Appendix A. Supplementary material

**Table A.1**

Sample-weighted multiple regression slopes for urinary HPMM concentrations among exclusive combusted tobacco users and non-users combined (N=4,502). The *p*-value was estimated from identical models where the dependent variable was log-transformed.

| **Predictor** | **Level** | **Slope [95% CI]c** | ***p*-Value****d** |
| --- | --- | --- | --- |
| NHANES Cycle | 2005–2006 | -162.83 [-240.44:-85.21] | < 0.0001 |
|  | 2011–2012 | Ref. |  |
| Creatinine, urine [mg/dL] | Slope | 6.48 [5.22:7.74] | < 0.0001 |
| CPD Groupa | ≤ 0.05 ng/mL  | Ref. |   |
|  | > 0.05 - ≤ 10 ng/mL  | 30.77 [-20.97:82.51] | 0.0414 |
|  | 1–10 CPD (0.5 pack) | 1394.41 [1123.70:1665.11] | < 0.0001 |
|  | 11–20 CPD (1 pack) | 2976.08 [2589.24:3362.91] | < 0.0001 |
|  | > 20 CPD (> 1 pack) | 3361.32 [2558.25:4164.40] | < 0.0001 |
| Age (yr) | 6-11 | 198.23 [71.78:324.68] | 0.0033 |
|  | 12-19 | -7.34 [-94.41:79.73] | 0.2476 |
|  | 20-39 | Ref. |   |
|  | 40-59 | 324.81 [223.70:425.93] | < 0.0001 |
|  | ≥60 | 352.00 [204.31:499.69] | < 0.0001 |
| Sex | Male | Ref. |   |
|  | Female | 182.67 [59.71:305.63] | 0.0324 |
| Race/Ethnicity | Non-Hispanic White | Ref. |   |
|  | Mexican American | 62.06 [-29.47:153.59] | 0.2186 |
|  | Non-Hispanic Black | -180.82 [-312.34:-49.30] | < 0.0001 |
|  | Other Race - Including Multi-Racial | 19.29 [-214.79:253.37] | 0.4798 |
| BMIb | Underweight | 536.37 [78.93:993.82] | 0.1887 |
|  | Healthy weight | Ref. |   |
|  | Overweight/Obese | -79.95 [-168.46:8.56] | 0.0333 |
| Poverty Status | No | Ref. |   |
|  | Yes | 43.31 [-90.49:177.11] | 0.5764 |
| Milk Products [kg] | Slope | -73.66 [-210.53:63.21] | 0.9695 |
| Meat, Poultry [kg] | Slope | -207.82 [-406.34:-9.30] | 0.5324 |
| Eggs [kg] | Slope | -259.54 [-1026.57:507.48] | 0.8252 |
| Legumes, Nuts, Seeds [kg] | Slope | 275.34 [-156.55:707.23] | 0.5055 |
| Grain Products [kg] | Slope | -2.68 [-140.41:135.05] | 0.0850 |
| Fruits [kg] | Slope | 69.15 [-41.66:179.95] | 0.0327 |
| Vegetables [kg] | Slope | -159.55 [-448.07:128.97] | 0.5513 |
| Fats, Oils, Salad Dressings [kg] | Slope | -672.57 [-2090.42:745.27] | 0.9439 |
| Sugars, Sweets, Beverages [kg] | Slope | -1.18 [-35.42:33.06] | 0.5172 |
| Pre-exam Fasting Time [hr] | Slope | -32.25 [-39.65:-24.85] | < 0.0001 |

a CPD: cigarettes smoked per day (smokers). Among smokers, 8.50% of participants smoked 1 – 10 CPD, 5.11% smoked 11 – 20 CPD, and 1.42% smoked >20 CPD.

b Body mass index

c 95% confidence interval

d *p*-Values estimated from identical models where the dependent variable was natural log-transformed

**Table A.2**

Sample-weighted summary statistics for urinary HPMM concentrations (mg/g creatinine) in non-users (serum cotinine ≤ 10 ng/mL), N = 3,825.

| **Predictor** | **Level** | **GM [95%CI]** | **Median [25th, 75th %ile]** | **2.5th %ile** | **5th %ile** | **10th %ile** | **90th %ile** | **95th %ile** | **97.5th %ile** | **Sample Size** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| All |  | 0.337 [0.318, 0.356] | 0.313 [0.231, 0.451] | 0.121 | 0.151 | 0.180 | 0.698 | 1.03 | 1.43 | 3,825 |
| Age (yr) | 6–11 | 0.450 [0.405, 0.495] | 0.423 [0.324, 0.511] | 0.191 | 0.227 | 0.269 | 0.921 | 1.27 | 1.67 | 276 |
|  | 12–19 | 0.278 [0.255, 0.300] | 0.259 [0.204, 0.350] | 0.119 | 0.143 | 0.162 | 0.491 | 0.627 | 1.18 | 1,002 |
|  | 20–39 | 0.297 [0.275, 0.319] | 0.275 [0.211, 0.400] | 0.119 | 0.143 | 0.165 | 0.615 | 0.865 | 1.20 | 969 |
|  | 40–59 | 0.350 [0.317, 0.382] | 0.329 [0.241, 0.479] | 0.110 | 0.152 | 0.186 | 0.727 | 1.08 | 1.60 | 757 |
|  | ≥ 60 | 0.406 [0.380, 0.432] | 0.375 [0.277, 0.542] | 0.141 | 0.180 | 0.219 | 0.923 | 1.20 | 1.81 | 821 |
| Sex | Male | 0.312 [0.296, 0.328] | 0.290 [0.218, 0.414] | 0.120 | 0.150 | 0.172 | 0.635 | 0.931 | 1.21 | 1,760 |
|  | Female | 0.360 [0.335, 0.386] | 0.332 [0.245, 0.484] | 0.126 | 0.151 | 0.191 | 0.730 | 1.20 | 1.81 | 2,065 |
| Race/Ethnicity | Non-Hispanic White | 0.349 [0.327, 0.372] | 0.330 [0.239, 0.476] | 0.122 | 0.154 | 0.186 | 0.708 | 1.02 | 1.43 | 1,448 |
|  | Mexican American | 0.335 [0.297, 0.372] | 0.306 [0.227, 0.423] | 0.117 | 0.157 | 0.173 | 0.740 | 1.31 | 2.24 | 829 |
|  | Non-Hispanic Black | 0.264 [0.242, 0.286] | 0.253 [0.195, 0.356] | 0.0836 | 0.127 | 0.150 | 0.493 | 0.696 | 1.09 | 957 |
|  | Other Race - Including Multi-Racial | 0.347 [0.319, 0.374] | 0.303 [0.236, 0.459] | 0.143 | 0.166 | 0.195 | 0.750 | 1.09 | 1.68 | 591 |
| BMI a | Underweight | 0.404 [0.282, 0.525] | 0.385 [0.249, 0.444] | 0.145 | 0.183 | 0.210 | 0.521 | 1.78 | . | 67 |
|  | Healthy weight | 0.356 [0.329, 0.383] | 0.323 [0.235, 0.486] | 0.121 | 0.147 | 0.181 | 0.730 | 1.28 | 1.65 | 1,468 |
|  | Overweight/Obese | 0.326 [0.307, 0.344] | 0.306 [0.227, 0.426] | 0.121 | 0.151 | 0.179 | 0.661 | 0.935 | 1.30 | 2,290 |
| Poverty Status | No | 0.338 [0.317, 0.358] | 0.316 [0.232, 0.453] | 0.120 | 0.150 | 0.180 | 0.700 | 1.02 | 1.43 | 2,972 |
|  | Yes | 0.333 [0.302, 0.364] | 0.297 [0.227, 0.434] | 0.140 | 0.157 | 0.180 | 0.659 | 1.10 | 1.76 | 853 |

a Body mass index

**Table A.3**

Sample-weighted summary statistics for urinary HPMM concentrations (mg/g creatinine) in exclusive combusted tobacco users (serum cotinine > 10 ng/mL), N = 867.

| **Predictor** | **Level** | **GM [95%CI]** | **Median [25th, 75th %ile]** | **2.5th %ile** | **5th %ile** | **10th %ile** | **90th %ile** | **95th %ile** | **97.5th %ile** | **Sample Size** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| All |  | 1.46 [1.29, 1.63] | 1.63 [0.680, 3.29] | 0.207 | 0.264 | 0.326 | 5.20 | 6.58 | 7.88 | 867 |
| Age (yr) | 12–19 | 0.758 [0.549, 0.966] | 0.607 [0.398, 1.32] | 0.172 | 0.179 | 0.233 | 3.31 | 4.37 | 5.11 | 133 |
|  | 20–39 | 1.10 [0.956, 1.24] | 1.17 [0.552, 2.16] | 0.189 | 0.248 | 0.299 | 3.52 | 4.63 | 5.51 | 306 |
|  | 40–59 | 1.90 [1.55, 2.25] | 2.25 [0.936, 4.04] | 0.210 | 0.289 | 0.385 | 6.08 | 7.50 | 9.24 | 279 |
|  | ≥ 60 | 2.02 [1.56, 2.47] | 2.24 [1.12, 4.09] | 0.268 | 0.361 | 0.595 | 5.66 | 7.31 | 7.67 | 149 |
| Sex | Male | 1.23 [1.05, 1.40] | 1.28 [0.580, 2.62] | 0.178 | 0.233 | 0.292 | 4.30 | 5.99 | 7.66 | 513 |
|  | Female | 1.82 [1.60, 2.04] | 2.03 [0.910, 3.92] | 0.264 | 0.322 | 0.403 | 5.77 | 6.88 | 10.2 | 354 |
| Race/Ethnicity | Non-Hispanic White | 1.67 [1.43, 1.91] | 1.88 [0.836, 3.62] | 0.210 | 0.274 | 0.348 | 5.71 | 7.33 | 8.26 | 403 |
|  | Mexican American | 0.835 [0.605, 1.07] | 0.694 [0.369, 1.82] | 0.186 | 0.189 | 0.248 | 4.13 | 5.12 | 5.52 | 97 |
|  | Non-Hispanic Black | 1.01 [0.890, 1.13] | 1.07 [0.489, 1.87] | 0.197 | 0.241 | 0.300 | 3.00 | 3.82 | 4.39 | 275 |
|  | Other Race - Including Multi-Racial | 1.26 [0.903, 1.61] | 1.44 [0.394, 2.61] | 0.271 | 0.302 | 0.328 | 5.41 | . | . | 92 |
| BMI a | Underweight | 1.89 [0.132, 3.65] | 1.73 [1.09, 4.28] | 0.345 | 0.381 | 0.401 | 4.92 | . | . | 25 |
|  | Healthy weight | 1.68 [1.33, 2.03] | 1.97 [0.863, 3.45] | 0.156 | 0.238 | 0.334 | 5.79 | 7.63 | 11.4 | 293 |
|  | Overweight/Obese | 1.34 [1.16, 1.52] | 1.44 [0.626, 3.02] | 0.215 | 0.273 | 0.319 | 4.80 | 6.08 | 7.59 | 549 |
| Poverty Status | No | 1.43 [1.25, 1.60] | 1.57 [0.655, 3.31] | 0.196 | 0.254 | 0.312 | 5.19 | 6.57 | 7.85 | 621 |
|  | Yes | 1.61 [1.24, 1.98] | 1.67 [0.906, 3.20] | 0.242 | 0.310 | 0.431 | 5.13 | 6.86 | 8.27 | 246 |

a Body mass index