

Table S1 Basic characteristics of participants with or without CKD in NHANES 2011–2014

Variables	CKD group (n=1,793)	Non-CKD group (n=8,264)	P value
Age (years)	59.70±17.67	45.13±15.85	<0.001
Gender (male/female)	42.64/57.36	50.03/49.97	<0.001
Race			0.004
Mexican American	7.30	8.83	
Other Hispanic	5.09	6.17	
Non-Hispanic White	68.09	66.68	
Non-Hispanic Black	12.75	10.38	
Other race	6.76	7.93	
BMI (<25/≥25 kg/m ²)	26.07/73.93	30.74/69.26	<0.001
Smoke (never/ever/current)	49.30/33.14/17.56	57.54/22.41/20.05	<0.001
SBP (mmHg)	130.86±21.53	120.05±15.14	<0.001
DBP (mmHg)	68.92±15.16	70.94±11.15	<0.001
Hypertension (yes/no)	66.24/33.76	33.11/66.89	<0.001
Diabetes (yes/no)	31.80/68.20	9.33/90.67	<0.001
CVD (yes/no)	24.29/75.71	5.67/94.33	<0.001
Hyperlipidemia (yes/no)	57.92/42.08	57.46/42.54	0.74
HbA1c (%)	6.19±1.47	5.53±0.79	<0.001
eGFR (mL/min/1.73 m ²)	72.42±29.27	97.38±17.90	<0.001
Scr (μmol/L)	90.17 (69.84, 113.15)	74.26 (63.65, 85.75)	<0.001
uACR (mg/g)	40.18 (13.04, 90.00)	6.19 (4.28, 9.64)	<0.001
BUN (mmol/L)	5.71 (3.93, 7.50)	4.28 (3.57, 5.36)	<0.001
Folate (nmol/L)	42.80 (28.90, 66.10)	39.00 (26.80, 55.40)	<0.001
VitB12 (pmol/L)	391.90 (275.30, 554.20)	377.10 (283.40, 510.00)	0.003
TC (mmol/L)	4.78 (4.14, 5.69)	4.91 (4.24, 5.61)	0.63
TG (mmol/L)	1.31 (0.90, 1.91)	1.12 (0.77, 1.66)	0.001
HDL-C (mmol/L)	1.27 (1.03, 1.58)	1.32 (1.09, 1.58)	0.105
LDL-C (mmol/L)	2.66 (2.10, 3.39)	2.90 (2.33, 3.49)	0.001
Blood MMA (log2)	7.58±0.77	7.16±0.61	<0.001

Data are presented as mean ± standard deviation, median (interquartile range), or percentage. BMI, body mass index; BUN, blood urea nitrogen; CKD, chronic kidney disease; CVD, cardiovascular disease; DBP, diastolic blood pressure; eGFR, estimated glomerular filtration rate; FBG, fasting blood glucose; HbA1c, hemoglobin A1c; HDL-C, high-density lipoprotein-cholesterol; LDL-C, low-density lipoprotein-cholesterol; MMA, methylmalonic acid; SBP, systolic blood pressure; NHANES, National Health and Nutrition Examination Survey; Scr, serum creatinine; TC, total cholesterol; TG, total triglyceride; uACR, urine albumin-to-creatinine ratio; VitB12, vitamin B12.

Table S2 Associations of CKD with blood MMA in NHANES 2011–2014

Variables	OR	95% CI	P value
M0	2.43	2.18–2.71	<0.001
M1	1.86	1.67–2.08	<0.001
M2	1.78	1.59–1.98	<0.001
M3	1.33	1.04–1.68	0.023

M0 (n=10,057): blood MMA; M1 (n=10,057): additionally adjusted for age, gender and race/ethnicity; M2 (n=9,818): additionally adjusted for smoke status, BMI, hypertension, diabetes, CVD; M3 (n=4,696): additionally adjusted for eGFR, uACR, HbA1c, FBG, folate, serum VitB12 and hyperlipidemia. BMI, body mass index; CI, confidence interval; CKD, chronic kidney disease; CVD, cardiovascular disease; eGFR, estimated glomerular filtration rate; FBG, fasting blood glucose; HbA1c, hemoglobin A1c; MMA, methylmalonic acid; NHANES, National Health and Nutrition Examination Survey; OR, odds ratio; uACR, urine albumin-to-creatinine ratio; VitB12, vitamin B12.

Table S3 Weighted Cox's proportional hazard models for all-cause mortality in CKD patients of NHANES 2011–2014

Variables	HR	95% CI	P value
M0	1.77	1.59–1.97	<0.001
M1	1.41	1.28–1.55	<0.001
M2	1.36	1.22–1.52	<0.001
M3	1.35	1.14–1.60	<0.001

M0 (n=1,793): blood MMA; M1 (n=1,793): additionally adjusted for age, gender and race/ethnicity; M2 (n=1,742): additionally adjusted for smoke status, BMI, hypertension, diabetes and CVD; M3 (n=812): additionally adjusted for eGFR, uACR, HbA1c, FBG, folate, serum VitB12 and hyperlipidemia. BMI, body mass index; CI, confidence interval; CKD, chronic kidney disease; CVD, cardiovascular disease; eGFR, estimated glomerular filtration rate; FBG, fasting blood glucose; HbA1c, hemoglobin A1c; MMA, methylmalonic acid; NHANES, National Health and Nutrition Examination Survey; HR, hazard ratio; uACR, urine albumin-to-creatinine ratio; VitB12, vitamin B12.