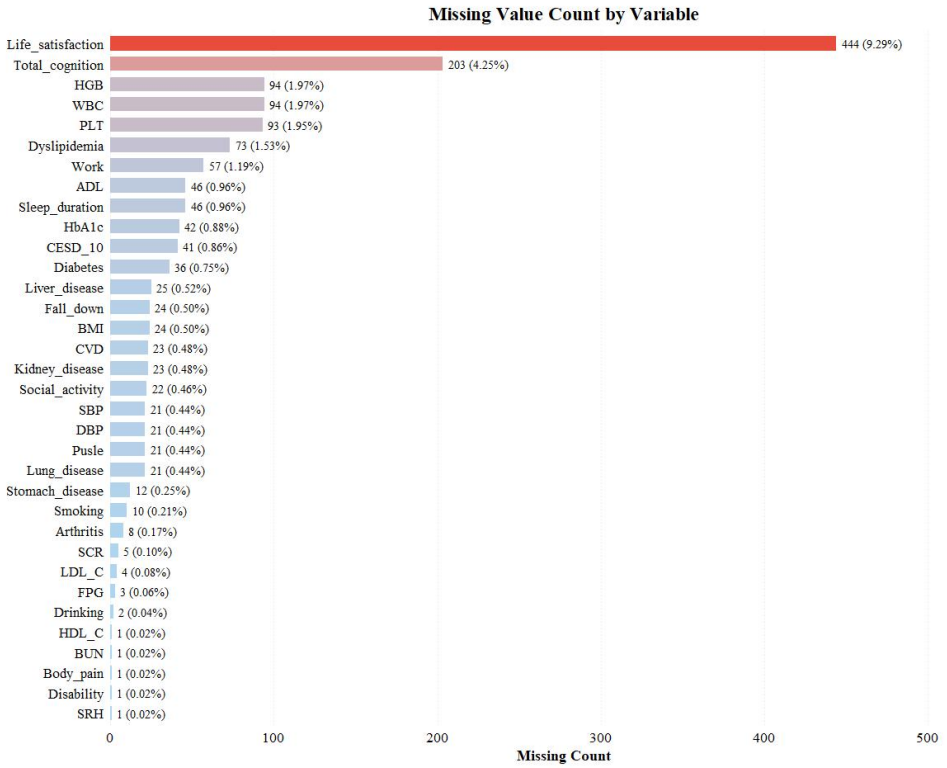
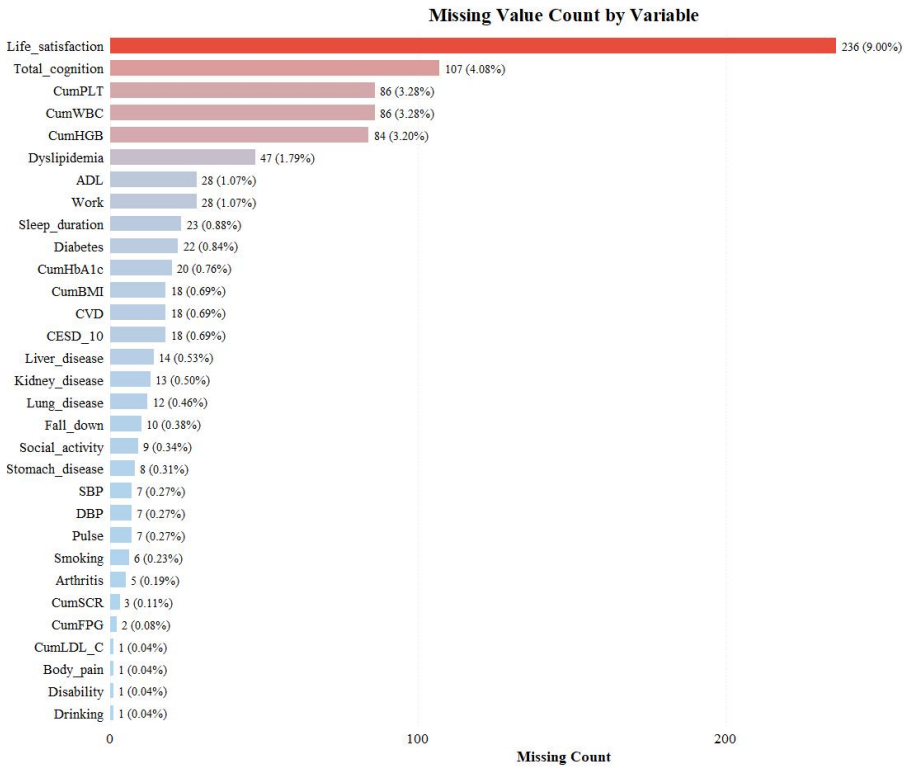
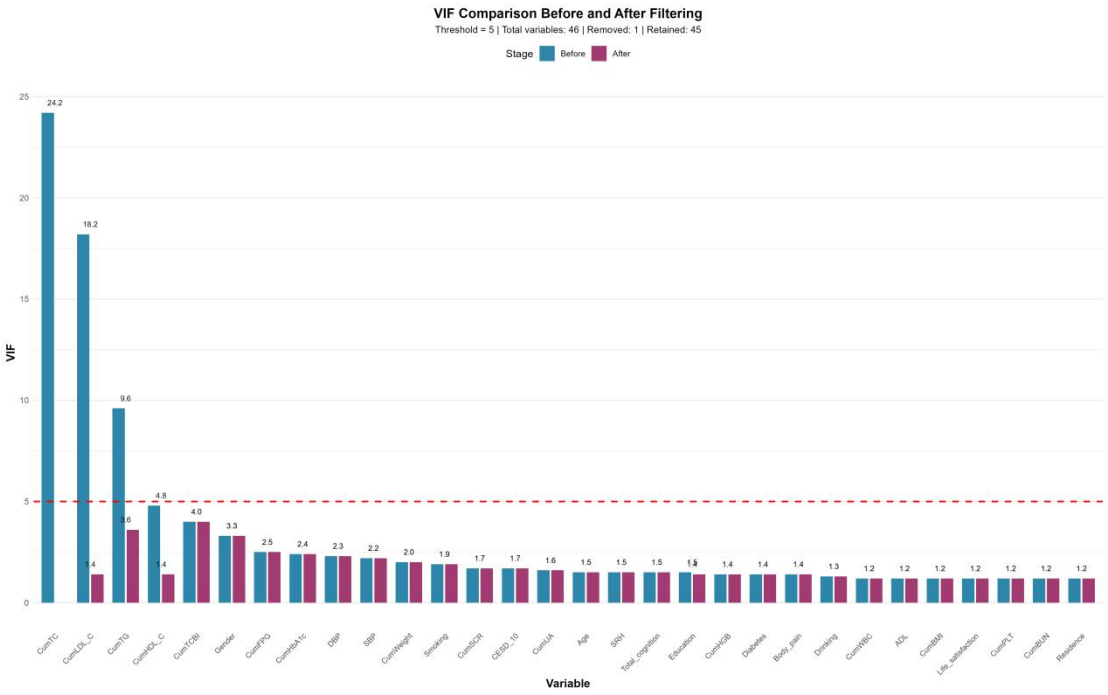


Supplementary Figure S1. Missing value distribution by variable in the baseline dataset. Bars represent the number and proportion (%) of missing values for each variable. The highest missing rate was observed for life satisfaction (9.29%), followed by total cognition (4.25%).

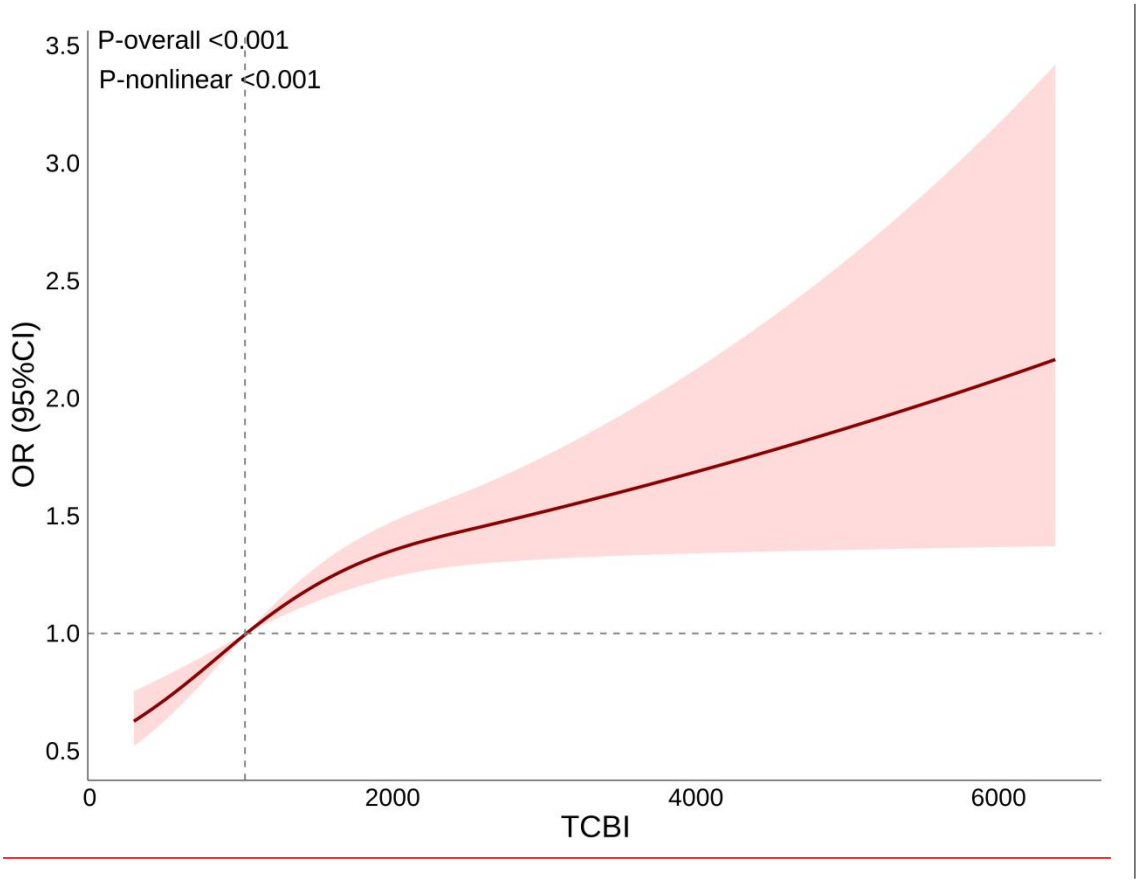


Supplementary Figure S2. Missing value distribution by variable in the cumulative and trajectory analysis dataset. Bars represent the number and proportion (%) of missing values for each variable. The

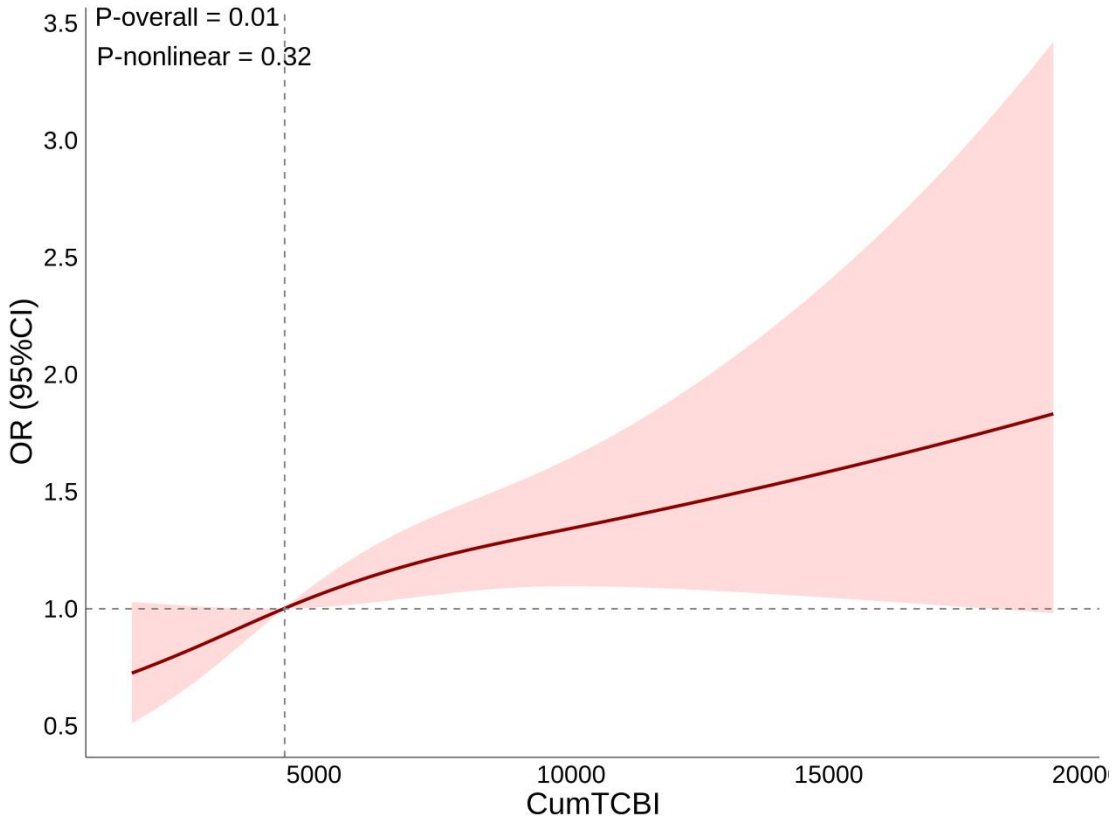
highest missing rate was observed for life satisfaction (9.00%), followed by total cognition (4.08%).



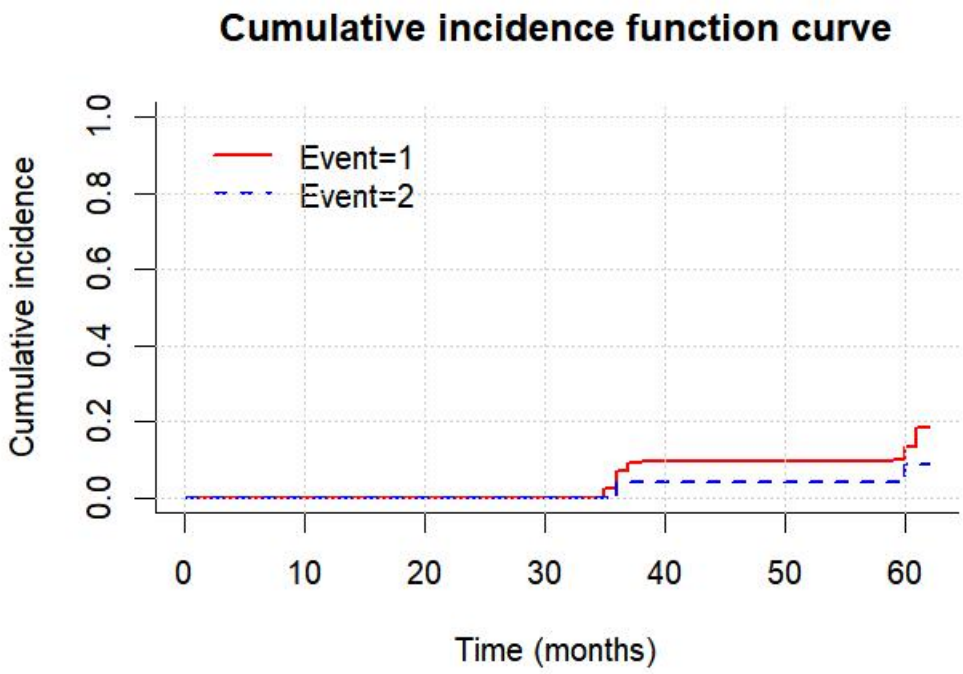
Supplementary Figure S3. Comparison of variance inflation factor (VIF) values for covariates before and after filtering in the baseline and cumulative datasets. Blue bars represent values before filtering, and red bars represent values after filtering. The red dashed line indicates the threshold of VIF = 5. After filtering, all VIF values were <5, indicating no significant multicollinearity.



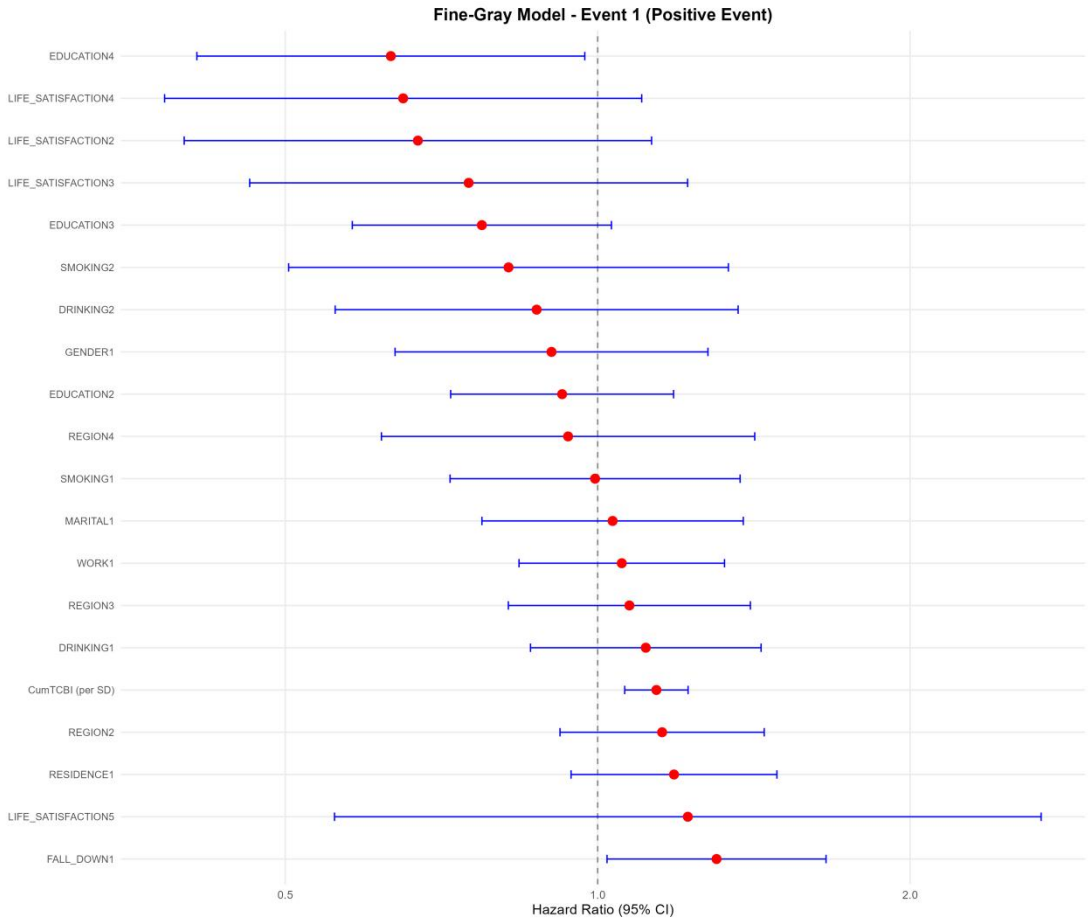
Supplementary Figure S4. Restricted cubic spline (RCS) curve for the association between baseline TCBI and the risk of new-onset hypertension using logistic regression. The solid line represents the odds ratio (OR), and the shaded area represents the 95% confidence interval. The dashed horizontal line indicates OR = 1.The model was adjusted for the same covariates as in the primary analysis.



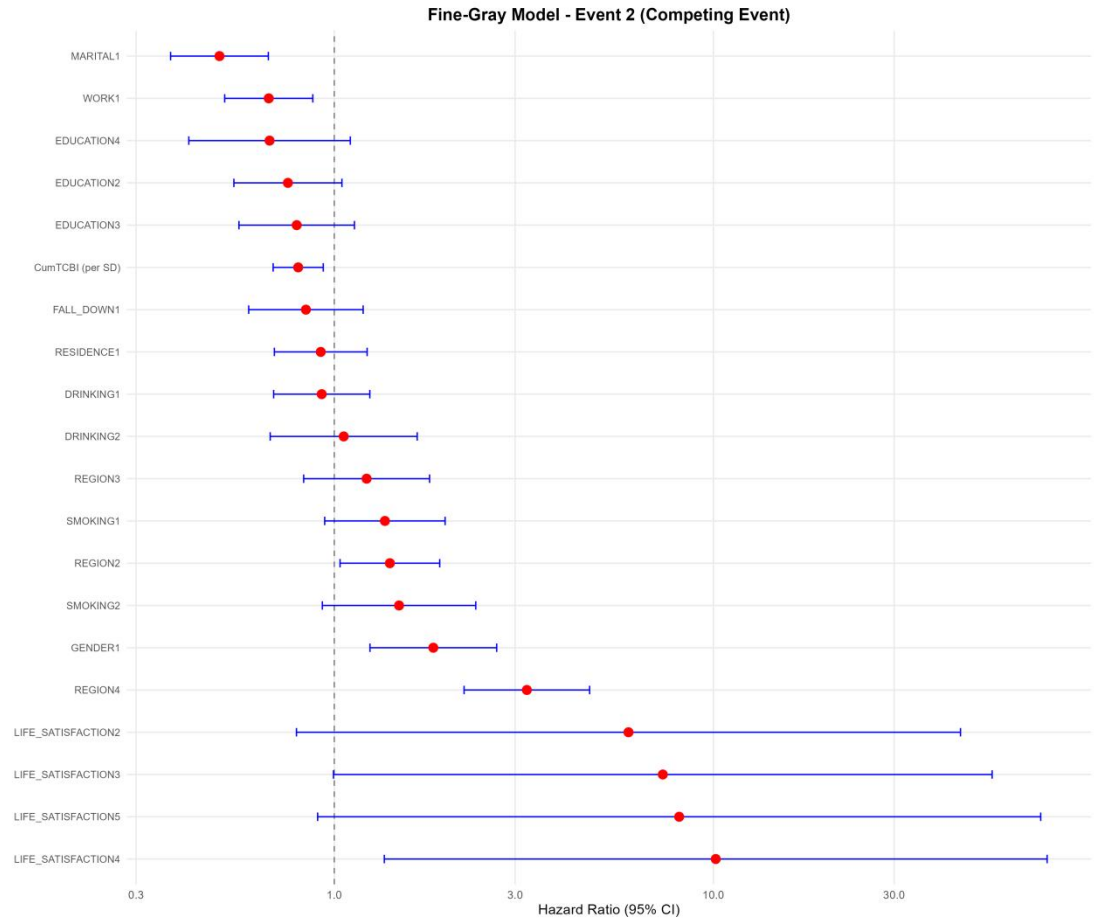
Supplementary Figure S5. Restricted cubic spline (RCS) curve for the association between cumulative TCBI and the risk of new-onset hypertension using logistic regression. The solid line represents the odds ratio (OR), and the shaded area represents the 95% confidence interval. The dashed horizontal line indicates OR = 1.



Supplementary Figure S6. Cumulative incidence function (CIF) curves for Event 1 (new-onset hypertension) and Event 2 (death, competing event) in the competing risk analysis. The red solid line represents Event 1, and the blue dashed line represents Event 2. The model was adjusted for the same covariates as in the primary analysis.



Supplementary Figure S7. Forest plot of the Fine-Gray subdistribution hazard model for new-onset hypertension (Event 1). SHR, subdistribution hazard ratio; CI, confidence interval. The dashed vertical line indicates SHR = 1. The model was adjusted for the same covariates as in the primary analysis.



Supplementary Figure S8. Forest plot of the Fine-Gray subdistribution hazard model for death (Event 2, competing event). SHR, subdistribution hazard ratio; CI, confidence interval. The dashed vertical line indicates SHR = 1. The model was adjusted for the same covariates as in the primary analysis.

Table S1. Multivariate Logistic regression analysis examining TCBI, cumulative TCBI and the risk of new-onset hypertension

Characteristic	Model 1	Model 1	Model 2	Model 2	Model 3	Model 3
	OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P
Hypertension by TCBI						
TCBI (Per 1 SD increase)	1.22 (1.15, 1.29)	<0.001	1.29 (1.22, 1.37)	<0.001	1.24 (1.16, 1.33)	<0.001
Quartile TCBI_						
Q1 (Reference)	1.00	—	1.00	—	1.00	—
Q2	1.10 (0.93, 1.31)	0.256	1.17 (0.98, 1.39)	0.078	1.14 (0.96, 1.37)	0.142
Q3	1.42 (1.20, 1.68)	<0.001	1.58 (1.33, 1.89)	<0.001	1.57 (1.29, 1.90)	<0.001
Q4	1.66 (1.41,	<0.001	1.99 (1.67,	<0.001	1.89 (1.53,	<0.001

	1.97)		2.37)		2.32)	
P for trend	—	<0.001	—	<0.001	—	<0.001
Hypertension by CumTCBI						
CumTCBI (Per 1 SD increase)	1.19 (1.08, 1.31)	<0.001	1.26 (1.14, 1.39)	<0.001	1.19 (1.06, 1.35)	0.004
Quartile CumTCBI						
Q1 (Reference)	1.00	—	1.00	—	1.00	—
Q2	1.23 (0.91, 1.68)	0.180	1.27 (0.93, 1.74)	0.129	1.21 (0.87, 1.68)	0.256
Q3	1.07 (0.78, 1.47)	0.680	1.17 (0.85, 1.61)	0.343	1.08 (0.76, 1.54)	0.671
Q4	1.74 (1.30, 2.34)	<0.001	2.07 (1.52, 2.80)	<0.001	1.84 (1.26, 2.68)	0.002
P for trend	—	0.001	—	<0.001	—	0.006

Model 1: Unadjusted.

Model 2: Adjusted for age, gender, marital status, residence, region, and education.

Model 3: Additionally adjusted for drinking, smoking, work status, fall down, life satisfaction, sleep duration, social activity, self-rated health (SRH), disability, body pain, activities of daily living (ADL), total cognition, depression, kidney disease, dyslipidemia, diabetes, lung disease, liver disease, cardiovascular disease (CVD), stomach disease, arthritis, pulse, white blood cell count (WBC), platelet count (PLT), blood urea nitrogen (BUN), fasting plasma glucose (FPG), serum creatinine (SCR), high-density lipoprotein cholesterol (HDL-C), low-density lipoprotein cholesterol (LDL-C), C-reactive protein (CRP), glycated hemoglobin (HbA1c), uric acid (UA), hemoglobin (HGB).Quartile ranges for TCBI_zscore: Q1 [–1.09, –0.66], Q2 (–0.66, –0.31], Q3 (–0.31, 0.30], Q4 (0.30, 5.71].Quartile ranges for CumTCBI_zscore: Q1 [−1.24, −0.71], Q2 (−0.71, −0.30], Q3 (−0.30, 0.38], Q4 (0.38, 5.22].Abbreviations: OR, odds ratio; CI, confidence interval.

Table S2. Multivariate Cox regression analysis examining TCBI and cumulative TCBI with the risk of new-onset hypertension in the complete-case analysis

Characteristic	**Model 1**		**Model 2**		**Model 3**	
	HR (95% CI)	***P***	**HR (95% CI)**	***P***	**HR (95% CI)**	***P***
Hypertension by TCBI (N=3,942)						
TCBI (Per 1 SD increase)	1.15 (1.10–1.20)	<0.001	1.19(1.14–1.25)	<0.001	1.16 (1.10–1.22)	<0.001
Quartile TCBI						
Q1	Reference		Reference		Reference	
Q2	1.03(0.89–1.20)	0.69	1.07 (0.92, 1.25)	0.37	1.09(0.93–1.27)	0.29

Q3	1.29(1.11–1.50)	<0.001	1.37(1.18–1.59)	<0.001	1.43 (1.22–1.68)	<0.001
Q4	1.46(1.27–1.68)	<0.001	1.64 (1.42–1.90)	<0.001	1.65(1.39–1.96)	<0.001
P for trend		<0.001		<0.001		<0.001
Hypertension by cumTCBI (N=2,157)						
CumTCBI (Per 1 SD increase)	1.18 (1.07–1.30)	<0.001	1.24 (1.13–1.37)	<0.001	1.19(1.06–1.33)	0.004
Quartile CumTCBI						
Q1	Reference		Reference		Reference	
Q2	1.30(0.95–1.80)	0.106	1.36(0.98–1.88)	0.064	1.38(0.98–1.94)	0.066
Q3	1.21(0.87–1.67)	0.262	1.34(0.96–1.86)	0.086	1.37(0.95–1.98)	0.095
Q4	1.78(1.32–2.42)	<0.001	2.07 (1.52–2.83)	<0.001	2. 03(1.38–2.96)	<0.001
P for trend		<0.001		<0.001		<0.001

Model 1: unadjusted.

Model 2: adjusted for Sex, Age, Residence, Marital , Education,and Region.

Model 3:Sex, Age, Residence, Marital, Education, Region, Work status, Drinking, Smoking, SRH, Social activity, Disability, Fall down, Life satisfaction, ADL, Total cognition, Depression, Body pain, Lung disease, Arthritis, Dyslipidemia, Liver disease, Kidney disease, Stomach disease, Diabetes, CVD, Pulse, Sleep duration, WBC, PLT, BUN, FPG, SCR, HbA1c, HGB, CRP, UA, LDL-C, HDL-C.

Table S3. Competing risk analysis of cumulative TCBI with new-onset hypertension and death using the Fine-Gray subdistribution hazard model.

Event	**SHR (95% CI)**	**P value**
New-onset hypertension (Event 1)	1.14 (1.06–1.22)	<0.001
Death (Event 2, competing event)	0.80 (0.69–0.94)	0.005

Model 3 covariates: sex, age, residence, marital status, education, region, work status, drinking, smoking, SRH, social activity, disability, fall down, life satisfaction, ADL, total cognition, depression, body pain, lung disease, arthritis, dyslipidemia, liver disease, kidney disease, stomach disease, diabetes, CVD, pulse, sleep duration, WBC, PLT, BUN, FPG, SCR, HbA1c, HGB, CRP, UA, LDL-C, HDL-C.

SHR, subdistribution hazard ratio; CI, confidence interval. Cumulative TCBI was analyzed as a continuous variable per 1-SD increase. The model was adjusted for Model 3 covariates (listed above).