

Supplementary Table 1. Univariate analysis for predictin cardiovascular mortality.

	HR	95% CI	P value
The TyG-BMI quartile			
Quartile 1	1.00		
Quartile 2	1.03	0.82-1.30	0.7775
Quartile 3	1.23	0.98-1.53	0.0710
Quartile 4	1.45	1.17-1.80	0.0007
Age (years)	1.06	1.05-1.07	<0.0001
Male	1.72	1.45-2.04	<0.0001
White	1.52	1.28-1.79	<0.0001
Education level			
Less than high school	1.00		
High school graduate or GED	0.79	0.63-1.00	0.0473
Some college	0.80	0.64-1.00	0.0515
College degree or higher	0.65	0.51-0.83	0.0004
Living alone	1.01	0.84-1.23	0.8944
Depression	0.98	0.82-1.18	0.8697
smoking	1.35	1.15-1.59	0.0002
Alcohol	0.86	0.71-1.04	0.1076
Proteinuria	1.23	1.03-1.47	0.0241

eGFR	0.99	0.98-0.99	<0.0001
Duration of diabetes (years)	1.03	1.02-1.04	<0.0001
CVD history	2.88	2.47-3.36	<0.0001
Previous heart failure	3.57	2.86-4.55	<0.0001
Previous hypertension	1.12	0.94-1.35	0.2151
Previous hyperlipidemia	1.00	0.85-1.18	0.9905
Blood pressure (mmHg)			
SBP	1.01	1.01-1.02	0.0001
DBP	0.98	0.97-0.99	<0.0001
Heart rate (bpm)	1.00	0.99-1.00	0.3002
HbA1c (%)	1.18	1.10-1.26	<0.0001
FPG (mmol/L)	1.00	1.00-1.00	0.0006
BMI (kg/m ²)	1.01	0.99-1.01	0.0403
TG (mg/dL)	1.00	1.00-1.00	0.1267
TC (mg/dL)	1.00	1.00-1.00	0.1545
LDL-C (mg/dL)	1.00	1.00-1.00	0.3781
TyG	1.21	1.09-1.3	0.0003
Medications use			
Insulin	1.54	1.32-1.80	<0.0001

ARB/ ACEI	1.08	0.91-1.28	0.3674
CCB	1.54	1.30-1.84	<0.0001
Beta blockers	1.92	1.65-2.24	<0.0001
Biguanides	0.80	0.69-0.93	0.0048
Thiazolidinediones	0.78	0.64-0.95	0.0151
Sulfonylureas	0.91	0.78-1.06	0.2386
Aspirin	1.02	0.87-1.19	0.8188
Statins	1.04	0.89-1.22	0.6428
Cholesterol absorption inhibitors	1.11	0.64-1.93	0.7020

TyG: Triglyceride glucose; BMI: Body mass index; GED: General education development; CVD: Cardiovascular disease; bpm: beet per minute; HbA1c: Glycated hemoglobin;; FPG: Fasting plasma glucose; TG: Triglycerides; eGFR: Estimated glomerular filtration rate; SBP: Systolic blood pressure; DBP: Diastolic blood pressure; ACEI: Angiotensin-converting enzyme inhibitors; ARB: Angiotensin receptor blockers; CCB: Calcium channel blockers.

Supplementary Table 2 Assessment of multicollinearity among adjustment variables.

Variables	Tolerance	VIF
TyG-BMI	0.758	1.319
Sex	0.827	1.209
Race	0.838	1.193
Age	0.732	1.367

Education	0.932	1.073
Duration of diabetes	0.760	1.316
History of cardiovascular disease	0.768	1.303
Previous hypertension	0.871	1.147
Previous hyperlipidemia	0.758	1.319
Proteinuria	0.964	1.037
Heart failure	0.941	1.063
Depression	0.932	1.073
Smoking status	0.901	1.109
SBP	0.610	1.641
DBP	0.551	1.816
HbA1c	0.923	1.083
TC	0.244	4.100
LDL-C	0.254	3.937
eGFR	0.894	1.118
CCB	0.951	1.052
Beta-blockers	0.812	1.231
Biguanides	0.895	1.117
Thiazolidinediones	0.955	1.047
Insulins	0.750	1.334

Aspirin	0.926	1.079
Statins	0.669	1.496
Cholesterol absorption inhibitors	0.989	1.012

TyG: Triglyceride glucose; BMI: Body mass index; GED: General education development; CVD: Cardiovascular disease; bpm: beat per minute; SBP: Systolic blood pressure; DBP: Diastolic blood pressure; FPG: Fasting plasma glucose; HbA1c: Glycated hemoglobin; TC: Total cholesterol; TG: Triglycerides; LDL-C: Low density lipoprotein-cholesterol; eGFR: Estimated glomerular filtration rate; ALT: Alanine aminotransferase; ACEI: Angiotensin-converting enzyme inhibitors; ARB: Angiotensin receptor blockers; CCB: Calcium channel blocker; VIF: Variance inflation factor.

Supplementary Table 3 Risk of outcome events based on triglyceride glucose-body mass index after employing multiple imputation by chained equations to address missing triglyceride glucose-body mass index values at baseline.

Outcome	Non-adjusted		Model 1		Model 2		Model 3	
	HR	<i>P</i>	HR	<i>P</i>	HR	<i>P</i>	HR	<i>P</i>
	(95%CI)	value	(95%CI)	value	(95%CI)	value	(95%CI)	value
Cardiovascular mortality								
TyG-BMI								
Q1	Ref		Ref		Ref		Ref	
Q2	1.04(0.83,	0.7229	1.07(0.85,	0.5396	1.06(0.84,	0.6292	1.03(0.81,	0.8071

	1.31)		1.35)		1.34)		1.31)	
Q3	1.24(0.99, 1.54)	0.0569	1.40(1.12, 1.76)	0.0035	1.39(1.10, 1.76)	0.0054	1.35(1.07, 1.71)	0.0121
Q4	1.45(1.17, 1.80)	0.0007	1.94(1.54, 2.44)	<0.0001	1.81(1.42, 2.31)	<0.0001	1.73(1.35, 2.21)	<0.0001
Per 1 SD	1.13(1.05, 1.22)	0.0010	1.27(1.17, 1.39)	<0.0001	1.24(1.13, 1.36)	<0.0001	1.21(1.11, 1.33)	<0.0001
P for trend		0.0002		<0.0001		<0.0001		<0.0001
CHF								
TyG-BMI								
Q1	Ref		Ref		Ref		Ref	
Q2	1.29(1.02, 1.64)	0.0337	1.34(1.05, 1.70)	0.0167	1.30(1.02, 1.66)	0.0334	1.30(1.02, 1.66)	0.0347
Q3	1.46(1.16, 1.84)	0.0011	1.78(1.41, 2.26)	<0.0001	1.75(1.38, 2.23)	<0.0001	1.72(1.35, 2.19)	<0.0001
Q4	2.15(1.73, 2.67)	<0.0001	3.02(2.39, 3.82)	<0.0001	2.71(2.12, 3.46)	<0.0001	2.66(2.08, 3.41)	<0.0001
Per 1 SD	1.32(1.22, 1.42)	<0.0001	1.52(1.40, 1.65)	<0.0001	1.46(1.34, 1.59)	<0.0001	1.45(1.33, 1.58)	<0.0001
P for trend		<0.0001		<0.0001		<0.0001		<0.0001

Total mortality

TyG-BMI

Q1	Ref		Ref		Ref		Ref	
Q2	1.04(0.92, 1.18)	0.5436	1.10(0.97, 1.25)	0.1448	1.08(0.95, 1.23)	0.2428	1.07(0.94, 1.22)	0.3090
Q3	1.01(0.89, 1.15)	0.8498	1.18(1.03, 1.35)	0.0119	1.17(1.02, 1.34)	0.0222	1.14(0.99, 1.31)	0.0594
Q4	1.19(1.05, 1.35)	0.0051	1.63(1.43, 1.86)	<0.0001	1.51(1.31, 1.74)	<0.0001	1.44(1.25, 1.66)	<0.0001
Per 1 SD	1.05(1.01, 1.10)	0.0251	1.19(1.13, 1.25)	<0.0001	1.15(1.09, 1.21)	<0.0001	1.13(1.07, 1.19)	<0.0001
P for trend		0.0251		<0.0001		<0.0001		<0.0001

Data are expressed as HR and 95% CIs (reported in parentheses) as assessed by multivariable Cox regression analysis. Model 1: Adjusted for sex, race, age, education, history of cardiovascular disease, previous hypertension, previous hyperlipidemia, systolic blood pressure and diastolic blood pressure. Model 2: Adjusted for model 1 covariables plus duration of diabetes, proteinuria, smoking status, glycated hemoglobin, total cholesterol, low density lipoprotein-cholesterol, and estimated glomerular filtration rate. Model 3: adjusted for model 2 covariables plus the medications use, calcium channel blocker, beta-blockers, biguanides, thiazolidinediones, insulin, aspirin, cholesterol absorption inhibitors. TyG: Triglyceride glucose; BMI: Body mass index.

Supplementary Table 4 Risk of cardiovascular outcomes and total mortality based on triglyceride glucose-body mass index after excluding participants with baseline cardiovascular disease.

Outcome	Non-adjusted		Model 1		Model 2		Model 3	
	HR (95%CI)	<i>P</i> value	HR (95%CI)	<i>P</i> value	HR (95%CI)	<i>P</i> value	HR (95%CI)	<i>P</i> value
Cardiovascular mortality								
TyG-BMI								
Q1	Ref		Ref		Ref		Ref	
Q2	1.22(0.83, 1.79)	0.3014	1.25(0.85, 1.84)	0.2500	1.24(0.84, 1.82)	0.2796	1.21(0.82, 1.78)	0.3366
Q3	1.65(1.15, 2.37)	0.0061	1.78(1.23, 2.58)	0.0022	1.80(1.24, 2.61)	0.0020	1.70(1.17, 2.47)	0.0057
Q4	1.86(1.30, 2.64)	0.0006	2.24(1.54, 3.26)	<0.0001	2.11(1.43, 3.12)	0.0002	1.93(1.30, 2.87)	0.0011
Per 1 SD	1.24(1.10, 1.39)	0.0003	1.35(1.19, 1.54)	<0.0001	1.32(1.15, 1.52)	<0.0001	1.28(1.12, 1.48)	0.0004
P for trend		0.0001		<0.0001		<0.0001		0.0002

CHF

TyG-BMI

Q1	Ref		Ref		Ref		Ref	
Q2	1.57(1.05, 2.35)	0.0268	1.66(1.11, 2.50)	0.0141	1.64(1.09, 2.48)	0.0178	1.64(1.08, 2.50)	0.0204
Q3	1.68(1.13, 2.50)	0.0100	1.99(1.33, 2.98)	0.0009	2.05(1.36, 3.09)	0.0006	1.94(1.27, 2.96)	0.0020
Q4	2.98(2.06, 4.30)	<0.0001	3.99(2.71, 5.89)	<0.0001	3.79(2.54, 5.65)	<0.0001	3.52(2.33, 5.33)	<0.0001
Per 1 SD	1.47(1.31, 1.65)	<0.0001	1.71(1.50, 1.95)	<0.0001	1.66(1.45, 1.90)	<0.0001	1.63(1.41, 1.88)	<0.0001
P for trend		<0.0001		<0.0001		<0.0001		<0.0001

Total mortality

TyG-BMI

Q1	Ref		Ref		Ref		Ref	
Q2	1.15(0.96, 1.38)	0.1268	1.20(1.00, 1.44)	0.0539	1.20(1.00, 1.44)	0.0515	1.18(0.98, 1.42)	0.0747
Q3	1.13(0.94, 1.35)	0.1950	1.27(1.05, 1.53)	0.0119	1.29(1.07, 1.56)	0.0088	1.25(1.03, 1.51)	0.0219
Q4	1.32(1.11, 1.53)	0.0021	1.67(1.38, 1.96)	<0.0001	1.59(1.31, 1.87)	<0.0001	1.49(1.22, 1.76)	<0.0001

	1.57)		2.01)		1.93)		1.82)	
Per 1 SD	1.08(1.02, 1.15)	0.0102	1.20(1.12, 1.29)	<0.0001	1.18(1.10, 1.26)	<0.0001	1.15(1.07, 1.24)	0.0002
P for trend		0.0043		<0.0001		<0.0001		<0.0001

Data are expressed as HR and 95%CI (reported in parentheses) as assessed by multivariable Cox regression analysis. Model 1: Adjusted for sex, race, age, education, history of cardiovascular disease, previous hypertension, previous hyperlipidemia, systolic blood pressure and diastolic blood pressure. Model 2: Adjusted for model 1 covariables plus duration of diabetes, proteinuria, smoking status, glycated hemoglobin, total cholesterol, low density lipoprotein-cholesterol, and estimated glomerular filtration rate. Model 3: adjusted for model 2 covariables plus the medications use, calcium channel blocker, beta-blockers, biguanides, thiazolidinediones, insulin, aspirin, cholesterol absorption inhibitors. TyG: Triglyceride glucose; BMI: Body mass index.

Supplementary Table 5 Risk of cardiovascular outcomes and total mortality based on triglyceride glucose-body mass index after excluding participants with baseline heart failure

Outcome	Non-adjusted		Model 1		Model 2		Model 3	
	HR (95%CI)	P value	HR (95%CI)	P value	HR (95%CI)	P value	HR (95%CI)	P value
Cardiovascular mortality								
TyG-BMI								

Q1	Ref		Ref		Ref		Ref	
Q2	0.99(0.77, 1.27)	0.9367	1.02(0.80, 1.32)	0.8488	1.03(0.80, 1.32)	0.8245	1.02(0.79, 1.31)	0.8941
Q3	1.22(0.96, 1.54)	0.0992	1.38(1.08, 1.76)	0.0091	1.40(1.10, 1.80)	0.0073	1.37(1.07, 1.77)	0.0126
Q4	1.40(1.11, 1.76)	0.0045	1.86(1.45, 2.38)	<0.0001	1.86(1.43, 2.41)	<0.0001	1.80(1.39, 2.35)	<0.0001
Per 1 SD	1.12(1.03, 1.21)	0.0077	1.25(1.15, 1.37)	<0.0001	1.24(1.13, 1.37)	<0.0001	1.23(1.12, 1.36)	<0.0001
P for trend		0.0010		<0.0001		<0.0001		<0.0001
CHF								
TyG-BMI								
Q1	Ref		Ref		Ref		Ref	
Q2	1.19(0.92, 1.53)	0.1899	1.25(0.96, 1.62)	0.0915	1.23(0.94, 1.60)	0.1279	1.21(0.93, 1.58)	0.1503
Q3	1.46(1.14, 1.86)	0.0028	1.81(1.41, 2.33)	<0.0001	1.81(1.40, 2.34)	<0.0001	1.74(1.34, 2.26)	<0.0001
Q4	1.95(1.54, 2.46)	<0.0001	2.84(2.20, 3.66)	<0.0001	2.73(2.10, 3.55)	<0.0001	2.59(1.98, 3.39)	<0.0001
Per 1 SD	1.29(1.19, 1.39)	<0.0001	1.52(1.39, 1.65)	<0.0001	1.50(1.36, 1.64)	<0.0001	1.47(1.34, 1.60)	<0.0001

	1.40)		1.66)		1.64)		1.62)	
P for trend		<0.0001		<0.0001		<0.0001		<0.0001
Total mortality								
TyG-BMI								
Q1	Ref		Ref		Ref		Ref	
Q2	1.01(0.88, 1.16)	0.8639	1.08(0.94, 1.23)	0.2948	1.07(0.93, 1.22)	0.3529	1.06(0.92, 1.21)	0.4225
Q3	1.00(0.88, 1.15)	0.9591	1.17(1.02, 1.35)	0.0226	1.17(1.01, 1.34)	0.0339	1.14(0.99, 1.32)	0.0688
Q4	1.15(1.00, 1.31)	0.0423	1.58(1.37, 1.82)	<0.0001	1.53(1.32, 1.77)	<0.0001	1.47(1.26, 1.70)	<0.0001
Per 1 SD	1.04(0.99, 1.09)	0.1190	1.18(1.12, 1.24)	<0.0001	1.16(1.10, 1.23)	<0.0001	1.15(1.08, 1.21)	<0.0001
P for trend		0.0576		<0.0001		<0.0001		<0.0001

Data are expressed as HR and 95% CIs (reported in parentheses) as assessed by multivariable Cox regression analysis. Model 1: Adjusted for sex, race, age, education, history of cardiovascular disease, previous hypertension, previous hyperlipidemia, systolic blood pressure and diastolic blood pressure. Model 2: Adjusted for model 1 covariables plus duration of diabetes, proteinuria, smoking status, glycated hemoglobin, total cholesterol, low density lipoprotein-cholesterol, and estimated glomerular filtration rate. Model 3: adjusted for model 2 covariables plus the medications use,

CCB, beta-blockers, biguanides, thiazolidinediones, insulin, aspirin, cholesterol absorption inhibitors. TyG: Triglyceride glucose; BMI: Body mass index.

Supplementary Table 6 Risk of Cardiovascular Outcomes and Total Mortality Based on TyG-BMI After Excluding Participants From the First 3 Years of Follow-Up.

Outcome	Non-adjusted		Model 1		Model 2		Model 3	
	HR (95%CI)	P value	HR (95%CI)	P value	HR (95%CI)	P value	HR (95%CI)	P value
Cardiovascular mortality								
TyG-BMI								
Q1	Ref		Ref		Ref		Ref	
Q2	1.09(0.83, 1.43)	0.5303	1.12(0.85, 1.47)	0.4273	1.11(0.85, 1.46)	0.4478	1.10(0.84, 1.45)	0.4853
Q3	1.20(0.92, 1.56)	0.1842	1.35(1.03, 1.77)	0.0322	1.35(1.02, 1.78)	0.0363	1.30(0.99, 1.72)	0.0627
Q4	1.57(1.22, 2.02)	0.0005	2.08(1.59, 2.73)	<0.0001	2.00 1.51, 2.66)	<0.0001	1.92(1.44, 2.55)	<0.0001
Per 1 SD	1.18(1.08, 1.29)	0.0003	1.32(1.20, 1.45)	<0.0001	1.29(1.16, 1.43)	<0.0001	1.26(1.14, 1.40)	<0.0001

P for trend		0.0003		<0.0001		<0.0001		<0.0001
CHF								
TyG-BMI								
Q1	Ref		Ref		Ref		Ref	
Q2	1.32(1.03, 1.69)	0.0272	1.36(1.06, 1.75)	0.0156	1.33(1.03, 1.71)	0.0275	1.35(1.04, 1.74)	0.0219
Q3	1.47(1.15, 1.87)	0.0019	1.78(1.39, 2.29)	0.0009	1.78(1.38, 2.29)	<0.0001	1.75(1.36, 2.26)	0.0020
Q4	2.25(1.79, 2.82)	<0.0001	3.15(2.47, 4.03)	<0.0001	2.87(2.23, 3.71)	<0.0001	2.84(2.19, 3.68)	<0.0001
Per 1 SD	1.34(1.24, 1.45)	<0.0001	1.55(1.43, 1.69)	<0.0001	1.50(1.37, 1.63)	<0.0001	1.49(1.36, 1.63)	<0.0001
P for trend		<0.0001		<0.0001		<0.0001		<0.0001
Total mortality								
TyG-BMI								
Q1	Ref		Ref		Ref		Ref	
Q2	1.01(0.87, 1.17)	0.8959	1.06(0.92, 1.23)	0.4240	1.05(0.90, 1.21)	0.5591	1.04(0.90, 1.21)	0.6083
Q3	1.00(0.87, 1.16)	0.9517	1.18(1.02, 1.37)	0.0301	1.16(1.00, 1.35)	0.0576	1.13(0.97, 1.32)	0.1181

Q4	1.19(1.03, 1.37)	0.0163	1.65(1.42, 1.92)	<0.0001	1.53(1.31, 1.80)	<0.0001	1.47(1.25, 1.72)	<0.0001
Per 1 SD	1.06(1.01, 1.12)	0.0205	1.21(1.15, 1.28)	<0.0001	1.17(1.10, 1.24)	<0.0001	1.15(1.08, 1.22)	<0.0001
P for trend		0.0043		<0.0001		<0.0001		<0.0001

Data are expressed as HR and 95% CIs (reported in parentheses) as assessed by multivariable Cox regression analysis. Model 1: Adjusted for sex, race, age, education, history of cardiovascular disease, previous hypertension, previous hyperlipidemia, systolic blood pressure and diastolic blood pressure. Model 2: Adjusted for model 1 covariables plus duration of diabetes, proteinuria, smoking status, glycated hemoglobin, total cholesterol, low density lipoprotein-cholesterol, and estimated glomerular filtration rate. Model 3: adjusted for model 2 covariables plus the medications use, CCB, beta-blockers, biguanides, thiazolidinediones, insulin, aspirin, cholesterol absorption inhibitors. TyG: Triglyceride glucose; BMI: Body mass index.