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| **Supplemental Table 1.** Weighted distribution of specific-gravity corrected urinary trace metal percentiles by ultrasound status, ppb. | | | | | | | | | | | | | | |
|  | YES visit 3 ultrasound  (n = 197) | | | NO visit 3 ultrasound  (n = 193) | | |  | YES visit 4 ultrasound  (n = 209) | | | NO visit 4 ultrasound  (n = 179) | | |  |
| **Metal** | **25th** | **50th** | **75th** | **25th** | **50th** | **75th** | **p** | **25th** | **50th** | **75th** | **25th** | **50th** | **75th** | **p** |
| As | 8.24 | 15.0 | 36.0 | 7.90 | 15.3 | 30.4 | 0.45 | 8.80 | 17.2 | 36.7 | 7.59 | 14.6 | 28.9 | 0.05 |
| Ba | 0.84 | 1.53 | 2.89 | 0.75 | 1.25 | 3.13 | 0.31 | 0.89 | 1.41 | 2.88 | 0.69 | 1.45 | 0.10 | 0.38 |
| Cd | 0.04 | 0.05 | 0.14 | 0.04 | 0.04 | 0.11 | 0.13 | 0.04 | 0.05 | 0.14 | 0.04 | 0.04 | 0.13 | 0.07 |
| Cu | 5.12 | 9.19 | 13.6 | 4.33 | 8.27 | 13.4 | 0.90 | 4.60 | 2.83 | 13.7 | 4.55 | 8.56 | 13.3 | 0.41 |
| Hg | 0.23 | 0.46 | 0.93 | 0.17 | 0.47 | 0.98 | 0.68 | 0.20 | 0.46 | 1.01 | 0.19 | 0.46 | 0.91 | 0.99 |
| Mn | 0.49 | 0.74 | 1.28 | 0.39 | 0.58 | 0.90 | 0.01 | 0.45 | 0.68 | 1.17 | 0.4 | 0.63 | 0.96 | 0.75 |
| Mo | 24.8 | 48.26 | 77.0 | 26.3 | 49.9 | 83.2 | 0.40 | 25.1 | 45.8 | 72.8 | 26.8 | 53.9 | 85.2 | 0.55 |
| Ni | 1.33 | 2.69 | 4.09 | 1.37 | 2.40 | 4.13 | 0.62 | 1.40 | 2.52 | 3.78 | 1.20 | 2.46 | 4.52 | 0.47 |
| Pb | 0.11 | 0.32 | 0.60 | 0.09 | 0.28 | 0.59 | 0.29 | 0.13 | 0.32 | 0.60 | 0.08 | 0.27 | 0.54 | 0.33 |
| Se | 18.6 | 37.5 | 54.5 | 17.7 | 33.5 | 58.3 | 0.99 | 18.5 | 33.5 | 53.8 | 18.0 | 36.9 | 58.6 | 0.37 |
| Sn | 0.28 | 0.59 | 1.36 | 0.25 | 0.50 | 1.16 | 0.61 | 0.27 | 0.56 | 1.29 | 0.25 | 0.51 | 1.27 | 0.44 |
| Tl | 0.05 | 0.10 | 0.19 | 0.05 | 0.10 | 0.18 | 0.18 | 0.06 | 0.11 | 0.17 | 0.05 | 0.10 | 0.20 | 0.43 |
| Zn | 105.6 | 190.9 | 387.2 | 95.8 | 212.7 | 425.1 | 0.91 | 105.1 | 208.7 | 392.0 | 95.8 | 183.6 | 426.9 | 0.54 |

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| **Supplemental Table 2.** Unadjusted1 differences in z-scores for repeated measures of femur length, head circumference, abdominal circumference, birth weight, and combination of estimated fetal weight and birth weight per IQR increase in each urinary trace metal. | | | | |
| **Metal** | **FLZ1** | **HCZ1** | **ACZ1** | **EFWZ + BWZ1** |
|  | observations=408  n=272 | observations=406  n=272 | observations=408  n=272 | observations=798  n=390 |
| As | -0.01 (-0.16, 0.14) | -0.05 (-0.19, 0.09) | 0.00 (-0.15, 0.16) | -0.06 (-0.19, 0.07) |
| Ba | 0.16 (-0.01, 0.32) | 0.09 (-0.06, 0.25) | 0.05 (-0.11, 0.21) | 0.05 (-0.09, 0.19) |
| Cd | 0.03 (-0.11, 0.18) | 0.06 (-0.08, 0.20) | 0.05 (-0.09, 0.19) | 0.04 (-0.08, 0.16) |
| Cu | -0.07 (-0.34, 0.21) | -0.05 (-0.31, 0.21) | -0.14 (-0.41, 0.12) | -0.01 (-0.21, 0.19) |
| Hg | -0.07 (-0.23, 0.10) | -0.10 (-0.25, 0.06) | 0.00 (-0.16, 0.17) | -0.02 (-0.16, 0.12) |
| Mn | 0.02 (-0.10, 0.14) | 0.01 (-0.10, 0.12) | -0.03 (-0.15, 0.09) | -0.02 (-0.12, 0.08) |
| Mo | **0.33 (0.11, 0.56)** | 0.20 (-0.02, 0.41) | 0.16 (-0.06, 0.39) | 0.14 (-0.05, 0.33) |
| Ni | -0.14 (-0.33, 0.06) | -0.14 (-0.32, 0.05) | 0.01 (-0.19, 0.20) | -0.03 (-0.20, 0.13) |
| Pb | 0.02 (-0.15, 0.19) | 0.01 (-0.14, 0.17) | 0.07 (-0.10, 0.23) | 0.00 (-0.14, 0.14) |
| Se | **-0.56 (-0.98, -0.15)** | **-0.43 (-0.82, -0.04)** | **-0.51 (-0.92, -0.10)** | **-0.37 (-0.71, -0.02)** |
| Sn | -0.09 (-0.26, 0.08) | -0.13 (-0.30, 0.03) | -0.07 (-0.24, 0.10) | -0.08 (-0.23, 0.06) |
| Tl | 0.02 (-0.13, 0.17) | -0.04 (-0.19,0.10) | 0.02 (-0.13, 0.17) | 0.00 (-0.13, 0.13) |
| Zn | **0.42 (0.19, 0.66)** | 0.11 (-0.11, 0.33) | **0.29 (0.06, 0.52)** | **0.22 (0.02, 0.41)** |
| Be | -0.24 (-0.66, 0.19) | -0.08 (-0.48, 0.32) | 0.19 (-0.23, 0.61) | 0.12 (-0.22, 0.46) |
| Cr | -0.25 (-0.57, 0.07) | 0.00 (-0.30, 0.31) | 0.06 (-0.26, 0.38) | -0.05 (-0.33, 0.22) |
| U | 0.31 (-0.06, 0.68) | -0.34 (-0.69, 0.02) | -0.14 (-0.51, 0.23) | -0.11 (-0.42, 0.20) |
| W | -0.15 (-0.44, 0.13) | -0.23 (-0.49, 0.04) | -0.24 (-0.53, 0.04) | -0.12 (-0.36, 0.12) |
| 1Adjusted for co-exposures, specific gravity. Shading indicates metals that were analyzed as detect/non-detect. Bold indicates p<0.05. Abbreviations: IQR, interquartile range; FLZ, femur length z-score; HCZ, head circumference z-score; ACZ, abdominal circumference z-score, EFWZ, estimated fetal weight z-score; BWZ, birth weight z-score. All models included a random intercept for ID and a random slope for gestational age at sample collection and were weighted to account for original case-control study design. | | | | |

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| **Supplemental Table 3.** Adjusted1,2 differences in z-scores for repeated measures of femur length, head circumference, abdominal circumference, and combination of estimated fetal weight and birth weight per IQR increase in each urinary trace metal. | | | | |
| **Metal** | **FLZ1** | **HCZ1** | **ACZ1** | **EFWZ + BWZ2** |
|  | observations=396  n=264 | observations=394  n=264 | observations=396  n=264 | observations=770  n=374 |
| As | 0.06 (-0.09, 0.22) | -0.09 (-0.23, 0.05) | 0.03 (-0.12, 0.19) | -0.02 (-0.15, 0.11) |
| Ba | 0.12 (-0.05, 0.28) | -0.02 (-0.17, 0.13) | -0.03 (-0.19, 0.13) | -0.01 (-0.14, 0.13) |
| Cd | 0.04 (-0.10, 0.19) | 0.04 (-0.09, 0.17) | 0.02 (-0.13, 0.16) | 0.02 (-0.10, 0.14) |
| Cu | -0.18 (-0.46, 0.10) | -0.01 (-0.27, 0.24) | -0.14 (-0.41, 0.13) | -0.02 (-0.21, 0.18) |
| Hg | -0.08 (-0.23, 0.08) | -0.07 (-0.21, 0.07) | 0.00 (-0.15, 0.16) | -0.03 (-0.17, 0.10) |
| Mn | -0.02 (-0.14, 0.10) | -0.02 (-0.13, 0.09) | -0.06 (-0.17, 0.06) | -0.05 (-0.16, 0.05) |
| Mo | **0.30 (0.08, 0.52)** | 0.16 (-0.04, 0.36) | 0.11 (-0.11, 0.33) | 0.12 (-0.07, 0.31) |
| Ni | -0.05 (-0.24, 0.14) | -0.07 (-0.25, 0.10) | 0.06 (-0.13, 0.25) | 0.01 (-0.15, 0.17) |
| Pb | 0.03 (-0.14, 0.19) | 0.06 (-0.08, 0.21) | 0.10 (-0.06, 0.27) | 0.04 (-0.10, 0.18) |
| Se | **-0.60 (-1.00, -0.20)** | **-0.48 (-0.84, -0.11)** | **-0.53 (-0.93, -0.13)** | **-0.43 (-0.76, -0.09)** |
| Sn | -0.12 (-0.30, 0.05) | -0.12 (-0.27, 0.04) | -0.09 (-0.27, 0.08) | -0.07 (-0.22, 0.07) |
| Tl | 0.04 (-0.10, 0.19) | -0.04 (-0.17, 0.09) | 0.02 (-0.12, 0.17) | 0.01 (-0.12, 0.14) |
| Zn | **0.37 (0.13, 0.60)** | 0.14 (-0.07, 0.35) | **0.32 (0.09, 0.55)** | **0.26 (0.06, 0.45)** |
| Be | -0.16 (-0.57, 0.25) | -0.09 (-0.46, 0.29) | 0.13 (-0.28, 0.54) | 0.11 (-0.22, 0.44) |
| Cr | -0.23 (-0.54, 0.09) | -0.06 (-0.35, 0.23) | 0.05 (-0.26, 0.37) | -0.05 (-0.32, 0.22) |
| U | 0.21 (-0.16, 0.59) | -0.18 (-0.52, 0.17) | -0.02 (-0.40, 0.35) | -0.01 (-0.32, 0.31) |
| W | 0.00 (-0.27, 0.27) | -0.14 (-0.39, 0.11) | -0.14 (-0.41, 0.14) | -0.06 (-0.29, 0.18) |
| 1Adjusted for co-exposures, specific gravity, maternal age, pre-pregnancy BMI, race/ethnicity, education, infant sex, gestational age at time of ultrasound. 2Adjusted for co-exposures, specific gravity, maternal age, pre-pregnancy BMI, race/ethnicity, education, infant sex, gestational age at time of ultrasound or gestational age at delivery. Shading indicates metals that were analyzed as detect/non-detect. Bold indicates p<0.05. Abbreviations: IQR: interquartile range; FLZ, femur length z-score; HCZ, head circumference z-score; ACZ, abdominal circumference z-score, EFWZ, estimated fetal weight z-score; BWZ, birth weight z-score. All models included a random intercept for ID and a random slope for gestational age at sample collection and were weighted to account for original case-control study design. | | | | |

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| **Supplemental Table 4.** Adjusted1 differences in birth weight, birth length and placenta weight per IQR increase in each urinary trace metal. | | | |
| **Metals** | **Birth Weight (g)** | **Birth Length (cm)** | **Placenta Weight (g)** |
|  | n=374 | n=354 | n=74 |
| As | -36.5 (-100.0, 27.0) | -0.02 (-0.36, 0.31) | -18.7 (-51.1, 13.6) |
| Ba | -20.9 (-86.3, 44.4) | 0.33 (-0.02, 0.68) | -14.4 (-52.9, 24.0) |
| Cd | 11.3 (-50.2, 72.8) | 0.18 (-0.15, 0.51) | 4.78 (-21.6, 31.1) |
| Cu | -5.28 (-104.7, 94.1) | -0.26 (-0.79, 0.27) | -36.8 (-85.2, 11.6) |
| Hg | -1.39 (-68.9, 66.1) | -0.03 (-0.38, 0.32) | 6.49 (-44.6, 57.5) |
| Mn | -5.77 (-56.0, 44.4) | -0.09 (-0.35, 0.18) | 2.49 (-21.3, 26.3) |
| Mo | 19.9 (-74.5, 114.3) | 0.16 (-0.34, 0.66) | -0.78 (-44.8, 43.3) |
| Ni | 47.6 (-36.1, 131.2) | 0.15 (-0.30, 0.60) | 12.8 (-21.8, 47.4) |
| Pb | -21.6 (-89.7, 46.5) | -0.11 (-0.47, 0.24) | -14.9 (-58.6, 28.8) |
| Se | -73.8 (-243.7, 96.2) | **-1.13 (-2.03, -0.24)** | 34.0 (-65.5, 133.5) |
| Sn | -15.4 (-86.6, 55.8) | 0.03 (-0.34, 0.40) | **38.9 (2.79, 75.0)** |
| Tl | -12.9 (-78.1, 52.4) | 0.06 (-0.28, 0.40) | -6.34 (-31.9, 19.2) |
| Zn | 84.5 (-15.1, 184.1) | 0.38 (-0.15, 0.90) | -21.1 (-69.6, 27.5) |
| Be | 126.5 (-34.7, 287.7) | 0.46 (-0.38, 1.29) | **106.0 (32.1, 179.9)** |
| Cr | -58.0 (-199.7, 83.7) | 0.01 (-0.74, 0.76) | -4.37 (-61.2, 52.5) |
| U | 10.7 (-153.1, 174.5) | 0.02 (-0.85, 0.88) | -62.9 (-142.0, 16.3) |
| W | -90.9 (-208.2, 26.4) | -0.20 (-0.82, 0.42) | -24.2 (-81.4, 32.9) |
| 1Adjusted for co-exposures, specific gravity, maternal age, pre-pregnancy BMI, race, education, infant sex, gestational age at delivery. Shading denotes metals analyzed as detect/non-detect. Bold indicates p≤0.05. Abbreviations: IQR, interquartile range. All models weighted to account for original case-control study design. | | | |

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| **Supplemental Table 5.** Unadjusted1 differences in z-scores for repeated measures of femur length, head circumference, abdominal circumference, birth weight, and combination of estimated fetal weight and birth weight by principal components. | | | | |
| **Metal** | **FLZ1** | **HCZ1** | **ACZ1** | **EFWZ + BWZ1** |
|  | observations used=408 n=272 | observations used=406 n=272 | observations used=408 n=272 | observations used=798 n=390 |
| PC12: "Toxic" | 0.06 (-0.05, 0.18) | 0.02 (-0.09, 0.12) | 0.08 (-0.04, 0.19) | 0.01 (-0.09, 0.10) |
| PC23: "Essential" | 0.07 (-0.05, 0.19) | -0.08 (-0.19, 0.03) | -0.02 (-0.13, 0.10) | 0.00 (-0.10, 0.10) |
| PC34: "Seafood-related" | -0.07 (-0.18, 0.03) | **-0.12 (-0.22, -0.03)** | -0.08 (-0.18, 0.02) | **-0.09 (-0.18, 0.00)** |
| 1Adjusted for specific gravity. 2PC 1: Pb, Cd, Mn. 3PC 2: Cu, Se, Zn. 4PC 3: As, Hg, Sn. Bold indicates p<0.05. Abbreviations: IQR, interquartile range; FLZ, femur length z-score; HCZ, head circumference z-score; ACZ, abdominal circumference z-score, EFWZ, estimated fetal weight z-score; BWZ, birth weight z-score; PC, principal component. | | | | |

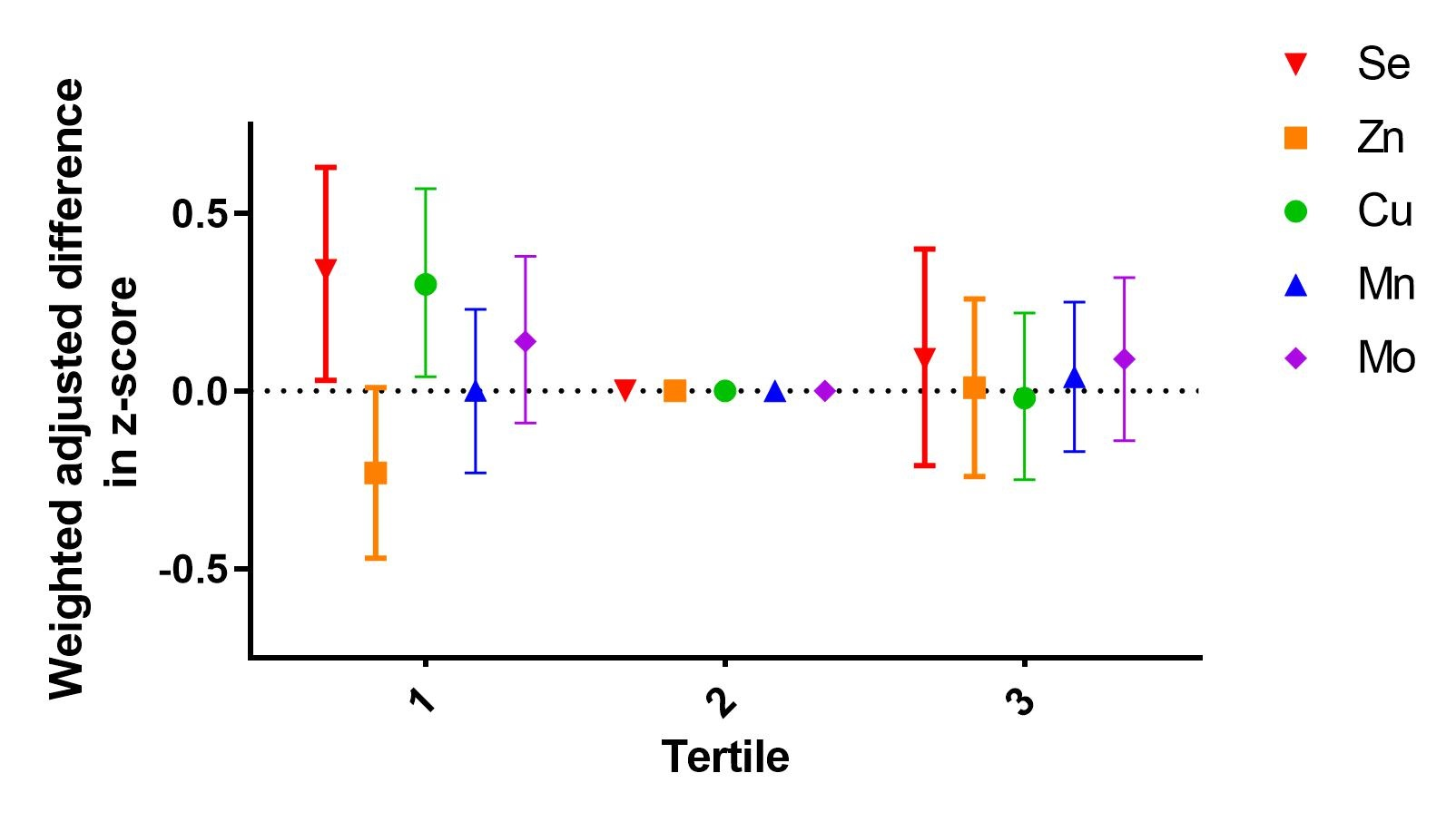
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| **Supplemental Table 6.** Adjusted1,2 differences in z-scores for repeated measures of femur length, head circumference, abdominal circumference, and combination of estimated fetal weight and birth weight per IQR increase in each urinary trace metal using imputed datasets.3 | | | | |
| **Metal** | **FLZ1** | **HCZ1** | **ACZ1** | **EFWZ + BWZ2** |
|  | observations=731  n=390 | observations=731  n=390 | observations=731  n=390 | observations=1121  n=390 |
| As | -0.04 (-0.19, 0.11) | -0.09 (-0.22, 0.04) | -0.04 (-0.18, 0.09) | -0.07 (-0.20, 0.05) |
| Ba | 0.07 (-0.08, 0.22) | 0.04 (-0.10, 0.18) | 0.03 (-0.12, 0.18) | 0.04 (-0.10, 0.17) |
| Cd | 0.02 (-0.13, 0.16) | 0.01 (-0.11, 0.13) | 0.00 (-0.13, 0.13) | 0.01 (-0.11, 0.13) |
| Cu | 0.01 (-0.22, 0.24) | -0.01 (-0.21, 0.20) | 0.01 (-0.20, 0.23) | -0.01 (-0.21, 0.18) |
| Hg | -0.04 (-0.20, 0.11) | -0.05 (-0.18, 0.09) | 0.02 (-0.13, 0.16) | -0.02 (-0.16, 0.11) |
| Mn | 0.02 (-0.09, 0.13) | 0.01 (-0.09, 0.11) | -0.02 (-0.14, 0.09) | -0.02 (-0.12, 0.08) |
| Mo | 0.16 (-0.05, 0.36) | 0.12 (-0.08, 0.31) | 0.09 (-0.11, 0.29) | 0.14 (-0.05, 0.32) |
| Ni | 0.00 (-0.20, 0.20) | -0.04 (-0.20, 0.13) | 0.04 (-0.13, 0.21) | 0.02 (-0.14, 0.18) |
| Pb | -0.02 (-0.18, 0.14) | -0.03 (-0.16, 0.11) | -0.02 (-0.17, 0.14) | -0.04 (-0.18, 0.10) |
| Se | -0.34 (-0.73, 0.05) | -0.28 (-0.64, 0.09) | **-0.39 (-0.75, -0.03)** | -0.34 (-0.67, 0.00) |
| Sn | -0.07 (-0.24, 0.10) | -0.04 (-0.19, 0.10) | -0.06 (-0.22, 0.11) | -0.06 (-0.21, 0.09) |
| Tl | 0.04 (-0.11, 0.18) | -0.02 (-0.16, 0.12) | -0.03 (-0.17, 0.12) | 0.02 (-0.11, 0.15) |
| Zn | 0.21 (-0.03, 0.45) | 0.08 (-0.13, 0.30) | 0.18 (-0.03, 0.39) | 0.20 (0.00, 0.39) |
| Be | -0.04 (-0.42, 0.34) | 0.03 (-0.30, 0.36) | 0.20 (-0.18, 0.58) | 0.20 (-0.13, 0.53) |
| Cr | -0.20 (-0.52, 0.12) | -0.05 (-0.33, 0.23) | 0.03 (-0.27, 0.33) | -0.03 (-0.30, 0.24) |
| U | 0.04 (-0.33, 0.41) | -0.19 (-0.50, 0.13) | -0.12 (-0.47, 0.32) | -0.10 (-0.41, 0.21) |
| W | 0.00 (-0.27, 0.28) | -0.04 (-0.29, 0.20) | -0.03 (-0.30, 0.14) | -0.05 (-0.29, 0.19) |
| 1Adjusted for co-exposure, specific gravity, maternal age, pre-pregnancy BMI, race, education, infant sex, gestational age at time of ultrasound. 2Adjusted for co-exposure, specific gravity, maternal age, pre-pregnancy BMI, race, education, infant sex, gestational age at time of ultrasound, gestational age at delivery. 3The number of observations used is averaged across all 50 imputed datasets. Shading indicates metals that were analyzed as detect/non-detect. Bold indicates p<0.05. Abbreviations: FLZ, femur length z-score; HCZ, head circumference z-score; ACZ, abdominal circumference z-score, EFWZ, estimated fetal weight z-score; BWZ, birth weight z-score. All models included a random intercept for ID and a random slope for gestational age at sample collection and were weighted to account for original case-control study design. | | | | |

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| **Supplemental Table 7.** Adjusted1,2 differences in z-scores for repeated measures of femur length, head circumference, abdominal circumference, and combination of estimated fetal weight and birth weight per IQR increase in individual urinary trace metals. | | | | |
| **Metal** | **FLZ1** | **HCZ1** | **ACZ1** | **EFWZ + BWZ2** |
|  | observations used=396 n=264 | observations used=394 n=264 | observations used=396 n=264 | observations used=770 n=374 |
| As | 0.00 (-0.15, 0.14) | **-0.17 (-0.30, -0.04)** | -0.03 (-0.18, 0.11) | -0.06 (-0.18, 0.06) |
| Ba | 0.09 (-0.05, 0.24) | -0.09 (-0.21, 0.04) | 0.00 (-0.14, 0.14) | 0.00 (-0.12, 0.11) |
| Cd | -0.01 (-0.14, 0.12) | -0.05 (-0.16, 0.07) | 0.01 (-0.12, 0.13) | 0.00 (-0.10, 0.10) |
| Cu | -0.21 (-0.43, 0.01) | **-0.22 (-0.42, -0.02)** | -0.11 (-0.32, 0.10) | -0.08 (-0.24, 0.08) |
| Hg | **-0.14 (-0.28, 0.00)** | **-0.15 (-0.27, -0.02)** | -0.07 (-0.21, 0.06) | -0.08 (-0.20, 0.05) |
| Mn | -0.03 (-0.15, 0.08) | -0.09 (-0.19, 0.01) | -0.07 (-0.18, 0.04) | -0.07 (-0.16, 0.02) |
| Mo | 0.15 (-0.05, 0.35) | -0.05 (-0.22, 0.13) | -0.02 (-0.21, 0.17) | 0.02 (-0.14, 0.18) |
| Ni | 0.06 (-0.11, 0.22) | -0.11 (-0.26, 0.04) | 0.04 (-0.12, 0.20) | 0.01 (-0.13, 0.15) |
| Pb | 0.03 (-0.11, 0.17) | -0.02 (-0.14, 0.10) | 0.09 (-0.05, 0.22) | 0.04 (-0.08, 0.16) |
| Se | -0.25 (-0.58, 0.07) | **-0.49 (-0.78, -0.21)** | **-0.34 (-0.66, -0.03)** | **-0.28 (-0.55, -0.01)** |
| Sn | -0.12 (-0.28, 0.04) | **-0.22 (-0.36, -0.07)** | -0.10 (-0.26, 0.06) | -0.10 (-0.24, 0.03) |
| Tl | -0.01 (-0.16, 0.13) | **-0.13 (-0.26, -0.01)** | -0.03 (-0.17, 0.10) | -0.03 (-0.15, 0.09) |
| Zn | 0.19 (-0.01, 0.40) | -0.05 (-0.24, 0.13) | 0.17 (-0.03, 0.37) | 0.14 (-0.03, 0.31) |
| Be | -0.05 (-0.43, 0.33) | -0.23 (-0.57, 0.11) | 0.10 (-0.27, 0.47) | 0.11 (-0.21, 0.42) |
| Cr | -0.24 (-0.56, 0.07) | -0.07 (-0.35, 0.22) | 0.10 (-0.21, 0.40) | -0.10 (-0.37, 0.17) |
| U | 0.22 (-0.12, 0.56) | **-0.31 (-0.61, -0.01)** | 0.03 (-0.29, 0.36) | 0.02 (-0.27, 0.30) |
| W | 0.07 (-0.20, 0.34) | **-0.24 (-0.48, 0.00)** | -0.10 (-0.36, 0.16) | -0.07 (-0.30, 0.15) |
| 1Adjusted for specific gravity, maternal age, pre-pregnancy BMI, race/ethnicity, education, infant sex, gestational age at time of ultrasound. 2Adjusted for specific gravity, maternal age, pre-pregnancy BMI, race/ethnicity, education, infant sex, gestational age at time of ultrasound or gestational age at delivery. Shading indicates metals that were analyzed as detect/non-detect. Bold indicates p≤0.05. Abbreviations: FLZ, femur length z-score; HCZ, head circumference z-score; ACZ, abdominal circumference z-score, EFWZ, estimated fetal weight z-score; BWZ, birth weight z-score. All models included a random intercept for ID and a random slope for gestational age at sample collection and were weighted to account for original case-control study design. | | | | |

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| **Supplemental Table 8.** Adjusted1 differences in z-scores for repeated measures of combination of estimated fetal weight and birth weight by tertiles for visits 3, 4 and birth. | | |
| **Metal tertile** | **EFWZ + BWZ1** | **p for trend** |
| Se T1 | **0.34 (0.03, 0.65)** | 0.04 |
| Se T2 | ref |
| Se T3 | 0.09 (-0.21, 0.40) |
|  |  |  |
| Zn T1 | -0.23 (-0.47, 0.01) | 0.10 |
| Zn T2 | ref |
| Zn T3 | 0.01 (-0.24, 0.26) |
|  |  |  |
| Cu T1 | **0.30 (0.04, 0.57)** | 0.34 |
| Cu T2 | ref |
| Cu T3 | -0.02 (-0.25, 0.22) |
|  |  |  |
| Mn T1 | 0.002 (-0.23, 0.23) | 0.14 |
| Mn T2 | ref |
| Mn T3 | 0.04 (-0.17, 0.25) |
|  |  |  |
| Mo T1 | 0.14 (-0.09. 0.38) | 0.82 |
| Mo T2 | ref |
| Mo T3 | 0.09 (-0.14, 0.32) |
| 1Adjusted for co-exposures, specific gravity, maternal age, prepregnancy BMI, race/ethnicity, education, infant sex, gestational age at time of ultrasound or gestational age at delivery. Bold indicates p≤0.05. All models included a random intercept for ID and a random slope for gestational age at sample collection and were weighted to account for original case-control study design. | | |

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| **Supplemental Table 9.** Adjusted1,2 differences in z-scores for repeated measures of femur length, head circumference, abdominal circumference, combination of estimated fetal weight and birth weight per IQR increase in each urinary trace metal excluding preterm births and without inverse probability weightings. | | | | |
| **Metal** | **FLZ1** | **HCZ1** | **ACZ1** | **EFWZ + BWZ2** |
|  | observations used=292 n=191 | observations used=290 n=191 | observations used=292 n=191 | observations used=572 n=280 |
| As | 0.06 (-0.12, 0.24) | -0.09 (-0.26, 0.07) | 0.02 (-0.16, 0.21) | -0.06 (-0.21, 0.09) |
| Ba | 0.17 (-0.03, 0.36) | -0.07 (-0.24, 0.11) | -0.02 (-0.21, 0.17) | -0.03 (-0.19, 0.13) |
| Cd | 0.08 (-0.08, 0.24) | -0.01 (-0.16, 0.14) | -0.08 (-0.25, 0.08) | -0.05 (-0.18, 0.09) |
| Cu | -0.27 (-0.64, 0.11) | -0.03 (-0.37, 0.32) | -0.12 (-0.50, 0.26) | 0.06 (-0.20, 0.32) |
| Hg | -0.10 (-0.28, 0.08) | -0.12 (-0.28, 0.05) | -0.09 (-0.27, 0.09) | -0.10 (-0.26, 0.06) |
| Mn | 0.03 (-0.11, 0.17) | 0.02 (-0.11, 0.15) | -0.03 (-0.17, 0.12) | -0.02 (-0.15, 0.10) |
| Mo | **0.39 (0.15, 0.63)** | 0.17 (-0.04, 0.39) | 0.17 (-0.07, 0.40) | 0.20 (-0.02, 0.41) |
| Ni | -0.10 (-0.33, 0.13) | -0.06 (-0.27, 0.15) | -0.07 (-0.29, 0.16) | -0.08 (-0.27, 0.11) |
| Pb | 0.02 (-0.17, 0.20) | 0.10 (-0.06, 0.27) | 0.13 (-0.06, 0.31) | 0.08 (-0.08, 0.24) |
| Se | **-0.46 (-0.92, -0.01)** | -0.23 (-0.64, 0.19) | -0.33 (-0.78, 0.13) | -0.29 (-0.67, 0.08) |
| Sn | **-0.21 (-0.40, -0.02)** | -0.14 (-0.31, 0.04) | -0.10, -0.28, 0.09) | -0.08 (-0.24, 0.08) |
| Tl | 0.05 (-0.12, 0.21) | -0.01 (-0.16, 0.14) | 0.04 (-0.12, 0.20) | -0.01 (-0.15, 0.14) |
| Zn | **0.28 (0.00, 0.55)** | -0.02 (-0.27, 0.24) | 0.21 (-0.07, 0.48) | 0.16 (-0.08, 0.40) |
| Be | -0.17 (-0.66, 0.33) | 0.03 (-0.43, 0.48) | 0.12 (-0.38, 0.61) | 0.08 (-0.30, 0.46) |
| Cr | -0.17 (-0.55, 0.20) | -0.02 (-0.36, 0.33) | 0.04 (-0.33, 0.42) | 0.01 (-0.31, 0.34) |
| U | 0.27 (-0.20, 0.74) | -0.27 (-0.70, 0.16) | 0.09 (-0.39, 0.56) | 0.03 (-0.35, 0.42) |
| W | 0.02 (-0.29, 0.32) | -0.20 (-0.47, 0.08) | -0.08 (-0.38, 0.23) | -0.04 (-0.31, 0.22) |
| 1Adjusted for specific gravity, maternal age, pre-pregnancy BMI, race/ethnicity, education, infant sex, gestational age at time of ultrasound. 2Adjusted for specific gravity, maternal age, pre-pregnancy BMI, race/ethnicity, education, infant sex, gestational age at time of ultrasound or gestational age at delivery. Shading indicates metals that were analyzed as detect/non-detect. Bold indicates p≤0.05. Abbreviations: FLZ, femur length z-score; HCZ, head circumference z-score; ACZ, abdominal circumference z-score, EFWZ, estimated fetal weight z-score; BWZ, birth weight z-score. All models included a random intercept for ID and a random slope for gestational age at sample collection. | | | | |

**Supplemental Figure 1.** Adjusted1 differences in z-scores for repeated measures of combination of estimated fetal weight and birth weight by tertiles for visits 3, 4 and birth



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| --- |
| 1Adjusted for co-exposures, specific gravity, maternal age, prepregnancy BMI, race/ethnicity, education, infant sex, gestational age at time of ultrasound or gestational age at delivery. Bold indicates p≤0.05. All models included a random intercept for ID and a random slope for gestational age at sample collection and were weighted to account for original case-control study design. |