

Table S1. Baseline characteristics by sample

	Overall	Those who have only ACR	Those who have ACR and Dipstick (Not imputed)	Those who have Dipstick but not ACR (Imputed)	Dipstick (Main analysis)
N	23,674	724	427	2,042	2,469
Demographic					
Age, years	63.2 (13.4)	62.4 (11.6)	63.0 (11.7)	65.6 (12.0)	65.2 (12.0)
Men	59.3%	66.8%	65.3%	50.9%	53.4%
Comorbidities					
Heart failure	30.0%	35.1%	41.1%	34.2%	35.2%
Hypertension	54.9%	75.9%	82.9%	63.3%	66.7%
Diabetes	22.0%	72.2%	61.9%	26.0%	32.0%
Prior stroke	11.6%	14.9%	14.1%	13.0%	13.2%
Coronary artery bypass graft	2.9%	5.7%	4.9%	3.0%	3.2%
Peripheral artery disease	7.7%	14.4%	16.2%	10.6%	11.5%
Kidney measures					
eGFR, ml/min/1.73m ²	72.8 (26.6)*	67.3 (28.1)	49.1 (31.6)	68.6 (26.7)	65.2 (28.6)
eGFR <60 ml/min/1.73m ²	31.5%	41.9%	65.6%	37.0%	42.0%
Log ACR	3.9 (1.9)	3.6 (1.8)	4.6 (2.0)	3.5 (1.3) †	4.6 (2.0)
Dipstick proteinuria, mg/dL					
<30	67.8%	NA	46.6%	72.2%	67.8%
30-100	15.1%	NA	18.3%	14.4%	15.0%
101-300	10.8%	NA	19.0%	9.1%	10.8%
>300	6.4%	NA	16.2%	4.4%	6.4%
Medication uses					
Aspirin	79.4%	83.8%	77.5%	79.0%	78.7%
Thienopyridine	51.7%	55.3%	45.4%	47.8%	47.4%
β-Blocker	78.3%	83.7%	83.4%	77.4%	78.4%
ACEi or ARB	62.1%	84.1%	77.3%	62.7%	65.2%
Statin	64.1%	75.7%	64.4%	60.9%	61.5%
Outcomes					
Composite outcome	55.3%	63.1%	72.6%	63.5%	65.1%
All-cause mortality	41.3%	42.1%	56.7%	48.0%	49.5%
Cardiovascular mortality	20.0%	18.3%	28.6%	21.9%	23.1%
Heart failure	26.1%	36.7%	36.5%	31.2%	32.2%
Recurrent MI	11.8%	14.9%	17.6%	15.7%	16.0%
Ischemic stroke	6.3%	6.8%	5.6%	7.1%	6.8%

ACEi: angiotensin-converting-enzyme inhibitor; ACR: albumin-to-creatinine ratio; ARB: angiotensin II receptor blockers; eGFR: estimated glomerular filtration rate; NA: not available

Note: Values for categorical variables are given as percentage; values for continuous variables are given as mean (standard deviation)

*Of 23,674 participants, 21,303 had eGFR values.

Table S2. Definition of covariates

Comorbidities	
Heart failure	ICD-10 codes I50
Hypertension	ICD-10 codes I10-I15
Diabetes	ICD-10 codes E10, E11, E13
Stroke	ICD-10 codes I61-I63
Coronary artery bypass graft	NOMESCO classification FNA, FNB, FNC, FND, FNE
Peripheral artery disease	ICD-10 codes I70.2x or I70.92, leg revascularization: NOMESCO classification PDE30, PDF30, PDH, PDP30 PDQ30 PEE, PEF, PEH, PEN, PEQ, PFE, PFH, PFN10, PFP, PFQ, PFW99, PGH, leg amputation: NOMESCO classification NFQ19, NGQ19, NHQ1
eGFR	1 year prior to MI
Medication uses	
Aspirin	ATC codes B01AC06
Thienopyridine	ATC codes ATC codes B01AC04, B01AC05, B01AC22
β -Blocker	ATC codes C07
ACEi or ARB	ATC codes C09A, C09B, C09C, C09D
Statin	ATC codes C10A

ATC codes, Anatomical, Therapeutic, Chemical classification system codes; ICD-10 codes, International Classification of Disease-Tenth Edition diagnostic codes; NOMESCO classification: Nordic Medico-Statistical Committee classification

Table S3. Adjusted hazard ratios (95% CI)* of adverse outcomes after index MI by continuous albumin-to-creatinine ratio (ACR) and diabetes status

	8-fold ACR	
	HR (95% CI)	P for interaction
Composite outcome†		
Non-diabetes	1.24 (1.09-1.40)	0.558
Diabetes	1.15 (1.00-1.32)	
All-cause mortality		
Non-diabetes	1.25 (1.11-1.40)	0.815
Diabetes	1.15 (0.99-1.33)	
Cardiovascular mortality		
Non-diabetes	1.19 (1.01-1.41)	0.625
Diabetes	1.22 (0.99-1.51)	
Heart failure		
Non-diabetes	1.23 (1.04-1.45)	0.987
Diabetes	1.19 (1.01-1.40)	
Recurrent MI		
Non-diabetes	1.27 (1.03-1.56)	0.614
Diabetes	1.16 (0.90-1.49)	
Ischemic stroke		
Non-diabetes	1.14 (0.87-1.49)	0.969
Diabetes	1.27 (0.86-1.89)	

ACR: albumin-creatinine ratio; HR: hazard ratio

* Adjusted for age (continuous), heart failure, hypertension, diabetes, stroke, coronary artery bypass graft, peripheral artery disease and eGFR (continuous)

† All-cause mortality, cardiovascular mortality, heart failure, recurrent MI, or ischemic stroke

Table S4. Model performance measures with the addition of albumin-to-creatinine ratio (ACR) to TRS2°P variables after excluding those who died within 14 days after hospitalized MI

	C statistic (95% CI)	Δ C statistic (95% CI)	NRI, categorical (95% CI)
Composite outcome*			
Conventional risk factors	0.690 (0.672, 0.708)		
+ACR	0.713 (0.696, 0.730)	0.023 (0.016, 0.031)	0.036 (0.013, 0.060)
All-cause mortality			
Conventional risk factors	0.728 (0.705, 0.750)		
+ACR	0.746 (0.724, 0.768)	0.018 (0.012, 0.024)	0.045 (0.016, 0.075)
Cardiovascular mortality			
Conventional risk factors	0.768 (0.738, 0.799)		
+ACR	0.780 (0.750, 0.818)	0.011 (0.006, 0.017)	0.064 (0.008, 0.120)
Heart failure			
Conventional risk factors	0.696 (0.674, 0.719)		
+ACR	0.750 (0.728, 0.772)	0.054 (0.039, 0.068)	0.014 (-0.007, 0.034)
Recurrent MI			
Conventional risk factors	0.609 (0.574, 0.644)		
+ACR	0.656 (0.621, 0.691)	0.047 (0.020, 0.074)	-
Ischemic stroke			
Conventional risk factors	0.720 (0.666, 0.774)		
+ACR	0.725 (0.672, 0.778)	0.005 (-0.002, 0.012)	-

ACR: albumin-to-creatinine ratio; NRI: net reclassification index

Note: All prediction statistics were based on 1-year predicted risk. Conventional risk factors were age (continuous), heart failure, hypertension, diabetes, stroke, coronary artery bypass graft, peripheral artery disease and eGFR (continuous). For individual outcomes, we restricted the analysis of categorical NRI to major individual outcomes, all-cause mortality, cardiovascular mortality, and heart failure, due to small number of events.

* All-cause mortality, cardiovascular mortality, heart failure, recurrent MI, or ischemic stroke

Table S5. Crude incidence rate (per 100 person-years) and adjusted hazard ratios (95% CI)* of adverse outcomes after index MI by dipstick proteinuria (N=2,469)

	Dipstick proteinuria, mg/dL				
	<30	30-100	101-300	>300	P for trend
	N=1,673	N=371	N=261	N=158	
Composite outcome†					
Rate	30.8	48.9	65.0	74.9	
HR (95% CI)	1.0	1.21 (1.05-1.38)	1.24 (1.06-1.45)	1.19 (0.98-1.44)	0.002
All-cause mortality					
Rate	16.1	23.4	38.6	31.9	
HR (95% CI)	1.0	1.21 (1.03-1.41)	1.61 (1.36-1.91)	1.25 (1.01-1.55)	<0.001
Cardiovascular mortality					
Rate	7.1	11.4	20.4	15.3	
HR (95% CI)	1.0	1.27 (1.01-1.59)	1.70 (1.34-2.15)	1.22 (0.90-1.67)	0.001
Heart failure					
Rate	13.9	20.4	25.7	34.7	
HR (95% CI)	1.0	1.10 (0.90-1.33)	1.10 (0.87-1.39)	1.31 (1.02-1.69)	0.037
Recurrent MI					
Rate	6.1	8.6	10.8	14.2	
HR (95% CI)	1.0	1.19 (0.90-1.57)	1.19 (0.86-1.65)	1.42 (0.98-2.04)	0.039
Ischemic stroke					
Rate	2.5	4.0	3.1	4.1	
HR (95% CI)	1.0	1.42 (0.96-2.12)	0.91 (0.52-1.61)	1.23 (0.67-2.25)	0.499

HR: hazard ratio

* Adjusted for age (continuous), heart failure, hypertension, diabetes, stroke, coronary artery bypass graft, peripheral artery disease and eGFR (continuous)

† All-cause mortality, cardiovascular mortality, heart failure, recurrent MI, or ischemic stroke

Table S6. Model performance measures with the addition of dipstick proteinuria to conventional risk factors

	C statistic (95% CI)	Δ C statistic (95% CI)	NRI, categorical (95% CI)
Composite outcomes*			
Conventional risk factors	0.664 (0.649, 0.680)		
+Dipstick proteinuria	0.680 (0.665, 0.696)	0.016 (0.009, 0.024)	0.008 (-0.008, 0.023)
All-cause mortality			
Conventional risk factors	0.694 (0.675, 0.713)		
+Dipstick proteinuria	0.712 (0.694, 0.731)	0.019 (0.012, 0.025)	0.021 (-0.001, 0.042)
Cardiovascular mortality			
Conventional risk factors	0.721 (0.698, 0.744)		
+Dipstick proteinuria	0.739 (0.716, 0.761)	0.018 (0.011, 0.024)	0.003 (-0.028, 0.035)
Heart failure			
Conventional risk factors	0.701 (0.680, 0.721)		
+Dipstick proteinuria	0.713 (0.692, 0.734)	0.013 (0.002, 0.023)	0.001 (-0.013, 0.016)
Recurrent MI			
Conventional risk factors	0.565 (0.530, 0.600)		
+Dipstick proteinuria	0.613 (0.578, 0.647)	0.048 (0.027, 0.068)	-
Ischemic stroke			
Conventional risk factors	0.780 (0.736, 0.824)		
+Dipstick proteinuria	0.785 (0.741, 0.828)	0.005 (-0.004, 0.013)	-

NRI: net reclassification index

Note: All prediction statistics were based on 1-year predicted risk. Conventional risk factors were age (continuous), heart failure, hypertension, diabetes, stroke, coronary artery bypass graft, peripheral artery disease and eGFR (continuous)

* All-cause mortality, cardiovascular mortality, heart failure, recurrent MI, or ischemic stroke

Table S7. Adjusted hazard ratios (95% CI)* of adverse outcomes after index MI by continuous urine albumin-to-creatinine ratio (ACR) among those who have ACR data (N=1,151)

	8-fold ACR
	HR (95% CI)
Composite outcome†	1.20 (1.10-1.31)
All-cause mortality	1.32 (1.18-1.46)
Cardiovascular mortality	1.33 (1.14-1.56)
Heart failure	1.23 (1.10-1.39)
Recurrent MI	1.29 (1.08-1.55)
Ischemic stroke	1.28 (0.97-1.68)

ACR: albumin-creatinine ratio; HR: hazard ratio

* Adjusted for age (continuous), heart failure, hypertension, diabetes, stroke, coronary artery bypass graft, peripheral artery disease and eGFR (continuous)

† All-cause mortality, cardiovascular mortality, heart failure, recurrent MI, or ischemic stroke

Table S8. Crude incidence rate (100 person years) and adjusted hazard ratios (95%CI)* of adverse outcome after index MI by urine albumin-to-creatinine ratio (ACR) among those who have ACR data (N=1,151)

	ACR, mg/g				
	<10	10-29	30-299	≥300	P for trend
Composite outcome†					
Rate	23.3	40.0	55.0	101.4	
HR (95% CI)	1.0	1.31 (1.03-1.67)	1.48 (1.18-1.85)	1.65 (1.30-2.14)	<0.001
All-cause mortality					
Rate	10.1	17.3	24.7	43.8	
HR (95% CI)	1.0	1.21 (0.89-1.65)	1.50 (1.13-2.00)	2.17 (1.58-2.99)	<0.001
Cardiovascular mortality					
Rate	3.5	9.3	11.8	19.7	
HR (95% CI)	1.0	1.90 (1.17-3.10)	1.96 (1.23-3.12)	2.59 (1.55-4.32)	0.001
Heart failure					
Rate	12.0	18.5	28.5	48.9	
HR (95% CI)	1.0	1.25 (0.91-1.74)	1.44 (1.07-1.94)	1.59 (1.13-2.25)	0.005
Recurrent MI					
Rate	4.3	6.8	9.8	14.4	
HR (95% CI)	1.0	1.32 (0.79-2.18)	1.60 (1.01-2.54)	1.80 (1.05-3.09)	0.021
Ischemic stroke					
Rate	1.8	2.4	3.9	4.4	
HR (95% CI)	1.0	1.15 (0.53-2.53)	1.59 (0.79-3.20)	1.35 (0.57-3.18)	0.302

ACR: albumin-creatinine ratio; HR: hazard ratio

* Adjusted for age (continuous), heart failure, hypertension, diabetes, stroke, coronary artery bypass graft, peripheral artery disease and eGFR (continuous)

† All-cause mortality, cardiovascular mortality, heart failure, recurrent MI, or ischemic stroke

Table S9. Model performance measures with the addition of albumin-creatinine ratio (ACR) to conventional risk factors among those who have ACR data (N=1,151)

	C statistic (95% CI)	Δ C statistic (95% CI)	NRI, categorical (95% CI)
Composite outcomes*			
Conventional risk factors	0.680 (0.659, 0.702)		
+ACR	0.683 (0.662, 0.705)	0.003 (-0.001, 0.008)	0.039 (0.006, 0.072)
All-cause mortality			
Conventional risk factors	0.712 (0.684, 0.740)		
+ACR	0.716 (0.688, 0.745)	0.004 (-0.004, 0.012)	0.035 (-0.005, 0.075)
Cardiovascular mortality			
Conventional risk factors	0.731 (0.695, 0.768)		
+ACR	0.733 (0.698, 0.769)	0.002 (-0.008, 0.012)	0.024 (-0.034, 0.082)
Heart failure			
Conventional risk factors	0.701 (0.672, 0.730)		
+ACR	0.706 (0.677, 0.734)	0.004 (-0.001, 0.010)	0.035 (0.001, 0.068)
Recurrent MI			
Conventional risk factors	0.687 (0.641, 0.733)		
+ACR	0.691 (0.646, 0.737)	0.005 (-0.010, 0.020)	-
Ischemic stroke			
Conventional risk factors	0.795 (0.722, 0.867)		
+ACR	0.808 (0.740, 0.876)	0.013 (-0.001, 0.032)	-

ACR: albumin-creatinine ratio; NRI: net reclassification index

Note: All prediction statistics were based on 1-year predicted risk. Conventional risk factors were age (continuous), heart failure, hypertension, diabetes, stroke, coronary artery bypass graft, peripheral artery disease and eGFR (continuous)

* All-cause mortality, cardiovascular mortality, heart failure, recurrent MI, or ischemic stroke

Figure S1. Study population

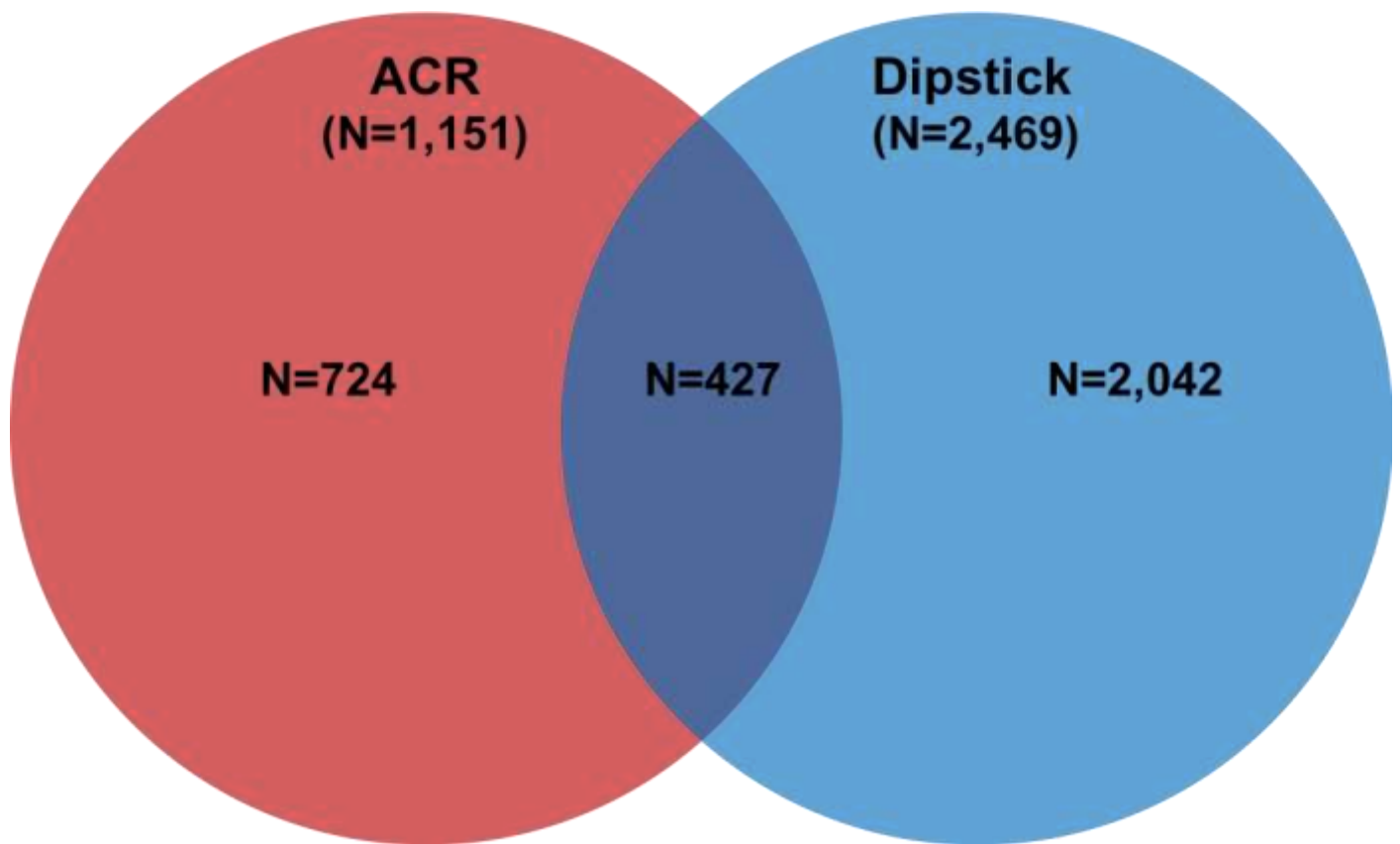


Figure S2. 1-year probability of adverse outcomes by decile of 1-year risk with the addition of urine albumin-to-creatinine ratio (ACR) to conventional risk factors

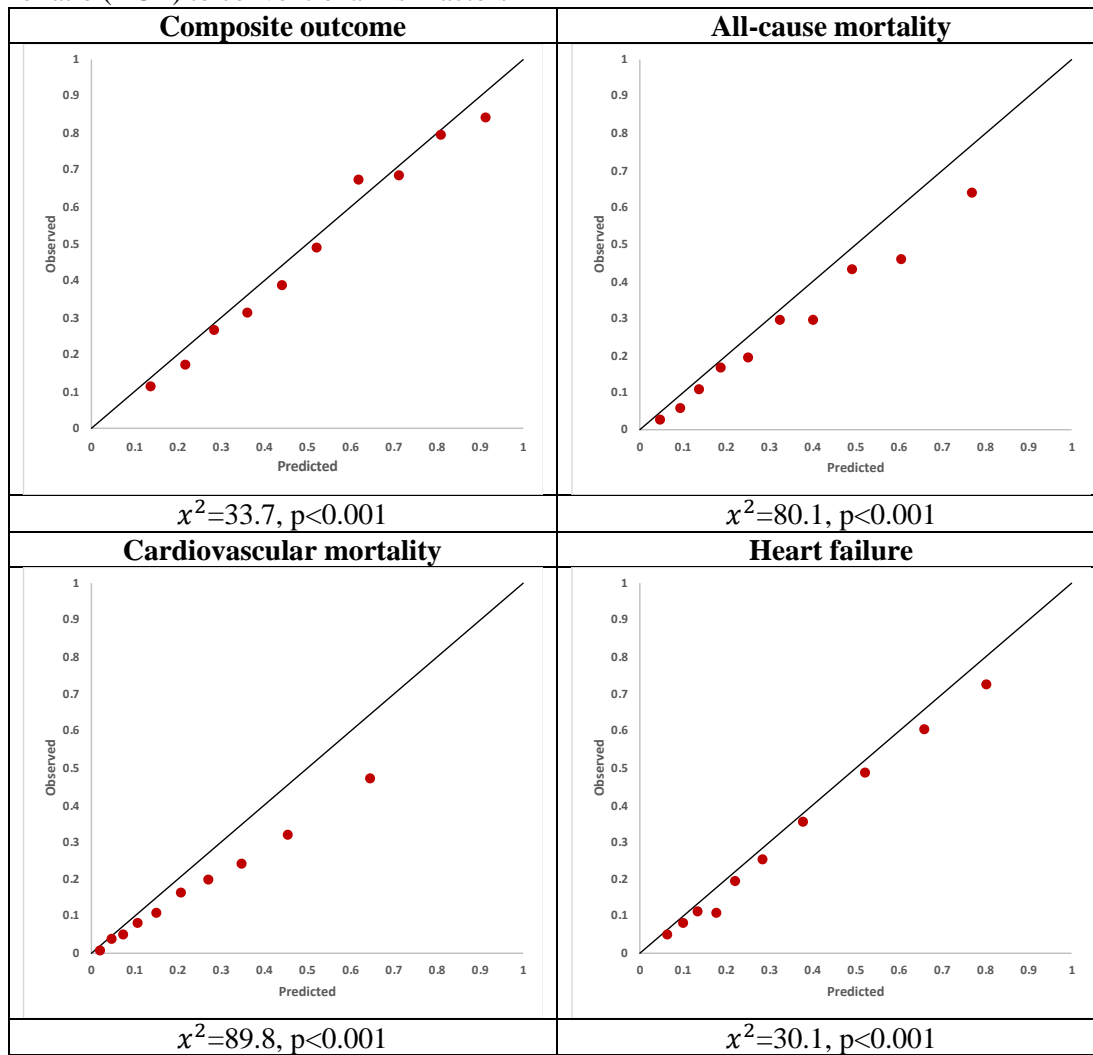


Figure S3. Adjusted hazard ratios of composite outcome after index MI by linear splines of urine albumin-to-creatinine ratio (ACR) with three knots (10, 30, and 300 mg/g) in those who have ACR data

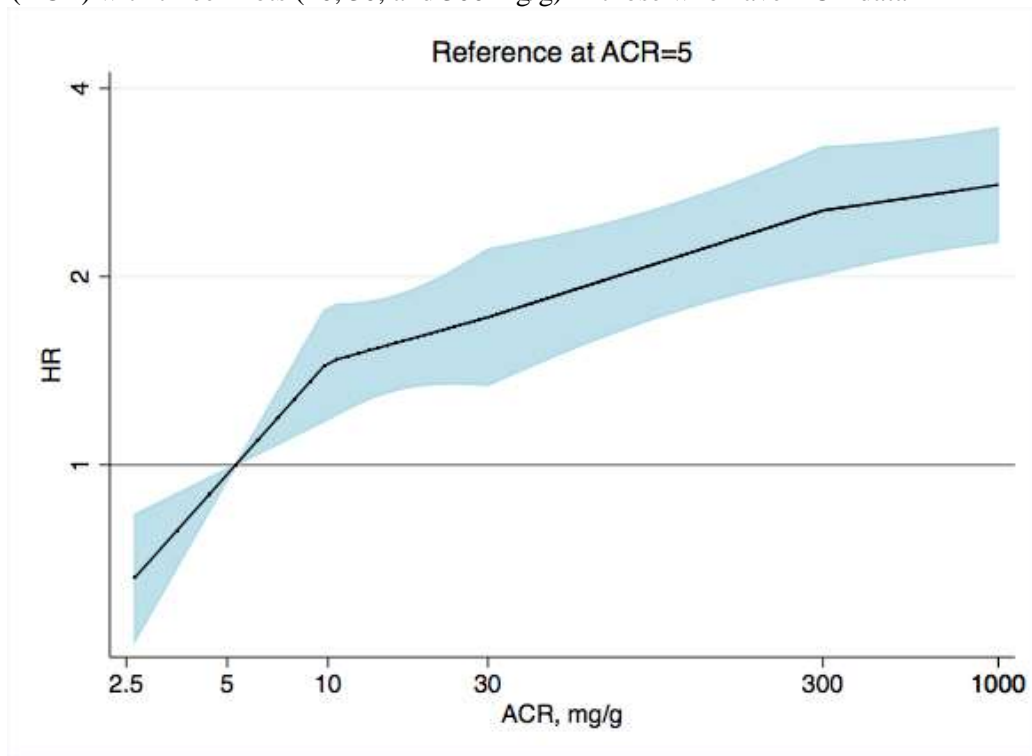


Figure S4. Adjusted hazard ratios of composite outcome after index MI by linear splines of converted urine albumin-to-creatinine ratio (ACR) with three knots (10, 30, and 300 mg/g)

