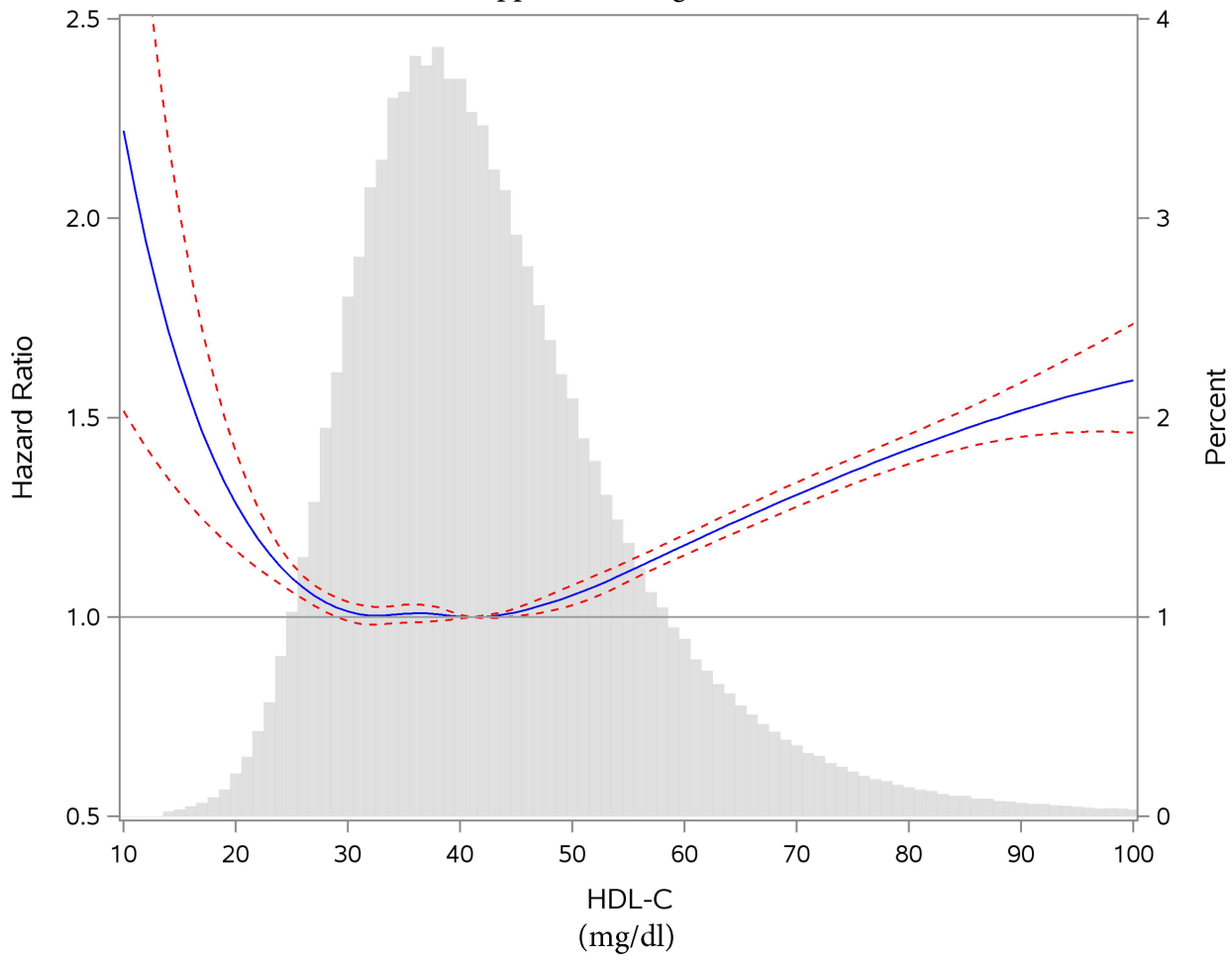


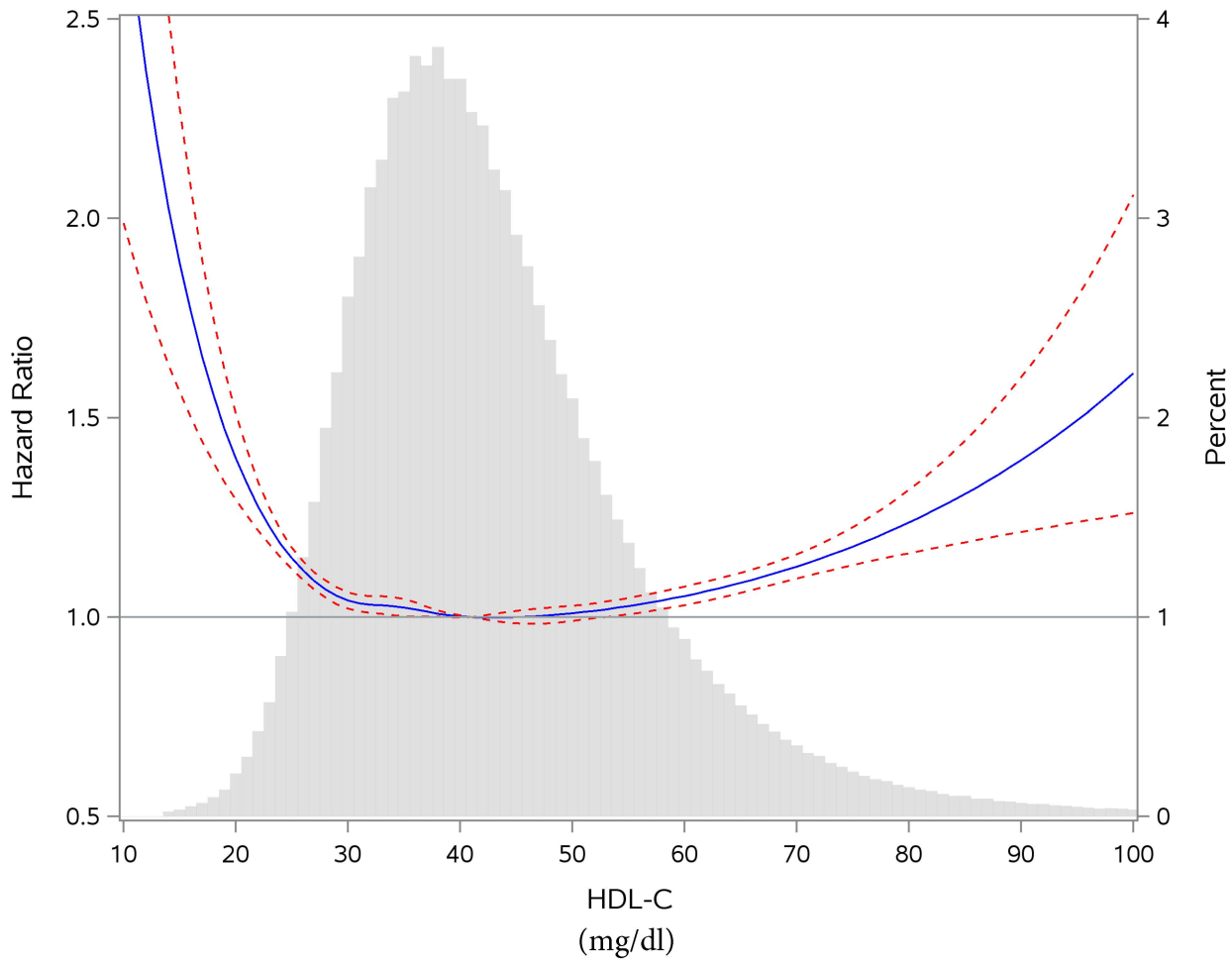
Supplemental Figure legends:

Supplemental Figure 1a-e: Spline analyses of all-cause mortality by HDL-C levels in each eGFR category, where median HDL-C was used as a reference and HDL-C probability distribution histogram represented in grey bars in the background. Dashed red lines represent 95% confidence limits. Figure 3s: eGFR \geq 90 ml/min.1.73m²; Figure 3b: eGFR \geq 60 to <90 ml/min.1.73m²; Figure 3c: \geq 45 to <60 ml/min.1.73m²; Figure 3d: \geq 30 to <45 ml/min.1.73m²; Figure 3e: \geq 15 to <30 ml/min.1.73m².

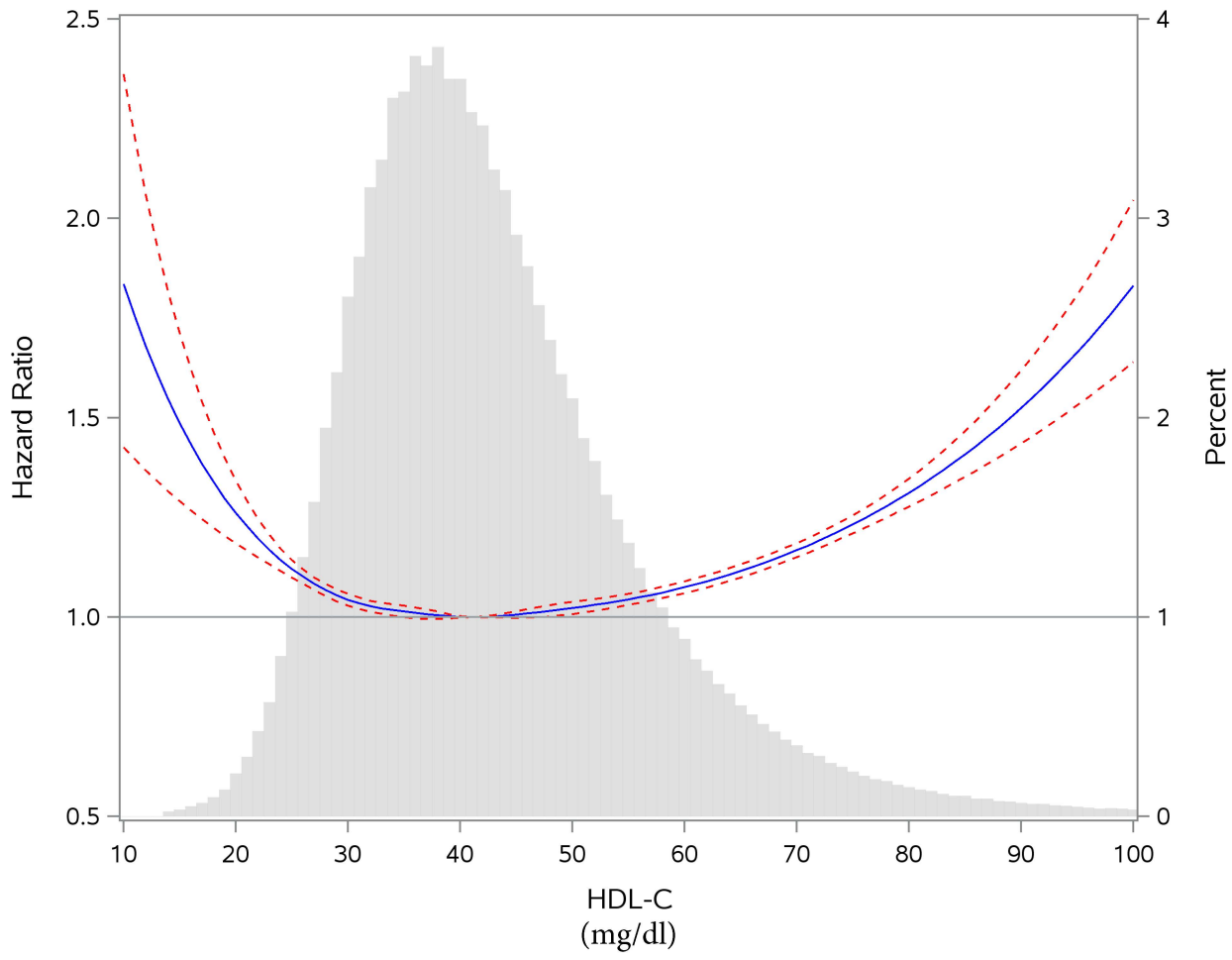
Supplemental Figure 1a



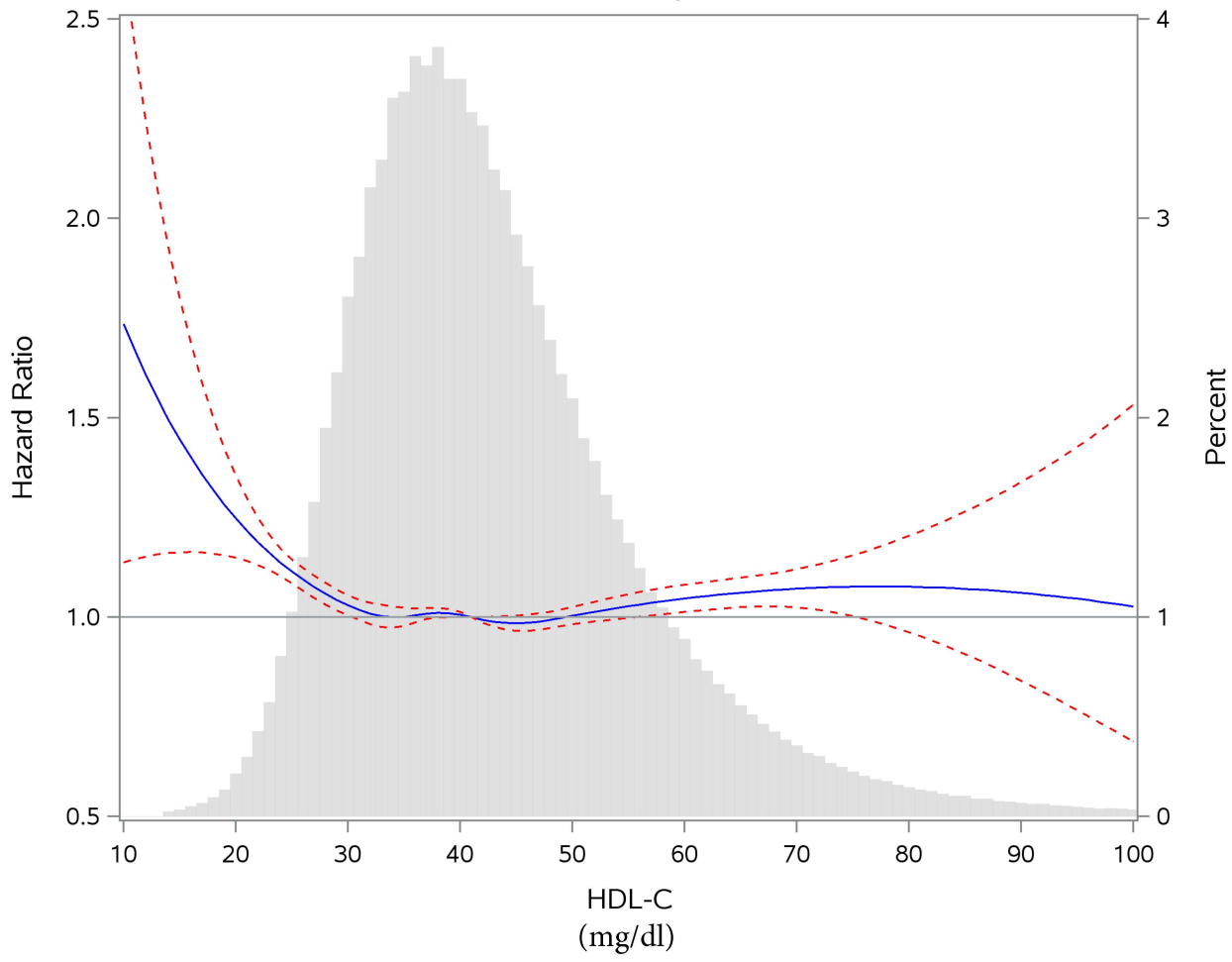
Supplemental Figure 1b



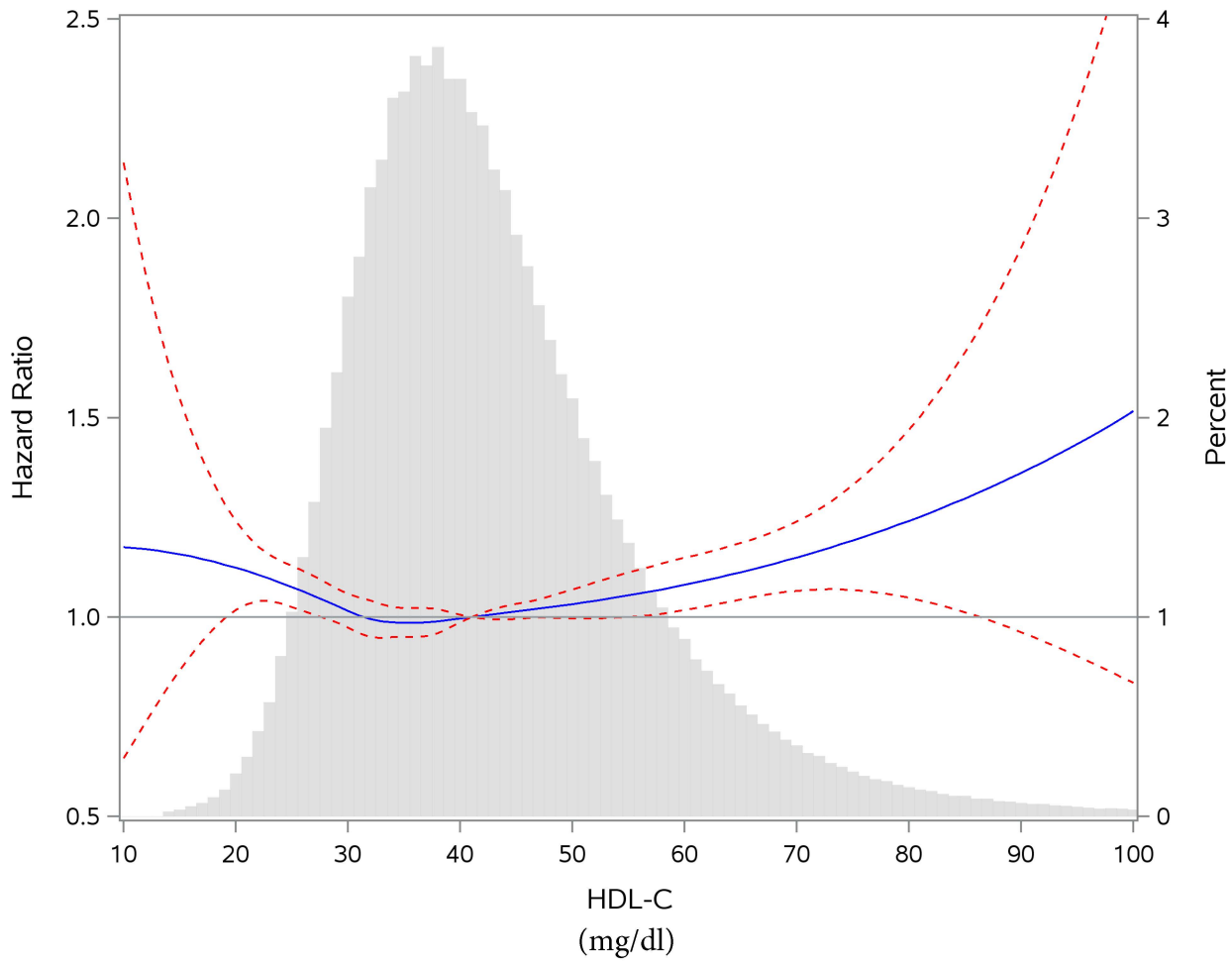
Supplemental Figure 1c



Supplemental Figure 1d



Supplemental Figure 1e



Supplementary Tables:

Supplementary Table 1: Demographic and clinical characteristics in the overall cohort and according to eGFR category.

		Overall	eGFR ≥15 to <30 (ml/min/1.73 m ²)	eGFR ≥30 to <45 (ml/min/1.7 3m ²)	eGFR ≥45 to <60 (ml/min/1.73 m ²)	eGFR ≥60 to <90 (ml/min/1.7 3m ²)	eGFR ≥90 (ml/min/1. 73m ²)
Number (%)		1,764,986	25,249 (1.4)	98,720 (5.6)	272,441 (15.4)	954,680 (54.1)	413,896 (23.5)
Average HDL-C (IQR) (mg/dl)		43.2 (13.2)	38.9 (12.1)	39.9 (11.8)	41.7 (12.1)	43.3 (12.9)	44.8 (14.8)
HDL-C Category (%) (mg/dl)	≤25	65,431 (3.7)	2,085 (8.3)	5,972 (6.1)	11,479 (4.2)	31,176 (3.3)	14,719 (3.6)
	>25 to <34	338,327 (19.2)	7,150 (28.3)	25,157 (25.5)	57,977 (21.3)	176,095 (18.5)	71,948 (17.4)
	≥34 to ≤42	522,373 (29.6)	7,640 (30.3)	31,263 (31.7)	85,344 (31.3)	283,942 (29.7)	114,184 (27.6)
	>42 to <50	399,303 (22.6)	4,462 (17.7)	19,746 (20.0)	60,612 (22.3)	222,440 (23.3)	92,043 (22.2)
	≥50	439,552 (24.9)	3,912 (15.5)	16,582 (16.8)	57,029 (20.9)	241,027 (25.3)	121,002 (29.2)
Race (%)	White (%)	1,503,312 (85.2)	21,357 (84.6)	87,990 (89.1)	245,041 (89.9)	828,170 (86.8)	320,754 (77.5)
	Black (%)	224,785 (12.7)	3376 (13.4)	8,974 (9.1)	22,461 (8.2)	106,616 (11.2)	83,358 (20.1)
	Other (%)	36,889 (2.1)	516 (2.0)	1,756 (1.8)	4,939 (1.8)	19,894 (2.1)	9,784 (2.4)
Median Age in years (IQR)		64.1 (56.1, 72.6)	73.4 (66.8, 77.4)	74.4 (68.8, 77.7)	72.6 (65.9, 76.5)	65.2 (56.7, 72.1)	56.0 (49.6, 60.7)
Cancer (%)		248,058 (14.1)	5,599 (22.2)	20,928 (21.2)	49,349 (18.1)	131,224 (13.8)	40,958 (9.9)
Cerebrovascular Accident (%)		11,633 (0.7)	494 (2.0)	1,417 (1.4)	2,610 (1.0)	5,446 (0.6)	1,666 (0.4)
Coronary Artery Disease (%)		576,589 (32.7)	15,109 (59.8)	54,648 (55.4)	122,166 (44.8)	297,555 (31.2)	87,111 (21.1)

Statin use during follow up (%)		1,282,527 (72.7)	18,098 (71.7)	76,775 (77.8)	212,500 (78.0)	706,048 (74.0)	269,106 (65.0)
ACEI/ARB* medication use (%)		876,615 (49.7)	19,845 (78.6)	74,421 (75.4)	172,066 (63.2)	450,839 (47.2)	159,444 (38.5)
Median Follow Up Time (IQR) (years)		9.1 (7.7, 9.4)	4.5 (1.7, 8.7)	7.5 (3.4, 9.2)	9.1 (5.7, 9.3)	9.2 (8.7, 9.4)	9.2 (9.0, 9.4)
Death During Following Up (%)		541,682 (30.7)	19,580 (77.6)	59,258 (60.0)	113,919 (41.8)	257,093 (26.9)	91,832 (22.2)
Micro Albumin/Creatinine Ratio ⁺ (mg/g)	0-20 (%)	93,696 (69.8)	1,160 (43.9)	5,381 (52.8)	14,750 (63.5)	49,468 (73.1)	22,937 (75.0)
	20-300 (%)	36,687 (27.3)	1,018 (38.5)	4,014 (39.4)	7,578 (32.6)	16,886 (25.0)	7,191 (23.5)
	>300 (%)	3,938 (2.9)	465 (17.6)	804 (7.9)	914 (3.9)	1,283 (1.9)	472 (1.5)
Average C Reactive Protein [†] (SD) (mg/dl)		2.0 (4.4)	3.1 (5.7)	2.8 (5.5)	2.3 (4.8)	1.8 (4.1)	1.9 (4.1)

* Angiotensin converting enzyme inhibitors (ACEI) and angiotensin receptor blockers (ARB)

+ Results for a subset of the cohort with available microalbumin/creatinine data (n=134,321)

† Results for a subset of the cohort with available C-reactive protein data (n=65,112)

Supplementary Table 2: Nested models for risk of all-cause mortality by HDL-C levels in each eGFR category

eGFR (ml/min/1.73m ²)	HDL-C ≤25 mg/dl	HDL-C >25 to <34 mg/dl	HDL-C ≥34 to ≤42 mg/dl	HDL-C >42 to <50 mg/dl	HDL-C ≥50 mg/dl
	HR (CI)	HR (CI)	HR (CI)	HR (CI)	HR (CI)
Model 1					
≥15 to <30	1.00	0.85 (0.81, 0.90)	0.79 (0.75, 0.83)	0.81 (0.76, 0.86)	0.90 (0.85, 0.95)
≥30 to <45	1.00	0.77 (0.74, 0.80)	0.70 (0.67, 0.72)	0.67 (0.64, 0.69)	0.73 (0.70, 0.76)
≥45 to <60	1.00	0.74 (0.72, 0.76)	0.65 (0.64, 0.67)	0.62 (0.61, 0.64)	0.68 (0.67, 0.70)
≥60 to <90	1.00	0.73 (0.71, 0.75)	0.63 (0.62, 0.65)	0.61 (0.60, 0.62)	0.69 (0.67, 0.70)
≥90	1.00	0.67 (0.65, 0.70)	0.59 (0.57, 0.61)	0.58 (0.56, .60)	0.76 (0.74, 0.79)
Model 2					
≥15 to <30	1.00	0.86 (0.81, 0.90)	0.80 (0.76, 0.84)	0.83 (0.79, 0.88)	0.92 (0.87, 0.98)
≥30 to <45	1.00	0.80 (0.77, 0.83)	0.73 (0.71, 0.76)	0.71 (0.68, 0.73)	0.78 (0.75, 0.81)
≥45 to <60	1.00	0.77 (0.75, 0.80)	0.71 (0.69, 0.73)	0.69 (0.67, 0.71)	0.76 (0.74, 0.79)
≥60 to <90	1.00	0.78 (0.76, 0.79)	0.70 (0.69, 0.71)	0.69 (0.68, 0.70)	0.78 (0.76, 0.80)
≥90	1.00	0.74 (0.72, 0.77)	0.68 (0.66, 0.70)	0.68 (0.66, 0.70)	0.88 (0.85, 0.91)
Model 3					
≥15 to <30	1.00	0.87 (0.83, 0.92)	0.82 (0.78, 0.87)	0.84 (0.79, 0.89)	0.87 (0.81, 0.92)
≥30 to <45	1.00	0.84 (0.81, 0.86)	0.78 (0.75, 0.81)	0.74 (0.71, 0.77)	0.76 (0.73, 0.79)
≥45 to <60	1.00	0.82 (0.79, 0.84)	0.76 (0.74, 0.78)	0.73 (0.71, 0.75)	0.75 (0.73, 0.78)
≥60 to <90	1.00	0.83 (0.81, 0.85)	0.76 (0.74, 0.78)	0.74 (0.72, 0.76)	0.77 (0.75, 0.79)
≥90	1.00	0.78 (0.75, 0.80)	0.71 (0.69, 0.74)	0.69 (0.66, 0.71)	0.76 (0.74, 0.79)
Model 4					
≥15 to <30	1.00	0.90 (0.85, 0.95)	0.86 (0.81, 0.91)	0.88 (0.83, 0.94)	0.93 (0.87, 0.99)
≥30 to <45	1.00	0.86 (0.83, 0.89)	0.82 (0.79, 0.85)	0.80 (0.77, 0.83)	0.83 (0.80, 0.86)
≥45 to <60	1.00	0.84 (0.81, 0.86)	0.80 (0.77, 0.82)	0.77 (0.75, 0.80)	0.82 (0.79, 0.84)
≥60 to <90	1.00	0.85 (0.83, 0.86)	0.79 (0.77, 0.81)	0.78 (0.76, 0.80)	0.83 (0.81, 0.85)

≥90	1.00	0.79 (0.76, 0.81)	0.73 (0.71, 0.76)	0.71 (0.69, 0.74)	0.80 (0.78, 0.83)
Model 5					
≥15 to <30	1.00	0.91 (0.86, 0.96)	0.89 (0.84, 0.94)	0.92 (0.86, 0.97)	0.97 (0.91, 1.03)
≥30 to <45	1.00	0.88 (0.85, 0.91)	0.86 (0.83, 0.89)	0.84 (0.81, 0.87)	0.88 (0.85, 0.92)
≥45 to <60	1.00	0.85 (0.83, 0.88)	0.83 (0.80, 0.85)	0.81 (0.79, 0.84)	0.87 (0.85, 0.89)
≥60 to <90	1.00	0.87 (0.85, 0.89)	0.83 (0.82, 0.85)	0.84 (0.82, 0.86)	0.91 (0.89, 0.93)
≥90	1.00	0.85 (0.83, 0.88)	0.84 (0.82, 0.87)	0.85 (0.82, 0.88)	1.01 (0.97, 1.04)
<p>Model 1: Demographics⁺ and Kidney Function Parameters⁺⁺ Model 2: Model 1 + Comorbidities* Model 3: Model 2 + Lipid Parameters[†], BMI, and Statins Model 4: Model 3 + Cardiovascular Disease** Model 5: Model 4 + Serum Albumin and ACEI/ARB +Demographics include age and race ++Kidney Function Parameters include eGFR, dialysis, and kidney transplant *Comorbidities include cancer, cerebrovascular accident, chronic lung disease, dementia, diabetes, hepatitis C, HIV, and hypertension † Lipid Parameters include LDL-C and triglycerides **Coronary artery disease, congestive heart failure, and peripheral artery disease Kidney Function Parameters and statin use are treated as time varying</p>					

Supplementary Table 3: Effect modification of risk of death by HDL-C levels and eGFR category:

eGFR (ml/min/1.73m ²)	HDL-C ≤25 (mg/dl)	HDL-C >25 to <34 (mg/dl)	HDL-C ≥34 to ≤42 (mg/dl)	HDL-C >42 to <50 (mg/dl)	HDL-C ≥50 (mg/dl)
	HR (CI)	HR (CI)	HR (CI)	HR (CI)	HR (CI)
≥15 to <30	1.00	0.91* (0.86, 0.96)	0.88* (0.84, 0.93)	0.92* (0.87, 0.97)	0.98 (0.92, 1.04)
≥30 to <45	1.00	0.90* (0.87, 0.93)	0.89* (0.86, 0.92)	0.87* (0.84, 0.90)	0.91 (0.87, 0.94)
≥45 to <60	1.00	0.87* (0.84, 0.89)	0.84* (0.82, 0.87)	0.83* (0.81, 0.86)	0.88* (0.86, 0.91)
≥60 to <90	1.00	0.87* (0.85, 0.89)	0.84* (0.82, 0.86)	0.84* (0.83, 0.86)	0.92 (0.90, 0.94)
≥90	1.00	0.81 (0.78, 0.84)	0.78 (0.75, 0.81)	0.78 (0.76, 0.81)	0.94 (0.91, 0.97)

Models adjusted for age, race, cancer, cerebrovascular accident, chronic lung disease, diabetes mellitus, dementia, hepatitis C, HIV, hypertension, BMI, LDL-C, triglycerides, serum albumin, ACEI/ARB use, coronary artery disease, congestive heart failure, and peripheral artery disease. Models additionally adjust for eGFR, dialysis, kidney transplant, and statin use as time varying

*Bold: indicates a significant (<0.05) p-value for interaction between HDL-C level and eGFR category, with the reference eGFR category being eGFR≥90 ml/min.1.73m²

Supplementary Table 4a: Effect modification of the relationship between HDL-C and risk of death by presence of congestive heart failure

eGFR (ml/min/1.73m ²)	Congestive Heart Failure	HDL-C ≤25 (mg/dl)	HDL-C >25 to <34 (mg/dl)	HDL-C ≥34 to ≤42 (mg/dl)	HDL-C >42 to <50 (mg/dl)	HDL-C ≥50 (mg/dl)
		HR (CI)	HR (CI)	HR (CI)	HR (CI)	HR (CI)
≥15 to <30	No	1.00	0.92 (0.86, 0.99)	0.89 (0.83, 0.96)	0.94 (0.87, 1.02)	0.97 (0.89, 1.05)
	Yes	1.00	0.89 (0.83, 0.97)	0.89 (0.82, 0.96)	0.88 (0.80, 0.96)	0.98 (0.89, 1.08)
≥30 to <45	No	1.00	0.90 (0.86, 0.94)	0.87 (0.83, 0.91)	0.85 (0.81, 0.89)	0.90 (0.86, 0.95)
	Yes	1.00	0.85 (0.81, 0.90)	0.84 (0.79, 0.88)	0.82 (0.77, 0.87)	0.84 (0.79, 0.90)
≥45 to <60	No	1.00	0.86 (0.83, 0.89)	0.83 (0.80, 0.86)	0.82 (0.79, 0.85)	0.87 (0.84, 0.90)
	Yes	1.00	0.84 (0.79, 0.88)	0.83 (0.79, 0.87)	0.79 (0.75, 0.84)	0.86 (0.81, 0.91)
≥60 to <90	No	1.00	0.86 (0.84, 0.88)	0.82 (0.80, 0.84)	0.82 (0.80, 0.84)	0.89 (0.87, 0.91)
	Yes	1.00	0.89 (0.85, 0.93)	0.88* (0.84, 0.92)	0.91* (0.86, 0.95)	1.00* (0.95, 1.05)
≥90	No	1.00	0.84 (0.81, 0.87)	0.82 (0.79, 0.85)	0.83 (0.80, 0.86)	0.99 (0.95, 1.02)
	Yes	1.00	0.97* (0.88, 1.07)	0.98* (0.90, 1.08)	1.00* (0.91, 1.10)	1.13* (1.02, 1.24)

Models adjusted for age, race, cancer, cerebrovascular accident, chronic lung disease, diabetes mellitus, dementia, hepatitis C, HIV, hypertension, BMI, LDL-C, triglycerides, serum albumin, ACEI/ARB use, coronary artery disease, congestive heart failure, and peripheral artery disease. Models additionally adjust for eGFR, dialysis, kidney transplant, and statin use as time varying
 *Bold: indicates a significant (<0.05) p-value for interaction between HDL-C level and Congestive Heart Failure status.

Supplementary Table 4b: Effect modification of relationship between HDL-C and risk of death by cardiovascular disease

eGFR (ml/min/1.73m ²)	Cardiovascular Disease ⁺	HDL-C ≤25 (mg/dl)	HDL-C >25 to <34 (mg/dl)	HDL-C ≥34 to ≤42 (mg/dl)	HDL-C >42 to <50 (mg/dl)	HDL-C ≥50 (mg/dl)
		HR (CI)	HR (CI)	HR (CI)	HR (CI)	HR (CI)
≥15 to <30	Neither CAD or CHF	1.00	0.94 (0.84, 1.06)	0.95 (0.84, 1.06)	1.01 (0.90, 1.14)	1.02 (0.90, 1.15)
	Either CAD or CHF	1.00	0.91 (0.83, 0.99)	0.85 (0.78, 0.93)	0.88 (0.80, 0.97)	0.92 (0.84, 1.02)
	Both CAD and CHF	1.00	0.90 (0.83, 0.98)	0.90 (0.81, 0.97)	0.89 (0.80, 0.98)	1.02 (0.92, 1.13)
≥30 to <45	Neither CAD or CHF	1.00	0.85 (0.79, 0.91)	0.83 (0.78, 0.89)	0.81 (0.76, 0.87)	0.86 (0.80, 0.92)
	Either CAD or CHF	1.00	0.91 (0.86, 0.96)	0.88 (0.83, 0.93)	0.87 (0.82, 0.92)	0.94 (0.88, 0.99)
	Both CAD and CHF	1.00	0.86 (0.82, 0.92)	0.85 (0.80, 0.90)	0.82 (0.77, 0.88)	0.83 (0.78, 0.90)
≥45 to <60	Neither CAD or CHF	1.00	0.84 (0.80, 0.88)	0.81 (0.77, 0.85)	0.81 (0.77, 0.85)	0.85 (0.81, 0.89)
	Either CAD or CHF	1.00	0.87 (0.83, 0.91)	0.84 (0.81, 0.88)	0.83 (0.79, 0.87)	0.89 (0.85, 0.93)
	Both CAD and CHF	1.00	0.84 (0.79, 0.89)	0.83 (0.78, 0.87)	0.78 (0.74, 0.83)	0.85 (0.80, 0.91)
≥60 to <90	Neither CAD or CHF	1.00	0.84 (0.81, 0.87)	0.80 (0.78, 0.82)	0.80 (0.78, 0.83)	0.87 (0.85, 0.90)
	Either CAD or CHF	1.00	0.90* (0.86, 0.93)	0.85* (0.83, 0.89)	0.86* (0.83, 0.89)	0.93* (0.90, 0.97)
	Both CAD and CHF	1.00	0.88 (0.83, 0.93)	0.87* (0.83, 0.92)	0.89* (0.84, 0.93)	0.95* (0.90, 1.00)

≥90	Neither CAD or CHF	1.00	0.81 (0.78, 0.85)	0.80 (0.76, 0.83)	0.80 (0.76, 0.83)	0.96 (0.92, 1.00)
	Either CAD or CHF	1.00	0.90* (0.85, 0.96)	0.90* (0.84, 0.95)	0.93* (0.87, 0.99)	1.07* (1.01, 1.14)
	Both CAD and CHF	1.00	0.99* (0.88, 1.10)	1.00* (0.90, 1.11)	0.97* (0.87, 1.09)	1.10* (0.99, 1.22)

Models adjusted for age, race, cancer, cerebrovascular accident, chronic lung disease, diabetes mellitus, dementia, hepatitis C, HIV, hypertension, BMI, LDL-C, triglycerides, serum albumin, ACEI/ARB use, cardiovascular disease⁺, and peripheral artery disease. Models additionally adjust for eGFR, dialysis, kidney transplant, and statin use as time varying

+Defined as having neither coronary artery disease (CAD) or congestive heart failure (CHF), either CAD alone or CHF alone, or both CAD and CHF

*Bold: indicates a significant (<0.05) p-value for interaction between HDL-C level and cardiovascular disease status

Supplementary Table 5: Risk of all-cause mortality by HDL-C levels in Women (n=82,442)

eGFR (ml/min/1.73m ²)	HDL-C ≤25 mg/dl	HDL-C >25 to <34 mg/dl	HDL-C ≥34 to ≤42 mg/dl	HDL-C >42 to <50 mg/dl	HDL-C ≥50 mg/dl
	HR (CI)	HR (CI)	HR (CI)	HR (CI)	HR (CI)
Model 1					
≥15 to <60	1.00	0.82 (0.58, 1.17)	0.72 (0.51, 1.06)	0.61 (0.43, 0.85)	0.57 (0.41, 0.80)
≥60 to <90	1.00	0.61 (0.44, 0.84)	0.49 (0.36, 0.67)	0.40 (0.30, 0.55)	0.36 (0.27, 0.49)
≥90	1.00	0.53 (0.38, 0.74)	0.40 (0.29, 0.56)	0.33 (0.24, 0.45)	0.34 (0.25, 0.46)
Model 2					
≥15 to <60	1.00	0.86 (0.60, 1.22)	0.77 (0.54, 1.08)	0.68 (0.48, 0.95)	0.67 (0.48, 0.94)
≥60 to <90	1.00	0.66 (0.48, 0.92)	0.58 (0.42, 0.79)	0.49 (0.36, 0.67)	0.47 (0.35, 0.64)
≥90	1.00	0.72 (0.51, 1.03)	0.60 (0.43, 0.83)	0.51 (0.36, 0.71)	0.56 (0.40, 0.78)
Model 3					
≥15 to <60	1.00	0.91 (0.64, 1.30)	0.86 (0.61, 1.22)	0.75 (0.53, 1.06)	0.70 (0.49, 0.98)
≥60 to <90	1.00	0.72 (0.52, 0.99)	0.65 (0.48, 0.88)	0.55 (0.40, 0.75)	0.51 (0.37, 0.69)
≥90	1.00	0.83 (0.58, 1.19)	0.69 (0.49, 0.98)	0.60 (0.42, 0.85)	0.60 (0.43, 0.85)
Model 4					
≥15 to <60	1.00	0.93 (0.65, 1.32)	0.91 (0.64, 1.28)	0.81 (0.57, 1.15)	0.77 (0.54, 1.09)
≥60 to <90	1.00	0.75 (0.54, 1.03)	0.67 (0.49, 0.91)	0.58 (0.42, 0.79)	0.54 (0.40, 0.73)
≥90	1.00	0.97 (0.67, 1.41)	0.84 (0.58, 1.20)	0.71 (0.50, 1.02)	0.73 (0.51, 1.04)
Model 5					
≥15 to <60	1.00	0.94 (0.66, 1.35)	0.93 (0.66, 1.31)	0.85 (0.60, 1.20)	0.81 (0.57, 1.15)
≥60 to <90	1.00	0.76 (0.55, 1.04)	0.68 (0.50, 0.93)	0.60 (0.44, 0.82)	0.57 (0.42, 0.77)
≥90	1.00	0.93 (0.65, 1.33)	0.84 (0.60, 1.19)	0.74 (0.52, 1.05)	0.79 (0.56, 1.12)
Model 1: Demographics ⁺ and Kidney Function Parameters ⁺⁺ Model 2: Model 1 + Comorbidities* Model 3: Model 2 + Lipid Parameters [†] , BMI, and Statins Model 4: Model 3 + Cardiovascular Disease** Model 5: Model 4 + Serum Albumin and ACEI/ARB +Demographics include age and race ++Kidney Function Parameters include eGFR, dialysis, and kidney transplant *Comorbidities include cancer, cerebrovascular accident, chronic lung disease, dementia,					

diabetes, hepatitis C, HIV, and hypertension

† Lipid Parameters include LDL-C and triglycerides

**Coronary artery disease, congestive heart failure, and peripheral artery disease

Kidney Function Parameters and statin use are treated as time varying

Supplementary Table 6: Risk of all-cause mortality by HDL-C level in a subcohort where data on microalbuminuria is available (N=134,321).

eGFR (ml/min/1.73m ²)	HDL-C ≤25 mg/dl	HDL-C >25 to <34 mg/dl	HDL-C ≥34 to ≤42 mg/dl	HDL-C >42 to <50 mg/dl	HDL-C ≥50 mg/dl
	HR (CI)	HR (CI)	HR (CI)	HR (CI)	HR (CI)
Model 1					
≥15 to <60	1.00	0.77 (0.73, 0.82)	0.68 (0.64, 0.72)	0.65 (0.62, 0.70)	0.71 (0.67, 0.76)
≥60 to <90	1.00	0.78 (0.73, 0.83)	0.67 (0.63, 0.72)	0.64 (0.60, 0.69)	0.73 (0.68, 0.78)
≥90	1.00	0.69 (0.62, 0.77)	0.62 (0.56, 0.69)	0.62 (0.56, 0.69)	0.77 (0.69, 0.85)
Model 2					
≥15 to <60	1.00	0.79 (0.75, 0.84)	0.71 (0.67, 0.76)	0.69 (0.65, 0.73)	0.75 (0.70, 0.80)
≥60 to <90	1.00	0.80 (0.74, 0.85)	0.71 (0.66, 0.76)	0.68 (0.64, 0.73)	0.78 (0.73, 0.83)
≥90	1.00	0.73 (0.66, 0.82)	0.68 (0.62, 0.76)	0.69 (0.62, 0.77)	0.85 (0.76, 0.95)
Model 3					
≥15 to <60	1.00	0.84 (0.79, 0.89)	0.77 (0.72, 0.81)	0.75 (0.70, 0.80)	0.76 (0.71, 0.81)
≥60 to <90	1.00	0.85 (0.79, 0.91)	0.77 (0.72, 0.82)	0.74 (0.69, 0.79)	0.80 (0.74, 0.86)
≥90	1.00	0.77 (0.69, 0.86)	0.73 (0.65, 0.81)	0.72 (0.64, 0.80)	0.79 (0.71, 0.89)
Model 4					
≥15 to <60	1.00	0.87 (0.82, 0.93)	0.83 (0.78, 0.88)	0.83 (0.77, 0.88)	0.86 (0.80, 0.92)
≥60 to <90	1.00	0.87 (0.81, 0.93)	0.81 (0.76, 0.87)	0.79 (0.74, 0.85)	0.88 (0.82, 0.94)
≥90	1.00	0.78 (0.70, 0.87)	0.75 (0.68, 0.84)	0.75 (0.67, 0.84)	0.84 (0.75, 0.94)
Model 5					
≥15 to <60	1.00	0.91 (0.86, 0.96)	0.89 (0.84, 0.95)	0.90 (0.85, 0.96)	0.95 (0.89, 1.02)
≥60 to <90	1.00	0.90 (0.84, 0.96)	0.87 (0.82, 0.93)	0.88 (0.82, 0.94)	0.99 (0.92, 1.06)
≥90	1.00	0.85 (0.76, 0.94)	0.85 (0.77, 0.95)	0.88 (0.79, 0.99)	1.02 (0.91, 1.14)
Model 6					
≥15 to <60	1.00	0.91 (0.86, 0.96)	0.89 (0.84, 0.95)	0.90 (0.85, 0.96)	0.95 (0.89, 1.02)
≥60 to <90	1.00	0.89 (0.84, 0.96)	0.87 (0.81, 0.93)	0.88 (0.82, 0.94)	0.98 (0.91, 1.05)
≥90	1.00	0.84 (0.76, 0.94)	0.85 (0.76, 0.95)	0.88 (0.78, 0.98)	1.01 (0.90, 1.13)

Model 1: Demographics⁺ and Kidney Function Parameters⁺⁺

Model 2: Model 1 + Comorbidities^{*}

Model 3: Model 2 + Lipid Parameters[†], BMI, and Statins

Model 4: Model 3 + Cardiovascular Disease^{**}

Model 5: Model 4 + Serum Albumin and ACEI/ARB

Model 6: Model 5 + Microalbumin/Creatinine Ratio

+Demographics include age and race

++Kidney Function Parameters include eGFR, dialysis, and kidney transplant

*Comorbidities include cancer, cerebrovascular accident, chronic lung disease, dementia, diabetes, hepatitis C, HIV, and hypertension

† Lipid Parameters include LDL-C and triglycerides

**Coronary artery disease, congestive heart failure, and peripheral artery disease

Kidney Function Parameters and statin use are treated as time varying

Supplementary Table 7: Risk of all-cause mortality by HDL-C level in a subcohort while additionally controlling for body surface area

eGFR (ml/min/1.73m ²)	HDL-C ≤25 (mg/dl)	HDL-C >25 to <34 (mg/dl)	HDL-C ≥34 to ≤42 (mg/dl)	HDL-C >42 to <50 (mg/dl)	HDL-C ≥50 (mg/dl)
	HR (CI)	HR (CI)	HR (CI)	HR (CI)	HR (CI)
≥15 to <30	1.00	0.91 (0.86, 0.96)	0.89 (0.84, 0.94)	0.91 (0.86, 0.97)	0.97 (0.91, 1.03)
≥30 to <45	1.00	0.88 (0.85, 0.91)	0.86 (0.83, 0.89)	0.84 (0.81, 0.87)	0.88 (0.85, 0.91)
≥45 to <60	1.00	0.85 (0.83, 0.88)	0.83 (0.80, 0.85)	0.81 (0.79, 0.84)	0.87 (0.84, 0.89)
≥60 to <90	1.00	0.87 (0.85, 0.89)	0.83 (0.82, 0.85)	0.84 (0.82, 0.86)	0.91 (0.89, 0.93)
≥90	1.00	0.86 (0.83, 0.89)	0.84 (0.82, 0.87)	0.85 (0.82, 0.88)	1.00 (0.97, 1.04)

Models adjusted for age, race, cancer, cerebrovascular accident, chronic lung disease, diabetes mellitus, dementia, hepatitis C, HIV, hypertension, BMI, LDL-C, triglycerides, serum albumin, ACEI/ARB use, coronary artery disease, congestive heart failure, peripheral artery disease, and body surface area. Models additionally adjust for eGFR, dialysis, kidney transplant, and statin use as time varying covariates

Supplementary Table 8: Risk of all-cause mortality by HDL-C level in a subcohort where data on C Reactive protein is available (N=65,112).

eGFR (ml/min/1.73m ²)	HDL-C ≤25 (mg/dl)	HDL-C >25 to <34 (mg/dl)	HDL-C ≥34 to ≤42 (mg/dl)	HDL-C >42 to <50 (mg/dl)	HDL-C ≥50 (mg/dl)
	HR (CI)	HR (CI)	HR (CI)	HR (CI)	HR (CI)
≥15 to <30	1.00	0.75 (0.67, 1.02)	0.89 (0.72, 1.11)	0.95 (0.75, 1.20)	1.08 (0.85, 1.37)
≥30 to <45	1.00	0.93 (0.79, 1.09)	0.94 (0.80, 1.10)	0.92 (0.78, 1.10)	0.88 (0.74, 1.06)
≥45 to <60	1.00	0.91 (0.80, 1.03)	0.82 (0.72, 0.93)	0.76 (0.67, 0.87)	0.87 (0.76, 1.00)
≥60 to <90	1.00	0.85 (0.77, 0.94)	0.82 (0.74, 0.90)	0.79 (0.72, 0.88)	0.86 (0.78, 0.95)
≥90	1.00	0.83 (0.72, 0.95)	0.79 (0.69, 0.90)	0.77 (0.67, 0.89)	0.87 (0.77, 0.99)

Models adjusted for age, race, cancer, cerebrovascular accident, chronic lung disease, diabetes mellitus, dementia, hepatitis C, HIV, hypertension, BMI, LDL-C, triglycerides, serum albumin, ACEI/ARB use, coronary artery disease, congestive heart failure, peripheral artery disease, and body surface area. Models additionally adjust for eGFR, dialysis, kidney transplant, and statin use as time varying covariates