

SUPPLEMENTAL MATERIALS

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Supplemental Figure 1. Incidence rates (95% CIs) of major cardiovascular disease events according to the ASCVD and KDIGO risk categories

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Supplemental Table 1. Incidence rates (95% CIs) of major cardiovascular disease events per 1000 person-years according to eGFR and urinary ACR categories

eGFR (ml/min/1.73 m ²)	Urinary albumin-to-creatinine ratio (mg/g)		
	<30	30-<300	≥300
≥90	4.36 (4.11-4.62)	10.16 (8.89-11.62)	15.42 (10.57-22.49)
60-<90	8.97 (8.42-9.55)	18.72 (16.56-21.15)	32.06 (24.84-41.38)
45-<60	15.83 (12.68-19.76)	36.61 (27.82-48.17)	42.31 (27.30-65.58)
30-<45	17.10 (9.71-30.10)	27.11 (15.40-47.74)	30.81 (16.58-57.26)
15-<30	35.52 (13.33-94.65)	30.03 (11.27-80.01)	52.73 (29.20-95.22)
<15	20.37 (2.87-144.6)	40.82 (5.75-289.8)	28.96 (9.34-89.79)

Abbreviations: ACR, albumin-to-creatinine ratio; CI, confidence interval; eGFR, estimated glomerular filtration rate.

Supplemental Table 2. Hazard ratios (95% CIs) of major cardiovascular disease events in association with the ASCVD risk score and its components

	Overall	KDIGO Categories		
		Low Risk	Intermediate Risk	High or Very High Risk
ASCVD risk score (per 5% increase)	1.24 (1.23, 1.25)	1.25 (1.24, 1.27)	1.16 (1.14, 1.19)	1.13 (1.09, 1.17)
ASCVD risk score components				
Age (per 5-year increase)	1.35 (1.32, 1.38)	1.37 (1.34, 1.41)	1.23 (1.17, 1.29)	1.22 (1.13, 1.32)
Sex (men vs. women)	1.36 (1.24, 1.50)	1.33 (1.19, 1.48)	1.44 (1.16, 1.80)	1.73 (1.22, 2.45)
Current smoking (yes vs. no)	1.32 (1.17, 1.48)	1.28 (1.12, 1.47)	1.49 (1.13, 1.97)	1.24 (0.81, 1.90)
Systolic BP (per 5-mmHg increase)	1.08 (1.07, 1.09)	1.08 (1.06, 1.09)	1.07 (1.05, 1.09)	1.06 (1.03, 1.09)
Anti-hypertensive drugs (yes vs. no)	1.14 (1.03, 1.26)	1.18 (1.04, 1.33)	1.01 (0.81, 1.26)	0.90 (0.64, 1.27)
Total cholesterol (per 5-mg/dl increase)	1.01 (1.01, 1.02)	1.01 (1.01, 1.02)	1.02 (1.01, 1.03)	1.01 (0.99, 1.02)
HDL cholesterol (per 5-mg/dl increase)	0.98 (0.965, 0.998)	0.98 (0.96, 1.00)	0.99 (0.95, 1.03)	1.00 (0.94, 1.07)
Diabetes (yes vs. no)	1.52 (1.39, 1.65)	1.36 (1.23, 1.51)	1.54 (1.28, 1.85)	2.04 (1.49, 2.79)
<i>P</i> for interaction*		<0.0001		

The analysis was adjusted for education, current drinking, fruit and vegetable intake, physical activity, body-mass index, and other components of the ASCVD score.

*The effect modification of KDIGO stratification on the association between ASCVD risk score and cardiovascular outcomes was examined by including a multiplicative interaction term in the model.

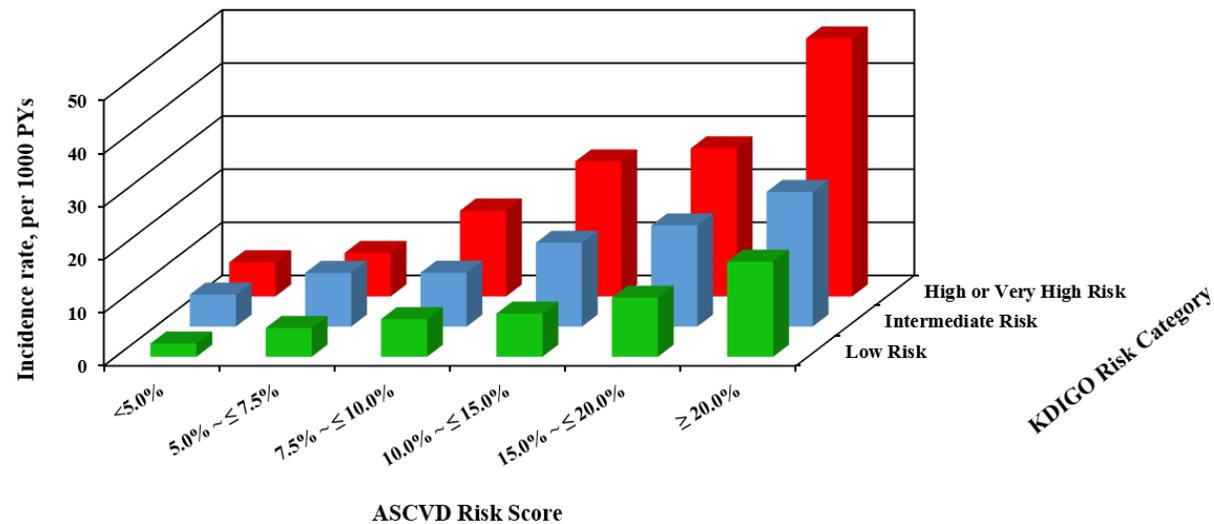
Abbreviations: ASCVD, atherosclerotic cardiovascular disease; BP, blood pressure; CI, confidence interval; HDL, high-density lipoprotein; KDIGO, Kidney Disease: Improving Global Outcomes.

Supplemental Table 3. Improvement in reclassification and discrimination of major cardiovascular disease events by adding KDIGO risk category to the ASCVD risk score

Model with the ASCVD risk score	Model with the ASCVD risk score + KDIGO category				Correctly Reclassified, %	Incorrectly Reclassified, %	Categorical NRI, % (95% CI)	Continuous NRI, % (95% CI)	IDI, % (95% CI)
	<7.5%	7.5%-19.9%	≥20.0%	Total					
Events					10.57 (9.52, 11.83)	6.45 (5.52, 7.38)	3.91 (2.57, 5.46)	30.71 (27.33, 33.86)	0.87 (0.69, 1.07)
<7.5%	1068	159	7	1234					
7.5%-19.9%	119	921	137	1177					
≥20.0%	0	66	389	455					
Total	1187	1146	533	2866					
Non-events					4.63 (4.51, 4.74)	4.84 (4.72, 4.96)	3.91 (2.57, 5.46)	30.71 (27.33, 33.86)	0.87 (0.69, 1.07)
<7.5%	81031	4368	47	85446					
7.5%-19.9%	4291	17704	1028	23023					
≥20.0%	0	915	3116	4031					
Total	85322	22987	4191	112500					

Abbreviations: ASCVD, atherosclerotic cardiovascular disease; IDI, integrated discrimination improvement; KDIGO, Kidney Disease: Improving Global Outcomes; NRI, net reclassification improvement.

Supplemental Figure 1. Incidence rates (95% CIs) of major cardiovascular disease events according to the ASCVD and KDIGO risk categories. Increases in the incidence rates were substantial across the low, intermediate, and high or very high KDIGO risk categories combined with ASCVD risk groups. Abbreviations: ASCVD, atherosclerotic cardiovascular disease; CI, confidence interval; KDIGO, Kidney Disease: Improving Global Outcomes.



KDIGO Risk Category	ASCVD Risk Score					
	<5.0%	5.0% ~ <7.5%	7.5% ~ <10.0%	10.0% ~ <15.0%	15.0% ~ <20.0%	≥20.0%
Low Risk	2.48 (2.28-2.71)	5.41 (4.74-6.18)	7.08 (6.15-8.14)	8.12 (7.24-9.10)	11.11 (9.78-12.61)	17.90 (16.57-19.34)
Intermediate Risk	6.03 (4.89-7.44)	10.10 (7.49-13.62)	10.13 (7.16-14.33)	15.79 (12.61-19.77)	19.04 (14.96-24.24)	25.37 (22.39-28.75)
High or Very High Risk	6.44 (3.57-11.63)	8.20 (3.41-19.69)	16.17 (8.70-30.05)	25.43 (16.75-38.63)	27.91 (18.20-42.81)	48.61 (41.33-57.17)

Supplemental Figure 2. C-statistic changes after adding eGFR, log(ACR), or eGFR and log(ACR) to the base model in prediction of major cardiovascular disease events. The base model included education, current drinking, fruit and vegetable intake, physical activity, body-mass index, and the ASCVD risk score. The addition of log(ACR) and eGFR to the base model further increased the predictive ability for CVD development in the overall population and in subgroups. Abbreviations: ACR, albumin-to-creatinine ratio; ASCVD, atherosclerotic cardiovascular disease; eGFR, estimated glomerular filtration rate.

