Supplemental Material

Supplemental Table 1. Baseline characteristics among incident hemodialysis patients with and without baseline serum triglyceride to high-density lipoprotein cholesterol ratio measurement

Characteristics	Total (n=133,162)	Baseline TG/HDL-C ratio		*p*-value
		Presence (n=51,705)	Absence (n=81,457)	
Age, years	62.2±0.0	62.8±0.1	61.9±0.1	<0.001
Gender, % women	43.3	43.6	43.1	0.08
Race, %				
White	47.0	46.5	47.4	0.001
Black	31.3	31.9	31.0	0.001
Hispanic	14.8	15.2	14.5	<0.001
Asian	3.3	3.0	3.5	<0.001
Others	3.6	3.4	3.6	0.02
Primary insurance, %				
Medicare	54.8	53.3	55.8	<0.001
Medicaid	6.5	6.5	6.6	0.42
Others	38.7	40.2	37.6	<0.001
Initial vascular access type, %				
Central venous catheter	73.9	74.3	73.7	0.02
Arteriovenous fistula	14.9	15.6	14.4	<0.001
Arteriovenous graft	4.1	4.3	4.0	0.009
Others and unknown	7.1	5.8	7.9	<0.001
Comorbidities, %				
Diabetes	55.5	62.9	50.8	<0.001
Hypertension	50.9	51.8	50.3	<0.001
Congestive heart failure	34.9	36.7	33.8	<0.001
Atherosclerotic heart disease	13.8	18.2	10.9	<0.001
Other cardiovascular disease	14.7	16.7	13.4	<0.001
Cerebrovascular disease	1.8	1.7	1.8	0.41
Dyslipidemia	24.0	34.7	17.3	<0.001
HIV	0.5	0.5	0.5	0.34
COPD	5.0	5.2	4.9	0.03
History of malignancy	2.3	2.3	2.3	0.93
Alcohol dependence, %	0.2	0.3	0.2	0.03
Substance abuse, %	0.2	0.3	0.2	0.80
Statin use, %	39.0	41.1	37.6	<0.001
Dialysis dose: single pool Kt/V	1.5±0.0	1.5±0.0	1.5±0.0	0.04
Body mass index, kg/m^2	28.1±0.0	28.3±0.0	28.0±0.0	<0.001
Other laboratory parameters				
Hemoglobin, g/dL	11.1±0.0	11.1±0.0	11.1±0.0	<0.001
White blood cells, $\times 10^3/\mu L$	7.8±0.0	7.8±0.0	7.8±0.0	0.01
Albumin, g/dL	3.5±0.0	3.5±0.0	3.5±0.0	<0.001
Calcium, mg/dL	9.1±0.0	9.1±0.0	9.1±0.0	<0.001
Phosphorus, mg/dL	4.9±0.0	4.9±0.0	4.9±0.0	0.77
Intact PTH, pg/mL	392.5±1.0	393.7±1.4	391.6±1.4	0.29
Bicarbonate, mEq/L	23.6±0.0	23.6±0.0	23.5±0.0	<0.001
TIBC, mg/dL	224.8±0.1	225.8±0.2	223.8±0.2	<0.001
Ferritin, ng/mL	389.0±1.2	389.7±1.7	388.3±1.7	0.54

Data are presented as means ± standard deviations, medians (interquartile ranges), or percentages. TG, triglyceride; HDL-C, high-density lipoprotein cholesterol; COPD, chronic obstructive pulmonary disease; PTH, parathyroid hormone; TIBC, total iron binding capacity.

Supplemental Table 2. Baseline characteristics in patients with or without data on cause of death among a total of 12,778 patients who died during the follow-up period (1/1/2007-12/31/2011)

Characteristics	Total (n=12,778)	Data on cause of death		*p*-value
		Presence (n=11,391)	Absence (n=1,387)	
Age, years	68.5±13.3	68.5±13.2	69.1±13.4	0.10
Gender, % women	43.6	43.7	43.2	0.73
Race, %				
White	58.4	57.7	63.1	<0.001
Black	26.2	26.4	24.9	0.24
Hispanic	10.8	11.1	8.5	0.004
Asian	1.9	2.0	1.2	0.05
Others	2.8	2.9	2.2	0.17
Primary insurance, %				
Medicare	61.8	61.5	63.7	0.11
Medicaid	5.4	5.5	5.1	0.57
Others	32.8	33.0	31.2	0.17
Initial vascular access type, %				
Central venous catheter	79.1	79.0	79.2	0.87
Arteriovenous fistula	11.1	11.0	12.0	0.24
Arteriovenous graft	4.1	4.2	3.5	0.26
Others and unknown	5.7	5.8	5.2	0.36
Comorbidities, %				
Diabetes	70.8	71.3	66.8	<0.001
Hypertension	50.7	50.5	52.5	0.17
Congestive heart failure	39.7	39.6	40.7	0.41
Atherosclerotic heart disease	23.3	22.9	26.0	0.01
Other cardiovascular disease	21.3	20.9	24.5	0.002
Cerebrovascular disease	2.2	2.2	2.4	0.63
Dyslipidemia	38.6	39.0	35.2	0.005
HIV	0.5	0.5	0.5	0.88
COPD	6.6	6.5	7.8	0.06
History of malignancy	3.1	2.9	4.4	0.003
Alcohol dependence, %	0.2	0.3	0.1	0.46
Substance abuse, %	0.2	0.3	0.1	0.17
Statin use, %	19.9	19.6	22.4	0.02
Dialysis dose: single pool Kt/V	1.5±0.3	1.5±0.3	1.5±0.3	0.94
Body mass index, kg/m^2	27.2±0.1	27.2±0.1	27.4±0.2	0.46
Lipid parameters				
Total cholesterol, mg/dL	144.5±45.2	144.7±45.7	142.5±41.5	0.09
LDL-C, mg/dL	75.6±34.8	75.7±35.1	74.9±32.7	0.43
TG, mg/dL	145.4±74.3	145.9±74.7	141.4±70.6	0.03
HDL-C, mg/dL	39.7±13.8	39.7±13.9	39.3±13.1	0.28
TG/HDL-C ratio	4.2±2.9	4.3±2.9	4.2±2.9	0.23
Other laboratory parameters				
Hemoglobin, g/dL	11.1±1.2	11.1±1.2	11.1±1.2	0.79
White blood cells, × 10^3/μL	8.1±3.0	8.1±3.1	8.0±2.8	0.22
Albumin, g/dL	3.4±0.5	3.3±0.5	3.4±0.5	0.78
Calcium, mg/dL	9.2±0.6	9.2±0.6	9.2±0.6	0.13
Phosphorus, mg/dL	4.8±1.2	4.8±1.2	4.8±1.1	0.77
Intact PTH, pg/mL	281 (178-436)	282 (178-439)	273 (171-421)	0.05
Bicarbonate, mEq/L	24.0±2.8	24.0±2.8	24.1±2.7	0.12
TIBC, mg/dL	214.8±51.2	214.7±51.2	215.8±51.5	0.44
Ferritin, ng/mL	298 (172-519)	298 (172-519)	292 (170-510)	0.40

Data are presented as means ± standard deviations, medians (interquartile ranges), or percentages. COPD, chronic obstructive pulmonary disease; LDL-C, low-density lipoprotein cholesterol; TG, triglyceride; HDL-C, high-density lipoprotein cholesterol; PTH, parathyroid hormone; TIBC, total iron binding capacity.

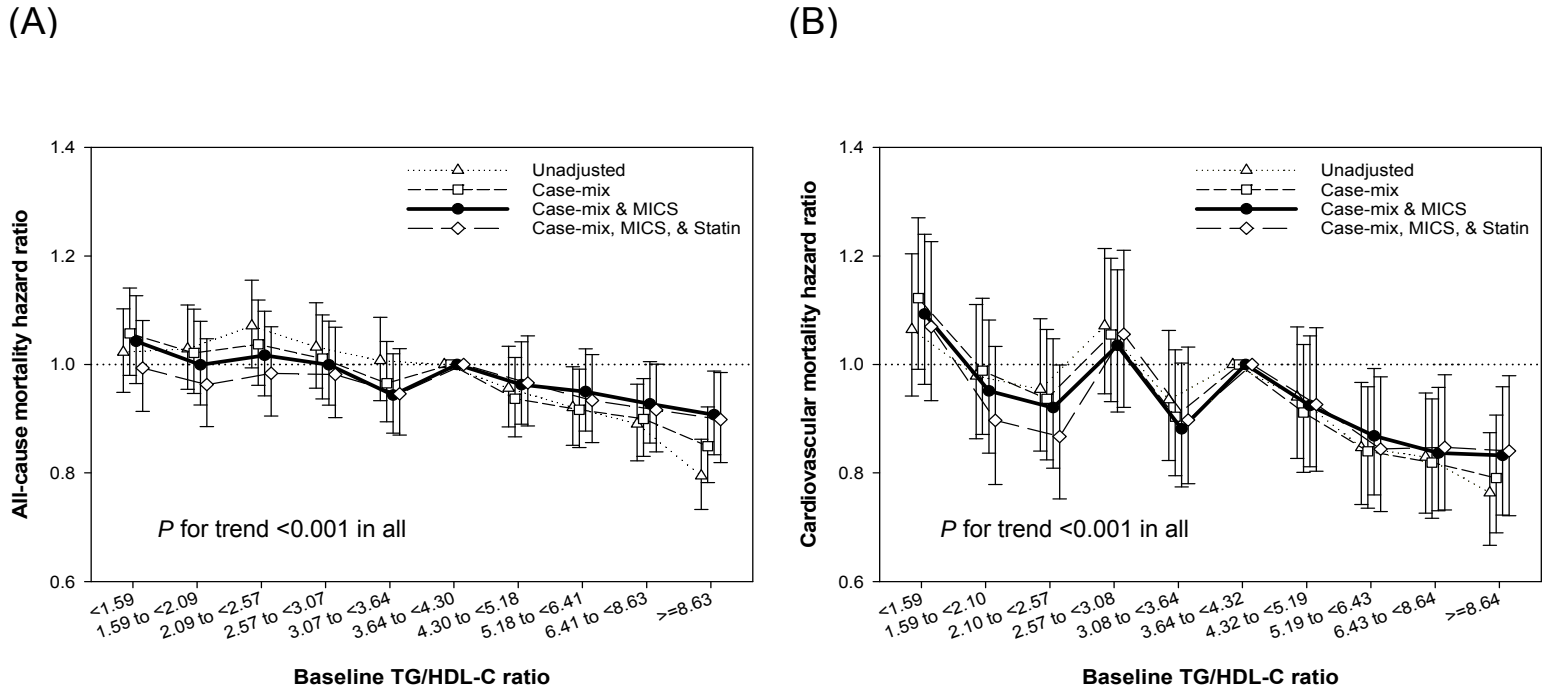
Supplemental Table 3. Competing risk regression analyses of association between serum triglyceride to high-density lipoprotein cholesterol ratio and cardiovascular mortality

TG/HDL-C levels	Unadjusted			Case-mix			Case-mix & MICS			Case-mix, MICS, & Statin		
	HR	95% CI	*p*	HR	95% CI	*p*	HR	95% CI	*p*	HR	95% CI	*p*
Baseline model												
<1.59	1.07	(0.95-1.21)	0.28	1.12	(0.99-1.27)	0.07	1.10	(0.97-1.25)	0.14	1.09	(0.95-1.25)	0.21
1.59 to <2.10	0.98	(0.86-1.11)	0.72	0.99	(0.87-1.12)	0.84	0.96	(0.84-1.09)	0.51	0.91	(0.79-1.05)	0.20
2.10 to <2.57	0.94	(0.83-1.07)	0.35	0.93	(0.82-1.06)	0.27	0.92	(0.81-1.05)	0.23	0.87	(0.75-1.00)	0.05
2.57 to <3.08	1.07	(0.94-1.21)	0.30	1.06	(0.93-1.20)	0.37	1.04	(0.92-1.18)	0.54	1.07	(0.93-1.22)	0.34
3.08 to <3.65	0.93	(0.82-1.06)	0.28	0.91	(0.80-1.03)	0.14	0.89	(0.78-1.02)	0.09	0.91	(0.79-1.05)	0.20
3.65 to <4.32	1.00			1.00			1.00			1.00		
4.32 to <5.19	0.94	(0.83-1.07)	0.35	0.92	(0.81-1.05)	0.20	0.93	(0.81-1.06)	0.26	0.93	(0.80-1.07)	0.31
5.19 to <6.43	0.85	(0.74-0.97)	0.02	0.85	(0.74-0.97)	0.02	0.87	(0.76-0.99)	0.04	0.85	(0.74-0.99)	0.04
6.43 to <8.64	0.83	(0.73-0.95)	0.007	0.83	(0.72-0.95)	0.005	0.84	(0.74-0.96)	0.01	0.86	(0.74-1.00)	0.05
≥8.64	0.78	(0.68-0.89)	<0.001	0.81	(0.70-0.92)	0.002	0.84	(0.73-0.97)	0.02	0.86	(0.74-1.00)	0.05
Time-varying model												
<1.38	1.10	(0.98-1.25)	0.12	1.21	(1.06-1.37)	0.004	1.21	(1.06-1.37)	0.004	1.18	(1.03-1.36)	0.02
1.38 to <1.84	1.09	(0.96-1.24)	0.17	1.13	(0.99-1.28)	0.06	1.09	(0.96-1.24)	0.17	1.09	(0.95-1.25)	0.22
1.84 to <2.29	1.12	(0.99-1.27)	0.06	1.14	(1.01-1.29)	0.04	1.10	(0.96-1.25)	0.16	1.07	(0.93-1.23)	0.32
2.29 to <2.77	1.05	(0.92-1.19)	0.48	1.05	(0.92-1.19)	0.47	1.02	(0.89-1.16)	0.79	1.03	(0.89-1.18)	0.73
2.77 to <3.33	1.00	(0.88-1.14)	1.00	1.00	(0.88-1.14)	0.95	0.98	(0.86-1.12)	0.76	0.97	(0.84-1.12)	0.69
3.33 to <4.00	1.00			1.00			1.00			1.00		
4.00 to <4.89	0.93	(0.82-1.06)	0.27	0.94	(0.82-1.07)	0.33	0.96	(0.84-1.10)	0.55	0.89	(0.77-1.03)	0.12
4.89 to <6.19	0.81	(0.71-0.93)	0.003	0.83	(0.72-0.95)	0.006	0.84	(0.73-0.97)	0.02	0.84	(0.72-0.98)	0.02
6.19 to <8.59	0.82	(0.72-0.94)	0.003	0.84	(0.74-0.96)	0.01	0.89	(0.77-1.02)	0.09	0.89	(0.77-1.04)	0.14
≥8.59	0.67	(0.58-0.78)	<0.001	0.72	(0.62-0.83)	<0.001	0.78	(0.67-0.92)	0.002	0.80	(0.67-0.94)	0.008

Adjustments in case-mix model (n=48,728): age, sex, race/ethnicity, primary insurance, vascular access type, comorbid conditions, alcohol dependence, substance abuse, and single-pool Kt/V; case-mix plus malnutrition-inflammation-cachexia syndrome (MICS) models (n=47,185): case-mix adjusted model plus laboratory parameters including serum hemoglobin, white blood cell count, albumin, calcium, phosphorus, intact parathyroid hormone, bicarbonate, total iron binding capacity, ferritin, low-density lipoprotein cholesterol, and body mass index; case-mix plus MICS plus statin models (n=42,605): statin therapy on the fully adjusted models. TG/HDL-C, triglyceride to high-density lipoprotein cholesterol ratio; HR, hazard ratio; CI, confidence interval

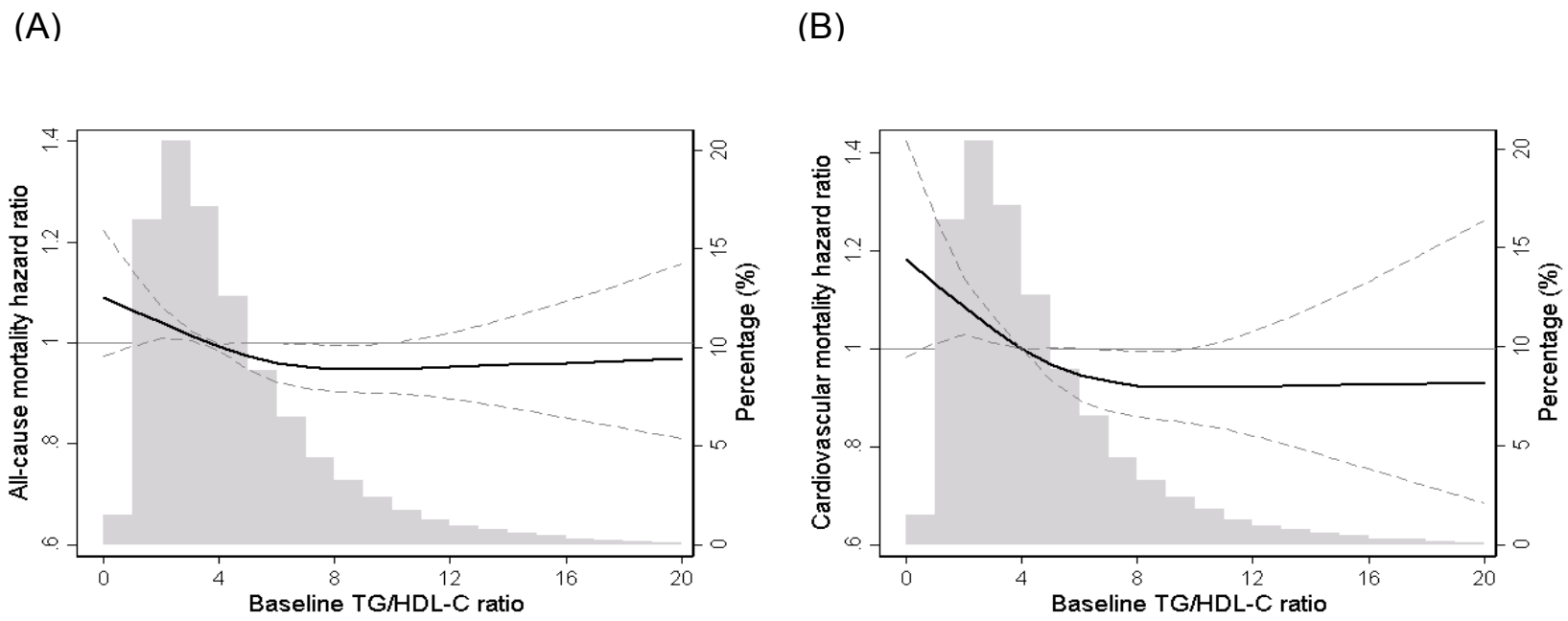
Supplemental material is neither peer-reviewed nor thoroughly edited by CJASN. The authors alone are responsible for the accuracy and presentation of the material.

Supplemental Figure 1



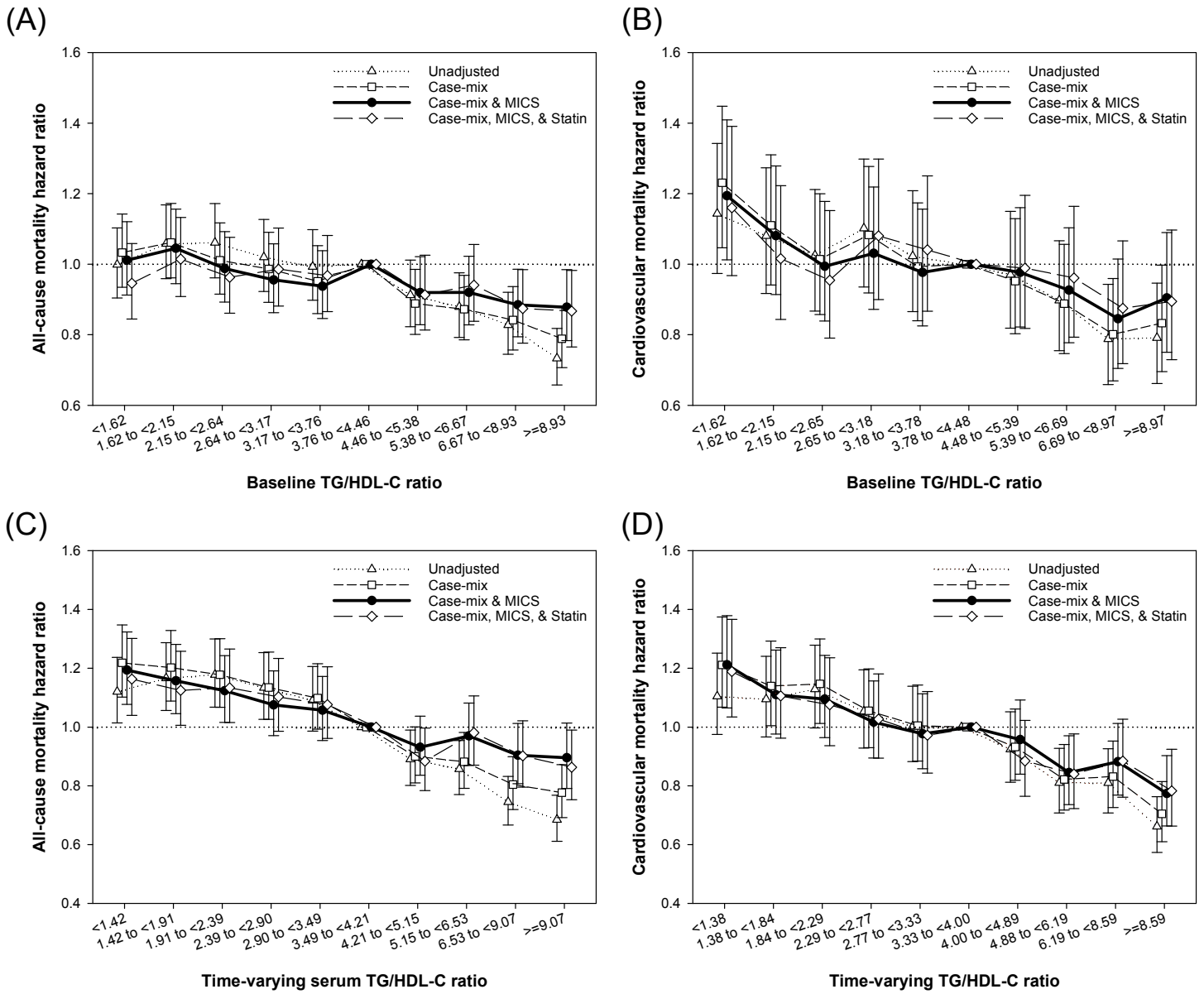
A fixed all-cause (A) and cardiovascular (B) mortality hazard ratios (and 95% confidence interval error bars) by baseline triglyceride to high-density lipoprotein cholesterol (TG/HDL-C) ratio. Adjustments in case-mix model: age, sex, race/ethnicity, primary insurance, vascular access type, comorbid conditions, alcohol dependence, substance abuse, and single-pool Kt/V; case-mix plus malnutrition-inflammation-cachexia syndrome (MICS) models: case-mix adjusted model plus laboratory parameters including serum hemoglobin, white blood cell count, albumin, calcium, phosphorus, intact parathyroid hormone, bicarbonate, total iron binding capacity, ferritin, low-density lipoprotein cholesterol, and body mass index; case-mix plus MICS plus statin models: statin therapy on the fully adjusted models.

Supplemental Figure 2



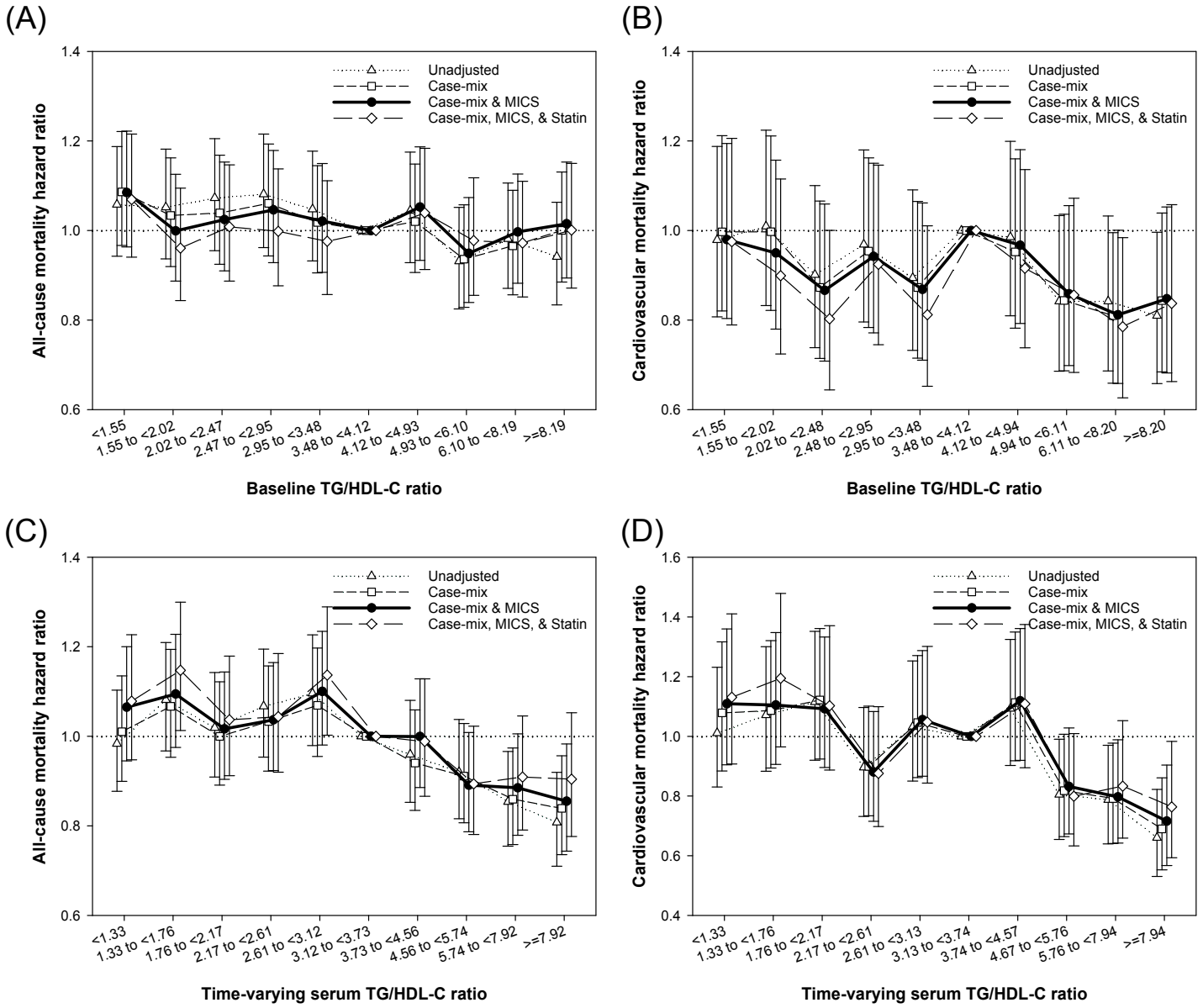
Multivariate adjusted hazard ratios of all-cause (A) and cardiovascular (B) mortality associated with baseline triglyceride to high-density lipoprotein cholesterol (TG/HDL-C) ratios in Cox model using restricted cubic spines, adjusted age, sex, race/ethnicity, primary insurance, vascular access type, comorbidities, alcohol dependence, substance abuse, single-pool Kt/V, hemoglobin, white blood cell count, albumin, calcium, phosphorus, intact parathyroid hormone, bicarbonate, total iron binding capacity, ferritin, low-density lipoprotein cholesterol, and body mass index. A histogram of observed baseline TG/HDL-C ratio values and a hazard reference ratio of 1 (solid line) is overlaid.

Supplemental Figure 3



Supplemental Figure 3 (continued). All-cause and cardiovascular mortality hazard ratios (and 95% confidence interval error bars) by serum triglyceride to high-density lipoprotein ratios (TG/HDL-C) in men. (A) All-cause mortality for baseline TG/HDL-C ratio (B) Cardiovascular mortality for baseline TG/HDL-C ratio (C) All-cause mortality for time-varying TG/HDL-C ratio (D) Cardiovascular mortality for time-varying TG/HDL-C ratio. Adjustments in case-mix model: age, sex, race/ethnicity, primary insurance, vascular access type, comorbid conditions, alcohol dependence, substance abuse, and single-pool Kt/V; case-mix plus malnutrition-inflammation-cachexia syndrome (MICS) models: case-mix adjusted model plus laboratory parameters including serum hemoglobin, white blood cell count, albumin, calcium, phosphorus, intact parathyroid hormone, bicarbonate, total iron binding capacity, ferritin, low-density lipoprotein cholesterol, and body mass index; case-mix plus MICS plus statin models: statin therapy on the fully adjusted models.

Supplemental Figure 4



Supplemental Figure 4 (continued). All-cause and cardiovascular mortality hazard ratios (and 95% confidence interval error bars) by serum triglyceride to high-density lipoprotein ratios (TG/HDL-C) in women. (A) All-cause mortality for baseline TG/HDL-C ratio (B) Cardiovascular mortality for baseline TG/HDL-C ratio (C) All-cause mortality for time-varying TG/HDL-C ratio (D) Cardiovascular mortality for time-varying TG/HDL-C ratio. Adjustments in case-mix model: age, sex, race/ethnicity, primary insurance, vascular access type, comorbid conditions, alcohol dependence, substance abuse, and single-pool Kt/V; case-mix plus malnutrition-inflammation-cachexia syndrome (MICS) models: case-mix adjusted model plus laboratory parameters including serum hemoglobin, white blood cell count, albumin, calcium, phosphorus, intact parathyroid hormone, bicarbonate, total iron binding capacity, ferritin, low-density lipoprotein cholesterol, and body mass index; case-mix plus MICS plus statin models: statin therapy on the fully adjusted models.