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Supplemental Figure 3. Multiple-adjusted hazard ratios and 95% confidence intervals of chronic kidney disease progression or death associated with 24-hour urinary sodium excretion in subgroups by sex, race, and diabetes status: spline regression analyses

Supplemental Figure 4. Multiple-adjusted hazard ratios and 95% confidence intervals of chronic kidney disease progression associated with 24-hour urinary potassium excretion in subgroups by sex, race, and diabetes status: spline regression analyses

Supplemental Figure 5. Multiple-adjusted hazard ratios and 95% confidence intervals of all-cause mortality associated with 24-hour urinary potassium excretion in subgroups by sex, race, and diabetes status: spline regression analyses

Supplemental Figure 6. Multiple-adjusted hazard ratios and 95% confidence intervals of chronic kidney disease progression or death associated with 24-hour urinary potassium excretion in subgroups by sex, race, and diabetes status: spline regression analyses

Complete Methods

Study Participants

The CRIC Study is an ongoing multi-center, prospective, observational study of men and women with mild to moderate chronic kidney disease. A total of 3,939 participants were enrolled between June 2003 and August 2008 through seven clinical centers in the US. Recruitment strategies varied from center to center and included computerized searches of laboratory databases, hand searches of medical records, and referrals from health care providers. The design of the study and baseline characteristics of the study participants have been published.[1,2] Briefly, the participants had to be age 21 to 74 years with an estimated-glomerular filtration rate (eGFR) between 20 and 70 ml/min/1.73 m^2 depending upon age (age 21-44, eGFR 20-70; age 45-64, eGFR 20-60; and age 65-74, eGFR 20-50). Age-based eGFR entry criteria were established to limit the proportion of older individuals who were recruited with age-related diminutions of GFR but otherwise nonprogressive CKD. Patients who previously received dialysis for ≥1 month or a kidney transplant, and those with glomerulonephritis requiring immunosuppression, advanced heart failure, cirrhosis or polycystic kidney disease were excluded. For this analysis, we excluded 54 participants who did not successfully collect a 24-hour urine specimen and 126 participants with incomplete 24-hour urine collection (3 with total urine volume <500 ml, 10 with collection duration <20 hours, and 113 with total creatinine excretion <7 mg/kg of body weight). Furthermore, two participants with urinary sodium excretion <20 mmol/24-hour were excluded. This resulted in a total of 3,757 participants included in this analysis.

Institutional review boards at all participating institutions approved the study protocol, and all participants provided written informed consent. The CRIC study has conducted in accordance with the Declaration of Helsinki.

Measurements

Self-reported socio-demographic characteristics, medical history, lifestyle behaviors, current medications, and a food frequency questionnaire were obtained at the baseline visit. Blood pressure and anthropometric measures were also obtained using a standard protocol.[2] An overnight fasting blood sample was collected to measure serum creatinine, lipids, and plasma glucose. Hypertension was defined as mean blood pressure ≥140/90 mmHg or self-reported use of antihypertensive medication. Diabetes was defined as a fasting plasma glucose ≥126 mg/dL, a non-fasting plasma glucose ≥200 mg/dL, or self-reported use of anti-diabetes medication. Dyslipidemia was defined as total cholesterol ≥240 mg/dL, LDL-cholesterol ≥160 mg/dL, HDL-cholesterol <40 mg/dL, or use of lipid-lowering medications.

Serum creatinine was measured annually using an enzymatic method on an Ortho Vitros 950 through October 2008 and by the Jaffe method on a Beckman Synchron System, thereafter. All serum creatinine measurements were standardized to isotope-dilution mass spectrometry traceable values. eGFR was calculated according to the Chronic Kidney Disease Epidemiology Collaboration (CKD-EPI) equation, which includes serum creatinine, age, gender, and race.[3]

CRIC Study participants were requested to collect 24-hour urine specimens at baseline and follow-up years 1 and 2. If either the total urine volume was less than 500 ml at the end of the collection period or the duration of collection was not between 22 and 24 hours they were instructed to collect a 24-hour urine sample a second time. Urinary sodium and potassium levels were measured by flame emission

spectrophotometry (Instrumentation Laboratory Flamephotometer model 943). Urinary creatinine was measured on a BioTek Plate Reader ELX 808 using a Jaffe reaction with a colorimetric endpoint and reagents from Sigma-Aldrich. A Roche Module P analyzer was used to quantify urine total protein using a turbidimetric reaction with benzethonium chloride. All laboratory measurements were conducted at the CRIC Study central laboratory at the University of Pennsylvania with stringent quality control.

Assessment of Outcomes

CRIC Study participants were followed annually by clinic visits with interim telephone contact at 6 months. The primary outcome was chronic kidney disease (CKD) progression, defined as a composite endpoint of incident end-stage renal disease (ESRD) or halving of eGFR from baseline. ESRD was defined as receipt of chronic dialysis or kidney transplant. Information on the initiation and maintenance of dialysis and kidney transplant was obtained by annual clinical follow-up visits and interim telephone interviews and confirmed by dialysis unit or hospital chart review. Ascertainment of ESRD in the CRIC Study was supplemented by information from the US Renal Data System. Time to eGFR halving was imputed assuming a linear decline in kidney function between in-person annual visit measurements for time-to-event analyses. Other outcomes were all-cause mortality and the composite outcome of CKD progression and mortality. All deaths were confirmed by death certificate. Time to eGFR halving was imputed assuming a linear decline in kidney function between in-person annual visit measurements.[4] Patients' follow-up was censored at the time of death, withdrawal, loss to follow-up, or the end of the follow-up period, whichever occurred first.

Statistical Analysis

The cumulative means of 24-hour urinary sodium and potassium excretion obtained from baseline and year 1 and 2 annual visits prior to developing a study event were calculated as exposure variables. For example, if a participant developed an event after the year 2 annual visit, the averages of 24-hour urinary sodium and potassium excretion obtained from baseline and year 1 and 2 annual visits were calculated as exposure. If a participant developed an event after the year 1 and prior to the year 2 annual visit, the averages of 24-hour urinary sodium and potassium excretion obtained from baseline and year 1 were calculated as exposures. If a participant developed an event after baseline and prior to year 1 annual visit, baseline 24-hour urinary sodium and potassium excretion were used as exposures. The cumulative average measurement method maximally utilized all exposure and outcome data.[5] A total of 2,165 participants had 3 sodium and potassium measurements, 983 had 2 measurements, and 609 had only 1 measurement. Baseline characteristics of study participants are presented by quartiles of urinary sodium or potassium excretion.

Multiple-adjusted cumulative event rates of CKD progression, all-cause mortality, and the composite outcome were calculated by quartile of urinary sodium or potassium excretion by estimating the survival function from Cox proportional hazards models at the mean level of the covariates of interest for each quartile.[6] Cox proportional hazard models were used to explore the association of urinary sodium and potassium excretion with CKD progression, all-cause mortality, and the composite outcome according to quartiles of urinary excretion.[7] In addition, we used spline regression models to examine the shape of the association between 24-hour sodium and potassium excretion and the outcomes, fitting a restricted cubic spline function with four knots (at the 5th, 35th, 65th, and 95th percentiles).[8] Analyses of

subgroups defined by sex, race, and diabetes status were performed. Important covariables for CKD progression were adjusted in multivariable analyses. First, we adjusted age, sex, race, urinary creatinine excretion, and CRIC clinic site in the multivariable models.[9] Next, we added important risk factors for CKD progression in the multivariable models. Furthermore, eGFR at baseline was included in the multivariable models. Finally, we estimated the independent relationship of urinary sodium and potassium excretion with CKD progression and all-cause mortality by including them in multivariable models simultaneously. Systolic BP and proteinuria were not adjusted in the main analyses as they were considered as intermediate variables on the causal pathway for CKD progression.[10] We also performed a sensitivity analysis which included systolic BP or proteinuria in the multivariable models. An additional sensitivity analysis was performed adjusting for baseline total caloric intake estimated from food frequency questionnaire due to substantial missing data in caloric intake (24%). In addition, sensitivity analyses using rapid CKD progression (a sustained decline in eGFR of ≥5 ml/min/1.73 m^2/year) as the outcome, as well as the urinary sodium-to-creatinine ratio and the potassium-to-creatinine ratio as exposure variables, were performed.[11]

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Supplemental Table 1. Multiple-adjusted Hazard Ratios and 95% Confidence Intervals of Chronic Kidney Disease Progression and All-cause Mortality According to Quartile of 24-Hour Urinary Excretion of Sodium and Potassium among 3,757 CRIC Study Participants: Sensitivity Analyses

Variable	Urinary Sodium Excretion, mmol/24 hours					Urinary Potassium Excretion, mmol/24 hours				
	<116.8 (n=940)	116.8 – 153.6 (n=939)	153.7 – 194.5 (n=938)	≥194.6 (n=940)	p value for difference	<39.4 (n=939)	39.4 – 52.1 (n=940)	52.2 – 67.0 (n=938)	≥67.1 (n=940)	p value for difference
Chronic Kidney Disease Progression										
Model 1	1.0	1.01 (0.83, 1.23)	1.14 (0.93, 1.40)	1.54 (1.23, 1.92)	0.0003	1.0	1.00 (0.83, 1.21)	1.28 (1.04, 1.59)	1.59 (1.25, 2.03)	0.0002
Model 2	1.0	0.97 (0.80, 1.18)	1.05 (0.86, 1.29)	1.40 (1.12, 1.74)	0.003	1.0	0.98 (0.81, 1.19)	1.24 (1.00, 1.53)	1.53 (1.20, 1.95)	0.0006
Model 3	1.0	0.86 (0.71, 1.06)	0.83 (0.68, 1.03)	0.84 (0.67, 1.05)	0.3	1.0	0.89 (0.73, 1.08)	0.93 (0.75, 1.15)	1.03 (0.80, 1.31)	0.4
Model 4	1.0	1.00 (0.80, 1.27)	1.13 (0.88, 1.43)	1.33 (1.02, 1.74)	0.1	1.0	0.93 (0.74, 1.18)	1.19 (0.93, 1.53)	1.39 (1.04, 1.85)	0.02
All-cause Mortality										
Model 1	1.0	1.14 (0.89, 1.47)	1.14 (0.87, 1.50)	1.45 (1.08, 1.95)	0.1	1.0	0.97 (0.76, 1.24)	0.87 (0.66, 1.16)	0.98 (0.71, 1.35)	0.8
Model 2	1.0	1.13 (0.88, 1.45)	1.12 (0.85, 1.48)	1.42 (1.06, 1.91)	0.1	1.0	0.96 (0.75, 1.22)	0.86 (0.65, 1.14)	0.96 (0.70, 1.33)	0.7
Model 3	1.0	1.13 (0.88, 1.46)	1.07 (0.81, 1.42)	1.29 (0.96, 1.75)	0.4	1.0	0.95 (0.75, 1.22)	0.83 (0.62, 1.10)	0.92 (0.66, 1.27)	0.6
Model 4	1.0	1.09 (0.81, 1.47)	1.19 (0.86, 1.64)	1.50 (1.05, 2.13)	0.1	1.0	1.02 (0.76, 1.37)	1.04 (0.74, 1.45)	1.07 (0.72, 1.57)	0.9
Chronic Kidney Disease Progression or Death										
Model 1	1.0	1.02 (0.86, 1.20)	1.08 (0.91, 1.29)	1.43 (1.18, 1.73)	0.0004	1.0	0.99 (0.85, 1.17)	1.17 (0.98, 1.41)	1.42 (1.15, 1.74)	0.002
Model 2	1.0	1.00 (0.84, 1.17)	1.02 (0.86, 1.22)	1.33 (1.10, 1.61)	0.003	1.0	0.97 (0.82, 1.14)	1.14 (0.95, 1.37)	1.37 (1.11, 1.69)	0.003
Model 3	1.0	0.91 (0.77, 1.08)	0.86 (0.72, 1.03)	0.94 (0.78, 1.14)	0.4	1.0	0.92 (0.78, 1.09)	0.95 (0.79, 1.15)	1.07 (0.87, 1.32)	0.4
Model 4	1.0	1.01 (0.83, 1.23)	1.09 (0.89, 1.34)	1.34 (1.06, 1.67)	0.04	1.0	0.97 (0.80, 1.18)	1.16 (0.93, 1.43)	1.31 (1.02, 1.68)	0.05

Model 1: Adjustment for age, sex, race, urinary creatinine excretion, clinic site, education, waist circumference, body mass index, lean body mass index, cigarette smoking, alcohol drinking, physical activity, history of hypercholesterolemia, history of diabetes, history of cardiovascular disease, use of diuretics, use of renin-angiotensin system blocking agents, use of other antihypertensive medications, and baseline eGFR.

Model 2: Model 1 plus additional adjustment for systolic blood pressure

Model 3: Model 1 plus additional adjustment for log of urinary protein

Model 4: Model 1 plus additional adjustment for total calorie intake

Supplemental Table 2. Multiple-adjusted Odds Ratios and 95% Confidence Intervals of Rapid Chronic Kidney Disease Progression According to Quartile of 24-Hour Urinary Excretion of Sodium and Potassium among 3,757 Patients with Chronic Kidney Disease, the Chronic Renal Insufficiency Cohort Study

Variable	Urinary Sodium Excretion, mmol/24 hours					Urinary Potassium Excretion, mmol/24 hours				
	<116.8	116.8 – 153.6	153.7 – 194.5	≥194.6	*P* value	<39.4	39.4 – 52.1	52.2 – 67.0	≥67.1	*P* value
No. of Participants	940	939	938	940		939	940	938	940	
Rapid Chronic Kidney Disease Progression*										
No. with Rapid Progression	143	123	129	162		160	148	133	116	
Odds Ratio (95% Confidence Intervals)										
Multivariable Model 1	1.0	0.92 (0.70, 1.22)	1.11 (0.83, 1.49)	1.63 (1.20, 2.21)	0.0009	1.0	1.24 (0.94, 1.62)	1.38 (1.02, 1.85)	1.51 (1.08, 2.13)	0.09
Multivariable Model 2	1.0	0.88 (0.65, 1.19)	0.98 (0.72, 1.34)	1.27 (0.91, 1.78)	0.1	1.0	1.07 (0.80, 1.42)	1.11 (0.81, 1.53)	1.24 (0.86, 1.78)	0.7
Multivariable Model 3	1.0	0.89 (0.66, 1.20)	0.98 (0.71, 1.34)	1.28 (0.91, 1.80)	0.1	1.0	1.07 (0.81, 1.43)	1.12 (0.81, 1.54)	1.26 (0.88, 1.82)	0.7
Multivariable Model 4	1.0	0.88 (0.65, 1.19)	0.96 (0.70, 1.32)	1.23 (0.87, 1.74)	0.2	1.0	1.03 (0.76, 1.39)	1.03 (0.71, 1.48)	1.06 (0.63, 1.77)	0.9

Model 1: Adjusted for age, sex, race, urinary creatinine excretion, and clinic site

Model 2: Model 1 plus education, waist circumference, body-mass index, lean body mass, cigarette smoking, alcohol drinking, physical activity, history of hypercholesterolemia, history of diabetes, history of cardiovascular disease, use of diuretics, use of renin-angiotensin system blocking agents, and use of other antihypertensive medications

Model 3: Model 2 plus baseline eGFR

Model 4: Model 3 plus adjustment for urinary potassium excretion in sodium models and adjustment for urinary sodium excretion in potassium models

*Rapid chronic kidney disease progression is defined as a sustained decline in eGFR of more than 5 mL/min/1.73 m^2 per year

Supplemental Table 3. Multiple-adjusted Hazard Ratios and 95% Confidence Intervals of Chronic Kidney Disease Progression and All-cause Mortality According to Quartile of Adjusted 24-Hour Urinary Excretion of Sodium and Potassium among 3,757 Patients with Chronic Kidney Disease, the Chronic Renal Insufficiency Cohort Study

Variable	Adjusted Urinary Sodium Excretion*, mmol/24 hours					Adjusted Urinary Potassium Excretion*, mmol/24 hours				
	<125.9	125.9 – 158.7	158.8 – 197.7	≥197.8	*P* value for difference	<41.3	41.3 – 54.0	54.1 – 70.5	≥70.6	*P* value for difference
No. of Participants	940	939	938	940		940	938	940	939	
Chronic Kidney Disease Progression										
Events	202	190	231	316		235	232	214	258	
Person-years	4,028	4,271	4,094	3,414		4,032	3,891	4,079	3,805	
Hazard Ratio (95% Confidence Intervals)										
Multivariable Model 1	1.0	0.91 (0.75, 1.11)	1.14 (0.94, 1.38)	1.86 (1.54, 2.24)	<0.0001	1.0	1.30 (1.08, 1.57)	1.36 (1.11, 1.68)	2.19 (1.76, 2.71)	<0.0001
Multivariable Model 2	1.0	0.80 (0.65, 0.99)	0.95 (0.78, 1.16)	1.31 (1.07, 1.60)	<0.0001	1.0	1.01 (0.83, 1.23)	1.06 (0.86, 1.31)	1.47 (1.17, 1.84)	0.001
Multivariable Model 3	1.0	0.87 (0.70, 1.07)	0.95 (0.78, 1.16)	1.38 (1.13, 1.69)	<0.0001	1.0	1.10 (0.90, 1.34)	1.11 (0.90, 1.37)	1.76 (1.39, 2.21)	<0.0001
Multivariable Model 4	1.0	0.86 (0.70, 1.06)	0.93 (0.76, 1.14)	1.29 (1.05, 1.58)	0.0004	1.0	1.09 (0.90, 1.33)	1.07 (0.86, 1.32)	1.61 (1.27, 2.03)	0.0001
All-cause Mortality										
Events	103	96	132	209		121	129	127	163	
Person-years	5,165	5,299	5,159	4,842		5,313	5,114	5,113	4,926	
Hazard Ratio (95% Confidence Intervals)										
Multivariable Model 1	1.0	0.87 (0.66, 1.15)	1.17 (0.90, 1.53)	1.96 (1.53, 2.52)	<0.0001	1.0	1.13 (0.88, 1.46)	1.16 (0.88, 1.52)	1.56 (1.17, 2.06)	0.01

Multivariable Model 2	1.0	0.78 (0.58, 1.05)	1.01 (0.77, 1.33)	1.33 (1.02, 1.74)	0.001	1.0	0.88 (0.67, 1.15)	0.93 (0.70, 1.23)	0.98 (0.72, 1.33)	0.7
Multivariable Model 3	1.0	0.81 (0.60, 1.08)	1.02 (0.77, 1.34)	1.36 (1.04, 1.79)	0.001	1.0	0.90 (0.69, 1.18)	0.95 (0.72, 1.26)	1.02 (0.75, 1.39)	0.8
Multivariable Model 4	1.0	0.81 (0.60, 1.09)	1.01 (0.77, 1.33)	1.35 (1.03, 1.77)	0.002	1.0	0.89 (0.68, 1.16)	0.91 (0.69, 1.22)	0.94 (0.69, 1.28)	0.8
Chronic Kidney Disease Progression or Death										
Events	271	264	310	447		306	317	307	362	
Person-years	4,095	4,369	4,179	3,546		4,109	4,001	4,187	3,894	
Hazard Ratio (95% Confidence Intervals)										
Multivariable Model 1	1.0	0.91 (0.77, 1.08)	1.10 (0.93, 1.30)	1.86 (1.58, 2.19)	<0.0001	1.0	1.26 (1.07, 1.48)	1.34 (1.12, 1.60)	1.99 (1.65, 2.39)	<0.0001
Multivariable Model 2	1.0	0.80 (0.67, 0.96)	0.92 (0.77, 1.09)	1.28 (1.08, 1.52)	<0.0001	1.0	0.99 (0.84, 1.18)	1.06 (0.88, 1.27)	1.34 (1.10, 1.63)	0.004
Multivariable Model 3	1.0	0.85 (0.71, 1.01)	0.92 (0.77, 1.09)	1.32 (1.11, 1.57)	<0.0001	1.0	1.07 (0.90, 1.26)	1.10 (0.92, 1.32)	1.54 (1.26, 1.87)	<0.0001
Multivariable Model 4	1.0	0.85 (0.71, 1.01)	0.90 (0.76, 1.07)	1.25 (1.05, 1.49)	<0.0001	1.0	1.06 (0.89, 1.25)	1.06 (0.88, 1.27)	1.41 (1.15, 1.73)	0.001

Model 1: Adjusted for age, sex, race and clinic site

Model 2: Model 1 plus education, waist circumference, body-mass index, lean body mass, urinary creatinine excretion, cigarette smoking, alcohol drinking, physical activity, history of hypercholesterolemia, history of diabetes, history of cardiovascular disease, use of diuretics, use of renin-angiotensin system blocking agents, and use of other antihypertensive medications

Model 3: Model 2 plus baseline eGFR

Model 4: Model 3 plus adjustment for urinary potassium excretion in sodium models and adjustment for urinary sodium excretion in potassium models

*Adjusted to mean urinary creatinine excretion of 1,569 mg/24 hours in men and 1,130 mg/24 hours in women.

Supplemental Table 4. Multiple-adjusted Hazard Ratios and 95% Confidence Intervals of Chronic Kidney Disease Progression and All-cause Mortality According to Quartile of Adjusted 24-Hour Urinary Excretion of Sodium and Potassium among 3,757 CRIC Study Participants: Sensitivity Analyses

Variable	Adjusted Urinary Sodium Excretion*, mmol/24 hours					Adjusted Urinary Potassium Excretion*, mmol/24 hours				
	<125.9 (n=940)	125.9 – 158.7 (n=939)	158.8 – 197.7 (n=938)	≥197.8 (n=940)	*P* value for difference	<41.3 (n=940)	41.3 – 54.0 (n=938)	54.1 – 70.5 (n=940)	≥70.6 (n=939)	*P* value for difference
Chronic Kidney Disease Progression										
Model 1	1.0	0.87 (0.70, 1.07)	0.95 (0.78, 1.16)	1.38 (1.13, 1.69)	<0.0001	1.0	1.10 (0.90, 1.34)	1.11 (0.90, 1.37)	1.76 (1.39, 2.21)	<0.0001
Model 2	1.0	0.84 (0.68, 1.04)	0.90 (0.73, 1.10)	1.27 (1.04, 1.56)	0.0001	1.0	1.06 (0.87, 1.29)	1.06 (0.85, 1.31)	1.63 (1.30, 2.06)	<0.0001
Model 3	1.0	0.79 (0.64, 0.97)	0.72 (0.59, 0.88)	0.86 (0.70, 1.06)	0.01	1.0	1.05 (0.86, 1.28)	0.87 (0.70, 1.08)	1.12 (0.89, 1.42)	0.07
Model 4	1.0	0.90 (0.71, 1.15)	1.02 (0.81, 1.29)	1.35 (1.06, 1.72)	0.007	1.0	1.01 (0.80, 1.27)	0.98 (0.77, 1.26)	1.61 (1.22, 2.12)	0.0002
All-cause Mortality										
Model 1	1.0	0.81 (0.60, 1.08)	1.02 (0.77, 1.34)	1.36 (1.04, 1.79)	0.001	1.0	0.90 (0.69, 1.18)	0.95 (0.72, 1.26)	1.02 (0.75, 1.39)	0.8
Model 2	1.0	0.81 (0.60, 1.08)	1.01 (0.77, 1.33)	1.34 (1.02, 1.76)	0.002	1.0	0.89 (0.68, 1.17)	0.94 (0.71, 1.25)	1.01 (0.74, 1.36)	0.8
Model 3	1.0	0.81 (0.60, 1.09)	1.00 (0.76, 1.33)	1.27 (0.96, 1.68)	0.01	1.0	0.91 (0.69, 1.20)	0.92 (0.69, 1.22)	0.92 (0.67, 1.26)	0.9
Model 4	1.0	0.91 (0.64, 1.28)	1.05 (0.76, 1.46)	1.50 (1.09, 2.07)	0.007	1.0	0.90 (0.65, 1.25)	1.06 (0.76, 1.48)	1.10 (0.76, 1.60)	0.6
Chronic Kidney Disease Progression or Death										
Model 1	1.0	0.85 (0.71, 1.01)	0.92 (0.77, 1.09)	1.32 (1.11, 1.57)	<0.0001	1.0	1.07 (0.90, 1.26)	1.10 (0.92, 1.32)	1.54 (1.26, 1.87)	<0.0001
Model 2	1.0	0.82 (0.69, 0.98)	0.88 (0.74, 1.04)	1.24 (1.04, 1.47)	<0.0001	1.0	1.03 (0.87, 1.23)	1.06 (0.88, 1.27)	1.46 (1.20, 1.77)	0.0001
Model 3	1.0	0.79 (0.66, 0.94)	0.77 (0.65, 0.92)	0.95 (0.80, 1.13)	0.003	1.0	1.04 (0.87, 1.23)	0.96 (0.79, 1.15)	1.14 (0.94, 1.40)	0.2
Model 4	1.0	0.88 (0.72, 1.08)	0.96 (0.79, 1.18)	1.32 (1.08, 1.62)	0.0003	1.0	1.02 (0.84, 1.25)	1.02 (0.82, 1.26)	1.44 (1.13, 1.83)	0.002

Model 1: Adjustment for age, sex, race, clinic site, education, waist circumference, body mass index, lean body mass, urinary creatinine excretion, cigarette smoking, alcohol drinking, physical activity, history of hypercholesterolemia, history of diabetes, history of cardiovascular disease, use of diuretics, use of renin-angiotensin system blocking agents, use of other antihypertensive medications, and baseline eGFR.

Model 2: Model 1 plus additional adjustment for systolic blood pressure

Model 3: Model 1 plus additional adjustment for log of urinary protein

Model 4: Model 1 plus additional adjustment for total calorie intake

*Adjusted to mean urinary creatinine excretion of 1,569 mg/24 hours in men and 1,130 mg/24 hours in women

Supplemental Table 5. Multiple-adjusted Odds Ratios and 95% Confidence Intervals of Rapid Chronic Kidney Disease Progression According to Quartile of Adjusted 24-Hour Urinary Excretion of Sodium and Potassium among 3,757 Patients with Chronic Kidney Disease, the Chronic Renal Insufficiency Cohort Study

Variable	Adjusted Urinary Sodium Excretion*, mmol/24 hours					Adjusted Urinary Potassium Excretion*, mmol/24 hours				
	<125.9	125.9 – 158.7	158.8 – 197.7	≥197.8	*P* value	<41.3	41.3 – 54.0	54.1 – 70.5	≥70.6	*P* value
No. of Participants	940	939	938	940		940	938	940	939	
Rapid Chronic Kidney Disease Progression†										
No. with Rapid Progression	119	110	128	200		135	147	127	148	
Odds Ratio (95% Confidence Intervals)										
Multivariable Model 1	1.0	0.86 (0.65, 1.15)	1.03 (0.78, 1.37)	2.08 (1.58, 2.74)	<0.0001	1.0	1.37 (1.04, 1.80)	1.40 (1.04, 1.88)	2.25 (1.64, 3.10)	<0.0001
Multivariable Model 2	1.0	0.82 (0.60, 1.12)	0.84 (0.61, 1.13)	1.43 (1.05, 1.95)	0.0003	1.0	1.12 (0.84, 1.50)	1.09 (0.79, 1.50)	1.57 (1.10, 2.22)	0.05
Multivariable Model 3	1.0	0.82 (0.61, 1.12)	0.84 (0.62, 1.14)	1.44 (1.06, 1.96)	0.0003	1.0	1.12 (0.84, 1.51)	1.10 (0.80, 1.51)	1.59 (1.12, 2.26)	0.04
Multivariable Model 4	1.0	0.82 (0.60, 1.12)	0.83 (0.61, 1.13)	1.40 (1.03, 1.92)	0.0006	1.0	1.16 (0.85, 1.60)	1.17 (0.79, 1.74)	1.79 (1.04, 3.10)	0.1

Model 1: Adjusted for age, sex, race and clinic site

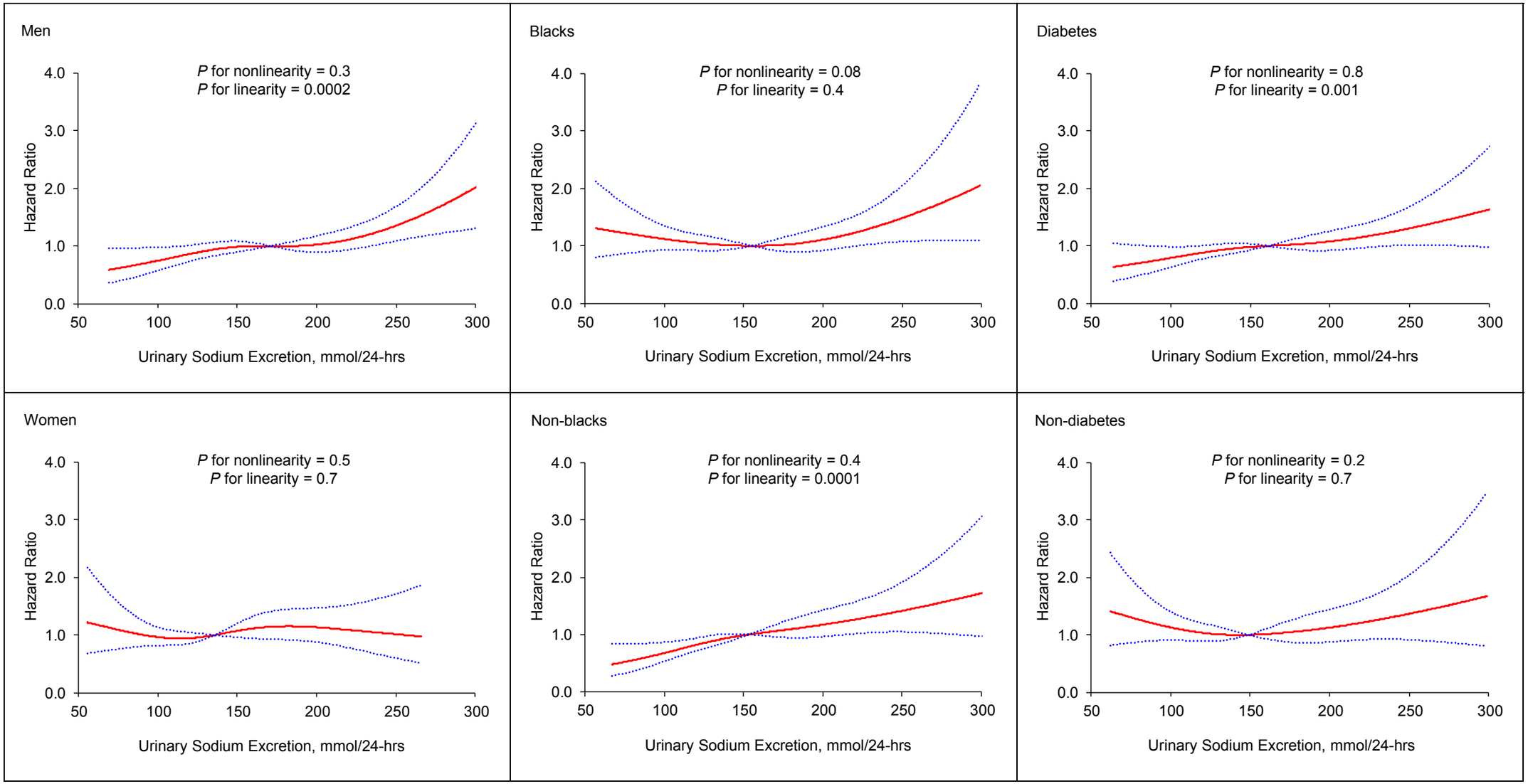
Model 2: Model 1 plus education, waist circumference, body-mass index, lean body mass, urinary creatinine excretion, cigarette smoking, alcohol drinking, physical activity, history of hypercholesterolemia, history of diabetes, history of cardiovascular disease, use of diuretics, use of renin-angiotensin system blocking agents, and use of other antihypertensive medications

Model 3: Model 2 plus baseline eGFR

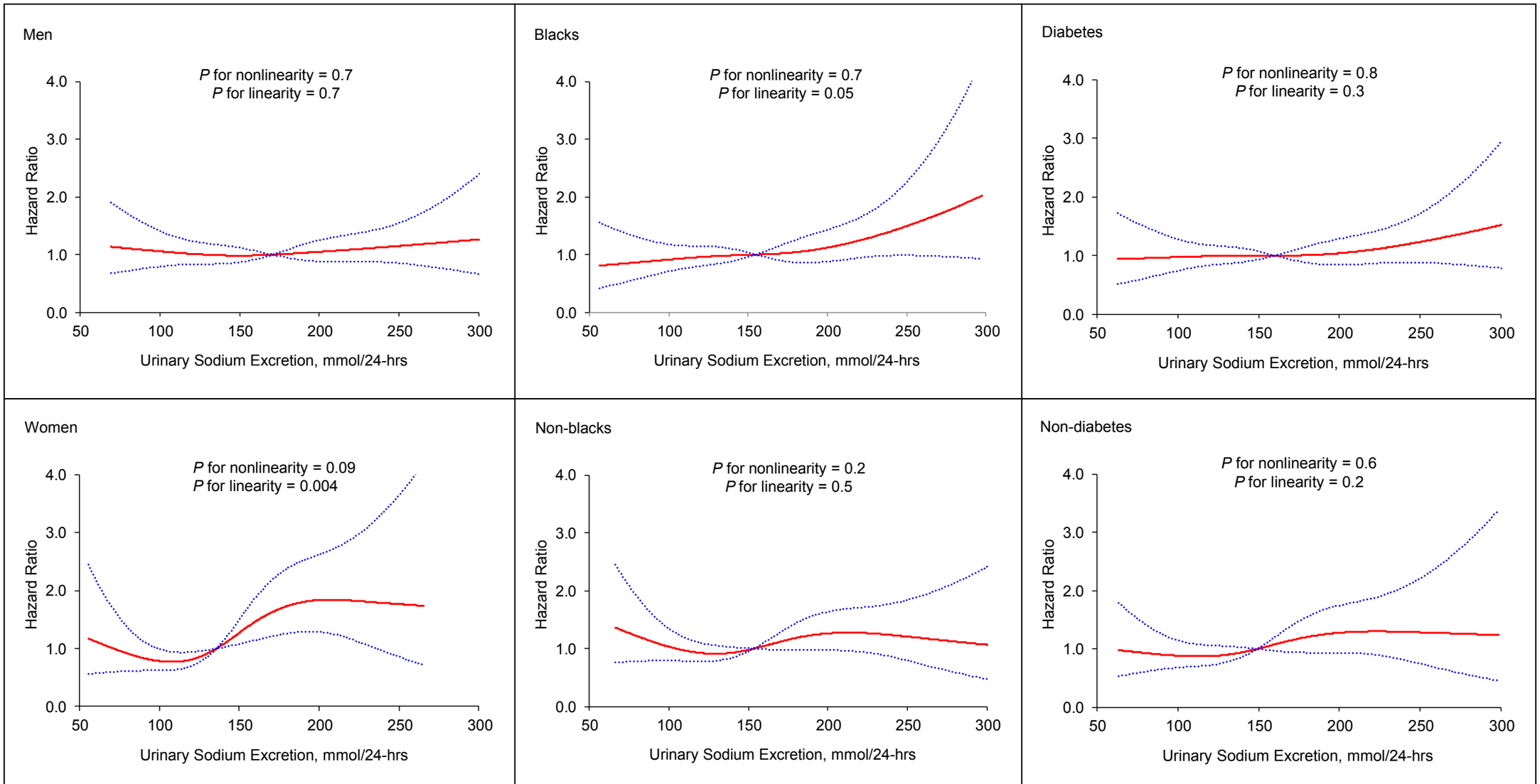
Model 4: Model 3 plus adjustment for urinary potassium excretion in sodium models and adjustment for urinary sodium excretion in potassium models

*Adjusted to mean urinary creatinine excretion of 1,569 mg/24 hours in men and 1,130 mg/24 hours in women; †Rapid chronic kidney disease progression is defined as a sustained decline in eGFR of more than 5 mL/min/1.73 m^2 per year.

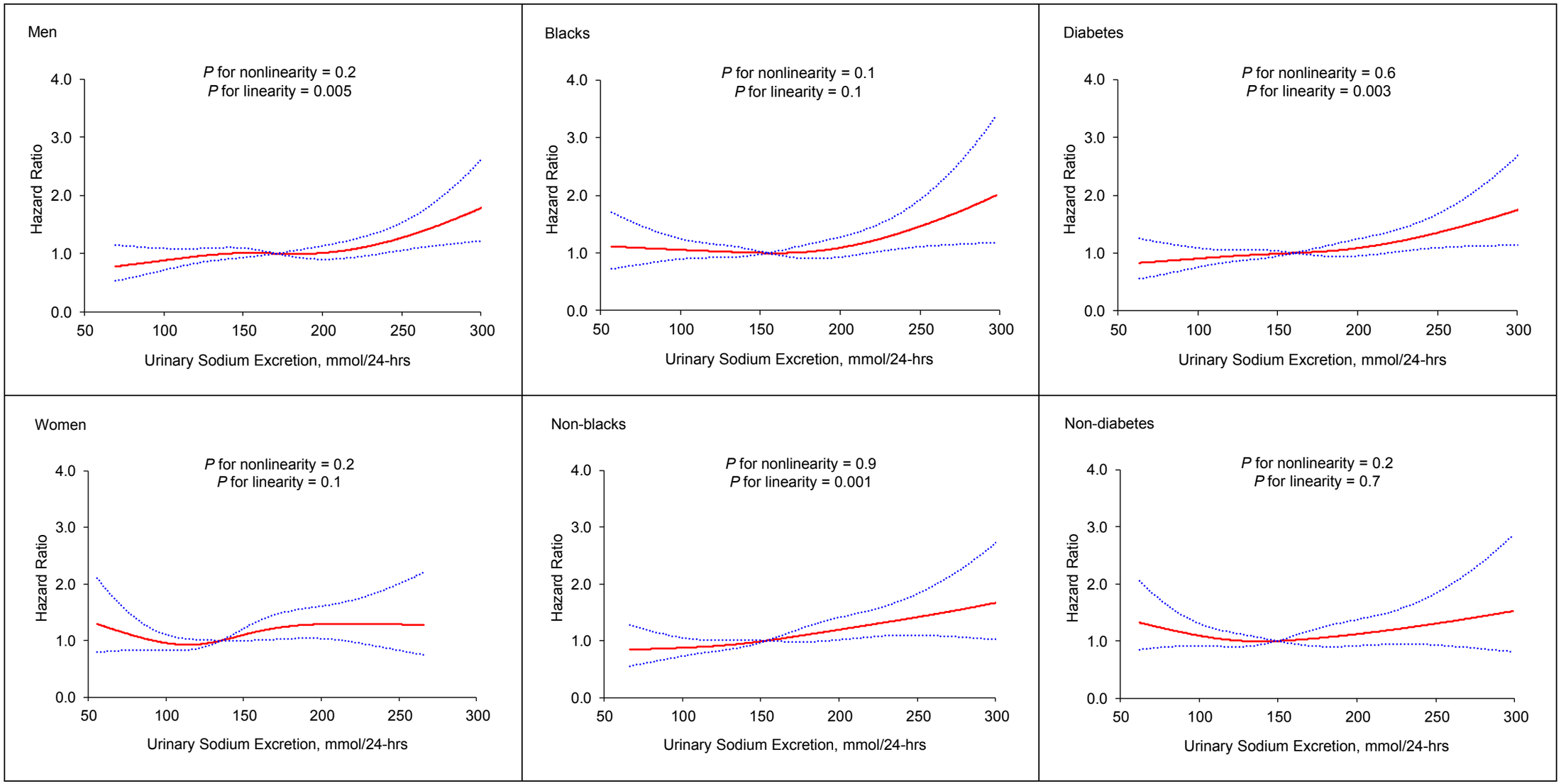
Supplemental Figure 1. Multiple-adjusted hazard ratios and 95% confidence intervals of chronic kidney disease progression associated with 24-hour urinary sodium excretion in subgroups by sex, race, and diabetes status: spline regression analyses



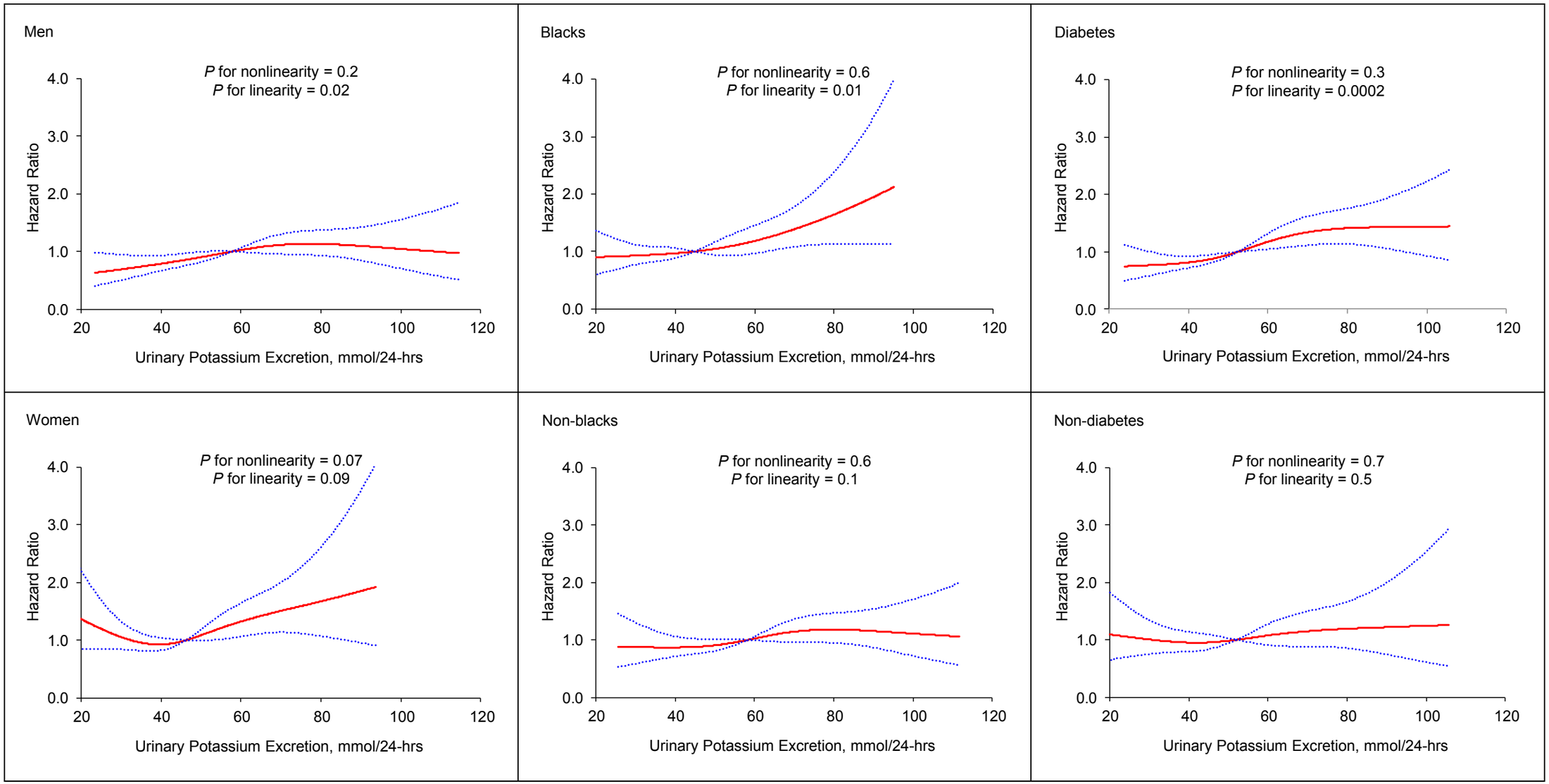
Supplemental Figure 2. Multiple-adjusted hazard ratios and 95% confidence intervals of all-cause mortality associated with 24-hour urinary sodium excretion in subgroups by sex, race, and diabetes status: spline regression analyses



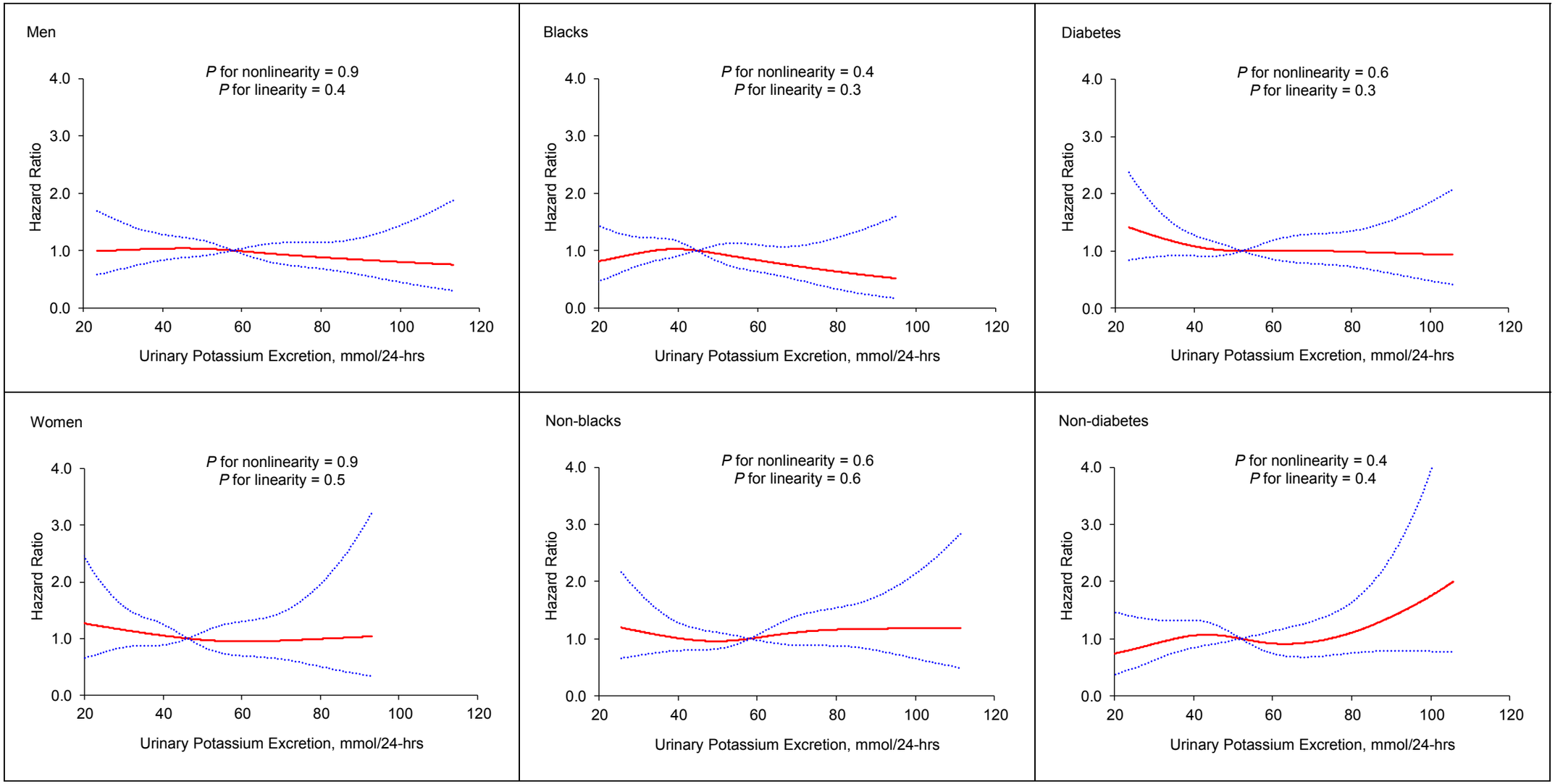
Supplemental Figure 3. Multiple-adjusted hazard ratios and 95% confidence intervals of chronic kidney disease progression or death associated with 24-hour urinary sodium excretion in subgroups by sex, race, and diabetes status: spline regression analyses



Supplemental Figure 4. Multiple-adjusted hazard ratios and 95% confidence intervals of chronic kidney disease progression associated with 24-hour urinary potassium excretion in subgroups by sex, race, and diabetes status: spline regression analyses



Supplemental Figure 5. Multiple-adjusted hazard ratios and 95% confidence intervals of all-cause mortality associated with 24-hour urinary potassium excretion in subgroups by sex, race, and diabetes status: spline regression analyses



Supplemental Figure 6. Multiple-adjusted hazard ratios and 95% confidence intervals of chronic kidney disease progression or death associated with 24-hour urinary potassium excretion in subgroups by sex, race, and diabetes status: spline regression analyses