

## **SUPPLEMENTAL MATERIALS**

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

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

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

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

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

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

|                                       | Urinary albumin-to-creatinine ratio (mg/g) |                     |                     |
|---------------------------------------|--|---------------------|---------------------|
| eGFR<br>(ml/min/1.73 m <sup>2</sup> ) | <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.

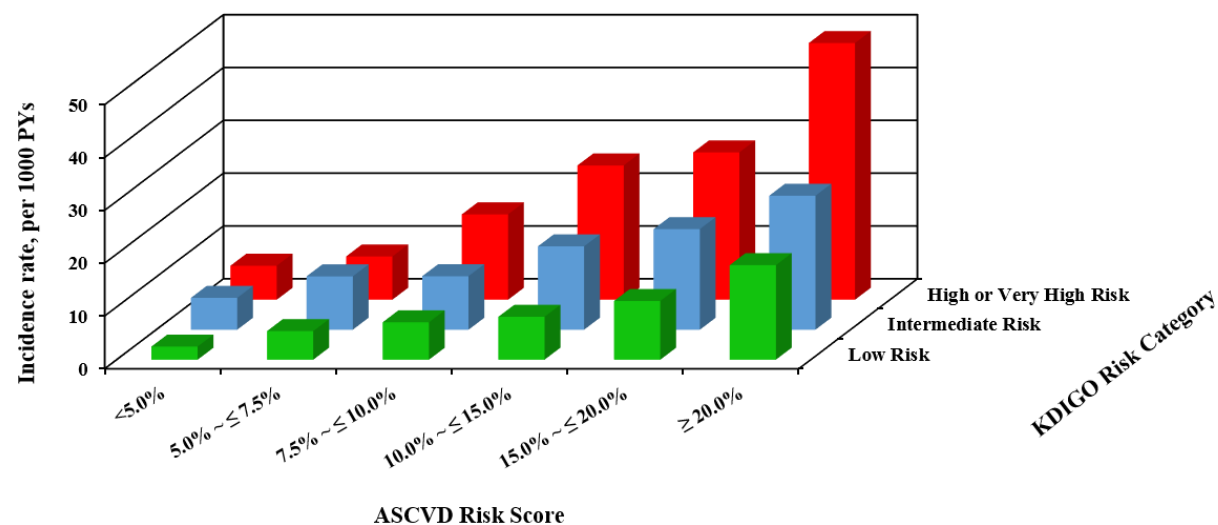
Abbreviations: ASCVD, atherosclerotic cardiovascular disease; BP, blood pressure; CI, confidence interval; HDL, high-density lipoprotein; KDIGO, Kidney Disease: Improving Global Outcomes.

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)           |                             |                            |                   |  |  |  |
| <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.

