

Table S1: Methods, coefficients of variation and limits of detection for laboratory parameters in the CHARLS wave 1 national survey

Biomarkers	Method	Coefficient of variation		Detection limits
		Within assay	Between assay	
TC, mg/dL	Enzymatic colormetric test	0.80%	1.70%	3-800 mg/dL
HDL-C, mg/dL	Enzymatic colormetric test	1.00%	1.30%	3-120 mg/dL
LDL-C, mg/dL	Enzymatic colormetric test	0.70%	1.20%	3-400 mg/dL
TG, mg/dL	Enzymatic colormetric test	1.50%	1.80%	4-1000 mg/dL
FPG, mg/dL	Enzymatic colormetric test	0.90%	1.80%	2-450 mg/dL
HbA1C, %	Boronate affinity HPLC	1.90%	2.10%	0-40%
hs-CRP, mg/L	Immunoturbidimetric assay	<1.3%	<5.7%	0.1-20 mg/L
Cr, mg/dL	Rate-blanked and compensated Jaffe creatinine method	<1.6%	<2.1%	0.1-25 mg/dL
UA, mg/dL	UA Plus method	1.10%	1.90%	Upto20 mg/dL

Abbreviations as in Table 1.

Table S2: Methods, coefficients of variation and limits of detection for laboratory parameters in the CHARLS wave 3 national survey

Biomarkers	Method	Coefficient of variation		Detection limits
		Within assay	Between assay	
TC, mmol/L	Oxidase method	<0.70	<3.18	0.13–18.18
HDL-C, mmol/L	Direct method	<0.67	<3.14	0.09–3.08
LDL-C, mmol/L	Direct method	<1.38	<2.90	0.22–14.14
TG, mmol/L	Oxidase method	<0.41	<3.64	0.12–9.78
FPG, mmol/L	Hexokinase	<0.40	<2.50	0.13–39.58
HbA1C, %	High performance liquid chromatography	<1.16	<1.27	3.85–17.80
hs-CRP, mg/L	Immunoturbidimetric assay	<2.94	<2.09	0.1-20 mg/L
UA, μ mol/L	Uricase, catalase	<0.25	<2.32	0.10–140.00
Cr, μ mol/L	Picric acid method	<1.87	<4.34	22.85–2151.70

Abbreviations as in Table 1.

Table S3: Comparing baseline characteristics of participants with and without missing TyG and its obesity derivatives in the first wave (2011-2012) of CHARLS.

	Complete group	Missing group	Standardized difference, % (95% CI)
No. of subjects	6979	5748	
Age, years	58.00 (51.00-65.00)	56.00 (49.00-64.00)	0.07 (0.03, 0.10)
Glucose, mmol/L	102.24 (94.14-112.86)	101.88 (94.27-112.86)	0.02 (-0.04, 0.08)
Cr, mg/dL	0.76 (0.64-0.88)	0.77 (0.66-0.89)	0.04 (-0.02, 0.10)
TC, mg/dL	190.21 (167.01-214.95)	185.57 (163.15-211.86)	0.12 (0.06, 0.18)
TG, mg/dL	102.66 (73.45-149.56)	107.08 (77.00-158.41)	0.06 (-0.00, 0.12)
HDL-C, mg/dL	49.87 (40.98-60.31)	48.33 (38.66-58.38)	0.13 (0.07, 0.19)
LDL-C, mg/dL	113.66 (92.78-136.47)	111.73 (90.08-134.15)	0.10 (0.04, 0.15)
hs-CRP, mg/L	0.99 (0.54-2.09)	0.97 (0.51-2.04)	0.02 (-0.04, 0.07)
HbA1c, %	5.24 (0.79)	5.20 (0.84)	0.05 (-0.01, 0.11)
UA, mg/dL	4.31 (3.58-5.16)	4.39 (3.65-5.24)	0.09 (0.03, 0.14)
Height, m	1.58 (0.09)	1.59 (0.09)	0.09 (0.05, 0.13)
Weight, kg	57.20 (50.60-64.95)	57.00 (50.60-64.90)	0.00 (-0.04, 0.04)
WC, cm	83.51 (12.26)	83.12 (12.22)	0.03 (-0.01, 0.08)
Sex, n (%)			0.10 (0.07, 0.14)
Male	3367 (48.24%)	3069 (53.41%)	
Female	3612 (51.76%)	2677 (46.59%)	
Marital status, n (%)			0.03 (-0.00, 0.07)
Married	6164 (88.32%)	5001 (87.26%)	
Other	815 (11.68%)	730 (12.74%)	
Living Place, n (%)			0.24 (0.20, 0.27)
Village	4640 (66.49%)	3162 (55.01%)	
City	2339 (33.51%)	2586 (44.99%)	
Education, n (%)			0.24 (0.21, 0.28)
Below primary	3388 (48.57%)	2348 (41.08%)	
Primary schools	1527 (21.89%)	1118 (19.56%)	
Middle school	1402 (20.10%)	1296 (22.68%)	
High school and above	658 (9.43%)	953 (16.68%)	
Kidney disease, n (%)			0.02 (-0.02, 0.05)
No	6618 (95.47%)	5424 (95.78%)	
Yes	314 (4.53%)	239 (4.22%)	
Hypertension, n (%)			0.25 (0.22, 0.29)
No	3908 (56.22%)	3878 (68.37%)	
Yes	3043 (43.78%)	1794 (31.63%)	
Diabetes, n (%)			0.24 (0.20, 0.27)
No	5979 (86.56%)	5293 (93.58%)	
Yes	928 (13.44%)	363 (6.42%)	
Drinking status, n (%)			0.02 (-0.01, 0.06)
No	4520 (64.81%)	3619 (63.69%)	
Yes	2454 (35.19%)	2063 (36.31%)	
Smoking status, n (%)			0.05 (0.01, 0.08)
No	4730 (67.99%)	3635 (70.12%)	
Yes	2227 (32.01%)	1549 (29.88%)	

Abbreviations as in Table 1.

Table S4: Comparing baseline characteristics of participants with and without missing TyG and its obesity derivatives in the third wave (2015) of CHARLS.

	Complete group	Missing group	Standardized difference, % (95% CI)
No. of subjects	6812	5915	
Age, years	61.00 (55.00-67.00)	61.00 (53.00-69.00)	0.07 (0.04, 0.11)
Glucose, mmol/L	95.50 (88.29-106.31)	95.50 (90.09-115.32)	0.13 (-0.03, 0.28)
Cr, mg/dL	0.76 (0.66-0.89)	0.76 (0.65-0.88)	0.01 (-0.16, 0.17)
TC, mg/dL	181.08 (159.46-205.02)	183.01 (161.00-202.90)	0.06 (-0.11, 0.23)
TG, mg/dL	111.50 (80.53-166.37)	123.01 (89.38-187.61)	0.11 (-0.05, 0.28)
HDL-C, mg/dL	50.58 (43.63-58.30)	49.81 (41.31-58.30)	0.14 (-0.02, 0.31)
LDL-C, mg/dL	100.39 (82.63-118.92)	99.61 (82.63-121.43)	0.09 (-0.07, 0.26)
hs-CRP, mg/L	1.40 (0.70-2.60)	1.60 (0.85-3.05)	0.14 (-0.03, 0.30)
HbA1c, %	5.97 (1.00)	5.84 (0.60)	0.15 (0.00, 0.31)
UA, mg/dL	4.80 (3.90-5.70)	5.05 (4.10-5.80)	0.12 (-0.04, 0.28)
Height, m	1.58 (0.08)	1.57 (0.09)	0.07 (0.02, 0.13)
Weight, kg	57.90 (51.27-65.50)	56.50 (49.60-65.00)	0.08 (0.03, 0.14)
WC, cm	84.49 (13.05)	85.00 (13.31)	0.04 (-0.02, 0.09)
Sex, n (%)			0.08 (0.04, 0.11)
Male	3320 (48.74%)	3116 (52.70%)	
Female	3492 (51.26%)	2797 (47.30%)	
Marital status, n (%)			0.03 (-0.01, 0.07)
Married	5869 (86.16%)	3008 (84.97%)	
Other	943 (13.84%)	532 (15.03%)	
Living Place, n (%)			0.08 (0.04, 0.12)
Village	4526 (66.44%)	2221 (62.55%)	
City	2286 (33.56%)	1330 (37.45%)	
Education, n (%)			0.14 (0.10, 0.18)
Below primary	3136 (46.04%)	1603 (45.14%)	
Primary schools	1535 (22.53%)	682 (19.21%)	
Middle school	1474 (21.64%)	769 (21.66%)	
High school and above	667 (9.79%)	497 (14.00%)	
Kidney disease, n (%)			0.01 (-0.03, 0.05)
No	6163 (92.15%)	3167 (91.93%)	
Yes	525 (7.85%)	278 (8.07%)	
Hypertension, n (%)			0.24 (0.19, 0.28)
No	3499 (51.93%)	2189 (63.49%)	
Yes	3239 (48.07%)	1259 (36.51%)	
Diabetes, n (%)			0.28 (0.24, 0.32)
No	5590 (83.52%)	3161 (92.51%)	
Yes	1103 (16.48%)	256 (7.49%)	
Drinking status, n (%)			0.02 (-0.03, 0.06)
No	4323 (63.54%)	2255 (64.26%)	
Yes	2481 (36.46%)	1254 (35.74%)	
Smoking status, n (%)			0.01 (-0.03, 0.05)
No	4771 (70.09%)	2443 (69.52%)	
Yes	2036 (29.91%)	1071 (30.48%)	

Abbreviations as in Table 1.

Table S5: The missing number and rate of covariates.

	Non- Missing	Missing
Education	3503	2
Kidney disease	3477	28
Drinking status	3503	2
Smoking status	3497	8
Cr	3504	1
LDL-C	3498	7
HbA1C	3488	17

Abbreviations as in Table 1.

Table S6: Predictive value of glucose, TyG and its obesity derivatives for cardiovascular events by ROC analysis.

	AUC	95%CI low	95%CI upp	Best threshold	Specificity	Sensitivity
Glucose	0.54	0.5126	0.5709	109.5300	0.7203	0.3605
TyG index	0.55	0.5226	0.5794	8.4274	0.4145	0.6803
TyG-BMI	0.58* [#]	0.5489	0.6053	208.1135	0.6159	0.5034
TyG-WC	0.58* [#]	0.5549	0.6109	694.0640	0.4204	0.7120
TyG-WHtR	0.58* [#]	0.5546	0.6110	4.7761	0.6136	0.5147
TyG-WWI	0.57* [#]	0.5378	0.5950	98.1941	0.6113	0.5057
TyG-BRI	0.58* [#]	0.5550	0.6119	35.6557	0.5525	0.5828
TyG-CVAI	0.59* [#]	0.5582	0.6147	752.7493	0.4847	0.6599
TyG-ABSI	0.57* [#]	0.5267	0.5843	0.7131	0.5196	0.5669
Cumulative TyG Index	0.56	0.5360	0.5926	25.5277	0.4683	0.6440
Cumulative TyG-BMI	0.58* [#]	0.5516	0.6085	575.4994	0.4253	0.7052
Cumulative TyG-WC	0.59* [#]	0.5595	0.6162	2130.4728	0.4559	0.6984
Cumulative TyG-WHtR	0.58* [#]	0.5583	0.6156	13.4277	0.4298	0.7075
Cumulative TyG-WWI	0.58* [#]	0.5465	0.6043	300.4977	0.6704	0.4490
Cumulative TyG-BRI	0.59* [#]	0.5566	0.6144	106.0940	0.5127	0.6236
Cumulative TyG-CVAI	0.59* [#]	0.5631	0.6202	3113.0654	0.7268	0.4082
Cumulative TyG-ABSI	0.57* [#]	0.5389	0.5970	2.2209	0.6635	0.4512

Abbreviations as in Table 1. *compare with glucose; [#]compare with TyG index.

Table S7: Evaluating the incremental prognostic value of adding the TyG and its obesity derivatives to the FRS model for predicting CVD events.

Model Description	C-statistic	Δ C-statistic (<i>P</i> value)	NRI (95%CI)
FRS Only (Baseline)	0.559	[Reference]	-
FRS + TyG Index	0.576	0.017 (0.042)	0.362 (0.317, 0.407)
FRS + TyG-BMI	0.583	0.024 (0.018)	0.377 (0.330, 0.426)
FRS + TyG-WC	0.583	0.024 (0.021)	0.318 (0.269, 0.367)
FRS + TyG-WHtR	0.587	0.028 (0.016)	0.288 (0.240, 0.336)
FRS + TyG-WWI	0.573	0.014 (0.046)	0.406 (0.358, 0.453)
FRS + TyG-ABSI	0.574	0.015 (0.045)	0.406 (0.358, 0.453)
FRS + TyG-BRI	0.591	0.032 (0.008)	0.316 (0.266, 0.365)
FRS + TyG-CVAI	0.584	0.025 (0.018)	0.043 (0.379, 0.473)
FRS + Cumulative TyG Index	0.579	0.020 (0.021)	0.318 (0.272, 0.364)
FRS + Cumulative TyG-BMI	0.587	0.028 (0.014)	0.313 (0.264, 0.362)
FRS + Cumulative TyG-WC	0.589	0.030 (0.011)	0.382 (0.331, 0.433)
FRS + Cumulative TyG-WHtR	0.592	0.033 (0.009)	0.362 (0.312, 0.412)
FRS + Cumulative TyG-WWI	0.582	0.023 (0.035)	0.380 (0.332, 0.429)
FRS + Cumulative TyG-ABSI	0.583	0.024 (0.032)	0.320 (0.274, 0.677)
FRS + Cumulative TyG-BRI	0.594	0.035 (0.006)	0.265 (0.215, 0.315)
FRS + Cumulative TyG-CVAI	0.589	0.030 (0.010)	0.357 (0.309, 0.405)

Abbreviations: NRI: net reclassification index; FRS: Framingham Risk Score; other abbreviations as in Table 1.

Table S8 (Sensitivity Analysis 1): Association between TyG and its obesity derivatives control trajectories and CVD in sex subgroups.

	Sex	OR (95% CI)
TyG index control trajectory		
Class 1	Male	Ref.
Class 2	Male	1.61 (1.13, 2.30)
Class 3	Male	1.49 (0.84, 2.62)
Class 1	Female	0.51 (0.06, 4.33)
Class 2	Female	0.55 (0.06, 4.75)
Class 3	Female	0.81 (0.09, 7.23)
<i>P</i> -interaction		0.1314
TyG-BMI control trajectory		
Class 1	Male	Ref.
Class 2	Male	1.40 (0.96, 2.05)
Class 3	Male	2.41 (1.50, 3.89)
Class 1	Female	0.44 (0.05, 3.81)
Class 2	Female	0.63 (0.07, 5.44)
Class 3	Female	0.88 (0.10, 7.53)
<i>P</i> -interaction		0.7271
TyG-WC control trajectory		
Class 1	Male	Ref.
Class 2	Male	1.70 (1.16, 2.49)
Class 3	Male	2.13 (1.33, 3.42)
Class 1	Female	0.50 (0.06, 4.28)
Class 2	Female	0.78 (0.09, 6.68)
Class 3	Female	0.95 (0.11, 8.27)
<i>P</i> -interaction		0.9288
TyG-WHtR control trajectory		
Class 1	Male	Ref.
Class 2	Male	1.37 (0.96, 1.97)
Class 3	Male	2.08 (1.26, 3.42)
Class 1	Female	0.47 (0.06, 3.96)
Class 2	Female	0.65 (0.08, 5.49)
Class 3	Female	0.77 (0.09, 6.60)
<i>P</i> -interaction		0.6718
TyG-WWI control trajectory		
Class 1	Male	Ref.
Class 2	Male	1.19 (0.84, 1.70)
Class 3	Male	1.27 (0.72, 2.24)
Class 1	Female	0.47 (0.06, 3.94)
Class 2	Female	0.51 (0.06, 4.34)
Class 3	Female	0.58 (0.07, 5.23)
<i>P</i> -interaction		0.9230
TyG-ABSI control trajectory		
Class 1	Male	Ref.
Class 2	Male	1.05 (0.74, 1.49)
Class 3	Male	1.25 (0.74, 2.10)
Class 1	Female	0.52 (0.06, 4.37)
Class 2	Female	0.57 (0.07, 4.98)
Class 3	Female	0.73 (0.08, 6.66)
<i>P</i> -interaction		0.9350
TyG-BRI control trajectory		
Class 1	Male	Ref.
Class 2	Male	1.32 (0.92, 1.89)
Class 3	Male	2.06 (1.25, 3.40)
Class 1	Female	0.46 (0.05, 3.89)
Class 2	Female	0.63 (0.08, 5.30)
Class 3	Female	0.77 (0.09, 6.56)
<i>P</i> -interaction		0.6947
TyG-CVAII control trajectory		
Class 1	Male	Ref.
Class 2	Male	1.58 (1.07, 2.33)
Class 3	Male	2.34 (1.52, 3.61)
Class 1	Female	0.69 (0.08, 5.88)
Class 2	Female	0.91 (0.10, 7.99)
Class 3	Female	1.16 (0.13, 10.63)
<i>P</i> -interaction		0.5690

Abbreviations: OR: Odds ratios; CI: confidence interval; other abbreviations as in Table 1.

Note: Models adjusted for the same covariates as in model III (Table 2), except for the stratification variable.

Table S9 (Sensitivity Analysis 1): Association between TyG and its obesity derivatives control trajectories and CVD in age subgroups.

	Age groups (years)	OR (95% CI)
TyG index control trajectory		
Class 1	<60	Ref.
Class 2	<60	1.49 (1.08, 2.07)
Class 3	<60	1.33 (0.84, 2.12)
Class 1	≥60	1.66 (0.32, 8.49)
Class 2	≥60	1.83 (0.34, 9.87)
Class 3	≥60	3.59 (0.62, 20.70)
<i>P</i> -interaction		0.3150
TyG-BMI control trajectory		
Class 1	<60	Ref.
Class 2	<60	1.27 (0.88, 1.83)
Class 3	<60	1.90 (1.26, 2.86)
Class 1	≥60	1.62 (0.31, 8.32)
Class 2	≥60	2.70 (0.51, 14.37)
Class 3	≥60	3.94 (0.71, 21.89)
<i>P</i> -interaction		0.5652
TyG-WC control trajectory		
Class 1	<60	Ref.
Class 2	<60	1.62 (1.14, 2.31)
Class 3	<60	1.77 (1.18, 2.67)
Class 1	≥60	1.77 (0.34, 9.07)
Class 2	≥60	2.89 (0.55, 15.30)
Class 3	≥60	4.18 (0.76, 23.13)
<i>P</i> -interaction		0.5289
TyG-WHtR control trajectory		
Class 1	<60	Ref.
Class 2	<60	1.36 (0.95, 1.94)
Class 3	<60	1.78 (1.18, 2.68)
Class 1	≥60	1.52 (0.30, 7.74)
Class 2	≥60	2.21 (0.42, 11.64)
Class 3	≥60	2.69 (0.49, 14.92)
<i>P</i> -interaction		0.9471
TyG-WWI control trajectory		
Class 1	<60	Ref.
Class 2	<60	1.23 (0.88, 1.72)
Class 3	<60	1.35 (0.87, 2.10)
Class 1	≥60	1.46 (0.29, 7.38)
Class 2	≥60	1.51 (0.29, 7.91)
Class 3	≥60	1.74 (0.31, 9.70)
<i>P</i> -interaction		0.8083
TyG-ABSI control trajectory		
Class 1	<60	Ref.
Class 2	<60	1.02 (0.74, 1.40)
Class 3	<60	1.23 (0.80, 1.90)
Class 1	≥60	1.45 (0.29, 7.33)
Class 2	≥60	1.66 (0.32, 8.61)
Class 3	≥60	2.19 (0.40, 12.03)
<i>P</i> -interaction		0.8159
TyG-BRI control trajectory		
Class 1	<60	Ref.
Class 2	<60	1.35 (0.95, 1.90)
Class 3	<60	1.69 (1.12, 2.54)
Class 1	≥60	1.64 (0.32, 8.37)
Class 2	≥60	2.29 (0.44, 12.01)
Class 3	≥60	3.10 (0.56, 17.04)
<i>P</i> -interaction		0.9330
TyG-CVAII control trajectory		
Class 1	<60	Ref.
Class 2	<60	1.55 (1.10, 2.18)
Class 3	<60	1.80 (1.20, 2.71)
Class 1	≥60	1.74 (0.34, 8.92)
Class 2	≥60	2.34 (0.44, 12.27)
Class 3	≥60	3.69 (0.68, 20.11)
<i>P</i> -interaction		0.4849

Abbreviations: OR: Odds ratios; CI: confidence interval; other abbreviations as in Table 1.

Note: Models adjusted for the same covariates as in model III (Table 2), except for the stratification variable.

Table S10 (Sensitivity Analysis 1): Association between TyG and its obesity derivatives control trajectories and CVD in hypertension subgroups.

	Hypertension	OR (95% CI)
TyG index control trajectory		
Class 1	No	Ref.
Class 2	No	1.33 (0.96, 1.86)
Class 3	No	1.85 (1.11, 3.06)
Class 1	Yes	25.68 (2.82, 233.86)
Class 2	Yes	31.77 (3.42, 294.97)
Class 3	Yes	37.02 (3.89, 352.25)
<i>P</i> -interaction		0.7728
TyG-BMI control trajectory		
Class 1	No	Ref.
Class 2	No	1.77 (1.24, 2.55)
Class 3	No	2.72 (1.74, 4.26)
Class 1	Yes	36.95 (3.85, 354.51)
Class 2	Yes	40.94 (4.33, 387.37)
Class 3	Yes	61.22 (6.49, 577.08)
<i>P</i> -interaction		0.1651
TyG-WC control trajectory		
Class 1	No	Ref.
Class 2	No	1.76 (1.24, 2.49)
Class 3	No	2.20 (1.40, 3.46)
Class 1	Yes	26.11 (2.80, 243.69)
Class 2	Yes	37.51 (4.03, 349.29)
Class 3	Yes	47.42 (5.08, 442.28)
<i>P</i> -interaction		0.7266
TyG-WHtR control trajectory		
Class 1	No	Ref.
Class 2	No	1.29 (0.90, 1.83)
Class 3	No	1.79 (1.15, 2.81)
Class 1	Yes	23.89 (2.59, 220.03)
Class 2	Yes	35.39 (3.84, 325.82)
Class 3	Yes	43.88 (4.68, 411.35)
<i>P</i> -interaction		0.8364
TyG-WWI control trajectory		
Class 1	No	Ref.
Class 2	No	0.92 (0.65, 1.31)
Class 3	No	1.48 (0.93, 2.34)
Class 1	Yes	21.05 (2.28, 194.35)
Class 2	Yes	29.18 (3.11, 273.53)
Class 3	Yes	28.18 (2.87, 277.00)
<i>P</i> -interaction		0.1054
TyG-ABSI control trajectory		
Class 1	No	Ref.
Class 2	No	0.90 (0.65, 1.26)
Class 3	No	1.34 (0.83, 2.16)
Class 1	Yes	27.78 (3.02, 255.94)
Class 2	Yes	35.36 (3.75, 333.11)
Class 3	Yes	42.92 (4.36, 422.84)
<i>P</i> -interaction		0.3745
TyG-BRI control trajectory		
Class 1	No	Ref.
Class 2	No	1.35 (0.95, 1.91)
Class 3	No	1.97 (1.26, 3.10)
Class 1	Yes	26.66 (2.91, 244.03)
Class 2	Yes	34.73 (3.80, 317.78)
Class 3	Yes	44.25 (4.73, 413.68)
<i>P</i> -interaction		0.8370
TyG-CVAI control trajectory		
Class 1	No	Ref.
Class 2	No	1.52 (1.07, 2.15)
Class 3	No	2.04 (1.31, 3.18)
Class 1	Yes	24.13 (2.63, 221.41)
Class 2	Yes	32.10 (3.45, 298.35)
Class 3	Yes	45.14 (4.77, 426.74)
<i>P</i> -interaction		0.8892

Abbreviations: OR: Odds ratios; CI: confidence interval; other abbreviations as in Table 1.

Note: Models adjusted for the same covariates as in model III (Table 2), except for the stratification variable.

Table S11 (Sensitivity Analysis 1): Association between TyG and its obesity derivatives control trajectories and CVD in kidney disease subgroups.

	Kidney disease	OR (95% CI)
TyG index control trajectory		
Class 1	No	Ref.
Class 2	No	1.31 (1.03, 1.67)
Class 3	No	1.65 (1.18, 2.32)
Class 1	Yes	6.44 (0.02, 2358.99)
Class 2	Yes	7.92 (0.01, 4430.14)
Class 3	Yes	13.01 (0.02, 11220.75)
<i>P</i> -interaction		0.9620
TyG-BMI control trajectory		
Class 1	No	Ref.
Class 2	No	1.48 (1.13, 1.93)
Class 3	No	2.11 (1.55, 2.88)
Class 1	Yes	9.83 (0.03, 3098.08)
Class 2	Yes	5.96 (0.02, 2286.63)
Class 3	Yes	24.02 (0.05, 10772.84)
<i>P</i> -interaction		0.3086
TyG-WC control trajectory		
Class 1	No	Ref.
Class 2	No	1.68 (1.29, 2.18)
Class 3	No	2.07 (1.52, 2.82)
Class 1	Yes	6.50 (0.02, 2172.18)
Class 2	Yes	6.84 (0.01, 3313.64)
Class 3	Yes	11.12 (0.02, 6122.09)
<i>P</i> -interaction		0.8081
TyG-WHtR control trajectory		
Class 1	No	Ref.
Class 2	No	1.46 (1.12, 1.91)
Class 3	No	1.80 (1.31, 2.48)
Class 1	Yes	5.57 (0.02, 1946.23)
Class 2	Yes	2.42 (0.01, 1027.94)
Class 3	Yes	4.85 (0.01, 2963.29)
<i>P</i> -interaction		0.3010
TyG-WWI control trajectory		
Class 1	No	Ref.
Class 2	No	1.15 (0.89, 1.50)
Class 3	No	1.32 (0.95, 1.83)
Class 1	Yes	3.96 (0.01, 1533.14)
Class 2	Yes	4.12 (0.01, 2122.53)
Class 3	Yes	4.60 (0.01, 3501.90)
<i>P</i> -interaction		0.9864
TyG-BRI control trajectory		
Class 1	No	Ref.
Class 2	No	1.40 (1.08, 1.82)
Class 3	No	1.77 (1.30, 2.42)
Class 1	Yes	8.25 (0.03, 2559.10)
Class 2	Yes	4.24 (0.01, 1478.38)
Class 3	Yes	10.32 (0.02, 5273.35)
<i>P</i> -interaction		0.3994
TyG-CVAI control trajectory		
Class 1	No	Ref.
Class 2	No	1.46 (1.12, 1.91)
Class 3	No	2.01 (1.49, 2.72)
Class 1	Yes	4.77 (0.01, 2403.35)
Class 2	Yes	9.57 (0.01, 6751.33)
Class 3	Yes	7.67 (0.01, 8675.37)
<i>P</i> -interaction		0.7676
TyG-ABSI control trajectory		
Class 1	No	Ref.
Class 2	No	1.08 (0.85, 1.39)
Class 3	No	1.39 (1.01, 1.92)
Class 1	Yes	4.81 (0.01, 2081.83)
Class 2	Yes	5.85 (0.01, 3683.65)
Class 3	Yes	6.94 (0.01, 6758.05)
<i>P</i> -interaction		0.9854

Abbreviations: OR: Odds ratios; CI: confidence interval; other abbreviations as in Table 1.

Note: Models adjusted for the same covariates as in model III (Table 2), except for the stratification variable.

Table S12 (Sensitivity Analysis 1): Association between TyG and its obesity derivatives control trajectories and CVD in diabetes subgroups.

	Diabetes	OR (95% CI)
TyG index control trajectory		
Class 1	No	Ref.
Class 2	No	1.28 (1.00, 1.63)
Class 3	No	1.50 (1.02, 2.21)
Class 1	Yes	0.05 (0.00, 1.35)
Class 2	Yes	0.12 (0.00, 3.21)
Class 3	Yes	0.15 (0.01, 3.95)
<i>P</i> -interaction		0.4250
TyG-BMI control trajectory		
Class 1	No	Ref.
Class 2	No	1.53 (1.16, 2.00)
Class 3	No	1.97 (1.41, 2.74)
Class 1	Yes	0.09 (0.00, 2.47)
Class 2	Yes	0.08 (0.00, 2.11)
Class 3	Yes	0.21 (0.01, 5.53)
<i>P</i> -interaction		0.0825
TyG-WC control trajectory		
Class 1	No	Ref.
Class 2	No	1.68 (1.29, 2.20)
Class 3	No	1.84 (1.32, 2.56)
Class 1	Yes	0.08 (0.00, 2.00)
Class 2	Yes	0.11 (0.00, 2.87)
Class 3	Yes	0.21 (0.01, 5.44)
<i>P</i> -interaction		0.2257
TyG-WHtR control trajectory		
Class 1	No	Ref.
Class 2	No	1.51 (1.15, 1.99)
Class 3	No	1.68 (1.20, 2.37)
Class 1	Yes	0.10 (0.00, 2.68)
Class 2	Yes	0.08 (0.00, 2.22)
Class 3	Yes	0.18 (0.01, 4.90)
<i>P</i> -interaction		0.1267
TyG-WWI control trajectory		
Class 1	No	Ref.
Class 2	No	1.16 (0.89, 1.52)
Class 3	No	1.27 (0.89, 1.80)
Class 1	Yes	0.07 (0.00, 1.82)
Class 2	Yes	0.13 (0.00, 3.35)
Class 3	Yes	0.14 (0.01, 4.07)
<i>P</i> -interaction		0.6464
TyG-BRI control trajectory		
Class 1	No	Ref.
Class 2	No	1.36 (1.04, 1.78)
Class 3	No	1.65 (1.18, 2.31)
Class 1	Yes	0.09 (0.00, 2.23)
Class 2	Yes	0.14 (0.01, 3.64)
Class 3	Yes	0.21 (0.01, 5.71)
<i>P</i> -interaction		0.6774
TyG-CVAI control trajectory		
Class 1	No	Ref.
Class 2	No	1.48 (1.12, 1.94)
Class 3	No	1.79 (1.30, 2.47)
Class 1	Yes	0.13 (0.00, 3.59)
Class 2	Yes	0.22 (0.01, 5.95)
Class 3	Yes	0.46 (0.02, 13.49)
<i>P</i> -interaction		0.2181
TyG-ABSI control trajectory		
Class 1	No	Ref.
Class 2	No	1.06 (0.83, 1.37)
Class 3	No	1.27 (0.89, 1.81)
Class 1	Yes	0.06 (0.00, 1.73)
Class 2	Yes	0.15 (0.01, 3.95)
Class 3	Yes	0.19 (0.01, 5.49)
<i>P</i> -interaction		0.2906

Abbreviations: OR: Odds ratios; CI: confidence interval; other abbreviations as in Table 1.

Note: Models adjusted for the same covariates as in model III (Table 2), except for the stratification variable.

Table S13 (Sensitivity Analysis 1): Association between TyG and its obesity derivatives control trajectories and CVD in drinking status subgroups.

	Drinking status	OR (95% CI)
TyG index control trajectory		
Class 1	No	Ref.
Class 2	No	1.08 (0.80, 1.45)
Class 3	No	1.64 (1.10, 2.43)
Class 1	Yes	0.27 (0.03, 2.74)
Class 2	Yes	0.49 (0.05, 5.10)
Class 3	Yes	0.40 (0.04, 4.45)
<i>P</i> -interaction		0.1472
TyG-BMI control trajectory		
Class 1	No	Ref.
Class 2	No	1.40 (1.00, 1.94)
Class 3	No	2.10 (1.45, 3.04)
Class 1	Yes	0.32 (0.03, 3.31)
Class 2	Yes	0.50 (0.05, 5.22)
Class 3	Yes	0.72 (0.07, 7.58)
<i>P</i> -interaction		0.9046
TyG-WC control trajectory		
Class 1	No	Ref.
Class 2	No	1.39 (1.01, 1.92)
Class 3	No	1.96 (1.36, 2.82)
Class 1	Yes	0.30 (0.03, 3.04)
Class 2	Yes	0.64 (0.06, 6.65)
Class 3	Yes	0.63 (0.06, 6.68)
<i>P</i> -interaction		0.1909
TyG-WHtR control trajectory		
Class 1	No	Ref.
Class 2	No	1.39 (0.99, 1.96)
Class 3	No	1.79 (1.22, 2.63)
Class 1	Yes	0.31 (0.03, 3.13)
Class 2	Yes	0.46 (0.04, 4.79)
Class 3	Yes	0.56 (0.05, 6.07)
<i>P</i> -interaction		0.9605
TyG-WWI control trajectory		
Class 1	No	Ref.
Class 2	No	1.12 (0.80, 1.56)
Class 3	No	1.35 (0.91, 2.01)
Class 1	Yes	0.28 (0.03, 2.85)
Class 2	Yes	0.35 (0.03, 3.72)
Class 3	Yes	0.33 (0.03, 3.92)
<i>P</i> -interaction		0.7466
TyG-BRI control trajectory		
Class 1	No	Ref.
Class 2	No	1.35 (0.97, 1.88)
Class 3	No	1.73 (1.19, 2.52)
Class 1	Yes	0.33 (0.03, 3.26)
Class 2	Yes	0.46 (0.05, 4.76)
Class 3	Yes	0.63 (0.06, 6.85)
<i>P</i> -interaction		0.9428
TyG-CVAI control trajectory		
Class 1	No	Ref.
Class 2	No	1.22 (0.88, 1.69)
Class 3	No	1.83 (1.27, 2.65)
Class 1	Yes	0.24 (0.02, 2.40)
Class 2	Yes	0.49 (0.05, 5.06)
Class 3	Yes	0.56 (0.05, 5.99)
<i>P</i> -interaction		0.1566
TyG-ABSI control trajectory		
Class 1	No	Ref.
Class 2	No	1.09 (0.80, 1.49)
Class 3	No	1.39 (0.94, 2.05)
Class 1	Yes	0.31 (0.03, 3.22)
Class 2	Yes	0.33 (0.03, 3.58)
Class 3	Yes	0.45 (0.04, 5.27)
<i>P</i> -interaction		0.9780

Abbreviations: OR: Odds ratios; CI: confidence interval; other abbreviations as in Table 1.

Note: Models adjusted for the same covariates as in model III (Table 2), except for the stratification variable.

Table S14 (Sensitivity Analysis 1): Association between TyG and its obesity derivatives control trajectories and CVD in smoking status subgroups.

	Smoking status	OR (95% CI)
TyG index control trajectory		
Class 1	No	Ref.
Class 2	No	1.07 (0.81, 1.42)
Class 3	No	1.49 (1.01, 2.20)
Class 1	Yes	49.97 (4.30, 580.53)
Class 2	Yes	98.95 (8.20, 1193.96)
Class 3	Yes	93.43 (7.27, 1201.36)
<i>P</i> -interaction		0.0572
TyG-BMI control trajectory		
Class 1	No	Ref.
Class 2	No	1.30 (0.95, 1.80)
Class 3	No	2.17 (1.52, 3.10)
Class 1	Yes	66.03 (5.60, 778.43)
Class 2	Yes	118.87 (9.85, 1434.91)
Class 3	Yes	129.43 (10.49, 1596.41)
<i>P</i> -interaction		0.3048
TyG-WC control trajectory		
Class 1	No	Ref.
Class 2	No	1.62 (1.18, 2.22)
Class 3	No	2.03 (1.42, 2.91)
Class 1	Yes	60.94 (5.26, 706.52)
Class 2	Yes	102.41 (8.53, 1230.05)
Class 3	Yes	126.99 (10.36, 1556.21)
<i>P</i> -interaction		0.9914
TyG-WHtR control trajectory		
Class 1	No	Ref.
Class 2	No	1.37 (0.98, 1.91)
Class 3	No	1.69 (1.16, 2.45)
Class 1	Yes	55.50 (4.84, 637.09)
Class 2	Yes	79.61 (6.66, 951.17)
Class 3	Yes	121.27 (9.71, 1513.99)
<i>P</i> -interaction		0.7594
TyG-WWI control trajectory		
Class 1	No	Ref.
Class 2	No	1.24 (0.90, 1.71)
Class 3	No	1.31 (0.89, 1.93)
Class 1	Yes	56.25 (4.88, 648.72)
Class 2	Yes	57.00 (4.63, 702.28)
Class 3	Yes	85.29 (6.41, 1134.40)
<i>P</i> -interaction		0.5329
TyG-BRI control trajectory		
Class 1	No	Ref.
Class 2	No	1.34 (0.97, 1.84)
Class 3	No	1.72 (1.19, 2.47)
Class 1	Yes	54.58 (4.78, 623.83)
Class 2	Yes	76.93 (6.48, 914.00)
Class 3	Yes	112.42 (9.00, 1404.54)
<i>P</i> -interaction		0.8812
TyG-CVAI control trajectory		
Class 1	No	Ref.
Class 2	No	1.36 (0.99, 1.87)
Class 3	No	1.81 (1.26, 2.61)
Class 1	Yes	49.89 (4.29, 580.49)
Class 2	Yes	82.67 (6.80, 1005.35)
Class 3	Yes	119.62 (9.52, 1502.97)
<i>P</i> -interaction		0.6681
TyG-ABSI control trajectory		
Class 1	No	Ref.
Class 2	No	1.15 (0.86, 1.55)
Class 3	No	1.42 (0.97, 2.07)
Class 1	Yes	46.44 (4.03, 535.24)
Class 2	Yes	44.60 (3.61, 551.70)
Class 3	Yes	60.22 (4.58, 792.19)
<i>P</i> -interaction		0.7907

Abbreviations: OR: Odds ratios; CI: confidence interval; other abbreviations as in Table 1.

Note: Models adjusted for the same covariates as in model III (Table 2), except for the stratification variable.

Table S15 (Sensitivity Analysis 2): Association between longitudinal trajectories in TyG and its obesity derivatives and CVD events.

	OR (95% CI)
Cumulative TyG index (Per SD increase)	1.12 (0.96, 1.32)
Cumulative TyG-BMI (Per SD increase)	1.21 (1.08, 1.46)
Cumulative TyG-WC (Per SD increase)	1.22 (1.05, 1.42)
Cumulative TyG-WHtR (Per SD increase)	1.21 (1.03, 1.42)
Cumulative TyG-WWI (Per SD increase)	1.10 (0.94, 1.30)
Cumulative TyG-ABSI (Per SD increase)	1.06 (0.90, 1.24)
Cumulative TyG-BRI (Per SD increase)	1.20 (1.03, 1.40)
Cumulative TyG-CVAI (Per SD increase)	1.22 (1.05, 1.41)
Cumulative TyG index tertile groups	
T1	1.0
T2	1.43 (0.99, 2.07)
T3	1.38 (0.93, 2.05)
Cumulative TyG-BMI tertile groups	
T1	1.0
T2	1.42 (0.97, 2.08)
T3	1.60 (1.22, 2.65)
Cumulative TyG-WC tertile groups	
T1	1.0
T2	1.41 (0.97, 2.06)
T3	1.73 (1.18, 2.54)
Cumulative TyG-WHtR tertile groups	
T1	1.0
T2	1.32 (0.90, 1.93)
T3	1.67 (1.13, 2.49)
Cumulative TyG-WWI tertile groups	
T1	1.0
T2	0.95 (0.66, 1.39)
T3	1.27 (0.86, 1.88)
Cumulative TyG-ABSI tertile groups	
T1	1.0
T2	1.00 (0.70, 1.45)
T3	1.23 (0.85, 1.80)
Cumulative TyG-BRI tertile groups	
T1	1.0
T2	1.23 (0.84, 1.79)
T3	1.45 (0.98, 2.14)
Cumulative TyG-CVAI tertile groups	
T1	1.0
T2	1.15 (0.79, 1.69)
T3	1.63 (1.12, 2.37)
TyG index control trajectory	
Class 1	1.0
Class 2	1.31 (0.94, 1.81)
Class 3	1.82 (1.17, 2.84)
TyG-BMI control trajectory	
Class 1	1.0
Class 2	1.40 (0.98, 2.01)
Class 3	1.84 (1.49, 2.77)
TyG-WC control trajectory	
Class 1	1.0
Class 2	1.39 (0.98, 1.97)
Class 3	1.87 (1.25, 2.79)
TyG-WHtR control trajectory	
Class 1	1.0
Class 2	1.29 (0.91, 1.84)
Class 3	1.57 (1.03, 2.39)
TyG-WWI control trajectory	
Class 1	1.0
Class 2	1.01 (0.71, 1.42)
Class 3	1.18 (0.77, 1.83)
TyG-ABSI control trajectory	
Class 1	1.0
Class 2	1.01 (0.72, 1.40)
Class 3	1.27 (0.83, 1.94)
TyG-BRI control trajectory	
Class 1	1.0
Class 2	1.35 (0.96, 1.91)
Class 3	1.56 (1.03, 2.37)
TyG-CVAI control trajectory	
Class 1	1.0
Class 2	1.35 (0.94, 1.94)

Class 3 2.03 (1.37, 3.02)

Abbreviations: OR: Odds ratios; CI: confidence interval; other abbreviations as in Table 1.

Note: Models adjusted for the same covariates as in model III (Table 2), except for the stratification variable.

Table S16 (Sensitivity Analysis 3): Association between longitudinal trajectories in TyG and its obesity derivatives and CVD events.

	OR (95% CI)
Cumulative TyG index (Per SD increase)	1.16 (1.04, 1.30)
Cumulative TyG-BMI (Per SD increase)	1.26 (1.13, 1.40)
Cumulative TyG-WC (Per SD increase)	1.28 (1.15, 1.43)
Cumulative TyG-WHtR (Per SD increase)	1.27 (1.13, 1.42)
Cumulative TyG-WWI (Per SD increase)	1.19 (1.06, 1.35)
Cumulative TyG-ABSI (Per SD increase)	1.16 (1.03, 1.29)
Cumulative TyG-BRI (Per SD increase)	1.25 (1.12, 1.40)
Cumulative TyG-CVAI (Per SD increase)	1.27 (1.14, 1.41)
Cumulative TyG index tertile groups	
T1	1.0
T2	1.36 (1.04, 1.78)
T3	1.40 (1.06, 1.86)
Cumulative TyG-BMI tertile groups	
T1	1.0
T2	1.51 (1.15, 1.98)
T3	1.69 (1.27, 2.25)
Cumulative TyG-WC tertile groups	
T1	1.0
T2	1.59 (1.21, 2.09)
T3	1.80 (1.35, 2.38)
Cumulative TyG-WHtR tertile groups	
T1	1.0
T2	1.38 (1.05, 1.82)
T3	1.62 (1.21, 2.16)
Cumulative TyG-WWI tertile groups	
T1	1.0
T2	1.06 (0.81, 1.39)
T3	1.38 (1.04, 1.84)
Cumulative TyG-ABSI tertile groups	
T1	1.0
T2	1.06 (0.81, 1.39)
T3	1.32 (1.00, 1.74)
Cumulative TyG-BRI tertile groups	
T1	1.0
T2	1.29 (0.98, 1.70)
T3	1.58 (1.19, 2.10)
Cumulative TyG-CVAI tertile groups	
T1	1.0
T2	1.32 (1.00, 1.74)
T3	1.74 (1.32, 2.30)
TyG index control trajectory	
Class 1	1.0
Class 2	1.28 (1.02, 1.62)
Class 3	1.61 (1.16, 2.24)
TyG-BMI control trajectory	
Class 1	1.0
Class 2	1.43 (1.10, 1.85)
Class 3	2.03 (1.58, 2.87)
TyG-WC control trajectory	
Class 1	1.0
Class 2	1.63 (1.26, 2.10)
Class 3	2.02 (1.50, 2.72)
TyG-WHtR control trajectory	
Class 1	1.0
Class 2	1.42 (1.09, 1.84)
Class 3	1.79 (1.32, 2.43)
TyG-WWI control trajectory	
Class 1	1.0
Class 2	1.16 (0.90, 1.49)
Class 3	1.31 (0.95, 1.81)
TyG-BRI control trajectory	
Class 1	1.0
Class 2	1.37 (1.06, 1.77)

	Class 3	1.80 (1.33, 2.44)
TyG-CVAI control trajectory		
	Class 1	1.0
	Class 2	1.46 (1.13, 1.90)
	Class 3	2.01 (1.50, 2.69)
TyG-ABSI control trajectory		
	Class 1	1.0
	Class 2	1.10 (0.86, 1.39)
	Class 3	1.38 (1.01, 1.88)

Abbreviations: OR: Odds ratios; CI: confidence interval; other abbreviations as in Table 1.

Note: Models adjusted for the same covariates as in model III (Table 2), except for the stratification variable.