

Supplemental Material

Table S1. ICD-9 codes.

	ICD-9
Cancer	140.0-239.00 (except 173.2, 173.4, and 173.9)
Diabetes	250.x
Atrial fibrillation	427.31
Anemia	280.x-285.x
Coronary artery disease	410.x, 411.x, 412.x, 414.x, 429.2x, 429.5x, 429.7x, and V45.82
Lung disease (COPD, asthma)	490.x – 496.x, 510.x
Stroke (cerebrovascular accident, CVA)	433.x, 434.x, 435.x, 436.x, 437.0x, 437.1x, 438.x, and 362.34,
Heart failure	428.x, 402.01, 402.11, 402.91, 404.01, 404.03, 404.11, 404.13, 404.91, 404.93
Hypertension	401.x, 402.x, 403.x, 404.x, 405.x
Kidney disease	403.00, 403.10, 403.90, 404.00, 404.01, 404.10, 404.11, 404.90, 404.91, 582.x, 585.x, 586.x, 587.x, 588.x, 250.4x
Liver disease or cirrhosis	531.x, 532.x, 533.x, 534.x, 570.x, 571.x, 572.2x, 572.3x, 572.8x, 573.x
Dementia	290.0x, 290.1x, 290.2x, 290.3x, 290.4x, 291.1x, 291.2x, 293.0x, 293.1x, 294.8x, 294.9x, 331.0x, 331.10, 331.11, 331.82, 331.83, 331.92, 333.4x, 438.0x, 780.09, 780.93, 799.5x
Depression	296.x, 298.0x, 309.0x, 309.1x, 311x

Table S2. Hazard ratio (95%CI) for CHD mortality according to baseline total cholesterol category stratified by sex.

Age groups	Very Low Cholesterol		Low Cholesterol		Reference	High Cholesterol		Very High Cholesterol		
	<120	120-139	140-159	160-179	180-199	200-219	220-239	240-259	260-279	≥280
All										
CHD death	15126	36295	65422	78366	69536	50278	31011	17414	9079	9344
Incident Rate*	14.4	12.0	9.9	8.2	6.8	5.9	5.5	5.4	5.5	6.3
HR model 1	1.74(1.71, 1.77)	1.43(1.41, 1.45)	1.24(1.23, 1.25)	1.10(1.09, 1.11)	1.0	0.95(0.94, 0.96)	0.96(0.95, 0.97)	1.03 (1.02, 1.05)	1.15 (1.12, 1.17)	1.47 (1.44, 1.50)
HR model 2	1.41(1.39, 1.44)	1.20(1.18, 1.22)	1.09(1.08, 1.11)	1.04(1.03, 1.05)	1.0	0.99(0.98, 1.01)	1.02(1.01, 1.03)	1.09(1.07, 1.11)	1.19(1.16, 1.21)	1.44 (1.41, 1.48)
HR model 3	1.33(1.30, 1.36)	1.19(1.17, 1.21)	1.10(1.09, 1.12)	1.04(1.03, 1.05)	1.0	0.98(0.97, 1.00)	1.00(0.99, 1.01)	1.07(1.05, 1.08)	1.15(1.12, 1.18)	1.39(1.35, 1.42)
HR model 4	1.23(1.20, 1.25)	1.13(1.12, 1.15)	1.07(1.06, 1.08)	1.03(1.02, 1.04)	1.0	1.00(0.98, 1.01)	1.02(1.00, 1.03)	1.09(1.07, 1.11)	1.18(1.16, 1.21)	1.42(1.39, 1.46)
HR model 5	0.99(0.97, 1.01)	0.97(0.96, 0.99)	0.97(0.96, 0.98)	0.99(0.97, 1.00)	1.0	1.03(1.02, 1.04)	1.07(1.06, 1.09)	1.15(1.13, 1.17)	1.25(1.22, 1.28)	1.45(1.42, 1.49)
Female										
CHD mortality	48	174	492	810	993	917	713	486	279	334
Incident Rate*	1.6	1.6	1.7	1.7	1.7	1.8	2.0	2.2	2.4	3.0
HR model 1	1.83(1.37, 2.45)	1.46(1.24, 1.72)	1.41(1.27, 1.57)	1.15(1.05, 1.27)	1.0	0.95(0.87, 1.04)	0.95(0.86, 1.04)	1.00(0.9., 1.12)	1.12(0.98, 1.28)	1.39(1.23, 1.57)
HR model 2	1.46(1.09, 1.95)	1.24(1.06, 1.46)	1.26(1.13, 1.4)	1.09(0.99, 1.19)	1.0	1.00(0.92, 1.10)	1.01(0.92, 1.12)	1.08(0.97, 1.21)	1.16(1.01, 1.33)	1.37(1.21, 1.55)
HR model 3	1.33(0.95, 1.85)	1.26(1.06, 1.50)	1.25(1.12, 1.41)	1.10(0.99, 1.21)	1.0	0.99(0.9, 1.09)	1.01(0.91, 1.12)	1.08(0.96, 1.21)	1.14(0.99, 1.32)	1.27(1.11, 1.46)
HR model 4	1.15(0.82, 1.61)	1.14(0.96, 1.36)	1.18(1.05, 1.32)	1.06(0.96, 1.17)	1.0	1.01(0.92, 1.11)	1.04(0.94, 1.16)	1.12(1.00, 1.26)	1.19(1.04, 1.37)	1.33(1.16, 1.52)
HR model 5	0.96(0.68, 1.34)	1.00(0.84, 1.19)	1.10(0.97, 1.23)	1.04(0.94, 1.15)	1.0	1.04(0.95, 1.15)	1.08(0.98, 1.2)	1.19(1.06, 1.33)	1.26(1.09, 1.45)	1.39(1.22, 1.59)
Male										
CHD mortality	15078	36121	64930	77556	68543	49361	30298	16928	8800	9010
Incident Rate*	14.8	12.4	10.3	8.5	7.1	6.2	5.7	5.6	5.8	6.6
HR model 1	1.74(1.71, 1.78)	1.43(1.41, 1.45)	1.24(1.23, 1.25)	1.10(1.09, 1.11)	1.0	0.95(0.94, 0.96)	0.96(0.95, 0.97)	1.03(1.01, 1.05)	1.14(1.12, 1.17)	1.47(1.44, 1.5)
HR model 2	1.42(1.39, 1.44)	1.20(1.19, 1.22)	1.09(1.08, 1.11)	1.04(1.03, 1.05)	1.0	0.99(0.98, 1.01)	1.02(1.01, 1.03)	1.09(1.07, 1.11)	1.19(1.16, 1.21)	1.44(1.41, 1.48)
HR model 3	1.33(1.30, 1.36)	1.19(1.18, 1.21)	1.10(1.09, 1.12)	1.04(1.03, 1.05)	1.0	0.98(0.97, 1.00)	1.00(0.98, 1.01)	1.06(1.04, 1.08)	1.15(1.12, 1.18)	1.39(1.35, 1.42)
HR model 4	1.23(1.20, 1.25)	1.13(1.12, 1.15)	1.07(1.06, 1.08)	1.03(1.02, 1.04)	1.0	0.99(0.98, 1.01)	1.02(1.00, 1.03)	1.09(1.07, 1.11)	1.18(1.15, 1.21)	1.42(1.39, 1.46)
HR model 5	0.99(0.97, 1.01)	0.98(0.96, 0.99)	0.97(0.96, 0.98)	0.99(0.97, 1.00)	1.0	1.03(1.01, 1.04)	1.07(1.06, 1.09)	1.15(1.13, 1.17)	1.25(1.22, 1.28)	1.45(1.42, 1.48)

*Incident rate: crude incident rate of CHD death per 1000 person years of follow-up (‰)

Model 1: adjusted age (year, continuous), sex (only for “all”), race (White, Black or African American, Asian, American Indian or Alaska Native, Native Hawaiian or other Pacific Islander, other race, race unknown or null), and smoking status (never, ever, current smoking or missing)

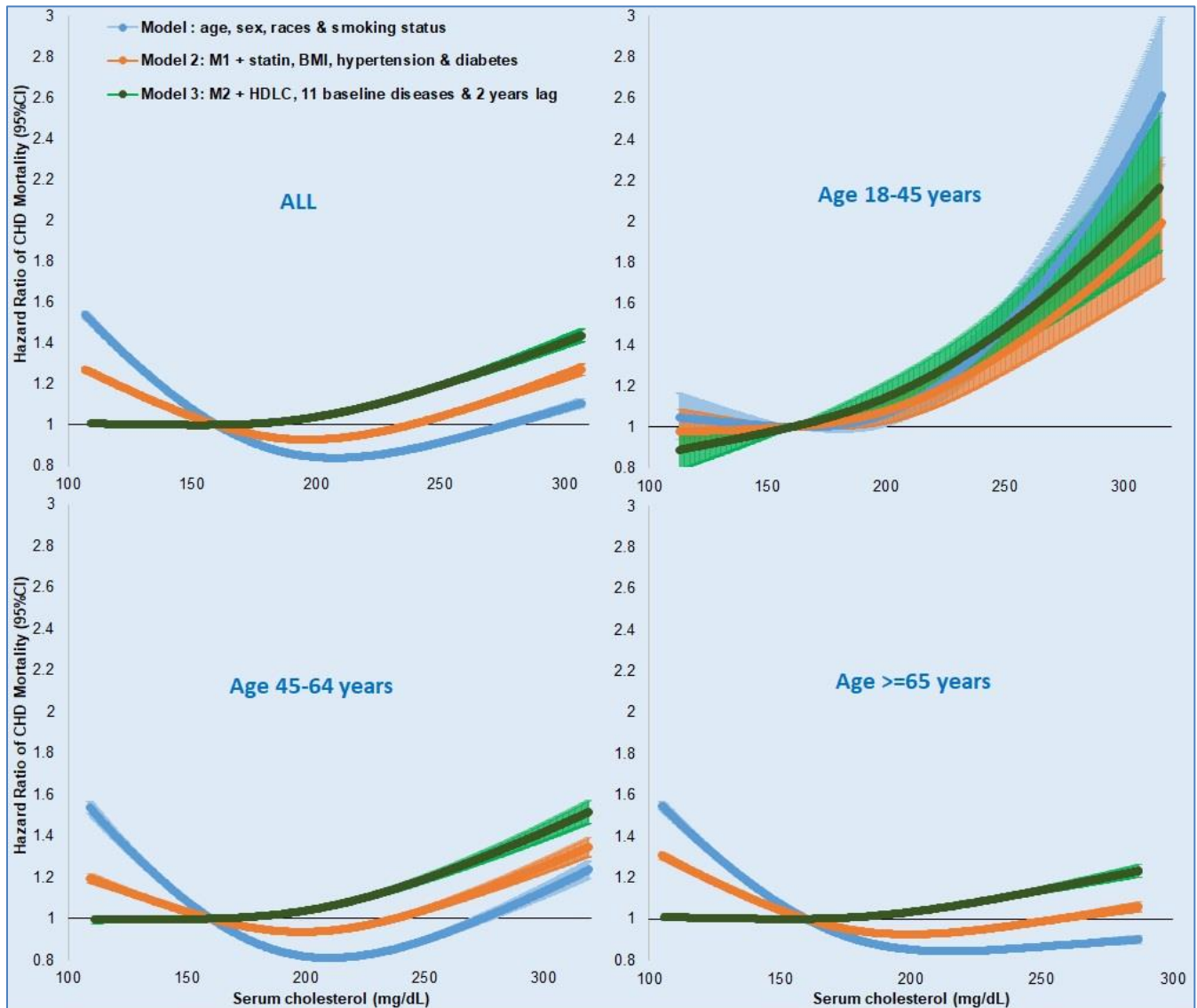
Model 2: further adjusted for timing of statin therapy initiation statin (no usage recorded, initiated statin therapy at or before baseline, within 2 years of follow-up, or after 2 years of follow-up), body mass index (kg/m²: <18.5, 18.5-22.4, 25.0-27.4, 27.5-29.9, 30.0-32.4, 32.5-34.9, ≥35, or missing), baseline hypertension and diabetes.

Model 3: model 2 after excluding the mortality cases within the first 2 years of follow-up (2 years lag).

Model 4: model 3 further adjusted for HDL-C (mg/dL, continuous).

Model 5: model 4 further adjusted for 11 baseline diseases including coronary artery disease, atrial fibrillation, heart failure, stroke, anemia, liver disease or cirrhosis, kidney disease, lung disease (COPD, asthma), cancer, depression, and dementia.

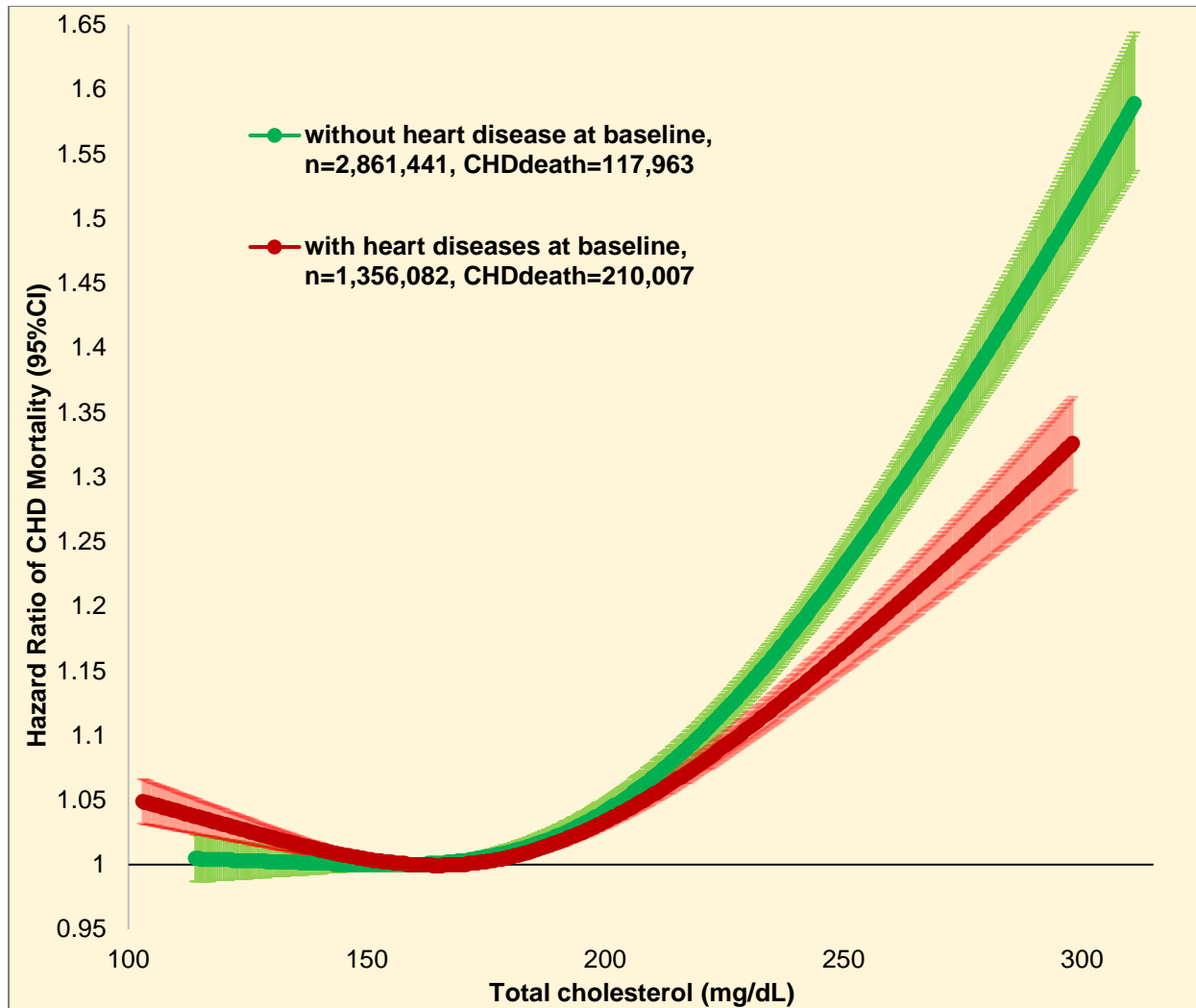
Figure S1. Dose-response relationship of serum total cholesterol (TC) with CHD mortality with the same scale.



Risk expressed as hazard ratio for CHD mortality according to levels of serum cholesterol (Reference was set at 160 mg/dL).

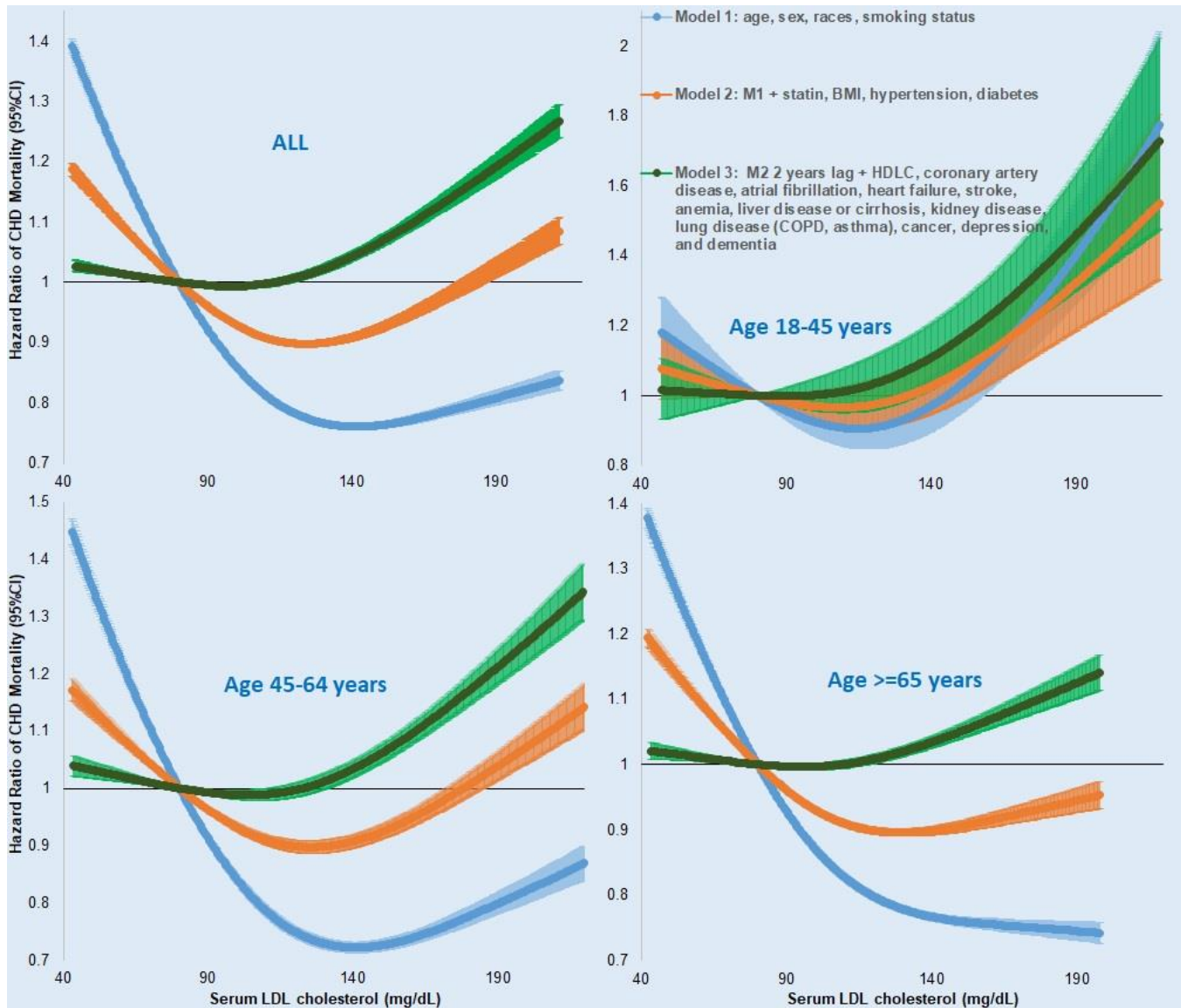
Model 1: adjusted age (year, continuous), sex, race (White, Black, Asian, American Indian or Alaska Native, Native Hawaiian or other Pacific Islander, other race, race unknown or null), and smoking status (never, ever, current smoking or missing); Model 2: further adjusted for timing of statin therapy initiation statin (no usage recorded, initiated statin therapy at or before baseline, within 2 years of follow-up, or after 2 years of follow-up), body mass index (kg/m^2 : <18.5, 18.5-22.4, 25.0-27.4, 27.5-29.9, 30.0-32.4, 32.5-34.9, ≥ 35 , or missing), baseline hypertension and diabetes; Model 3: model 2 further adjusted for HDL-C (mg/dL, continuous), 11 baseline diseases including coronary artery disease, atrial fibrillation, heart failure, stroke, anemia, liver disease or cirrhosis, kidney disease, lung disease (COPD, asthma), cancer, depression, and dementia, and excluding the mortality cases within the first 2 years of follow-up (2 years lag).

Figure S2. Dose-response relationship of serum total cholesterol (TC) with CHD mortality stratified by prevalence of heart disease at baseline.



Adjusted for age (year, continuous), sex, race (White, Black or African American, Asian, American Indian or Alaska Native, Native Hawaiian or other Pacific Islander, other race, race unknown or null and smoking status (never, ever, current smoking or missing), timing of statin therapy initiation (no usage recorded, initiated statin therapy at or before baseline, within 2 years of follow-up, or after 2 years of follow-up), body mass index (kg/m²: <18.5, 18.5-22.4, 25.0-27.4, 27.5-29.9, 30.0-32.4, 32.5-34.9, ≥35, or missing), HDL-C (mg/dL, continuous), baseline diseases including hypertension, diabetes, stroke, anemia, liver disease or cirrhosis, kidney disease, lung disease (COPD, asthma), cancer, depression, and dementia, and excluding the mortality cases within the first 2 years of follow-up (2 years lag).

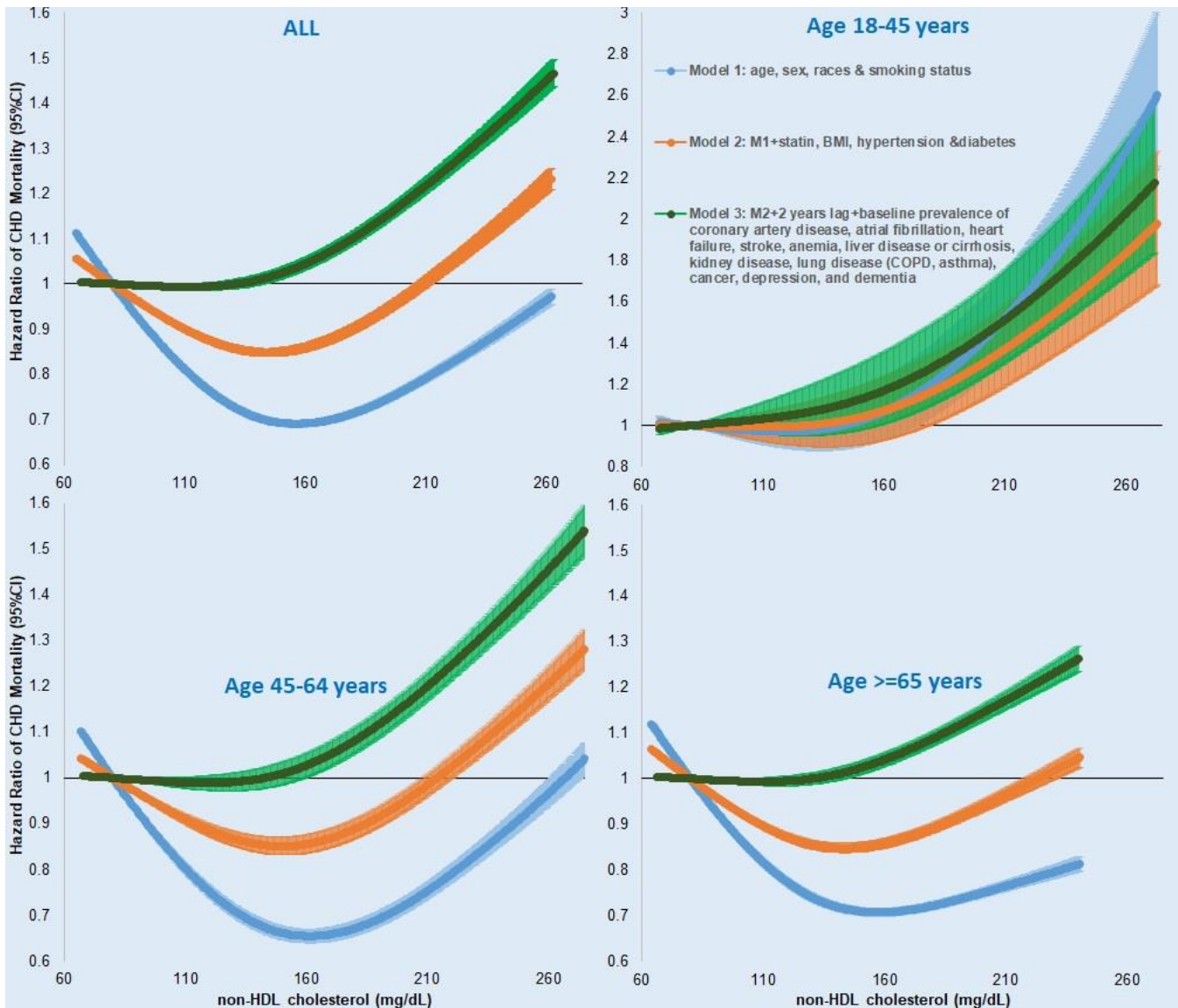
Figure S3. Dose-response relationship of serum LDL cholesterol with CHD mortality.



Risk expressed as hazard ratio for CHD mortality according to levels of serum cholesterol.

Model 1: adjusted age (year, continuous), sex, race (White, Black or African American, Asian, American Indian or Alaska Native, Native Hawaiian or other Pacific Islander, other race, race unknown or null), and smoking status (never, ever, current smoking or missing); Model 2: further adjusted for timing of statin therapy initiation (statin (no usage recorded, initiated statin therapy at or before baseline, within 2 years of follow-up, or after 2 years of follow-up), body mass index (kg/m^2 : <18.5, 18.5-22.4, 25.0-27.4, 27.5-29.9, 30.0-32.4, 32.5-34.9, ≥ 35 , or missing), baseline hypertension and diabetes; Model 3: model 2 further adjusted for HDL-C (mg/dL, continuous), 11 baseline diseases including coronary artery disease, atrial fibrillation, heart failure, stroke, anemia, liver disease or cirrhosis, kidney disease, lung disease (COPD, asthma), cancer, depression, and dementia, and excluding the mortality cases within the first 2 years of follow-up (2 years lag).

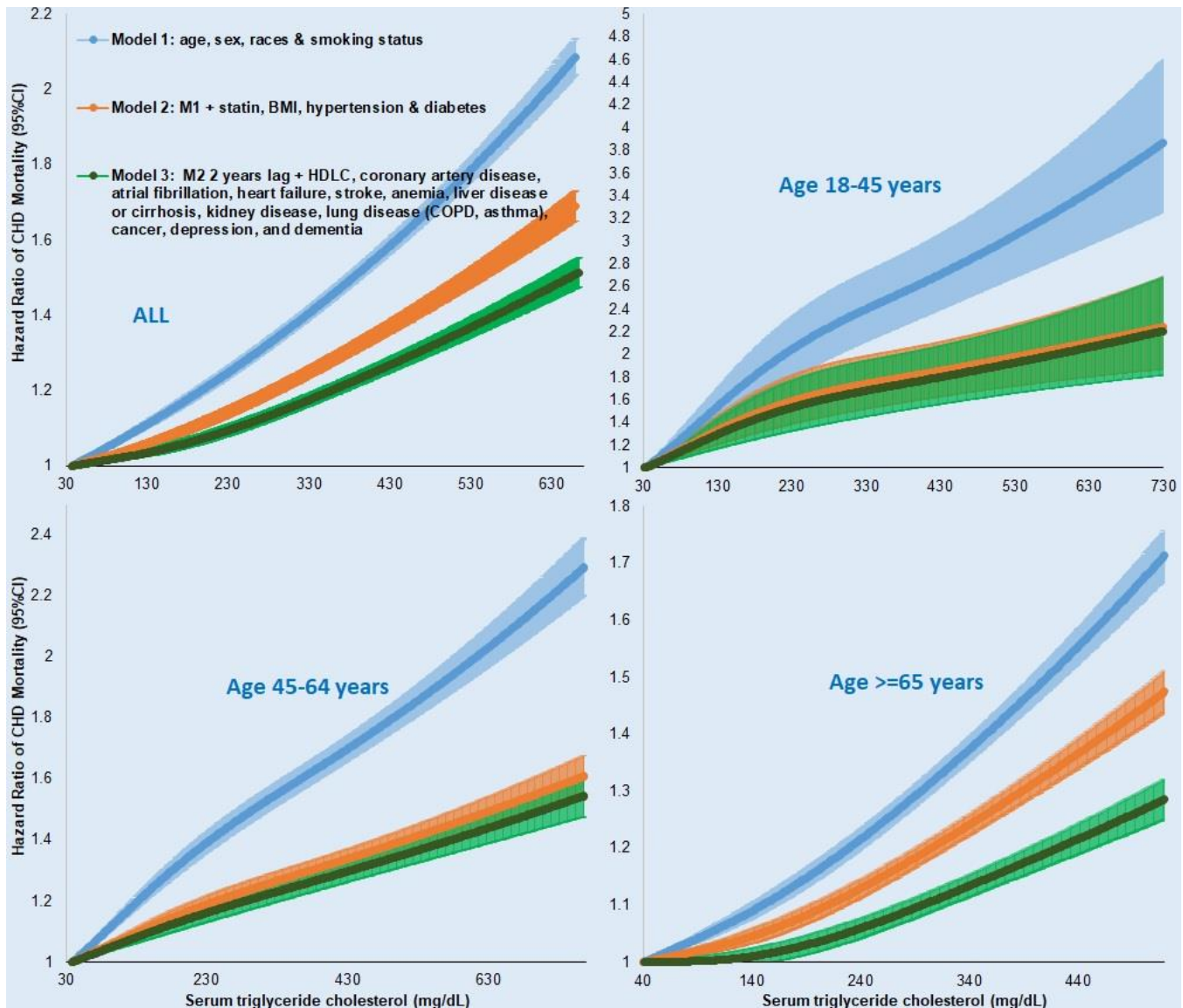
Figure S4. Dose-response relationship of non-HDL cholesterol with CHD mortality.



Risk expressed as hazard ratio for CHD mortality according to levels of non-HDL cholesterol.

Model 1: adjusted age (year, continuous), sex, race (White, Black or African American, Asian, American Indian or Alaska Native, Native Hawaiian or other Pacific Islander, other race, race unknown or null), and smoking status (never, ever, current smoking or missing); Model 2: further adjusted for timing of statin therapy initiation (no usage recorded, initiated statin therapy at or before baseline, within 2 years of follow-up, or after 2 years of follow-up), body mass index (kg/m²: <18.5, 18.5-22.4, 25.0-27.4, 27.5-29.9, 30.0-32.4, 32.5-34.9, ≥35, or missing), baseline hypertension and diabetes; Model 3: model 2 further adjusted for 11 baseline diseases including coronary artery disease, atrial fibrillation, heart failure, stroke, anemia, liver disease or cirrhosis, kidney disease, lung disease (COPD, asthma), cancer, depression, and dementia, and excluding the mortality cases within the first 2 years of follow-up (2 years lag).

Figure S5. Dose-response relationship of serum triglyceride with CHD mortality.



Risk expressed as hazard ratio for CHD mortality according to levels of serum cholesterol.

Model 1: adjusted age (year, continuous), sex, race (White, Black or African American, Asian, American Indian or Alaska Native, Native Hawaiian or other Pacific Islander, other race, race unknown or null), and smoking status (never, ever, current smoking or missing); Model 2: further adjusted for timing of statin therapy initiation (no usage recorded, initiated statin therapy at or before baseline, within 2 years of follow-up, or after 2 years of follow-up), body mass index (kg/m^2 : <18.5, 18.5-22.4, 25.0-27.4, 27.5-29.9, 30.0-32.4, 32.5-34.9, ≥ 35 , or missing), baseline hypertension and diabetes; Model 3: model 2 further adjusted for HDL-C (mg/dL, continuous), 11 baseline diseases including coronary artery disease, atrial fibrillation, heart failure, stroke, anemia, liver disease or cirrhosis, kidney disease, lung disease (COPD, asthma), cancer, depression, and dementia, and excluding the mortality cases within the first 2 years of follow-up (2 years lag).