

Supplementary Table 1 Hazard ratios (95% CI) for all-cause mortality among patients with new-onset heart failure versus controls, across age groups: Sensitivity analysis excluding participants with a history of prior myocardial infarction, atrial fibrillation. (n=3654)

Onset age	New-onset heart failure	Control subjects	Model 1	Model 2	Model 3
	Case/Total	Case/Total	HR(95%CI)	HR(95%CI)	HR(95%CI)
<55	91/395	54/1642	6.47(4.61-9.08)	5.04(3.52-7.21)	6.64(4.24-10.41)
55-64	350/1073	286/4588	5.05(4.32-5.91)	4.01(3.38-4.76)	4.47(3.51-5.70)
65-74	501/1139	729/4948	3.05(2.72-3.42)	2.65(2.34-3.00)	3.14(2.65-3.73)
≥75	640/1047	1535/4484	1.84(1.68-2.02)	1.53(1.37-1.70)	1.66(1.45-1.90)

Model 1: adjusted for age, gender; Model 2 adjusted for smoking, alcohol consumption, educational level, physical exercise, body mass index, low-density lipoprotein, and hemoglobin based on Model 1; Model 3 further adjusted for medication usage (including antidiabetic drugs, lipid-lowering drugs, antiplatelet drugs, beta-blockers, ACEI/ARB, MRA, diuretics) based on Model 2.

Supplementary Table 2 Hazard ratios (95% CI) for all-cause mortality among patients with new-onset heart failure versus controls, across age groups: Sensitivity analysis excluding participants with a history of prior stroke. (n=3349)

Onset age	New-onset heart failure	Control subjects	Model 1	Model 2	Model 3
	Case/Total	Case/Total	HR(95%CI)	HR(95%CI)	HR(95%CI)
<55	88/393	54/1639	6.24(4.44-8.78)	4.86(3.38-6.99)	6.73(4.27-10.60)
55-64	318/1011	278/4561	4.93(4.20-5.80)	4.00(3.36-4.77)	4.28(3.33-5.51)
65-74	434/1042	704/4891	2.89(2.56-3.26)	2.50(2.20-2.85)	2.79(2.31-3.36)
≥75	535/903	1503/4435	1.82(1.65-2.01)	1.52(1.36-1.70)	1.63(1.40-1.89)

Model 1: adjusted for age, gender; Model 2 adjusted for smoking, alcohol consumption, educational level, physical exercise, body mass index, low-density lipoprotein, and hemoglobin based on Model 1; Model 3 further adjusted for medication usage (including antidiabetic drugs, lipid-lowering drugs, antiplatelet drugs, beta-blockers, ACEI/ARB, MRA, diuretics) based on Model 2.

Supplementary Table 3 Hazard ratios (95% CI) for all-cause mortality among patients with new-onset heart failure versus controls, across age groups: Sensitivity analysis excluding participants with a history of prior hypertension. (n=1074)

Onset age	New-onset heart failure	Control subjects	Model 1	Model 2	Model 3
	Case/Total	Case/Total	HR(95%CI)	HR(95%CI)	HR(95%CI)
<55	26/115	17/780	9.03(4.85-16.80)	6.91(3.57-13.37)	5.42(2.66-11.03)
55-64	103/298	87/1640	6.24(4.69-8.31)	5.20(3.81-7.10)	4.53(3.28-6.27)
65-74	134/293	160/1473	4.11(3.27-5.18)	3.64(2.83-4.69)	3.53(2.72-4.57)
≥75	244/368	480/1409	1.98(1.70-2.31)	1.67(1.39-1.99)	1.59(1.32-1.91)

Model 1: adjusted for age, gender; Model 2 adjusted for smoking, alcohol consumption, educational level, physical exercise, body mass index, low-density lipoprotein, and hemoglobin based on Model 1; Model 3 further adjusted for medication usage (including antidiabetic drugs, MRA, diuretics) based on Model 2.

Supplementary Table 4 Hazard ratios (95% CI) for all-cause mortality among patients with new-onset heart failure versus controls, across age groups: Sensitivity analysis excluding participants with a history of prior diabetes. (n=2716)

Onset age	New-onset heart failure	Control subjects	Model 1	Model 2	Model 3
	Case/Total	Case/Total	HR(95%CI)	HR(95%CI)	HR(95%CI)
<55	48/279	43/1422	4.91(3.24-7.45)	3.37(2.12-5.35)	4.30(2.36-7.82)
55-64	218/726	209/3780	5.14(4.24-6.21)	4.26(3.46-5.23)	5.29(4.00-7.00)
65-74	356/820	569/4046	3.09(2.70-3.53)	2.82(2.45-3.25)	3.33(2.73-4.06)
≥75	536/891	1272/3762	1.83(1.66-2.03)	1.57(1.40-1.76)	1.65(1.42-1.92)

Model 1: adjusted for age, gender; Model 2 adjusted for smoking, alcohol consumption, educational level, physical exercise, body mass index, low-density lipoprotein, and hemoglobin based on Model 1; Model 3 further adjusted for medication usage (including antidiabetic drugs, lipid-lowering drugs, antiplatelet drugs, beta-blockers, ACEI/ARB, MRA, diuretics) based on Model 2.

Supplementary Table 5 Hazard ratios (95% CI) for all-cause mortality among patients with new-onset heart failure versus controls, across age groups: Sensitivity analysis excluding participants with a history of prior renal insufficiency. (n=3270)

Onset age	New-onset heart failure Case/Total	Control subjects Case/Total	Model 1 HR(95%CI)	Model 2 HR(95%CI)	Model 3 HR(95%CI)
<55	72/364	50/1588	5.59(3.89-8.04)	4.63(3.15-6.79)	5.81(3.52-9.60)
55-64	300/986	253/4390	4.92(4.16-5.82)	4.26(3.56-5.11)	4.61(3.55-5.98)
65-74	426/1026	622/4541	3.08(2.72-3.49)	2.71(2.37-3.10)	2.90(2.40-3.51)
≥75	531/894	/3685	1.87(1.69-2.08)	1.56(1.38-1.76)	1.74(1.49-2.04)

Model 1: adjusted for age, gender; Model 2 adjusted for smoking, alcohol consumption, educational level, physical exercise, body mass index, low-density lipoprotein, and hemoglobin based on Model 1; Model 3 further adjusted for medication usage (including antidiabetic drugs, lipid-lowering drugs, antiplatelet drugs, beta-blockers, ACEI/ARB, MRA, diuretics) based on Model 2.

Supplementary Figure 1. The cumulative incidence of all-cause mortality among participants with new-onset heart failure versus controls across onset age groups.

