945 (43.4)	1,826 (60.1)	< 0.001
<b>PVD (%)</b>	3,459 (1.0)	4,544 (3.0)	1,812 (5.3)	225 (7.4)	< 0.001
<b>Malignancy (%)</b>	10,627 (3.1)	15,924 (10.6)	5,088 (14.8)	523 (17.2)	< 0.001
<b>Parkinsonism (%)</b>	1,786 (0.5)	3,981 (2.7)	2,096 (6.1)	432 (14.2)	< 0.001
<b>Gout (%)</b>	43,575 (12.9)	35,775 (23.9)	10,293 (29.9)	873 (28.8)	< 0.001
<b>Osteoarthritis (%)</b>	60,878 (18.0)	64,432 (43.0)	20,730 (60.2)	2,132 (70.2)	< 0.001
<b>Mental disorders (%)</b>	39,920 (11.8)	37,255 (24.9)	12,977 (37.7)	1,375 (45.3)	< 0.001
<b>Rheumatologic disorders (%)</b>					
SLE (%)	375 (0.1)	556 (0.4)	175 (0.5)	17 (0.6)	< 0.001
RA (%)	4,119 (1.2)	5,683 (3.8)	1,984 (5.8)	241 (7.9)	< 0.001
AS (%)	1,165 (0.3)	1,100 (0.7)	370 (1.1)	41 (1.4)	< 0.001
Systemic sclerosis (%)	47 (0.01)	65 (0.04)	15 (0.04)	2 (0.07)	< 0.001
<i>Medications with potential influences on stone risk</i>					
<b>Aspirin (%)</b>	97,100 (28.7)	65,770 (43.9)	16,960 (49.2)	1,327 (43.7)	< 0.001
<b>β-blockers (%)</b>	127,859 (37.8)	75,609 (50.5)	18,535 (53.8)	1,328 (43.7)	< 0.001
<b>CCB (%)</b>	151,737 (44.9)	93,079 (62.2)	23,508 (68.2)	1,882 (62)	< 0.001
<b>ACEi (%)</b>	90,336 (26.7)	49,510 (33.1)	12,049 (35.0)	939 (30.9)	< 0.001
<b>ARB (%)</b>	114,485 (33.9)	67,517 (45.1)	16,253 (47.2)	1,166 (38.4)	< 0.001
<b>Loop diuretics (%)</b>	42,867 (12.7)	40,309 (26.9)	12,230 (35.5)	1,123 (37.0)	< 0.001
<b>Thiazide (%)</b>	79,100 (23.4)	53,146 (35.5)	13,930 (40.4)	1,077 (35.5)	< 0.001
<b>Spironolactone (%)</b>	15,008 (4.4)	13,985 (9.3)	4,324 (12.6)	409 (13.5)	< 0.001
<b>Clopidogrel (%)</b>	11,589 (3.4)	12,254 (8.2)	3,357 (9.7)	241 (7.9)	< 0.001

<b>Statin (%)</b>	149,459 (44.2)	66,449 (44.4)	13,740 (39.9)	816 (26.9)	< 0.001
<b>Fibrate (%)</b>	67,429 (19.9)	27,714 (18.5)	5,859 (17.0)	337 (11.1)	< 0.001
<b>NSAID (%)</b>	306,567 (90.7)	135,747 (90.7)	30,373 (88.1)	2,363 (77.8)	< 0.001
<b>COX2 inhibitor (%)</b>	67,497 (20.0)	52,274 (34.9)	14,536 (42.2)	1,126 (37.1)	< 0.001
<b>Allopurinol (%)</b>	7,423 (2.2)	6,214 (4.2)	1,671 (4.9)	143 (4.7)	< 0.001
<b>Warfarin (%)</b>	4,111 (1.2)	4,930 (3.3)	1,332 (3.9)	98 (3.2)	< 0.001
<b>Magnesium oxide (%)</b>	168,749 (49.9)	91,383 (61.0)	23,022 (66.8)	1,952 (64.3)	< 0.001
<b>Potassium citrate (%)</b>	981 (0.3)	525 (0.4)	140 (0.4)	10 (0.3)	< 0.001
<b>Calcium tablet (%)</b>	31,534 (9.3)	19,010 (12.7)	5,072 (14.7)	391 (12.9)	< 0.001
<b>Vitamin D (%)</b>	1,502 (0.4)	1,315 (0.9)	363 (1.1)	38 (1.3)	< 0.001
<b>Bisphosphonate (%)</b>	3,814 (1.1)	4,523 (3.0)	1,559 (4.5)	143 (4.7)	< 0.001
<i>Oral anti-diabetic agents</i>					
<b>Insulin (%)</b>	36,151 (10.7)	14,673 (9.8)	3,411 (9.9)	283 (9.3)	< 0.001
<b>Biguanide (%)</b>	227,318 (67.2)	82,849 (55.3)	16,255 (47.2)	998 (32.9)	< 0.001
<b>Sulfonylurea (%)</b>	201,836 (59.7)	71,845 (48.0)	13,927 (40.4)	850 (28.0)	< 0.001
<b>Meglitinide (%)</b>	34,156 (10.1)	14,388 (9.6)	3,107 (9.0)	209 (6.9)	< 0.001
<b><math>\alpha</math>-glucosidase inhibitor (%)</b>	51,251 (15.2)	19,964 (13.3)	3,904 (11.3)	222 (7.3)	< 0.001
<b>DPP4 inhibitors (%)</b>	33,607 (9.9)	11,131 (7.4)	1,868 (5.4)	87 (2.9)	< 0.001
<b>Thiazolidinedione (%)</b>	40,875 (12.1)	12,139 (8.1)	1,994 (5.8)	113 (3.7)	< 0.001

*ACEi, angiotensin-converting enzyme inhibitor; ACS, acute coronary syndrome; aDCSI, adjusted diabetic complication severity index; ARB, angiotensin receptor blocker; AS, ankylosing spondylitis; CCB, calcium channel blocker; CCI, Charlson comorbidity index; CeVD,*

*cerebrovascular disease; CHF, congestive heart failure; CKD, chronic kidney disease; CLD, chronic liver disease; COPD, chronic obstructive pulmonary disease; COX, cyclo-oxygenase; DPP4, dipeptidyl peptidase 4; NSAID, non-steroidal anti-inflammatory agent; PVD, peripheral vascular disease; RA, rheumatoid arthritis; SLE, systemic lupus erythematosus*

**Supplementary Table 3. The distribution of FRAIL items among participants without and with different degrees of frailty**

	Numbers of frailty items		
	1 item (n = 149,748)	2 item (n = 34,463)	≥ 3 items (n = 3,036)
<i>Items of FRAIL scale</i>			
<b>Fatigue</b>	48,167 (32.2)	29,780 (86.4)	2,805 (92.4)
<b>Resistance</b>	2,110 (1.4)	2,431 (7.1)	1,393 (45.9)
<b>Ambulation</b>	662 (0.4)	1,259 (3.7)	731 (24.1)
<b>Illness</b>	96,409 (64.4)	32,668 (94.8)	3002 (98.9)
<b>Loss of weight</b>	2,400 (1.6)	2,788 (8.1)	1,377 (45.4)

**Supplementary Table 4. Changes of frailty status during follow-up**

<i>Baseline Numbers of frailty items</i>	<b>Patient counts</b>	<i>Follow-up numbers of frailty items</i>			
		<b>0</b>	<b>1</b>	<b>2</b>	<b>≥ 3</b>
	<b>0 (n = 338,121)</b>	257,790	69,888	9,767	676
	<b>1 (n = 149,748)</b>	0	124,732	23,387	1,629
	<b>2 (n = 34,463)</b>	0	0	32,126	2,337
	<b>≥ 3 (n = 3,036)</b>	0	0	0	3,036