

Supplementary Table 1. Selection of the number of knots by Akaike’s criteria.

RCS	knots	AIC	Selection
Cardiovascular mortality	3	7184.69	
	4	7183.83	
	5	7182.68	selected

Supplementary Table 2. Sensitivity analysis of NHHR and cardiovascular mortality after excluding cardiovascular deaths within 3 years.

Cardiovascular mortality	Hazard Ratio (95% CI)				
	Q1	Q2	Q3	Q4	per SD
Model 1	Reference	0.85 (0.66-1.10)	0.88 (0.69-1.13)	0.81 (0.63-1.04)	0.92 (0.84-1.02)
Model 2	Reference	1.03 (0.79-1.33)	1.20 (0.93-1.55)	1.33 (1.03-1.71)	1.13 (1.03-1.24)
Model 3	Reference	1.02 (0.79-1.32)	1.20 (0.93-1.54)	1.33 (1.03-1.71)	1.13 (1.03-1.24)

Model 1: No adjustment.

Model 2: Adjusted for age, ethnicities, education levels, poverty-income ratio.

Model 3: Adjusted for age, ethnicities, education levels, poverty-income ratio, history of heart failure.

Supplementary Table 3. Sensitivity analysis of NHHR and cardiovascular mortality after adjusting all covariates included in feature selection.

Cardiovascular mortality	Hazard Ratio (95% CI)				
	Q1	Q2	Q3	Q4	per SD
Model 4	Reference	0.99 (0.83-1.18)	1.19 (1.00-1.41)	1.24 (1.05-1.48)	1.09 (1.01-1.18)

Model 4: Adjusted for age, gender, ethnicity, body mass index, poverty-income ratio, education, smoking status, alcohol consumption, survey period, hypercholesterolemia, hypertension, history of heart failure, history of coronary heart disease, and history of cancer.

Supplementary Table 4. Sensitivity analysis of NHHR and cardiovascular mortality after excluding patients with extreme value of NHHR.

Cardiovascular mortality	Hazard Ratio (95% CI)				
	Q1	Q2	Q3	Q4	per SD
Model 1	Reference	0.86 (0.69-1.07)	0.92 (0.74-1.14)	0.87 (0.70-1.09)	0.95 (0.86-1.04)
Model 2	Reference	1.02 (0.82-1.28)	1.25 (1.00-1.55)	1.38 (1.10-1.72)	1.16 (1.05-1.27)
Model 3	Reference	1.02 (0.82-1.28)	1.25 (1.00-1.55)	1.38 (1.10-1.72)	1.16 (1.06-1.28)

Model 1: No adjustment.

Model 2: Adjusted for age, ethnicities, education levels, poverty-income ratio.

Model 3: Adjusted for age, ethnicities, education levels, poverty-income ratio, history of heart failure.

Supplementary Table 5. Sensitivity analysis of NHHR and cardiovascular mortality after excluding patients with history of heart failure.

		Hazard Ratio (95% CI)			
Cardiovascular mortality	Q1	Q2	Q3	Q4	per SD
Model 1	Reference	0.82 (0.63-1.06)	0.89 (0.69-1.14)	0.86 (0.67-1.11)	0.95 (0.86-1.04)
Model 2	Reference	1.00 (0.77-1.30)	1.23 (0.95-1.58)	1.43 (1.11-1.84)	1.16 (1.06-1.27)
Model 3	Reference	1.00 (0.96-1.30)	1.23 (0.96-1.59)	1.43 (1.11-1.85)	1.16 (1.06-1.27)

Model 1: No adjustment.

Model 2: Adjusted for age, ethnicities, education levels, poverty-income ratio.

Model 3: Adjusted for age, ethnicities, education levels, poverty-income ratio, history of heart failure.

Supplementary Table 6. Sensitivity analysis of NHHR and cardiovascular mortality after excluding patients with history of coronary heart disease.

Cardiovascular mortality	Hazard Ratio (95% CI)				
	Q1	Q2	Q3	Q4	per SD
Model 1	Reference	0.92 (0.71-1.19)	0.94 (0.73-1.21)	0.91 (0.71-1.17)	0.95 (0.87-1.04)
Model 2	Reference	1.09 (0.84-1.41)	1.24 (0.96-1.60)	1.45 (1.12-1.87)	1.15 (1.08-1.25)
Model 3	Reference	1.08 (0.83-1.40)	1.24 (0.96-1.60)	1.46 (1.13-1.89)	1.15 (1.05-1.25)

Model 1: No adjustment.

Model 2: Adjusted for age, ethnicities, education levels, poverty-income ratio.

Model 3: Adjusted for age, ethnicities, education levels, poverty-income ratio, history of heart failure.