Supplemental Table 1: Adjusted\* odd ratio (aOR) for diabetes and Insulin Resistance in adult participants (20 years of age and older) in NHANES 2005-2006

|  |  |  |
| --- | --- | --- |
|  | DiabetesaOR (95% CI) | Insulin Resistance (HOMA-IR>2.6)aOR (95% CI) |
|  | n | 2027 | n | 850 |
| Creatinine-adjusted CEMA Q1 | 472 | referent | 205 | referent |
| Creatinine-adjusted CEMA Q2 | 505 | 2.21 (1.20, 4.08) | 215 | 2.31 (1.43, 3.73) |
| Creatinine-adjusted CEMA Q3 | 537 | 2.23 (1.32, 3.79) | 225 | 3.14 (1.91, 5.16) |
| Creatinine-adjusted CEMA Q4 | 513 | 2.43 (1.51, 3.90) | 205 | 3.61 (1.71, 7.60) |
| p-trend |  | 0.007 |  | 0.001 |
|  |  |  |  |  |
| Creatinine-adjusted 3-HPMA Q1 | 506 | referent | 269 | referent |
| Creatinine-adjusted 3-HPMA Q2 | 535 | 1.32 (0.77, 2.25) | 231 | 2.53 (1.55, 4.13) |
| Creatinine-adjusted 3-HPMA Q3 | 495 | 2.01 (1.29, 3.12) | 180 | 3.06 (1.55, 6.04) |
| Creatinine-adjusted 3-HPMA Q4 | 491 | 1.81 (1.05, 3.13) | 170 | 2.87 (1.37, 5.99) |
| p-trend |  | 0.02 |  | 0.004 |
|  |  |  |  |  |
| ∑ creatinine-adjusted AcroleinQ1 | 495 | referent | 251 | referent |
| ∑ creatinine-adjusted Acrolein Q2 | 522 | 1.4 (0.66, 2.94) | 234 | 2.12 (1.29, 3.47) |
| ∑ creatinine-adjusted Acrolein Q3 | 517 | 2.06 (1.21, 3.50) | 192 | 4.15 (2.03, 8.47) |
| ∑ creatinine-adjusted Acrolein Q4 | 493 | 2.25 (1.15, 4.39) | 173 | 3.20 (1.41, 7.26) |
| p-trend |  | 0.02 |  | 0.006 |

\*Adjusted for age, race/ethnicity, sex, length of fasting, education attainment, alcohol consumption, self-reported cigarette smoking, serum cotinine, body weight status, and recreational activity.

Quartiles CEMA (μg/g of creatinine)): Q1: ≤ 59.05; Q2: 59.06 – 96.88; Q3: 96.89 – 167.37; Q4: >167.37. Quartiles 3-HPMA (μg/g of creatinine)): Q1: ≤ 163.97; Q2: 163.98 – 288.72; Q3: 288.73 – 596.96 ; Q4: >596.96. Quartiles ∑Acrolein (µmol/ g of creatinine ): Q1: ≤ 1.08; Q2: 1.09 – 1.75; Q3: 1.76 – 3.48; Q4: >3.48.

Supplemental Table 2: Adjusted\* beta –coefficient (95% CI) for diabetes markers in adult participants (20 years of age and older) in NHANES 2005-2006

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Ln - HOMA-IR | Ln –HOMA-β | Ln-Fasting Insulin | Ln-Fasting Plasma Glucose |
| n | 850 | 850 | 851 | 860 |
| Creatinine-adjusted 3- CEMA Q1 | 0.0 | 0.0 | 0.0 | 0.0 |
| Creatinine-adjusted 3- CEMA Q2 | 0.23 (0.09, 0.37) | 0.20 (0.06, 0.34) | 0.21 (0.08, 0.35) | 0.02 (-0.01, 0.04) |
| Creatinine-adjusted 3- CEMA Q3 | 0.25 (0.14, 0.37) | 0.20 (0.10, 0.29) | 0.23 (0.13, 0.34) | 0.02 (-0.01, 0.04) |
| Creatinine-adjusted 3- CEMA Q4 | 0.21 (0.03, 0.39) | 0.12 (-0.02, 0.25) | 0.18 (0.01, 0.34) | 0.02 (-0.00, 0.05) |
| p-trend | 0.001 | 0.003 | 0.001 | 0.19 |
|  |  |  |  |  |
| Creatinine-adjusted 3-HPMA Q1 | 0.0 | 0.0 | 0.0 | 0.0 |
| Creatinine-adjusted 3-HPMA Q2 | 0.16 (0.04, 0.28) | 0.13 (0.04, 0.21) | 0.15 (0.04, 0.26) | 0.01 (-0.01, 0.04) |
| Creatinine-adjusted 3-HPMA Q3 | 0.28 (0.12, 0.44) | 0.17 (0.07, 0.27) | 0.25 (0.11, 0.38) | 0.04 (0.00, 0.07) |
| Creatinine-adjusted 3-HPMA Q4 | 0.15 (-0.03, 0.34) | 0.14 (-0.04, 0.31) | 0.14 (-0.04, 0.31) | 0.00 (-0.03, 0.04) |
| p-trend | 0.006 | 0.01 | 0.006 | 0.11 |
|  |  |  |  |  |
| ∑ creatinine-adjusted AcroleinQ1 | 0.0 | 0.0 | 0.0 | 0.0 |
| ∑ creatinine-adjusted Acrolein Q2 | 0.19 (0.10, 0.28) | 0.15 (0.07, 0.24) | 0.18 (0.10, 0.25) | 0.01 (-0.02, 0.03) |
| ∑ creatinine-adjusted Acrolein Q3 | 0.36 (0.22, 0.50) | 0.22 (0.14, 0.31) | 0.32 (0.20, 0.44) | 0.04 (0.01, 0.07) |
| ∑ creatinine-adjusted Acrolein Q4 | 0.18 (-0.04, 0.40) | 0.14 (-0.03, 0.31) | 0.16 (-0.04, 0.36) | 0.01 (-0.03, 0.04) |
| p-trend | 0.001 | 0.001 | 0.001 | 0.06 |
|  |  |  |  |  |

\*Adjusted for age, race/ethnicity, sex, length of fasting, education attainment, alcohol consumption, self-reported cigarette smoking, serum cotinine, body weight status, and recreational activity. Quartiles CEMA (μg/g of creatinine)): Q1: ≤ 59.05; Q2: 59.06 – 96.88; Q3: 96.89 – 167.37; Q4: >167.37. Quartiles 3-HPMA (μg/g of creatinine)): Q1: ≤ 163.97; Q2: 163.98 – 288.72; Q3: 288.73 – 596.96; Q4: >596.96. Quartiles ∑Acrolein (µmol/ g of creatinine): Q1: ≤ 1.08; Q2: 1.09 – 1.75; Q3: 1.76 – 3.48; Q4: >3.48.