

# **Additional file 1**

**(pages 41, 23 tables, 11 figures)**

**Stage- and sex-specific associations of prenatal individual and mixed metals exposure with adiposity peak and adiposity rebound among children: A prospective birth cohort study**

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**Table S1.** Basic characteristics of included and excluded mother-child dyads.

| Characteristics                                           | Included (n = 2718) <sup>a</sup><br>mean ± SD / n (%) | Excluded (n = 555) <sup>b</sup><br>mean ± SD / n (%) | p-value |
|-----------------------------------------------------------|-------------------------------------------------------|------------------------------------------------------|---------|
| <b>Mother</b>                                             |                                                       |                                                      |         |
| Age at enrollment (years)                                 | 26.69 ± 3.64                                          | 26.21 ± 3.64                                         | < 0.05  |
| Pre-pregnancy BMI (kg/m <sup>2</sup> )                    | 21.43 ± 3.16                                          | 21.43 ± 3.10                                         | 0.99    |
| Education level at enrollment                             |                                                       |                                                      | < 0.05  |
| Junior high school and below                              | 523 (19.24)                                           | 137 (24.68)                                          |         |
| High school/technical                                     | 606 (22.30)                                           | 129 (23.24)                                          |         |
| Junior college                                            | 847 (31.16)                                           | 169 (30.45)                                          |         |
| University or above                                       | 742 (27.30)                                           | 120 (21.62)                                          |         |
| Residence status at enrollment (last half a year)         |                                                       |                                                      | < 0.05  |
| Urban                                                     | 2146 (78.96)                                          | 408 (73.51)                                          |         |
| Countryside                                               | 572 (21.04)                                           | 147 (26.49)                                          |         |
| Parity                                                    |                                                       |                                                      | 0.07    |
| 0                                                         | 299 (11.00)                                           | 76 (13.69)                                           |         |
| ≥1                                                        | 2419 (89.00)                                          | 479 (86.31)                                          |         |
| Family monthly income per capita at enrollment            |                                                       |                                                      | 0.19    |
| <2500 yuan                                                | 731 (26.89)                                           | 136 (24.50)                                          |         |
| 2500–4000 yuan                                            | 1145 (42.13)                                          | 257 (46.31)                                          |         |
| >4000 yuan                                                | 842 (30.98)                                           | 162 (29.19)                                          |         |
| Smoking before or during pregnancy                        |                                                       |                                                      | < 0.05  |
| Yes                                                       | 108 (3.97)                                            | 34 (6.13)                                            |         |
| No                                                        | 2610 (96.03)                                          | 521 (93.87)                                          |         |
| Alcohol consumption before or during pregnancy            |                                                       |                                                      | 0.90    |
| Yes                                                       | 216 (7.95)                                            | 45 (8.11)                                            |         |
| No                                                        | 2502 (92.05)                                          | 510 (91.89)                                          |         |
| Folic acid supplementation before or during pregnancy     |                                                       |                                                      | 0.28    |
| Never                                                     | 184 (6.77)                                            | 41 (7.39)                                            |         |
| 1-2 times per week                                        | 94 (3.46)                                             | 12 (2.16)                                            |         |
| ≥3 times per week                                         | 2440 (89.77)                                          | 487 (87.75)                                          |         |
| Maternal metabolic dysfunction before or during pregnancy |                                                       |                                                      | 0.64    |
| Yes                                                       | 469 (17.26)                                           | 100 (18.02)                                          |         |
| No                                                        | 2249 (82.74)                                          | 453 (81.62)                                          |         |
| <b>Children</b>                                           |                                                       |                                                      |         |
| Sex                                                       |                                                       |                                                      | 0.70    |
| Boy                                                       | 1393 (51.25)                                          | 277 (49.91)                                          |         |
| Girl                                                      | 1325 (48.75)                                          | 273 (49.19)                                          |         |
| Birth defects                                             |                                                       |                                                      | 0.28    |
| Yes                                                       | 70 (2.58)                                             | 10 (1.80)                                            |         |
| No                                                        | 2648 (97.42)                                          | 545 (98.20)                                          |         |
| Gestational age at birth (weeks)                          | 39.04 ± 1.37                                          | 38.95 ± 1.46                                         | 0.15    |
| Birth weight (g)                                          | 3368.60 ± 444.03                                      | 3349.63 ± 464.01                                     | 0.37    |

Note: SD, standard deviation; BMI, body mass index.

<sup>a</sup>Numbers may not sum to the included sample size (n = 2718) for some characteristics due to missing data: birth weight (n = 1).

<sup>b</sup>Numbers may not sum to the excluded sample size (n = 555) for some characteristics due to missing data: folic acid supplementation before or during pregnancy (n = 15), maternal metabolic dysfunction before or during pregnancy (n = 2); sex (n = 5), gestational age at birth (n = 3), birth weight (n = 7).

**Table S2.** Detection rate and distribution of 17 metal elements concentrations before imputation ( $\mu\text{g/L}$ )<sup>a</sup>.

| Elements | LODs    | > LOD (%) | $M_{50}$ ( $P_{25}$ - $P_{75}$ ) |                             |                            |                            |
|----------|---------|-----------|----------------------------------|-----------------------------|----------------------------|----------------------------|
|          |         |           | First trimester (n = 2461)       | Second trimester (n = 2602) | Third trimester (n = 2476) | At delivery (n = 2305)     |
| Al       | 0.1147  | 100       | 69.33 (59.23, 82.97)             | 57.67 (48.44, 70.12)        | 45.12 (35.71, 60.73)       | 46.08 (28.1, 66.3)         |
| V        | 0.0004  | 100       | 1.46 (1.29, 1.65)                | 1.42 (1.20, 1.66)           | 1.75 (1.50, 2.12)          | 1.56 (1.31, 1.85)          |
| Mn       | 0.01275 | 100       | 2.76 (2.00, 4.11)                | 2.67 (2.04, 3.66)           | 4.52 (3.29, 6.48)          | 5.45 (4.5, 6.76)           |
| Fe       | 0.4119  | 100       | 1534.24 (1233.19, 1862.71)       | 1090.76 (859.73, 1413.89)   | 1007.17 (769.69, 1362.1)   | 3152.54 (2619.09, 3963.84) |
| Co       | 0.0021  | 100       | 0.17 (0.13, 0.24)                | 0.39 (0.28, 0.54)           | 0.51 (0.39, 0.68)          | 0.3 (0.24, 0.38)           |
| Ni       | 0.006   | 99.93     | 0.73 (0.54, 1.02)                | 0.75 (0.55, 0.99)           | 1.09 (0.77, 1.61)          | 1.3 (0.94, 1.82)           |
| Cu       | 0.0171  | 100       | 1535.47 (1272, 1795.78)          | 2026.32 (1804.96, 2278.08)  | 2224.17 (1945.29, 2574.43) | 300.22 (248.05, 362.93)    |
| Zn       | 0.0674  | 100       | 1016.52 (908.6, 1145.8)          | 813.18 (733.53, 897.82)     | 817.04 (723.22, 919.74)    | 903.93 (809.87, 1015.43)   |
| Se       | 0.2030  | 100       | 72.97 (64.07, 83.15)             | 70.46 (61.19, 81.32)        | 72.97 (61.37, 87.09)       | 43.24 (37.24, 51.07)       |
| Cd       | 0.0009  | 98.83     | 0.07 (0.05, 0.09)                | 0.07 (0.05, 0.09)           | 0.08 (0.06, 0.10)          | 0.04 (0.03, 0.06)          |
| Ba       | 0.0097  | 99.85     | 41.42 (34.64, 48.12)             | 34.11 (18.78, 42.02)        | 33.75 (15.17, 45.19)       | 16.16 (12.91, 19.86)       |
| Tl       | 0.0002  | 99.41     | 0.06 (0.05, 0.08)                | 0.06 (0.05, 0.08)           | 0.05 (0.04, 0.06)          | 0.04 (0.03, 0.04)          |
| Pb       | 0.0095  | 99.34     | 0.93 (0.54, 1.81)                | 0.86 (0.51, 1.59)           | 0.85 (0.56, 1.38)          | 0.73 (0.41, 1.55)          |
| Ca       | 44.4    | 100       | 99.5 (93.83, 106.23)             | 97.09 (92.02, 103.34)       | 93.9 (86.64, 101.87)       | 103.1 (96.41, 110.58)      |
| Mg       | 0.7     | 99.41     | 20.44 (19.22, 21.73)             | 19.49 (18.27, 20.77)        | 19.24 (17.85, 20.82)       | 17.59 (16.41, 18.88)       |
| Hg       | 0.0014  | 99.82     | 0.46 (0.34, 0.62)                | 0.36 (0.27, 0.49)           | 1 (0.69, 1.40)             | 0.35 (0.26, 0.47)          |
| Mo       | 0.0026  | 99.89     | 0.93 (0.82, 1.08)                | 0.92 (0.77, 1.11)           | 0.87 (0.7, 1.08)           | 1.06 (0.86, 1.32)          |

Note: LODs, limits of detection; > LOD (%): the total detectable rate of the four measurements;  $M_{50}$ , median concentration; Al, aluminum; V, vanadium; Mn, manganese; Fe, iron; Co, cobalt; Ni, nickel; Cu, copper; Zn, zinc; Se, selenium; Cd, cadmium; Ba, barium; Tl, thallium; Pb, lead; Ca, calcium; Mg, magnesium; Hg, mercury; Mo, molybdenum. <sup>a</sup>All metal element concentrations represent the original concentrations before interpolation.

**Table S3.** Association between prenatal metal element exposure and AP and AR by linear mixed models ( $N = 2718$ ).

| Elements | AP_BMI <sup>a</sup>  |                 |                 | AP_Age <sup>a</sup>  |                 |                 | AR_BMI <sup>a</sup>  |                 |                 | AR_Age <sup>a</sup>  |                 |                 |
|----------|----------------------|-----------------|-----------------|----------------------|-----------------|-----------------|----------------------|-----------------|-----------------|----------------------|-----------------|-----------------|
|          | $\beta$ (95%CI)      | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)      | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)      | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)      | <i>p</i> -value | <i>q</i> -value |
| Al       | -0.004 (-0.03, 0.02) | 0.77            | 0.97            | 0.02 (0.00, 0.03)    | 0.048           | 0.36            | 0.01 (-0.02, 0.04)   | 0.49            | 0.95            | -0.19 (-0.50, 0.11)  | 0.21            | 0.64            |
| V        | 0.03 (-0.01, 0.08)   | 0.16            | 0.58            | 0.01 (-0.02, 0.04)   | 0.56            | 0.95            | 0.04 (-0.02, 0.10)   | 0.22            | 0.64            | -0.08 (-0.64, 0.48)  | 0.78            | 0.97            |
| Mn       | 0.01 (-0.01, 0.03)   | 0.21            | 0.64            | 0.01 (0.00, 0.02)    | 0.05            | 0.37            | 0.03 (0.01, 0.06)    | 0.01            | 0.17            | -0.25 (-0.50, -0.01) | 0.04            | 0.36            |
| Fe       | -0.01 (-0.02, 0.01)  | 0.59            | 0.95            | 0.00 (-0.01, 0.01)   | 0.67            | 0.97            | 0.00 (-0.02, 0.03)   | 0.89            | 0.97            | -0.08 (-0.31, 0.15)  | 0.50            | 0.95            |
| Co       | 0.04 (0.02, 0.07)    | 0.00            | 0.00            | -0.00 (-0.01, 0.01)  | 0.69            | 0.97            | 0.02 (-0.01, 0.05)   | 0.14            | 0.58            | 0.13 (-0.12, 0.38)   | 0.31            | 0.83            |
| Ni       | 0.01 (0.00, 0.03)    | 0.12            | 0.56            | 0.00 (-0.01, 0.01)   | 0.62            | 0.95            | 0.02 (0.00, 0.05)    | 0.09            | 0.50            | -0.08 (-0.31, 0.14)  | 0.47            | 0.95            |
| Cu       | -0.004 (-0.02, 0.01) | 0.59            | 0.95            | 0.00 (-0.01, 0.01)   | 0.70            | 0.97            | 0.00 (-0.02, 0.02)   | 0.97            | 0.98            | -0.05 (-0.22, 0.12)  | 0.55            | 0.95            |
| Zn       | 0.02 (-0.03, 0.08)   | 0.41            | 0.95            | 0.00 (-0.03, 0.03)   | 0.84            | 0.97            | 0.01 (-0.07, 0.08)   | 0.89            | 0.97            | 0.19 (-0.48, 0.85)   | 0.58            | 0.95            |
| Se       | 0.01 (-0.03, 0.05)   | 0.55            | 0.95            | -0.00 (-0.02, 0.02)  | 0.93            | 0.98            | 0.01 (-0.04, 0.06)   | 0.79            | 0.97            | 0.05 (-0.40, 0.50)   | 0.82            | 0.97            |
| Cd       | 0.01 (-0.01, 0.02)   | 0.50            | 0.95            | -0.002 (-0.01, 0.01) | 0.77            | 0.97            | 0.00 (-0.02, 0.03)   | 0.75            | 0.97            | 0.02 (-0.19, 0.23)   | 0.83            | 0.97            |
| Ba       | -0.03 (-0.04, -0.01) | 0.00            | 0.03            | 0.02 (0.01, 0.03)    | 0.00            | 0.05            | -0.00 (-0.03, 0.02)  | 0.72            | 0.97            | -0.29 (-0.50, -0.09) | 0.01            | 0.09            |
| Tl       | -0.02 (-0.05, 0.01)  | 0.12            | 0.56            | 0.00 (-0.01, 0.02)   | 0.60            | 0.95            | 0.01 (-0.02, 0.05)   | 0.52            | 0.95            | -0.36 (-0.67, -0.05) | 0.02            | 0.23            |
| Pb       | -0.001 (-0.01, 0.01) | 0.89            | 0.97            | 0.00 (-0.01, 0.01)   | 0.63            | 0.95            | -0.002 (-0.02, 0.01) | 0.81            | 0.97            | 0.01 (-0.14, 0.15)   | 0.91            | 0.97            |
| Ca       | 0.06 (-0.03, 0.15)   | 0.16            | 0.58            | -0.02 (-0.07, 0.04)  | 0.57            | 0.95            | 0.01 (-0.11, 0.12)   | 0.89            | 0.97            | 0.65 (-0.42, 1.73)   | 0.23            | 0.66            |
| Mg       | 0.02 (-0.05, 0.08)   | 0.60            | 0.95            | 0.00 (-0.04, 0.04)   | 0.99            | 0.99            | 0.01 (-0.07, 0.10)   | 0.76            | 0.97            | 0.02 (-0.76, 0.79)   | 0.97            | 0.98            |
| Hg       | 0.01 (-0.01, 0.03)   | 0.36            | 0.94            | 0.01 (0.00, 0.02)    | 0.02            | 0.17            | 0.02 (0.00, 0.04)    | 0.06            | 0.37            | -0.17 (-0.38, 0.04)  | 0.11            | 0.56            |
| Mo       | -0.02 (-0.05, 0.01)  | 0.20            | 0.64            | 0.01 (-0.01, 0.03)   | 0.16            | 0.58            | -0.01 (-0.05, 0.03)  | 0.62            | 0.95            | -0.14 (-0.54, 0.26)  | 0.50            | 0.95            |

Note: AP, adiposity peak; AR, adiposity rebound; Al, aluminum; V, vanadium; Mn, manganese; Fe, iron; Co, cobalt; Ni, nickel; Cu, copper; Zn, zinc; Se, selenium; Cd, cadmium; Ba, barium; Tl, thallium; Pb, lead; Ca, calcium; Mg, magnesium; Hg, mercury; Mo, molybdenum.

<sup>a</sup>Adjusted for maternal age at enrollment, maternal metabolic dysfunction, pre-pregnancy BMI, family monthly income per capita at enrollment, and children's sex.

**Table S4.** Association between prenatal metal element exposure and AP and AR in boys by linear mixed models ( $N = 2718$ ).

| Elements | AP_BMI <sup>a</sup>  |                 |                 | AP_Age <sup>a</sup> |                 |                 | AR_BMI <sup>a</sup>  |                 |                 | AR_Age <sup>a</sup>  |                 |                 |
|----------|----------------------|-----------------|-----------------|---------------------|-----------------|-----------------|----------------------|-----------------|-----------------|----------------------|-----------------|-----------------|
|          | $\beta$ (95%CI)      | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)     | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)      | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)      | <i>p</i> -value | <i>q</i> -value |
| Al       | 0.00 (-0.03, 0.04)   | 0.88            | 0.95            | 0.02 (-0.01, 0.04)  | 0.18            | 0.64            | 0.01 (-0.03, 0.06)   | 0.62            | 0.87            | -0.13 (-0.57, 0.31)  | 0.56            | 0.86            |
| V        | 0.05 (-0.01, 0.12)   | 0.12            | 0.59            | 0.02 (-0.02, 0.07)  | 0.25            | 0.77            | 0.06 (-0.03, 0.14)   | 0.19            | 0.64            | -0.12 (-0.94, 0.70)  | 0.77            | 0.91            |
| Mn       | 0.02 (0.00, 0.05)    | 0.10            | 0.59            | 0.01 (-0.01, 0.03)  | 0.33            | 0.82            | 0.04 (0.00, 0.07)    | 0.06            | 0.44            | -0.17 (-0.53, 0.20)  | 0.37            | 0.82            |
| Fe       | -0.01 (-0.04, 0.01)  | 0.31            | 0.82            | 0.00 (-0.02, 0.02)  | 0.89            | 0.95            | -0.01 (-0.04, 0.03)  | 0.68            | 0.87            | -0.07 (-0.41, 0.27)  | 0.70            | 0.87            |
| Co       | 0.07 (0.03, 0.10)    | 0.00            | 0.00            | -0.01 (-0.03, 0.01) | 0.32            | 0.82            | 0.03 (-0.01, 0.07)   | 0.09            | 0.59            | 0.17 (-0.19, 0.53)   | 0.36            | 0.82            |
| Ni       | 0.02 (-0.01, 0.05)   | 0.12            | 0.59            | 0.01 (-0.01, 0.02)  | 0.44            | 0.83            | 0.04 (0.01, 0.07)    | 0.03            | 0.34            | -0.23 (-0.55, 0.10)  | 0.17            | 0.64            |
| Cu       | -0.01 (-0.03, 0.01)  | 0.53            | 0.84            | 0.00 (-0.01, 0.01)  | 0.83            | 0.93            | -0.003 (-0.03, 0.02) | 0.81            | 0.92            | -0.04 (-0.29, 0.21)  | 0.76            | 0.91            |
| Zn       | 0.05 (-0.03, 0.13)   | 0.20            | 0.64            | 0.00 (-0.05, 0.05)  | 1.00            | 1.00            | 0.02 (-0.08, 0.12)   | 0.70            | 0.87            | 0.31 (-0.65, 1.28)   | 0.53            | 0.84            |
| Se       | 0.02 (-0.03, 0.07)   | 0.41            | 0.83            | 0.00 (-0.03, 0.03)  | 0.88            | 0.95            | 0.02 (-0.05, 0.09)   | 0.52            | 0.84            | -0.03 (-0.67, 0.61)  | 0.94            | 0.96            |
| Cd       | 0.02 (-0.01, 0.04)   | 0.18            | 0.64            | 0.01 (-0.01, 0.02)  | 0.40            | 0.83            | 0.01 (-0.03, 0.04)   | 0.64            | 0.87            | 0.08 (-0.22, 0.39)   | 0.59            | 0.87            |
| Ba       | -0.04 (-0.06, -0.01) | 0.00            | 0.10            | 0.02 (0.00, 0.03)   | 0.02            | 0.26            | -0.01 (-0.04, 0.03)  | 0.71            | 0.87            | -0.37 (-0.66, -0.07) | 0.01            | 0.26            |
| Tl       | -0.01 (-0.04, 0.03)  | 0.72            | 0.87            | 0.00 (-0.02, 0.03)  | 0.80            | 0.92            | 0.01 (-0.04, 0.06)   | 0.70            | 0.87            | -0.19 (-0.65, 0.27)  | 0.41            | 0.83            |
| Pb       | 0.01 (-0.01, 0.03)   | 0.19            | 0.64            | 0.00 (-0.01, 0.01)  | 0.64            | 0.87            | 0.00 (-0.02, 0.03)   | 0.70            | 0.87            | 0.08 (-0.14, 0.29)   | 0.48            | 0.84            |
| Ca       | 0.06 (-0.07, 0.19)   | 0.38            | 0.82            | -0.02 (-0.10, 0.06) | 0.63            | 0.87            | 0.00 (-0.17, 0.18)   | 0.99            | 1.00            | 0.67 (-0.99, 2.33)   | 0.43            | 0.83            |
| Mg       | 0.03 (-0.06, 0.13)   | 0.49            | 0.84            | 0.03 (-0.03, 0.10)  | 0.29            | 0.82            | 0.07 (-0.06, 0.20)   | 0.31            | 0.82            | -0.46 (-1.69, 0.78)  | 0.47            | 0.84            |
| Hg       | 0.01 (-0.02, 0.03)   | 0.53            | 0.84            | 0.01 (0.00, 0.03)   | 0.06            | 0.44            | 0.03 (0.00, 0.06)    | 0.047           | 0.44            | -0.31 (-0.60, 0.01)  | 0.046           | 0.44            |
| Mo       | -0.002 (-0.05, 0.04) | 0.93            | 0.96            | 0.02 (-0.01, 0.05)  | 0.11            | 0.59            | 0.03 (-0.03, 0.09)   | 0.34            | 0.82            | -0.41 (-1.00, 0.19)  | 0.18            | 0.64            |

Note: AP, adiposity peak; AR, adiposity rebound; Al, aluminum; V, vanadium; Mn, manganese; Fe, iron; Co, cobalt; Ni, nickel; Cu, copper; Zn, zinc; Se, selenium; Cd, cadmium; Ba, barium; Tl, thallium; Pb, lead; Ca, calcium; Mg, magnesium; Hg, mercury; Mo, molybdenum.

<sup>a</sup>Adjusted for maternal age at enrollment, maternal metabolic dysfunction, pre-pregnancy BMI, and family monthly income per capita at enrollment.

**Table S5.** Association between prenatal metal element exposure and AP and AR in girls by linear mixed models ( $N = 2718$ ).

| Elements | AP_BMI <sup>a</sup>  |                 |                 | AP_Age <sup>a</sup>  |                 |                 | AR_BMI <sup>a</sup>  |                 |                 | AR_Age <sup>a</sup>  |                 |                 |
|----------|----------------------|-----------------|-----------------|----------------------|-----------------|-----------------|----------------------|-----------------|-----------------|----------------------|-----------------|-----------------|
|          | $\beta$ (95%CI)      | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)      | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)      | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)      | <i>p</i> -value | <i>q</i> -value |
| Al       | -0.01 (-0.05, 0.02)  | 0.53            | 0.97            | 0.02 (0.00, 0.03)    | 0.12            | 0.72            | 0.01 (-0.04, 0.06)   | 0.63            | 0.97            | -0.27 (-0.69, 0.14)  | 0.20            | 0.90            |
| V        | 0.01 (-0.05, 0.08)   | 0.70            | 0.97            | -0.01 (-0.04, 0.03)  | 0.63            | 0.97            | 0.02 (-0.07, 0.11)   | 0.67            | 0.97            | -0.05 (-0.81, 0.72)  | 0.90            | 0.97            |
| Mn       | 0.00 (-0.03, 0.03)   | 0.91            | 0.97            | 0.01 (0.00, 0.03)    | 0.07            | 0.72            | 0.03 (-0.01, 0.07)   | 0.13            | 0.72            | -0.34 (-0.68, -0.01) | 0.046           | 0.72            |
| Fe       | 0.01 (-0.02, 0.03)   | 0.76            | 0.97            | 0.00 (-0.01, 0.02)   | 0.62            | 0.97            | 0.01 (-0.02, 0.05)   | 0.51            | 0.97            | -0.09 (-0.40, 0.22)  | 0.58            | 0.97            |
| Co       | 0.01 (-0.01, 0.04)   | 0.33            | 0.97            | 0.01 (-0.01, 0.02)   | 0.48            | 0.97            | 0.01 (-0.03, 0.04)   | 0.72            | 0.97            | 0.07 (-0.26, 0.41)   | 0.67            | 0.97            |
| Ni       | 0.01 (-0.02, 0.03)   | 0.60            | 0.97            | 0.00 (-0.01, 0.01)   | 0.99            | 0.99            | 0.00 (-0.03, 0.04)   | 0.87            | 0.97            | 0.05 (-0.26, 0.35)   | 0.77            | 0.97            |
| Cu       | -0.001 (-0.02, 0.02) | 0.91            | 0.97            | 0.00 (-0.01, 0.01)   | 0.74            | 0.97            | 0.00 (-0.02, 0.03)   | 0.76            | 0.97            | -0.06 (-0.29, 0.17)  | 0.59            | 0.97            |
| Zn       | -0.01 (-0.08, 0.07)  | 0.85            | 0.97            | 0.01 (-0.04, 0.05)   | 0.77            | 0.97            | -0.01 (-0.11, 0.09)  | 0.82            | 0.97            | 0.06 (-0.85, 0.97)   | 0.90            | 0.97            |
| Se       | 0.00 (-0.05, 0.05)   | 0.99            | 0.99            | -0.004 (-0.03, 0.03) | 0.79            | 0.97            | -0.01 (-0.08, 0.06)  | 0.79            | 0.97            | 0.12 (-0.50, 0.75)   | 0.70            | 0.97            |
| Cd       | -0.01 (-0.03, 0.02)  | 0.63            | 0.97            | -0.01 (-0.02, 0.00)  | 0.14            | 0.75            | 0.00 (-0.03, 0.03)   | 0.99            | 0.99            | -0.05 (-0.33, 0.23)  | 0.72            | 0.97            |
| Ba       | -0.02 (-0.04, 0.00)  | 0.12            | 0.72            | 0.01 (0.00, 0.03)    | 0.06            | 0.72            | -0.004 (-0.04, 0.03) | 0.82            | 0.97            | -0.20 (-0.48, 0.09)  | 0.17            | 0.83            |
| Tl       | -0.03 (-0.07, 0.01)  | 0.06            | 0.72            | 0.01 (-0.01, 0.02)   | 0.61            | 0.97            | 0.01 (-0.04, 0.06)   | 0.62            | 0.97            | -0.53 (-0.95, -0.11) | 0.01            | 0.72            |
| Pb       | -0.01 (-0.03, 0.00)  | 0.11            | 0.72            | 0.00 (-0.01, 0.01)   | 0.82            | 0.97            | -0.01 (-0.03, 0.01)  | 0.45            | 0.97            | -0.07 (-0.27, 0.13)  | 0.50            | 0.97            |
| Ca       | 0.07 (-0.05, 0.18)   | 0.26            | 0.97            | -0.01 (-0.07, 0.05)  | 0.72            | 0.97            | 0.01 (-0.14, 0.17)   | 0.86            | 0.97            | 0.66 (-0.72, 2.04)   | 0.35            | 0.97            |
| Mg       | 0.00 (-0.08, 0.09)   | 0.93            | 0.97            | -0.02 (-0.07, 0.02)  | 0.32            | 0.97            | -0.02 (-0.13, 0.08)  | 0.66            | 0.97            | 0.32 (-0.64, 1.29)   | 0.51            | 0.97            |
| Hg       | 0.01 (-0.02, 0.03)   | 0.53            | 0.97            | 0.01 (0.00, 0.02)    | 0.13            | 0.72            | 0.01 (-0.02, 0.04)   | 0.56            | 0.97            | -0.02 (-0.30, 0.26)  | 0.88            | 0.97            |
| Mo       | -0.04 (-0.09, 0.00)  | 0.08            | 0.72            | 0.00 (-0.02, 0.03)   | 0.82            | 0.97            | -0.05 (-0.11, 0.01)  | 0.08            | 0.72            | 0.13 (-0.40, 0.67)   | 0.63            | 0.97            |

Note: AP, adiposity peak; AR, adiposity rebound; Al, aluminum; V, vanadium; Mn, manganese; Fe, iron; Co, cobalt; Ni, nickel; Cu, copper; Zn, zinc; Se, selenium; Cd, cadmium; Ba, barium; Tl, thallium; Pb, lead; Ca, calcium; Mg, magnesium; Hg, mercury; Mo, molybdenum.

<sup>a</sup>Adjusted for maternal age at enrollment, maternal metabolic dysfunction, pre-pregnancy BMI, and family monthly income per capita at enrollment.

**Table S6.** Adjusted association between prenatal metal exposure and the BMI of AP stratified by children's sex by multiple informant models ( $N = 2718$ ).

| Variables     | Boys <sup>a</sup>    |                 |                 | Girls <sup>a</sup>   |                 |                 |
|---------------|----------------------|-----------------|-----------------|----------------------|-----------------|-----------------|
|               | $\beta$ (95%CI)      | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)      | <i>p</i> -value | <i>q</i> -value |
| Al            |                      |                 |                 |                      |                 |                 |
| 1st trimester | -0.05 (-0.15, 0.05)  | 0.33            | 0.72            | -0.03 (-0.13, 0.08)  | 0.63            | 0.93            |
| 2nd trimester | 0.09 (-0.01, 0.20)   | 0.08            | 0.56            | 0.04 (-0.05, 0.14)   | 0.37            | 0.93            |
| 3rd trimester | 0.05 (-0.02, 0.11)   | 0.17            | 0.64            | -0.05 (-0.12, 0.02)  | 0.15            | 0.67            |
| At delivery   | -0.04 (-0.10, 0.02)  | 0.17            | 0.64            | -0.01 (-0.07, 0.05)  | 0.84            | 0.93            |
| Mn            |                      |                 |                 |                      |                 |                 |
| 1st trimester | 0.01 (-0.05, 0.07)   | 0.72            | 0.93            | -0.03 (-0.08, 0.02)  | 0.25            | 0.88            |
| 2nd trimester | 0.06 (-0.01, 0.12)   | 0.07            | 0.56            | 0.06 (0.00, 0.13)    | 0.07            | 0.58            |
| 3rd trimester | 0.06 (-0.01, 0.12)   | 0.09            | 0.57            | 0.00 (-0.07, 0.06)   | 0.95            | 0.96            |
| At delivery   | -0.01 (-0.11, 0.09)  | 0.81            | 0.93            | -0.01 (-0.1, 0.08)   | 0.82            | 0.93            |
| Co            |                      |                 |                 |                      |                 |                 |
| 1st trimester | 0.04 (-0.03, 0.11)   | 0.25            | 0.68            | -0.03 (-0.1, 0.04)   | 0.39            | 0.93            |
| 2nd trimester | 0.14 (0.08, 0.21)    | <0.001          | 0.10            | 0.08 (0.01, 0.14)    | 0.02            | 0.52            |
| 3rd trimester | 0.10 (0.02, 0.18)    | 0.01            | 0.23            | 0.01 (-0.07, 0.09)   | 0.81            | 0.93            |
| At delivery   | 0.00 (-0.10, 0.09)   | 0.95            | 0.97            | 0.05 (-0.05, 0.14)   | 0.31            | 0.93            |
| Ba            |                      |                 |                 |                      |                 |                 |
| 1st trimester | -0.08 (-0.15, -0.01) | 0.02            | 0.30            | 0.02 (-0.05, 0.09)   | 0.60            | 0.93            |
| 2nd trimester | -0.03 (-0.07, 0.01)  | 0.11            | 0.58            | -0.04 (-0.09, 0.01)  | 0.14            | 0.66            |
| 3rd trimester | -0.04 (-0.08, 0.01)  | 0.09            | 0.57            | -0.04 (-0.08, 0.00)  | 0.06            | 0.58            |
| At delivery   | -0.06 (-0.15, 0.03)  | 0.16            | 0.64            | 0.03 (-0.07, 0.12)   | 0.59            | 0.93            |
| Tl            |                      |                 |                 |                      |                 |                 |
| 1st trimester | -0.01 (-0.12, 0.09)  | 0.80            | 0.93            | -0.02 (-0.14, 0.09)  | 0.70            | 0.93            |
| 2nd trimester | -0.02 (-0.12, 0.09)  | 0.76            | 0.93            | -0.02 (-0.13, 0.10)  | 0.80            | 0.93            |
| 3rd trimester | 0.00 (-0.05, 0.05)   | 0.93            | 0.97            | -0.06 (-0.10, -0.01) | 0.02            | 0.52            |
| At delivery   | -0.08 (-0.24, 0.08)  | 0.34            | 0.72            | 0.04 (-0.12, 0.21)   | 0.60            | 0.93            |
| Hg            |                      |                 |                 |                      |                 |                 |
| 1st trimester | 0.02 (-0.04, 0.09)   | 0.45            | 0.84            | 0.01 (-0.05, 0.08)   | 0.68            | 0.93            |
| 2nd trimester | 0.06 (0.01, 0.11)    | 0.03            | 0.44            | 0.03 (-0.03, 0.08)   | 0.36            | 0.93            |
| 3rd trimester | -0.01 (-0.07, 0.05)  | 0.81            | 0.93            | 0.00 (-0.05, 0.05)   | 0.99            | 0.99            |
| At delivery   | -0.04 (-0.10, 0.02)  | 0.19            | 0.64            | 0.01 (-0.06, 0.07)   | 0.85            | 0.93            |

Note: AP, adiposity peak; Al, aluminum; Mn, manganese; Co, cobalt; Ba, barium; Tl, thallium; Hg, mercury; 1st trimester, first trimester; 2nd trimester, second trimester; 3rd trimester, third trimester.

<sup>a</sup>Adjusted for maternal age at recruitment, maternal metabolic dysfunction, pre-pregnancy BMI, and family monthly income per capita at enrollment.

**Table S7.** Adjusted association between prenatal metal exposure and AP age stratified by children's sex by multiple informant models ( $N = 2718$ ).

| Variables     | Boys <sup>a</sup>   |                 |                 | Girls <sup>a</sup>  |                 |                 |
|---------------|---------------------|-----------------|-----------------|---------------------|-----------------|-----------------|
|               | $\beta$ (95%CI)     | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)     | <i>p</i> -value | <i>q</i> -value |
| Al            |                     |                 |                 |                     |                 |                 |
| 1st trimester | -0.01 (-0.07, 0.05) | 0.80            | 0.93            | 0.02 (-0.04, 0.08)  | 0.46            | 0.93            |
| 2nd trimester | 0.03 (-0.03, 0.10)  | 0.34            | 0.72            | 0.05 (0.00, 0.10)   | 0.06            | 0.58            |
| 3rd trimester | 0.02 (-0.03, 0.06)  | 0.49            | 0.87            | 0.01 (-0.02, 0.05)  | 0.45            | 0.93            |
| At delivery   | 0.02 (-0.01, 0.06)  | 0.22            | 0.67            | 0.01 (-0.03, 0.04)  | 0.74            | 0.93            |
| Mn            |                     |                 |                 |                     |                 |                 |
| 1st trimester | -0.01 (-0.04, 0.03) | 0.75            | 0.93            | 0.00 (-0.03, 0.03)  | 0.85            | 0.93            |
| 2nd trimester | 0.02 (-0.02, 0.06)  | 0.40            | 0.81            | 0.04 (0.00, 0.07)   | 0.04            | 0.58            |
| 3rd trimester | 0.03 (-0.01, 0.08)  | 0.13            | 0.60            | 0.03 (-0.01, 0.06)  | 0.13            | 0.65            |
| At delivery   | 0.01 (-0.05, 0.08)  | 0.66            | 0.93            | 0.01 (-0.04, 0.06)  | 0.70            | 0.93            |
| Co            |                     |                 |                 |                     |                 |                 |
| 1st trimester | -0.02 (-0.06, 0.02) | 0.40            | 0.81            | 0.01 (-0.03, 0.05)  | 0.60            | 0.93            |
| 2nd trimester | -0.02 (-0.07, 0.02) | 0.27            | 0.69            | 0.01 (-0.03, 0.04)  | 0.78            | 0.93            |
| 3rd trimester | -0.01 (-0.06, 0.04) | 0.66            | 0.93            | -0.01 (-0.05, 0.04) | 0.77            | 0.93            |
| At delivery   | 0.00 (-0.07, 0.06)  | 0.94            | 0.97            | 0.05 (0.00, 0.10)   | 0.06            | 0.58            |
| Ba            |                     |                 |                 |                     |                 |                 |
| 1st trimester | 0.03 (-0.01, 0.08)  | 0.14            | 0.60            | 0.01 (-0.03, 0.05)  | 0.67            | 0.93            |
| 2nd trimester | 0.02 (-0.01, 0.04)  | 0.24            | 0.68            | 0.01 (-0.02, 0.03)  | 0.66            | 0.93            |
| 3rd trimester | 0.02 (-0.01, 0.05)  | 0.14            | 0.61            | 0.02 (0.00, 0.05)   | 0.03            | 0.52            |
| At delivery   | 0.06 (0.00, 0.11)   | 0.06            | 0.56            | 0.02 (-0.03, 0.07)  | 0.45            | 0.93            |
| Tl            |                     |                 |                 |                     |                 |                 |
| 1st trimester | -0.01 (-0.08, 0.06) | 0.74            | 0.93            | 0.07 (0.01, 0.13)   | 0.03            | 0.52            |
| 2nd trimester | 0.04 (-0.03, 0.10)  | 0.29            | 0.69            | 0.04 (-0.02, 0.10)  | 0.22            | 0.85            |
| 3rd trimester | 0.00 (-0.03, 0.03)  | 0.89            | 0.97            | -0.02 (-0.04, 0.01) | 0.23            | 0.87            |
| At delivery   | -0.02 (-0.12, 0.08) | 0.71            | 0.93            | 0.07 (-0.01, 0.16)  | 0.10            | 0.64            |
| Hg            |                     |                 |                 |                     |                 |                 |
| 1st trimester | -0.01 (-0.05, 0.03) | 0.59            | 0.93            | 0.02 (-0.02, 0.05)  | 0.39            | 0.93            |
| 2nd trimester | 0.02 (-0.02, 0.05)  | 0.29            | 0.69            | 0.01 (-0.02, 0.04)  | 0.64            | 0.93            |
| 3rd trimester | 0.02 (-0.02, 0.06)  | 0.28            | 0.69            | 0.02 (-0.01, 0.05)  | 0.13            | 0.65            |
| At delivery   | 0.06 (0.02, 0.10)   | 0.00            | 0.19            | 0.01 (-0.02, 0.05)  | 0.48            | 0.93            |

Note: AP, adiposity peak; Al, aluminum; Mn, manganese; Co, cobalt; Ba, barium; Tl, thallium; Hg, mercury; 1st trimester, first trimester; 2nd trimester, second trimester; 3rd trimester, third trimester.

<sup>a</sup>Adjusted for maternal age at recruitment, maternal metabolic dysfunction, pre-pregnancy BMI, and family monthly income per capita at enrollment.

**Table S8.** Adjusted association between prenatal metal exposure and the BMI of AR stratified by children's sex by multiple informant models ( $N = 2718$ ).

| Variables     | Boys <sup>a</sup>   |                 |                 | Girls <sup>a</sup>  |                 |                 |
|---------------|---------------------|-----------------|-----------------|---------------------|-----------------|-----------------|
|               | $\beta$ (95%CI)     | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)     | <i>p</i> -value | <i>q</i> -value |
| Al            |                     |                 |                 |                     |                 |                 |
| 1st trimester | -0.05 (-0.18, 0.08) | 0.45            | 0.84            | -0.01 (-0.15, 0.13) | 0.89            | 0.93            |
| 2nd trimester | 0.07 (-0.06, 0.21)  | 0.29            | 0.69            | 0.11 (-0.01, 0.24)  | 0.08            | 0.64            |
| 3rd trimester | 0.05 (-0.04, 0.15)  | 0.24            | 0.68            | -0.02 (-0.12, 0.07) | 0.61            | 0.93            |
| At delivery   | -0.01 (-0.09, 0.06) | 0.72            | 0.93            | 0.01 (-0.07, 0.09)  | 0.88            | 0.93            |
| Mn            |                     |                 |                 |                     |                 |                 |
| 1st trimester | 0.02 (-0.05, 0.10)  | 0.53            | 0.89            | -0.01 (-0.08, 0.06) | 0.74            | 0.93            |
| 2nd trimester | 0.08 (0.00, 0.16)   | 0.06            | 0.56            | 0.13 (0.05, 0.22)   | 0.00            | 0.28            |
| 3rd trimester | 0.08 (-0.01, 0.17)  | 0.09            | 0.57            | 0.03 (-0.06, 0.12)  | 0.53            | 0.93            |
| At delivery   | 0.01 (-0.12, 0.14)  | 0.93            | 0.97            | 0.02 (-0.11, 0.14)  | 0.81            | 0.93            |
| Co            |                     |                 |                 |                     |                 |                 |
| 1st trimester | 0.01 (-0.08, 0.10)  | 0.78            | 0.93            | -0.01 (-0.10, 0.08) | 0.77            | 0.93            |
| 2nd trimester | 0.09 (0.00, 0.17)   | 0.06            | 0.56            | 0.05 (-0.04, 0.13)  | 0.31            | 0.93            |
| 3rd trimester | 0.10 (-0.01, 0.20)  | 0.07            | 0.56            | -0.01 (-0.12, 0.09) | 0.78            | 0.93            |
| At delivery   | 0.02 (-0.11, 0.15)  | 0.72            | 0.93            | 0.05 (-0.08, 0.18)  | 0.43            | 0.93            |
| Ba            |                     |                 |                 |                     |                 |                 |
| 1st trimester | 0.01 (-0.08, 0.10)  | 0.83            | 0.93            | 0.01 (-0.08, 0.11)  | 0.77            | 0.93            |
| 2nd trimester | 0.00 (-0.06, 0.05)  | 0.87            | 0.96            | -0.02 (-0.09, 0.04) | 0.45            | 0.93            |
| 3rd trimester | -0.01 (-0.07, 0.05) | 0.71            | 0.93            | -0.01 (-0.06, 0.05) | 0.80            | 0.93            |
| At delivery   | -0.03 (-0.15, 0.09) | 0.63            | 0.93            | 0.05 (-0.07, 0.18)  | 0.42            | 0.93            |
| Tl            |                     |                 |                 |                     |                 |                 |
| 1st trimester | 0.02 (-0.13, 0.16)  | 0.80            | 0.93            | 0.06 (-0.09, 0.22)  | 0.43            | 0.93            |
| 2nd trimester | 0.07 (-0.07, 0.21)  | 0.33            | 0.72            | 0.08 (-0.08, 0.23)  | 0.33            | 0.93            |
| 3rd trimester | 0.01 (-0.05, 0.08)  | 0.70            | 0.93            | -0.01 (-0.08, 0.05) | 0.65            | 0.93            |
| At delivery   | -0.14 (-0.36, 0.07) | 0.19            | 0.64            | 0.14 (-0.07, 0.36)  | 0.19            | 0.80            |
| Hg            |                     |                 |                 |                     |                 |                 |
| 1st trimester | 0.00 (-0.08, 0.09)  | 0.91            | 0.97            | 0.01 (-0.08, 0.10)  | 0.87            | 0.93            |
| 2nd trimester | 0.10 (0.03, 0.17)   | 0.01            | 0.19            | 0.02 (-0.06, 0.09)  | 0.67            | 0.93            |
| 3rd trimester | 0.02 (-0.05, 0.1)   | 0.53            | 0.89            | 0.01 (-0.06, 0.08)  | 0.74            | 0.93            |
| At delivery   | 0.05 (-0.03, 0.13)  | 0.22            | 0.67            | 0.01 (-0.07, 0.10)  | 0.77            | 0.93            |

Note: AR, adiposity rebound; Al, aluminum; Mn, manganese; Co, cobalt; Ba, barium; Tl, thallium; Hg, mercury; 1st trimester, first trimester; 2nd trimester, second trimester; 3rd trimester, third trimester.

<sup>a</sup>Adjusted for maternal age at recruitment, maternal metabolic dysfunction, pre-pregnancy BMI, and family monthly income per capita at enrollment.

**Table S9.** Adjusted association between prenatal metal exposure and AR age stratified by children's sex by multiple informant models ( $N = 2718$ ).

| Variables     | Boys <sup>a</sup>    |                 |                 | Girls <sup>a</sup>   |                 |                 |
|---------------|----------------------|-----------------|-----------------|----------------------|-----------------|-----------------|
|               | $\beta$ (95%CI)      | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)      | <i>p</i> -value | <i>q</i> -value |
| Al            |                      |                 |                 |                      |                 |                 |
| 1st trimester | 0.01 (-1.24, 1.26)   | 0.98            | 1.00            | -0.22 (-1.50, 1.06)  | 0.74            | 0.93            |
| 2nd trimester | 0.14 (-1.17, 1.45)   | 0.83            | 0.93            | -0.85 (-1.99, 0.30)  | 0.15            | 0.67            |
| 3rd trimester | -0.12 (-0.99, 0.74)  | 0.78            | 0.93            | -0.32 (-1.16, 0.51)  | 0.45            | 0.93            |
| At delivery   | -0.34 (-1.09, 0.42)  | 0.38            | 0.80            | -0.14 (-0.85, 0.57)  | 0.70            | 0.93            |
| Mn            |                      |                 |                 |                      |                 |                 |
| 1st trimester | -0.15 (-0.86, 0.55)  | 0.67            | 0.93            | -0.23 (-0.86, 0.39)  | 0.47            | 0.93            |
| 2nd trimester | -0.27 (-1.08, 0.53)  | 0.50            | 0.87            | -0.83 (-1.60, -0.07) | 0.03            | 0.52            |
| 3rd trimester | -0.29 (-1.14, 0.56)  | 0.51            | 0.87            | -0.41 (-1.19, 0.37)  | 0.30            | 0.93            |
| At delivery   | -0.20 (-1.45, 1.04)  | 0.75            | 0.93            | -0.31 (-1.42, 0.79)  | 0.58            | 0.93            |
| Co            |                      |                 |                 |                      |                 |                 |
| 1st trimester | 0.33 (-0.54, 1.19)   | 0.46            | 0.84            | -0.21 (-1.02, 0.6)   | 0.61            | 0.93            |
| 2nd trimester | 0.69 (-0.15, 1.52)   | 0.11            | 0.58            | 0.37 (-0.42, 1.15)   | 0.36            | 0.93            |
| 3rd trimester | 0.07 (-0.93, 1.06)   | 0.90            | 0.97            | 0.28 (-0.65, 1.21)   | 0.56            | 0.93            |
| At delivery   | -0.29 (-1.53, 0.96)  | 0.65            | 0.93            | -0.06 (-1.18, 1.06)  | 0.92            | 0.95            |
| Ba            |                      |                 |                 |                      |                 |                 |
| 1st trimester | -1.14 (-2.03, -0.25) | 0.01            | 0.23            | 0.04 (-0.81, 0.88)   | 0.93            | 0.96            |
| 2nd trimester | -0.34 (-0.86, 0.17)  | 0.19            | 0.64            | -0.14 (-0.72, 0.43)  | 0.62            | 0.93            |
| 3rd trimester | -0.33 (-0.86, 0.21)  | 0.23            | 0.68            | -0.4 (-0.87, 0.07)   | 0.09            | 0.64            |
| At delivery   | -0.48 (-1.63, 0.67)  | 0.41            | 0.81            | -0.36 (-1.49, 0.76)  | 0.53            | 0.93            |
| Tl            |                      |                 |                 |                      |                 |                 |
| 1st trimester | -0.36 (-1.74, 1.01)  | 0.60            | 0.93            | -1.07 (-2.43, 0.29)  | 0.12            | 0.65            |
| 2nd trimester | -0.99 (-2.30, 0.31)  | 0.14            | 0.60            | -1.13 (-2.49, 0.22)  | 0.10            | 0.64            |
| 3rd trimester | -0.13 (-0.78, 0.51)  | 0.68            | 0.93            | -0.45 (-1.00, 0.10)  | 0.11            | 0.65            |
| At delivery   | 0.73 (-1.28, 2.75)   | 0.48            | 0.86            | -1.21 (-3.12, 0.7)   | 0.22            | 0.85            |
| Hg            |                      |                 |                 |                      |                 |                 |
| 1st trimester | 0.23 (-0.57, 1.03)   | 0.57            | 0.93            | 0.08 (-0.71, 0.87)   | 0.84            | 0.93            |
| 2nd trimester | -0.51 (-1.19, 0.17)  | 0.14            | 0.60            | 0.11 (-0.54, 0.77)   | 0.74            | 0.93            |
| 3rd trimester | -0.41 (-1.15, 0.34)  | 0.29            | 0.69            | -0.15 (-0.76, 0.45)  | 0.62            | 0.93            |
| At delivery   | -1.13 (-1.90, -0.36) | 0.00            | 0.19            | -0.07 (-0.85, 0.71)  | 0.87            | 0.93            |

Note: AR, adiposity rebound; Al, aluminum; Mn, manganese; Co, cobalt; Ba, barium; Tl, thallium; Hg, mercury; 1st trimester, first trimester; 2nd trimester, second trimester; 3rd trimester, third trimester.

<sup>a</sup>Adjusted for maternal age at recruitment, maternal metabolic dysfunction, pre-pregnancy BMI, and family monthly income per capita at enrollment.

**Table S10.** Association between prenatal metal exposure and the early AR timing on logistic regression models ( $N = 2718$ ).

| Variables        | AR phase advance <sup>a</sup> |         |         | AR phase advance <sup>b</sup> |         |         |
|------------------|-------------------------------|---------|---------|-------------------------------|---------|---------|
|                  | OR (95%CI)                    | p-value | q-value | OR (95%CI)                    | p-value | q-value |
| First trimester  |                               |         |         |                               |         |         |
| Al               | 0.96 (0.75, 1.23)             | 0.75    | 0.90    | 0.97 (0.76, 1.24)             | 0.80    | 0.87    |
| Mn               | 1.12 (0.98, 1.28)             | 0.09    | 0.18    | 1.13 (0.99, 1.29)             | 0.08    | 0.36    |
| Co               | 1.01 (0.86, 1.19)             | 0.91    | 0.91    | 1.05 (0.89, 1.24)             | 0.59    | 0.87    |
| Ba               | 1.22 (1.05, 1.41)             | 0.01    | 0.03    | 1.20 (1.03, 1.39)             | 0.02    | 0.36    |
| Tl               | 1.41 (1.08, 1.85)             | 0.01    | 0.03    | 1.36 (1.04, 1.78)             | 0.03    | 0.36    |
| Hg               | 0.95 (0.81, 1.11)             | 0.52    | 0.78    | 0.95 (0.81, 1.11)             | 0.49    | 0.87    |
| Second trimester |                               |         |         |                               |         |         |
| Al               | 0.95 (0.75, 1.21)             | 0.68    | 0.82    | 0.95 (0.75, 1.21)             | 0.69    | 0.87    |
| Mn               | 1.06 (0.91, 1.24)             | 0.45    | 0.82    | 1.08 (0.92, 1.26)             | 0.34    | 0.87    |
| Co               | 0.83 (0.71, 0.98)             | 0.02    | 0.12    | 0.87 (0.74, 1.02)             | 0.09    | 0.36    |
| Ba               | 1.03 (0.93, 1.14)             | 0.56    | 0.82    | 1.02 (0.92, 1.12)             | 0.74    | 0.87    |
| Tl               | 1.30 (1.01, 1.68)             | 0.04    | 0.12    | 1.26 (0.98, 1.63)             | 0.07    | 0.36    |
| Hg               | 1.01 (0.89, 1.15)             | 0.86    | 0.86    | 1.02 (0.90, 1.16)             | 0.77    | 0.87    |
| Third trimester  |                               |         |         |                               |         |         |
| Al               | 1.11 (0.93, 1.32)             | 0.24    | 0.72    | 1.12 (0.94, 1.33)             | 0.20    | 0.60    |
| Mn               | 1.01 (0.86, 1.18)             | 0.90    | 0.90    | 0.99 (0.84, 1.16)             | 0.89    | 0.90    |
| Co               | 0.93 (0.77, 1.12)             | 0.43    | 0.86    | 0.95 (0.79, 1.14)             | 0.59    | 0.87    |
| Ba               | 1.03 (0.93, 1.13)             | 0.58    | 0.87    | 1.02 (0.93, 1.12)             | 0.70    | 0.87    |
| Tl               | 1.11 (1.00, 1.23)             | 0.04    | 0.24    | 1.10 (0.99, 1.21)             | 0.07    | 0.36    |
| Hg               | 0.99 (0.87, 1.13)             | 0.88    | 0.90    | 0.98 (0.86, 1.12)             | 0.75    | 0.87    |
| At delivery      |                               |         |         |                               |         |         |
| Al               | 0.99 (0.86, 1.14)             | 0.90    | 0.90    | 0.99 (0.86, 1.14)             | 0.90    | 0.90    |
| Mn               | 0.93 (0.74, 1.15)             | 0.49    | 0.78    | 0.97 (0.77, 1.21)             | 0.77    | 0.87    |
| Co               | 1.07 (0.85, 1.35)             | 0.56    | 0.78    | 1.10 (0.87, 1.39)             | 0.42    | 0.87    |
| Ba               | 1.07 (0.86, 1.34)             | 0.56    | 0.78    | 1.06 (0.85, 1.33)             | 0.59    | 0.87    |
| Tl               | 0.81 (0.55, 1.18)             | 0.27    | 0.78    | 0.77 (0.52, 1.13)             | 0.18    | 0.60    |
| Hg               | 0.97 (0.83, 1.13)             | 0.65    | 0.78    | 0.97 (0.83, 1.13)             | 0.68    | 0.87    |

Note: AR, adiposity rebound; Al, aluminum; Mn, manganese; Co, cobalt; Ba, barium; Tl, thallium; Hg, mercury.

<sup>a</sup>Original model (crude model).

<sup>b</sup>Adjusted for maternal age at recruitment, maternal metabolic dysfunction, pre-pregnancy BMI, family monthly income per capita at enrollment, and children's sex.

**Table S11.** Joint effects of prenatal metal exposure on AP and AR in the quantile-based g-computation model ( $N = 2718$ ).

| Variables           | First trimester     |                 |                 | Second trimester    |                 |                 | Third trimester     |                 |                 | At delivery         |                 |                 |
|---------------------|---------------------|-----------------|-----------------|---------------------|-----------------|-----------------|---------------------|-----------------|-----------------|---------------------|-----------------|-----------------|
|                     | $\beta$ (95%CI)     | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)     | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)     | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)     | <i>p</i> -value | <i>q</i> -value |
| AP_BMI <sup>a</sup> | -0.01 (-0.07, 0.05) | 0.77            | 0.82            | 0.07 (0.00, 0.14)   | 0.04            | 0.16            | 0.01 (-0.05, 0.08)  | 0.68            | 0.82            | -0.01 (-0.07, 0.06) | 0.82            | 0.82            |
| AP_Age <sup>a</sup> | 0.01 (-0.03, 0.05)  | 0.54            | 0.54            | 0.04 (-0.001, 0.08) | 0.06            | 0.07            | 0.04 (0.00, 0.08)   | 0.04            | 0.07            | 0.05 (0.01, 0.08)   | 0.01            | 0.04            |
| AR_BMI <sup>a</sup> | 0.004 (-0.08, 0.09) | 0.93            | 0.93            | 0.13 (0.04, 0.22)   | 0.01            | 0.04            | 0.06 (-0.02, 0.15)  | 0.15            | 0.29            | 0.05 (-0.03, 0.14)  | 0.22            | 0.29            |
| AR_Age <sup>a</sup> | -0.17 (-0.97, 0.62) | 0.67            | 0.67            | -0.73 (-1.56, 0.09) | 0.08            | 0.15            | -0.62 (-1.39, 0.14) | 0.11            | 0.15            | -0.75 (-1.52, 0.02) | 0.06            | 0.15            |

Note: AP, adiposity peak; AR, adiposity rebound.

<sup>a</sup> Adjusted for maternal age at recruitment, maternal metabolic dysfunction, pre-pregnancy BMI, family monthly income per capita at enrollment, and children's sex.

**Table S12.** Joint effects of prenatal metal exposure on AP and AR in the weighted quantile sum model ( $N = 2718$ ).

| Variables           | First trimester     |                 |                 | Second trimester     |                 |                 | Third trimester      |                 |                 | At delivery          |                 |                 |
|---------------------|---------------------|-----------------|-----------------|----------------------|-----------------|-----------------|----------------------|-----------------|-----------------|----------------------|-----------------|-----------------|
|                     | $\beta$ (95%CI)     | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)      | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)      | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)      | <i>p</i> -value | <i>q</i> -value |
| AP_BMI <sup>a</sup> | 0.01 (-0.04, 0.06)  | 0.67            | 0.67            | 0.11 (0.07, 0.16)    | 0.00            | 0.00            | 0.06 (0.01, 0.10)    | 0.01            | 0.02            | 0.02 (-0.03, 0.07)   | 0.49            | 0.65            |
| AP_Age <sup>a</sup> | 0.01 (-0.02, 0.05)  | 0.54            | 0.54            | 0.05 (0.02, 0.09)    | 0.00            | 0.00            | 0.05 (0.02, 0.08)    | 0.00            | 0.00            | 0.05 (0.02, 0.08)    | 0.00            | 0.00            |
| AR_BMI <sup>a</sup> | 0.01 (-0.06, 0.09)  | 0.74            | 0.74            | 0.17 (0.09, 0.25)    | 0.00            | 0.00            | 0.07 (0.01, 0.14)    | 0.03            | 0.06            | 0.06 (-0.01, 0.14)   | 0.09            | 0.12            |
| AR_Age <sup>a</sup> | -0.39 (-0.96, 0.18) | 0.18            | 0.18            | -1.26 (-1.95, -0.58) | 0.00            | 0.00            | -0.75 (-1.37, -0.13) | 0.02            | 0.03            | -0.87 (-1.51, -0.22) | 0.01            | 0.02            |

Note: AP, adiposity peak; AR, adiposity rebound.

<sup>a</sup> Adjusted for maternal age at recruitment, maternal metabolic dysfunction, pre-pregnancy BMI, family monthly income per capita at enrollment, and children's sex.

**Table S13.** Analysis of the interaction effect between prenatal metal exposure and children's sex on AP and AR ( $N = 2718$ ).

| Variables     | AP_BMI <sup>a</sup> |                          |            | AP_Age <sup>a</sup> |                          |            | AR_BMI <sup>a</sup> |                          |            | AR_Age <sup>a</sup> |                          |            |
|---------------|---------------------|--------------------------|------------|---------------------|--------------------------|------------|---------------------|--------------------------|------------|---------------------|--------------------------|------------|
|               | $\beta$ (95%CI)     | $p_{\text{interaction}}$ | $q$ -value | $\beta$ (95%CI)     | $p_{\text{interaction}}$ | $q$ -value | $\beta$ (95%CI)     | $p_{\text{interaction}}$ | $q$ -value | $\beta$ (95%CI)     | $p_{\text{interaction}}$ | $q$ -value |
| Al*Sex        |                     |                          |            |                     |                          |            |                     |                          |            |                     |                          |            |
| 1st trimester | 0.02 (-0.12, 0.17)  | 0.76                     | 1.00       | 0.03 (-0.06, 0.12)  | 0.50                     | 0.96       | 0.04 (-0.15, 0.24)  | 0.68                     | 0.97       | -0.24 (-2.05, 1.57) | 0.80                     | 0.96       |
| 2nd trimester | -0.05 (-0.19, 0.09) | 0.47                     | 0.74       | 0.02 (-0.06, 0.11)  | 0.60                     | 0.96       | 0.04 (-0.15, 0.23)  | 0.67                     | 0.97       | -1.05 (-2.79, 0.7)  | 0.24                     | 0.96       |
| 3rd trimester | -0.10 (-0.20, 0.00) | 0.05                     | 0.56       | 0.00 (-0.06, 0.06)  | 0.97                     | 0.93       | -0.08 (-0.21, 0.06) | 0.26                     | 0.97       | -0.24 (-1.45, 0.97) | 0.70                     | 0.94       |
| At delivery   | 0.04 (-0.05, 0.12)  | 0.37                     | 0.56       | -0.02 (-0.07, 0.03) | 0.46                     | 0.93       | 0.02 (-0.09, 0.14)  | 0.68                     | 0.98       | 0.2 (-0.84, 1.24)   | 0.71                     | 0.73       |
| Mn*Sex        |                     |                          |            |                     |                          |            |                     |                          |            |                     |                          |            |
| 1st trimester | -0.04 (-0.12, 0.03) | 0.26                     | 1.00       | 0.01 (-0.04, 0.06)  | 0.65                     | 0.93       | -0.04 (-0.14, 0.07) | 0.50                     | 0.97       | -0.12 (-1.06, 0.83) | 0.81                     | 0.96       |
| 2nd trimester | 0.00 (-0.09, 0.09)  | 0.99                     | 1.00       | 0.02 (-0.03, 0.08)  | 0.43                     | 0.93       | 0.05 (-0.07, 0.18)  | 0.38                     | 0.98       | -0.62 (-1.74, 0.49) | 0.27                     | 0.96       |
| 3rd trimester | -0.06 (-0.15, 0.04) | 0.24                     | 0.90       | -0.01 (-0.07, 0.05) | 0.73                     | 0.96       | -0.05 (-0.18, 0.07) | 0.39                     | 0.97       | -0.03 (-1.19, 1.12) | 0.96                     | 0.94       |
| At delivery   | 0.00 (-0.13, 0.14)  | 0.98                     | 1.00       | 0.00 (-0.08, 0.08)  | 0.93                     | 0.93       | 0.02 (-0.16, 0.2)   | 0.80                     | 0.97       | -0.27 (-1.94, 1.39) | 0.75                     | 0.94       |
| Co*Sex        |                     |                          |            |                     |                          |            |                     |                          |            |                     |                          |            |
| 1st trimester | -0.07 (-0.17, 0.02) | 0.13                     | 0.56       | 0.04 (-0.02, 0.09)  | 0.23                     | 0.93       | -0.02 (-0.15, 0.11) | 0.78                     | 0.97       | -0.69 (-1.88, 0.5)  | 0.26                     | 0.96       |
| 2nd trimester | -0.07 (-0.16, 0.02) | 0.14                     | 1.00       | 0.04 (-0.02, 0.09)  | 0.18                     | 0.96       | -0.03 (-0.15, 0.1)  | 0.65                     | 0.97       | -0.51 (-1.66, 0.64) | 0.38                     | 0.96       |
| 3rd trimester | -0.09 (-0.2, 0.02)  | 0.10                     | 1.00       | 0.01 (-0.06, 0.08)  | 0.77                     | 0.99       | -0.11 (-0.25, 0.04) | 0.16                     | 0.98       | 0.12 (-1.24, 1.49)  | 0.86                     | 0.96       |
| At delivery   | 0.05 (-0.09, 0.19)  | 0.47                     | 0.74       | 0.06 (-0.02, 0.14)  | 0.17                     | 0.96       | 0.04 (-0.15, 0.22)  | 0.70                     | 0.97       | 0.10 (-1.58, 1.78)  | 0.90                     | 0.94       |
| Ba*Sex        |                     |                          |            |                     |                          |            |                     |                          |            |                     |                          |            |
| 1st trimester | 0.10 (0.00, 0.20)   | 0.04                     | 0.56       | -0.03 (-0.09, 0.03) | 0.35                     | 0.99       | 0.00 (-0.13, 0.13)  | 0.99                     | 0.97       | 1.24 (0.01, 2.47)   | 0.05                     | 0.96       |
| 2nd trimester | 0.00 (-0.06, 0.06)  | 0.96                     | 0.72       | -0.01 (-0.05, 0.03) | 0.54                     | 0.97       | -0.02 (-0.11, 0.06) | 0.62                     | 0.97       | 0.25 (-0.54, 1.03)  | 0.54                     | 0.96       |
| 3rd trimester | 0.00 (-0.06, 0.06)  | 0.99                     | 0.56       | 0.00 (-0.03, 0.04)  | 0.90                     | 0.97       | 0.00 (-0.08, 0.08)  | 0.96                     | 0.97       | -0.03 (-0.75, 0.68) | 0.93                     | 0.96       |
| At delivery   | 0.10 (-0.04, 0.23)  | 0.16                     | 1.00       | -0.04 (-0.12, 0.04) | 0.36                     | 0.99       | 0.08 (-0.09, 0.26)  | 0.35                     | 0.98       | 0.14 (-1.48, 1.76)  | 0.87                     | 0.96       |
| Tl*Sex        |                     |                          |            |                     |                          |            |                     |                          |            |                     |                          |            |

|               |                     |      |      |                     |      |      |                     |      |      |                     |      |      |
|---------------|---------------------|------|------|---------------------|------|------|---------------------|------|------|---------------------|------|------|
| 1st trimester | -0.01 (-0.17, 0.15) | 0.92 | 0.56 | 0.07 (-0.02, 0.17)  | 0.13 | 0.93 | 0.03 (-0.18, 0.25)  | 0.76 | 0.97 | -0.58 (-2.53, 1.37) | 0.56 | 0.96 |
| 2nd trimester | 0.00 (-0.15, 0.16)  | 0.97 | 1.00 | 0.00 (-0.09, 0.09)  | 0.97 | 0.99 | 0.00 (-0.21, 0.21)  | 1.00 | 0.97 | -0.03 (-1.93, 1.88) | 0.98 | 0.96 |
| 3rd trimester | -0.06 (-0.13, 0.01) | 0.09 | 0.80 | -0.02 (-0.06, 0.02) | 0.34 | 0.96 | -0.03 (-0.12, 0.06) | 0.52 | 0.97 | -0.28 (-1.12, 0.57) | 0.52 | 0.96 |
| At delivery   | 0.12 (-0.11, 0.35)  | 0.29 | 1.00 | 0.09 (-0.05, 0.22)  | 0.21 | 0.99 | 0.28 (-0.03, 0.58)  | 0.07 | 0.97 | -1.82 (-4.62, 0.98) | 0.20 | 0.96 |
| Hg*Sex        |                     |      |      |                     |      |      |                     |      |      |                     |      |      |
| 1st trimester | -0.02 (-0.11, 0.08) | 0.74 | 0.80 | 0.03 (-0.03, 0.08)  | 0.35 | 0.93 | 0.00 (-0.13, 0.12)  | 0.96 | 0.97 | -0.14 (-1.27, 0.99) | 0.81 | 0.96 |
| 2nd trimester | -0.04 (-0.11, 0.04) | 0.36 | 0.56 | -0.01 (-0.06, 0.04) | 0.68 | 0.93 | -0.08 (-0.19, 0.02) | 0.11 | 0.97 | 0.59 (-0.36, 1.54)  | 0.22 | 0.96 |
| 3rd trimester | 0.01 (-0.07, 0.08)  | 0.90 | 0.74 | 0.00 (-0.05, 0.05)  | 0.99 | 0.93 | -0.02 (-0.12, 0.09) | 0.76 | 0.97 | 0.27 (-0.69, 1.23)  | 0.58 | 0.94 |
| At delivery   | 0.05 (-0.04, 0.13)  | 0.33 | 0.74 | -0.05 (-0.1, 0.01)  | 0.08 | 0.93 | -0.04 (-0.16, 0.08) | 0.53 | 0.97 | 1.05 (-0.05, 2.16)  | 0.06 | 0.73 |

Note: AP, adiposity peak; AR, adiposity rebound; Al, aluminum; Mn, manganese; Co, cobalt; Ba, barium; Tl, thallium; Hg, mercury; 1st trimester, first trimester; 2nd trimester, second trimester; 3rd trimester, third trimester.

<sup>a</sup>Adjusted for maternal age at enrollment, maternal metabolic dysfunction, pre-pregnancy BMI, and family monthly income per capita at enrollment.

**Table S14.** Association between prenatal metal exposure and the AP and AR before interpolation of missing values ( $N = 2718$ ).

| Variables     | AP_BMI <sup>a</sup>  |                 |                 | AP_Age <sup>a</sup> |                 |                 | AR_BMI <sup>a</sup> |                 |                 | AR_Age <sup>a</sup>  |                 |                 |
|---------------|----------------------|-----------------|-----------------|---------------------|-----------------|-----------------|---------------------|-----------------|-----------------|----------------------|-----------------|-----------------|
|               | $\beta$ (95%CI)      | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)     | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)     | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)      | <i>p</i> -value | <i>q</i> -value |
| Al            |                      |                 |                 |                     |                 |                 |                     |                 |                 |                      |                 |                 |
| 1st trimester | -0.04 (-0.11, 0.03)  | 0.30            | 0.68            | 0.00 (-0.04, 0.05)  | 0.85            | 0.96            | -0.03 (-0.13, 0.06) | 0.51            | 0.80            | -0.08 (-0.97, 0.81)  | 0.86            | 0.96            |
| 2nd trimester | 0.07 (0.00, 0.14)    | 0.06            | 0.30            | 0.04 (0.00, 0.09)   | 0.04            | 0.26            | 0.10 (0.00, 0.19)   | 0.04            | 0.26            | -0.40 (-1.26, 0.47)  | 0.37            | 0.73            |
| 3rd trimester | 0.00 (-0.05, 0.05)   | 0.97            | 1.00            | 0.02 (-0.01, 0.04)  | 0.29            | 0.68            | 0.02 (-0.05, 0.08)  | 0.62            | 0.86            | -0.23 (-0.83, 0.37)  | 0.45            | 0.79            |
| At delivery   | -0.02 (-0.06, 0.02)  | 0.33            | 0.69            | 0.01 (-0.01, 0.04)  | 0.26            | 0.65            | 0.00 (-0.06, 0.05)  | 0.95            | 0.99            | -0.23 (-0.75, 0.29)  | 0.38            | 0.73            |
| Mn            |                      |                 |                 |                     |                 |                 |                     |                 |                 |                      |                 |                 |
| 1st trimester | -0.01 (-0.05, 0.03)  | 0.55            | 0.81            | 0.00 (-0.02, 0.02)  | 0.98            | 1.00            | 0.01 (-0.04, 0.06)  | 0.75            | 0.90            | -0.23 (-0.7, 0.24)   | 0.33            | 0.69            |
| 2nd trimester | 0.06 (0.01, 0.10)    | 0.01            | 0.26            | 0.03 (0.00, 0.05)   | 0.04            | 0.26            | 0.11 (0.05, 0.17)   | 0.00            | 0.05            | -0.58 (-1.13, -0.02) | 0.04            | 0.26            |
| 3rd trimester | 0.03 (-0.02, 0.08)   | 0.19            | 0.55            | 0.03 (0.00, 0.06)   | 0.047           | 0.27            | 0.05 (-0.01, 0.11)  | 0.10            | 0.41            | -0.30 (-0.88, 0.27)  | 0.31            | 0.68            |
| At delivery   | -0.02 (-0.09, 0.05)  | 0.60            | 0.86            | 0.01 (-0.03, 0.05)  | 0.49            | 0.79            | 0.01 (-0.08, 0.10)  | 0.87            | 0.96            | -0.30 (-1.13, 0.53)  | 0.48            | 0.79            |
| Co            |                      |                 |                 |                     |                 |                 |                     |                 |                 |                      |                 |                 |
| 1st trimester | 0.00 (-0.05, 0.05)   | 0.91            | 0.98            | 0.00 (-0.03, 0.03)  | 0.84            | 0.96            | 0.00 (-0.06, 0.07)  | 0.94            | 0.99            | 0.0 (-0.59, 0.59)    | 1.00            | 1.00            |
| 2nd trimester | 0.12 (0.07, 0.16)    | <0.001          | 0.10            | -0.01 (-0.04, 0.02) | 0.45            | 0.79            | 0.07 (0.01, 0.13)   | 0.02            | 0.26            | 0.54 (-0.04, 1.11)   | 0.07            | 0.33            |
| 3rd trimester | 0.05 (-0.01, 0.10)   | 0.09            | 0.37            | -0.01 (-0.04, 0.03) | 0.64            | 0.88            | 0.04 (-0.04, 0.11)  | 0.31            | 0.68            | 0.12 (-0.56, 0.81)   | 0.72            | 0.89            |
| At delivery   | 0.01 (-0.06, 0.08)   | 0.84            | 0.96            | 0.03 (-0.01, 0.07)  | 0.17            | 0.55            | 0.03 (-0.06, 0.13)  | 0.48            | 0.79            | -0.32 (-1.16, 0.53)  | 0.46            | 0.79            |
| Ba            |                      |                 |                 |                     |                 |                 |                     |                 |                 |                      |                 |                 |
| 1st trimester | -0.03 (-0.08, 0.02)  | 0.20            | 0.56            | 0.02 (-0.01, 0.05)  | 0.18            | 0.55            | 0.01 (-0.06, 0.08)  | 0.74            | 0.90            | -0.54 (-1.15, 0.07)  | 0.08            | 0.37            |
| 2nd trimester | -0.03 (-0.07, 0.00)  | 0.03            | 0.26            | 0.01 (-0.01, 0.03)  | 0.18            | 0.55            | -0.01 (-0.05, 0.03) | 0.57            | 0.83            | -0.27 (-0.65, 0.11)  | 0.16            | 0.55            |
| 3rd trimester | -0.03 (-0.06, -0.01) | 0.02            | 0.26            | 0.02 (0.00, 0.04)   | 0.03            | 0.26            | -0.01 (-0.05, 0.03) | 0.54            | 0.81            | -0.29 (-0.65, 0.07)  | 0.11            | 0.41            |
| At delivery   | -0.02 (-0.09, 0.04)  | 0.50            | 0.80            | 0.04 (0.00, 0.08)   | 0.04            | 0.26            | 0.01 (-0.07, 0.10)  | 0.78            | 0.91            | -0.48 (-1.28, 0.32)  | 0.24            | 0.63            |
| Tl            |                      |                 |                 |                     |                 |                 |                     |                 |                 |                      |                 |                 |

|               |                     |      |      |                     |      |      |                     |      |      |                      |      |      |
|---------------|---------------------|------|------|---------------------|------|------|---------------------|------|------|----------------------|------|------|
| 1st trimester | -0.02 (-0.10, 0.06) | 0.61 | 0.86 | 0.02 (-0.02, 0.07)  | 0.32 | 0.69 | 0.03 (-0.07, 0.14)  | 0.54 | 0.81 | -0.66 (-1.62, 0.31)  | 0.18 | 0.55 |
| 2nd trimester | -0.02 (-0.09, 0.06) | 0.65 | 0.88 | 0.04 (-0.01, 0.09)  | 0.08 | 0.37 | 0.07 (-0.03, 0.17)  | 0.16 | 0.55 | -1.09 (-2.03, -0.15) | 0.02 | 0.26 |
| 3rd trimester | -0.03 (-0.06, 0.01) | 0.11 | 0.41 | -0.01 (-0.03, 0.01) | 0.44 | 0.79 | 0.00 (-0.05, 0.04)  | 0.90 | 0.98 | -0.27 (-0.69, 0.15)  | 0.21 | 0.57 |
| At delivery   | -0.03 (-0.14, 0.09) | 0.66 | 0.88 | 0.03 (-0.04, 0.10)  | 0.38 | 0.73 | -0.01 (-0.16, 0.15) | 0.94 | 0.99 | -0.27 (-1.66, 1.12)  | 0.71 | 0.89 |
| Hg            |                     |      |      |                     |      |      |                     |      |      |                      |      |      |
| 1st trimester | 0.02 (-0.03, 0.07)  | 0.39 | 0.73 | 0.00 (-0.02, 0.03)  | 0.77 | 0.91 | 0.01 (-0.05, 0.07)  | 0.72 | 0.89 | 0.11 (-0.46, 0.67)   | 0.72 | 0.89 |
| 2nd trimester | 0.04 (0.00, 0.08)   | 0.03 | 0.26 | 0.01 (-0.01, 0.03)  | 0.30 | 0.68 | 0.06 (0.01, 0.11)   | 0.02 | 0.26 | -0.21 (-0.68, 0.26)  | 0.39 | 0.73 |
| 3rd trimester | -0.01 (-0.05, 0.03) | 0.73 | 0.89 | 0.02 (0.00, 0.04)   | 0.11 | 0.41 | 0.01 (-0.04, 0.06)  | 0.71 | 0.89 | -0.22 (-0.70, 0.26)  | 0.37 | 0.73 |
| At delivery   | -0.03 (-0.07, 0.02) | 0.21 | 0.57 | 0.04 (0.01, 0.06)   | 0.01 | 0.26 | 0.02 (-0.04, 0.08)  | 0.53 | 0.81 | -0.59 (-1.14, -0.04) | 0.04 | 0.26 |

Note: AP, adiposity peak; AR, adiposity rebound; Al, aluminum; Mn, manganese; Co, cobalt; Ba, barium; Tl, thallium; Hg, mercury; 1st trimester, first trimester; 2nd trimester, second trimester; 3rd trimester, third trimester.

<sup>a</sup>Adjusted for maternal age at enrollment, maternal metabolic dysfunction, pre-pregnancy BMI, family monthly income per capita at enrollment, and children's sex.

**Table S15.** Inverse probability weighted associations of prenatal metal exposure with the AP and AR in children ( $N = 2718$ ).

| Variables     | AP_BMI <sup>a</sup>  |                 |                 | AP_Age <sup>a</sup> |                 |                 | AR_BMI <sup>a</sup> |                 |                 | AR_Age <sup>a</sup>  |                 |                 |
|---------------|----------------------|-----------------|-----------------|---------------------|-----------------|-----------------|---------------------|-----------------|-----------------|----------------------|-----------------|-----------------|
|               | $\beta$ (95%CI)      | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)     | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)     | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)      | <i>p</i> -value | <i>q</i> -value |
| Al            |                      |                 |                 |                     |                 |                 |                     |                 |                 |                      |                 |                 |
| 1st trimester | -0.04 (-0.11, 0.03)  | 0.28            | 0.56            | 0.00 (-0.04, 0.05)  | 0.85            | 0.92            | -0.04 (-0.13, 0.06) | 0.48            | 0.98            | -0.07 (-0.97, 0.82)  | 0.88            | 0.88            |
| 2nd trimester | 0.07 (0.00, 0.14)    | 0.06            | 0.22            | 0.04 (0, 0.08)      | 0.05            | 0.20            | 0.09 (0.00, 0.19)   | 0.049           | 0.29            | -0.38 (-1.24, 0.49)  | 0.40            | 0.64            |
| 3rd trimester | 0.00 (-0.05, 0.05)   | 0.96            | 0.96            | 0.01 (-0.02, 0.04)  | 0.34            | 0.54            | 0.02 (-0.05, 0.08)  | 0.63            | 0.98            | -0.20 (-0.80, 0.41)  | 0.52            | 0.70            |
| At delivery   | -0.02 (-0.07, 0.02)  | 0.28            | 0.56            | 0.02 (-0.01, 0.04)  | 0.24            | 0.50            | 0.00 (-0.06, 0.05)  | 0.91            | 0.98            | -0.24 (-0.76, 0.28)  | 0.36            | 0.62            |
| Mn            |                      |                 |                 |                     |                 |                 |                     |                 |                 |                      |                 |                 |
| 1st trimester | -0.01 (-0.05, 0.03)  | 0.57            | 0.80            | 0.00 (-0.02, 0.02)  | 0.89            | 0.93            | 0.01 (-0.05, 0.06)  | 0.84            | 0.98            | -0.19 (-0.66, 0.28)  | 0.42            | 0.64            |
| 2nd trimester | 0.06 (0.01, 0.10)    | 0.01            | 0.11            | 0.03 (0.00, 0.05)   | 0.048           | 0.20            | 0.11 (0.04, 0.17)   | 0.00            | 0.01            | -0.56 (-1.12, -0.01) | 0.048           | 0.26            |
| 3rd trimester | 0.03 (-0.02, 0.08)   | 0.23            | 0.54            | 0.03 (0.00, 0.06)   | 0.04            | 0.20            | 0.05 (-0.01, 0.12)  | 0.10            | 0.48            | -0.33 (-0.91, 0.24)  | 0.26            | 0.56            |
| At delivery   | -0.01 (-0.08, 0.06)  | 0.74            | 0.84            | 0.01 (-0.03, 0.05)  | 0.51            | 0.64            | 0.01 (-0.08, 0.10)  | 0.77            | 0.98            | -0.29 (-1.12, 0.54)  | 0.49            | 0.69            |
| Co            |                      |                 |                 |                     |                 |                 |                     |                 |                 |                      |                 |                 |
| 1st trimester | 0.01 (-0.04, 0.05)   | 0.82            | 0.89            | 0.00 (-0.03, 0.02)  | 0.74            | 0.84            | 0.00 (-0.07, 0.06)  | 0.98            | 0.98            | 0.07 (-0.52, 0.67)   | 0.81            | 0.84            |
| 2nd trimester | 0.11 (0.07, 0.16)    | <0.001          | 0.00            | -0.01 (-0.04, 0.02) | 0.43            | 0.63            | 0.06 (0.00, 0.13)   | 0.04            | 0.29            | 0.56 (-0.01, 1.14)   | 0.05            | 0.26            |
| 3rd trimester | 0.06 (0.00, 0.11)    | 0.04            | 0.17            | -0.01 (-0.04, 0.02) | 0.53            | 0.64            | 0.04 (-0.03, 0.11)  | 0.28            | 0.85            | 0.20 (-0.48, 0.88)   | 0.56            | 0.71            |
| At delivery   | 0.03 (-0.04, 0.09)   | 0.47            | 0.75            | 0.02 (-0.02, 0.06)  | 0.30            | 0.54            | 0.04 (-0.05, 0.13)  | 0.43            | 0.98            | -0.14 (-0.98, 0.7)   | 0.74            | 0.84            |
| Ba            |                      |                 |                 |                     |                 |                 |                     |                 |                 |                      |                 |                 |
| 1st trimester | -0.03 (-0.08, 0.01)  | 0.17            | 0.45            | 0.02 (-0.01, 0.05)  | 0.16            | 0.43            | 0.01 (-0.06, 0.08)  | 0.76            | 0.98            | -0.57 (-1.18, 0.05)  | 0.07            | 0.29            |
| 2nd trimester | -0.03 (-0.06, 0.00)  | 0.03            | 0.15            | 0.01 (-0.01, 0.03)  | 0.18            | 0.43            | -0.01 (-0.05, 0.03) | 0.64            | 0.98            | -0.29 (-0.67, 0.09)  | 0.14            | 0.46            |
| 3rd trimester | -0.04 (-0.07, -0.01) | 0.01            | 0.11            | 0.02 (0.00, 0.04)   | 0.01            | 0.16            | -0.01 (-0.05, 0.03) | 0.68            | 0.98            | -0.36 (-0.72, 0.00)  | 0.048           | 0.26            |
| At delivery   | -0.02 (-0.09, 0.04)  | 0.51            | 0.76            | 0.04 (0.00, 0.08)   | 0.04            | 0.20            | 0.01 (-0.08, 0.10)  | 0.79            | 0.98            | -0.47 (-1.27, 0.34)  | 0.26            | 0.56            |
| Tl            |                      |                 |                 |                     |                 |                 |                     |                 |                 |                      |                 |                 |

|               |                     |      |      |                     |      |      |                     |      |      |                      |      |      |
|---------------|---------------------|------|------|---------------------|------|------|---------------------|------|------|----------------------|------|------|
| 1st trimester | -0.02 (-0.1, 0.06)  | 0.66 | 0.82 | 0.02 (-0.02, 0.07)  | 0.32 | 0.54 | 0.04 (-0.07, 0.14)  | 0.48 | 0.98 | -0.68 (-1.65, 0.29)  | 0.17 | 0.46 |
| 2nd trimester | -0.02 (-0.09, 0.06) | 0.68 | 0.82 | 0.04 (-0.01, 0.09)  | 0.09 | 0.27 | 0.08 (-0.03, 0.18)  | 0.14 | 0.57 | -1.11 (-2.05, -0.17) | 0.02 | 0.25 |
| 3rd trimester | -0.03 (-0.06, 0.01) | 0.11 | 0.32 | -0.01 (-0.03, 0.01) | 0.48 | 0.64 | 0.00 (-0.05, 0.04)  | 0.96 | 0.98 | -0.30 (-0.72, 0.13)  | 0.17 | 0.46 |
| At delivery   | -0.02 (-0.14, 0.09) | 0.69 | 0.82 | 0.03 (-0.04, 0.09)  | 0.45 | 0.63 | -0.01 (-0.16, 0.14) | 0.92 | 0.98 | -0.21 (-1.61, 1.18)  | 0.77 | 0.84 |
| Hg            |                     |      |      |                     |      |      |                     |      |      |                      |      |      |
| 1st trimester | 0.02 (-0.03, 0.07)  | 0.40 | 0.68 | 0.00 (-0.03, 0.03)  | 0.92 | 0.93 | 0.01 (-0.05, 0.07)  | 0.84 | 0.98 | 0.16 (-0.41, 0.72)   | 0.59 | 0.71 |
| 2nd trimester | 0.04 (0.01, 0.08)   | 0.03 | 0.15 | 0.01 (-0.01, 0.04)  | 0.25 | 0.50 | 0.06 (0.01, 0.11)   | 0.02 | 0.21 | -0.23 (-0.71, 0.24)  | 0.34 | 0.62 |
| 3rd trimester | 0.00 (-0.04, 0.04)  | 0.89 | 0.93 | 0.02 (0.00, 0.04)   | 0.08 | 0.27 | 0.02 (-0.03, 0.07)  | 0.51 | 0.98 | -0.26 (-0.73, 0.22)  | 0.29 | 0.59 |
| At delivery   | -0.02 (-0.06, 0.03) | 0.40 | 0.68 | 0.04 (0.01, 0.07)   | 0.00 | 0.07 | 0.04 (-0.02, 0.1)   | 0.24 | 0.83 | -0.67 (-1.22, -0.12) | 0.02 | 0.25 |

Note: AP, adiposity peak; AR, adiposity rebound; Al, aluminum; Mn, manganese; Co, cobalt; Ba, barium; Tl, thallium; Hg, mercury; 1st trimester, first trimester; 2nd trimester, second trimester; 3rd trimester, third trimester.

<sup>a</sup>Adjusted for maternal age at enrollment, maternal metabolic dysfunction, pre-pregnancy BMI, family monthly income per capita at enrollment, and children's sex.

**Table S16.** Association between prenatal metal exposure and the BMI of AP after further adjusting for maternal folic acid supplementation during pregnancy ( $N = 2718$ ).

| Variables     | All <sup>a</sup>     |                 |                 | Boys <sup>b</sup>    |                 |                 | Girls <sup>b</sup>   |                 |                 |
|---------------|----------------------|-----------------|-----------------|----------------------|-----------------|-----------------|----------------------|-----------------|-----------------|
|               | $\beta$ (95%CI)      | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)      | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)      | <i>p</i> -value | <i>q</i> -value |
| <b>Al</b>     |                      |                 |                 |                      |                 |                 |                      |                 |                 |
| 1st trimester | -0.04 (-0.11, 0.03)  | 0.28            | 0.64            | -0.05 (-0.15, 0.05)  | 0.33            | 0.73            | -0.03 (-0.13, 0.08)  | 0.64            | 0.93            |
| 2nd trimester | 0.07 (0, 0.14)       | 0.06            | 0.27            | 0.09 (-0.01, 0.19)   | 0.08            | 0.51            | 0.04 (-0.05, 0.14)   | 0.38            | 0.93            |
| 3rd trimester | 0 (-0.05, 0.05)      | 0.96            | 0.99            | 0.05 (-0.02, 0.11)   | 0.18            | 0.64            | -0.05 (-0.12, 0.02)  | 0.15            | 0.67            |
| At delivery   | -0.02 (-0.07, 0.02)  | 0.28            | 0.64            | -0.04 (-0.10, 0.02)  | 0.17            | 0.64            | -0.01 (-0.07, 0.05)  | 0.84            | 0.93            |
| <b>Mn</b>     |                      |                 |                 |                      |                 |                 |                      |                 |                 |
| 1st trimester | -0.01 (-0.05, 0.03)  | 0.58            | 0.84            | 0.01 (-0.05, 0.07)   | 0.72            | 0.93            | -0.03 (-0.08, 0.02)  | 0.25            | 0.88            |
| 2nd trimester | 0.06 (0.01, 0.1)     | 0.01            | 0.24            | 0.06 (-0.01, 0.12)   | 0.07            | 0.51            | 0.06 (0.00, 0.13)    | 0.07            | 0.58            |
| 3rd trimester | 0.03 (-0.02, 0.08)   | 0.22            | 0.62            | 0.06 (-0.01, 0.12)   | 0.09            | 0.55            | 0.00 (-0.07, 0.06)   | 0.95            | 0.96            |
| At delivery   | -0.01 (-0.08, 0.06)  | 0.74            | 0.93            | -0.01 (-0.11, 0.08)  | 0.80            | 0.93            | -0.01 (-0.1, 0.08)   | 0.82            | 0.93            |
| <b>Co</b>     |                      |                 |                 |                      |                 |                 |                      |                 |                 |
| 1st trimester | 0.01 (-0.04, 0.05)   | 0.82            | 0.93            | 0.04 (-0.03, 0.11)   | 0.25            | 0.69            | -0.03 (-0.1, 0.04)   | 0.38            | 0.93            |
| 2nd trimester | 0.11 (0.07, 0.16)    | <0.001          | 0.10            | 0.14 (0.08, 0.21)    | <0.001          | 0.10            | 0.08 (0.01, 0.15)    | 0.02            | 0.58            |
| 3rd trimester | 0.06 (0, 0.11)       | 0.04            | 0.26            | 0.10 (0.02, 0.18)    | 0.01            | 0.23            | 0.01 (-0.07, 0.09)   | 0.81            | 0.93            |
| At delivery   | 0.03 (-0.04, 0.09)   | 0.46            | 0.79            | 0.00 (-0.11, 0.10)   | 0.97            | 0.99            | 0.05 (-0.05, 0.14)   | 0.31            | 0.93            |
| <b>Ba</b>     |                      |                 |                 |                      |                 |                 |                      |                 |                 |
| 1st trimester | -0.04 (-0.08, 0.01)  | 0.17            | 0.54            | -0.08 (-0.15, -0.01) | 0.02            | 0.29            | 0.02 (-0.05, 0.09)   | 0.59            | 0.93            |
| 2nd trimester | -0.03 (-0.07, 0)     | 0.03            | 0.26            | -0.03 (-0.07, 0.01)  | 0.11            | 0.57            | -0.04 (-0.09, 0.01)  | 0.14            | 0.65            |
| 3rd trimester | -0.04 (-0.07, -0.01) | 0.01            | 0.24            | -0.03 (-0.08, 0.00)  | 0.08            | 0.51            | -0.04 (-0.08, 0.00)  | 0.06            | 0.58            |
| At delivery   | -0.02 (-0.09, 0.04)  | 0.51            | 0.79            | -0.06 (-0.15, 0.03)  | 0.17            | 0.64            | 0.03 (-0.07, 0.12)   | 0.59            | 0.93            |
| <b>Tl</b>     |                      |                 |                 |                      |                 |                 |                      |                 |                 |
| 1st trimester | -0.02 (-0.1, 0.06)   | 0.66            | 0.88            | -0.02 (-0.12, 0.09)  | 0.78            | 0.93            | -0.02 (-0.14, 0.09)  | 0.71            | 0.93            |
| 2nd trimester | -0.02 (-0.09, 0.06)  | 0.68            | 0.89            | -0.02 (-0.12, 0.09)  | 0.77            | 0.93            | -0.01 (-0.13, 0.10)  | 0.81            | 0.93            |
| 3rd trimester | -0.03 (-0.06, 0.01)  | 0.11            | 0.41            | 0.00 (-0.05, 0.05)   | 0.95            | 0.99            | -0.06 (-0.10, -0.01) | 0.02            | 0.58            |
| At delivery   | -0.02 (-0.14, 0.09)  | 0.69            | 0.89            | -0.08 (-0.24, 0.08)  | 0.33            | 0.73            | 0.04 (-0.12, 0.21)   | 0.60            | 0.93            |
| <b>Hg</b>     |                      |                 |                 |                      |                 |                 |                      |                 |                 |
| 1st trimester | 0.02 (-0.03, 0.07)   | 0.40            | 0.75            | 0.02 (-0.04, 0.09)   | 0.45            | 0.83            | 0.01 (-0.05, 0.08)   | 0.69            | 0.93            |
| 2nd trimester | 0.04 (0.01, 0.08)    | 0.03            | 0.26            | 0.06 (0.01, 0.11)    | 0.03            | 0.42            | 0.03 (-0.03, 0.08)   | 0.37            | 0.93            |
| 3rd trimester | 0 (-0.04, 0.04)      | 0.89            | 0.97            | -0.01 (-0.07, 0.05)  | 0.83            | 0.93            | 0.00 (-0.05, 0.05)   | 0.99            | 0.99            |
| At delivery   | -0.02 (-0.06, 0.03)  | 0.39            | 0.75            | -0.04 (-0.1, 0.02)   | 0.19            | 0.64            | 0.01 (-0.06, 0.07)   | 0.85            | 0.93            |

Note: IP, infancy peak; Al, aluminum; Mn, manganese; Co, cobalt; Ba, barium; Tl, thallium; Hg, mercury; 1st trimester, first trimester; 2nd trimester, second trimester; 3rd trimester, third trimester.

<sup>a</sup>Adjusted for maternal age at recruitment, maternal metabolic dysfunction, pre-pregnancy BMI, folic acid supplementation during pregnancy, family monthly income per capita at enrollment, and children's sex.

<sup>b</sup>Adjusted for maternal age at recruitment, maternal metabolic dysfunction, pre-pregnancy BMI, folic acid supplementation during pregnancy, and family monthly income per capita at enrollment.

**Table S17.** Association between prenatal metal exposure and the age of AP after further adjusting for maternal folic acid supplementation during pregnancy ( $N = 2718$ ).

| Variables     | All <sup>a</sup>    |                 |                 | Boys <sup>b</sup>   |                 |                 | Girls <sup>b</sup>  |                 |                 |
|---------------|---------------------|-----------------|-----------------|---------------------|-----------------|-----------------|---------------------|-----------------|-----------------|
|               | $\beta$ (95%CI)     | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)     | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)     | <i>p</i> -value | <i>q</i> -value |
| Al            |                     |                 |                 |                     |                 |                 |                     |                 |                 |
| 1st trimester | 0.00 (-0.04, 0.05)  | 0.84            | 0.94            | -0.01 (-0.07, 0.05) | 0.81            | 0.93            | 0.02 (-0.04, 0.08)  | 0.46            | 0.93            |
| 2nd trimester | 0.04 (0.00, 0.09)   | 0.046           | 0.26            | 0.03 (-0.03, 0.10)  | 0.36            | 0.76            | 0.05 (0.00, 0.10)   | 0.05            | 0.58            |
| 3rd trimester | 0.01 (-0.02, 0.04)  | 0.36            | 0.73            | 0.02 (-0.03, 0.06)  | 0.49            | 0.85            | 0.01 (-0.02, 0.05)  | 0.45            | 0.93            |
| At delivery   | 0.02 (-0.01, 0.04)  | 0.24            | 0.62            | 0.02 (-0.01, 0.06)  | 0.22            | 0.69            | 0.01 (-0.03, 0.04)  | 0.74            | 0.93            |
| Mn            |                     |                 |                 |                     |                 |                 |                     |                 |                 |
| 1st trimester | 0.00 (-0.02, 0.02)  | 0.91            | 0.97            | -0.01 (-0.04, 0.03) | 0.75            | 0.93            | 0.00 (-0.03, 0.03)  | 0.84            | 0.93            |
| 2nd trimester | 0.03 (0.00, 0.05)   | 0.049           | 0.26            | 0.02 (-0.02, 0.06)  | 0.41            | 0.81            | 0.04 (0.00, 0.07)   | 0.049           | 0.58            |
| 3rd trimester | 0.03 (0.00, 0.06)   | 0.04            | 0.26            | 0.03 (-0.01, 0.08)  | 0.11            | 0.57            | 0.03 (-0.01, 0.06)  | 0.12            | 0.62            |
| At delivery   | 0.01 (-0.03, 0.05)  | 0.52            | 0.79            | 0.01 (-0.05, 0.08)  | 0.69            | 0.93            | 0.01 (-0.04, 0.06)  | 0.73            | 0.93            |
| Co            |                     |                 |                 |                     |                 |                 |                     |                 |                 |
| 1st trimester | 0.00 (-0.03, 0.02)  | 0.75            | 0.93            | -0.02 (-0.06, 0.02) | 0.39            | 0.81            | 0.01 (-0.03, 0.05)  | 0.59            | 0.93            |
| 2nd trimester | -0.01 (-0.04, 0.02) | 0.45            | 0.79            | -0.02 (-0.07, 0.02) | 0.28            | 0.69            | 0.01 (-0.03, 0.04)  | 0.77            | 0.93            |
| 3rd trimester | -0.01 (-0.04, 0.02) | 0.56            | 0.82            | -0.01 (-0.06, 0.04) | 0.69            | 0.93            | -0.01 (-0.05, 0.04) | 0.78            | 0.93            |
| At delivery   | 0.02 (-0.02, 0.06)  | 0.29            | 0.64            | 0.00 (-0.07, 0.06)  | 0.92            | 0.97            | 0.05 (0.00, 0.10)   | 0.07            | 0.58            |
| Ba            |                     |                 |                 |                     |                 |                 |                     |                 |                 |
| 1st trimester | 0.02 (-0.01, 0.05)  | 0.16            | 0.53            | 0.03 (-0.01, 0.08)  | 0.14            | 0.62            | 0.01 (-0.03, 0.05)  | 0.66            | 0.93            |
| 2nd trimester | 0.01 (-0.01, 0.03)  | 0.19            | 0.55            | 0.01 (-0.01, 0.04)  | 0.25            | 0.69            | 0.01 (-0.02, 0.03)  | 0.66            | 0.93            |
| 3rd trimester | 0.02 (0.00, 0.04)   | 0.02            | 0.24            | 0.02 (-0.01, 0.05)  | 0.15            | 0.64            | 0.02 (0.00, 0.05)   | 0.03            | 0.58            |
| At delivery   | 0.04 (0.00, 0.08)   | 0.04            | 0.26            | 0.06 (0.00, 0.11)   | 0.06            | 0.51            | 0.02 (-0.03, 0.07)  | 0.47            | 0.93            |
| Tl            |                     |                 |                 |                     |                 |                 |                     |                 |                 |
| 1st trimester | 0.02 (-0.02, 0.07)  | 0.33            | 0.69            | -0.01 (-0.08, 0.06) | 0.75            | 0.93            | 0.07 (0.01, 0.13)   | 0.03            | 0.58            |
| 2nd trimester | 0.04 (-0.01, 0.08)  | 0.09            | 0.36            | 0.04 (-0.03, 0.10)  | 0.29            | 0.69            | 0.04 (-0.02, 0.10)  | 0.22            | 0.81            |
| 3rd trimester | -0.01 (-0.03, 0.01) | 0.48            | 0.79            | .000(-0.03, 0.03)   | 0.91            | 0.97            | -0.02 (-0.04, 0.01) | 0.22            | 0.81            |
| At delivery   | 0.03 (-0.04, 0.09)  | 0.45            | 0.79            | -0.02 (-0.12, 0.08) | 0.69            | 0.93            | 0.07 (-0.01, 0.16)  | 0.10            | 0.62            |
| Hg            |                     |                 |                 |                     |                 |                 |                     |                 |                 |
| 1st trimester | 0.00 (-0.03, 0.03)  | 0.92            | 0.97            | -0.01 (-0.05, 0.03) | 0.62            | 0.93            | 0.01 (-0.02, 0.05)  | 0.43            | 0.93            |
| 2nd trimester | 0.01 (-0.01, 0.04)  | 0.24            | 0.62            | 0.02 (-0.02, 0.05)  | 0.28            | 0.69            | 0.01 (-0.02, 0.04)  | 0.67            | 0.93            |
| 3rd trimester | 0.02 (0.00, 0.04)   | 0.08            | 0.33            | 0.02 (-0.02, 0.06)  | 0.27            | 0.69            | 0.02 (-0.01, 0.05)  | 0.13            | 0.64            |
| At delivery   | 0.04 (0.01, 0.07)   | 0.00            | 0.15            | 0.06 (0.02, 0.10)   | 0.00            | 0.17            | 0.01 (-0.02, 0.05)  | 0.48            | 0.93            |

Note: IP, infancy peak; Al, aluminum; Mn, manganese; Co, cobalt; Ba, barium; Tl, thallium; Hg, mercury; 1st trimester, first trimester; 2nd trimester, second trimester; 3rd trimester, third trimester.

<sup>a</sup>Adjusted for maternal age at recruitment, maternal metabolic dysfunction, pre-pregnancy BMI, folic acid supplementation during pregnancy, family monthly income per capita at enrollment, and children's sex.

<sup>b</sup>Adjusted for maternal age at recruitment, maternal metabolic dysfunction, pre-pregnancy BMI, folic acid supplementation during pregnancy, and family monthly income per capita at enrollment.

**Table S18.** Association between prenatal metal exposure and the BMI of AR after further adjusting for maternal folic acid supplementation during pregnancy ( $N = 2718$ ).

| Variables     | All <sup>a</sup>    |                 |                 | Boys <sup>b</sup>   |                 |                 | Girls <sup>b</sup>  |                 |                 |
|---------------|---------------------|-----------------|-----------------|---------------------|-----------------|-----------------|---------------------|-----------------|-----------------|
|               | $\beta$ (95%CI)     | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)     | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)     | <i>p</i> -value | <i>q</i> -value |
| Al            |                     |                 |                 |                     |                 |                 |                     |                 |                 |
| 1st trimester | -0.04 (-0.13, 0.06) | 0.48            | 0.79            | -0.05 (-0.18, 0.08) | 0.45            | 0.83            | -0.01 (-0.15, 0.13) | 0.89            | 0.94            |
| 2nd trimester | 0.10 (0.00, 0.19)   | 0.04            | 0.26            | 0.07 (-0.07, 0.21)  | 0.30            | 0.71            | 0.12 (-0.01, 0.25)  | 0.07            | 0.58            |
| 3rd trimester | 0.02 (-0.05, 0.08)  | 0.64            | 0.87            | 0.05 (-0.04, 0.15)  | 0.24            | 0.69            | -0.02 (-0.12, 0.07) | 0.60            | 0.93            |
| At delivery   | 0.00 (-0.06, 0.05)  | 0.90            | 0.97            | -0.02 (-0.09, 0.06) | 0.71            | 0.93            | 0.01 (-0.07, 0.09)  | 0.88            | 0.94            |
| Mn            |                     |                 |                 |                     |                 |                 |                     |                 |                 |
| 1st trimester | 0.01 (-0.05, 0.06)  | 0.82            | 0.93            | 0.02 (-0.05, 0.10)  | 0.53            | 0.88            | -0.01 (-0.08, 0.06) | 0.75            | 0.93            |
| 2nd trimester | 0.10 (0.04, 0.17)   | 0.00            | 0.07            | 0.08 (-0.01, 0.16)  | 0.07            | 0.51            | 0.13 (0.04, 0.22)   | 0.00            | 0.31            |
| 3rd trimester | 0.05 (-0.01, 0.12)  | 0.09            | 0.36            | 0.08 (-0.01, 0.17)  | 0.08            | 0.51            | 0.03 (-0.06, 0.12)  | 0.52            | 0.93            |
| At delivery   | 0.01 (-0.08, 0.10)  | 0.79            | 0.93            | 0.00 (-0.13, 0.13)  | 0.96            | 0.99            | 0.01 (-0.11, 0.14)  | 0.84            | 0.93            |
| Co            |                     |                 |                 |                     |                 |                 |                     |                 |                 |
| 1st trimester | 0.00 (-0.06, 0.06)  | 1.00            | 1.00            | 0.01 (-0.08, 0.10)  | 0.80            | 0.93            | -0.01 (-0.1, 0.08)  | 0.78            | 0.93            |
| 2nd trimester | 0.07 (0.00, 0.13)   | 0.04            | 0.26            | 0.09 (0.00, 0.17)   | 0.05            | 0.51            | 0.05 (-0.04, 0.13)  | 0.32            | 0.93            |
| 3rd trimester | 0.04 (-0.03, 0.12)  | 0.26            | 0.63            | 0.10 (-0.01, 0.20)  | 0.06            | 0.51            | -0.01 (-0.12, 0.09) | 0.79            | 0.93            |
| At delivery   | 0.04 (-0.05, 0.13)  | 0.42            | 0.76            | 0.02 (-0.11, 0.15)  | 0.74            | 0.93            | 0.05 (-0.08, 0.18)  | 0.44            | 0.93            |
| Ba            |                     |                 |                 |                     |                 |                 |                     |                 |                 |
| 1st trimester | 0.01 (-0.06, 0.08)  | 0.75            | 0.93            | 0.01 (-0.08, 0.10)  | 0.84            | 0.94            | 0.01 (-0.08, 0.11)  | 0.76            | 0.93            |
| 2nd trimester | -0.01 (-0.05, 0.03) | 0.60            | 0.84            | 0.00 (-0.06, 0.05)  | 0.87            | 0.96            | -0.03 (-0.09, 0.04) | 0.44            | 0.93            |
| 3rd trimester | -0.01 (-0.05, 0.03) | 0.64            | 0.87            | -0.01 (-0.07, 0.04) | 0.68            | 0.93            | -0.01 (-0.06, 0.05) | 0.78            | 0.93            |
| At delivery   | 0.01 (-0.07, 0.10)  | 0.77            | 0.93            | -0.03 (-0.15, 0.09) | 0.64            | 0.93            | 0.05 (-0.08, 0.18)  | 0.43            | 0.93            |
| Tl            |                     |                 |                 |                     |                 |                 |                     |                 |                 |
| 1st trimester | 0.04 (-0.07, 0.14)  | 0.50            | 0.79            | 0.02 (-0.13, 0.16)  | 0.79            | 0.93            | 0.06 (-0.09, 0.22)  | 0.42            | 0.93            |
| 2nd trimester | 0.08 (-0.03, 0.18)  | 0.15            | 0.52            | 0.07 (-0.07, 0.21)  | 0.32            | 0.73            | 0.08 (-0.08, 0.23)  | 0.33            | 0.93            |
| 3rd trimester | 0.00 (-0.05, 0.04)  | 0.95            | 0.98            | 0.01 (-0.06, 0.08)  | 0.72            | 0.93            | -0.02 (-0.08, 0.05) | 0.62            | 0.93            |
| At delivery   | -0.01 (-0.16, 0.14) | 0.92            | 0.97            | -0.14 (-0.36, 0.07) | 0.18            | 0.64            | 0.15 (-0.07, 0.36)  | 0.19            | 0.78            |
| Hg            |                     |                 |                 |                     |                 |                 |                     |                 |                 |
| 1st trimester | 0.01 (-0.05, 0.07)  | 0.82            | 0.93            | 0.01 (-0.08, 0.09)  | 0.88            | 0.96            | 0.01 (-0.08, 0.09)  | 0.90            | 0.94            |
| 2nd trimester | 0.06 (0.01, 0.11)   | 0.02            | 0.24            | 0.10 (0.03, 0.17)   | 0.01            | 0.17            | 0.02 (-0.06, 0.09)  | 0.68            | 0.93            |
| 3rd trimester | 0.02 (-0.03, 0.07)  | 0.50            | 0.79            | 0.03 (-0.05, 0.10)  | 0.52            | 0.88            | 0.01 (-0.06, 0.08)  | 0.74            | 0.93            |
| At delivery   | 0.03 (-0.02, 0.09)  | 0.25            | 0.62            | 0.05 (-0.03, 0.13)  | 0.22            | 0.69            | 0.01 (-0.08, 0.1)   | 0.78            | 0.93            |

Note: AR, adiposity rebound; Al, aluminum; Mn, manganese; Co, cobalt; Ba, barium; Tl, thallium; Hg, mercury; 1st trimester, first trimester; 2nd trimester, second trimester; 3rd trimester, third trimester.

<sup>a</sup>Adjusted for maternal age at recruitment, maternal metabolic dysfunction, pre-pregnancy BMI, folic acid supplementation during pregnancy, family monthly income per capita at enrollment, and children's sex.

<sup>b</sup>Adjusted for maternal age at recruitment, maternal metabolic dysfunction, pre-pregnancy BMI, folic acid supplementation during pregnancy, and family monthly income per capita at enrollment.

**Table S19.** Association between prenatal metal exposure and the age of AR after further adjusting for maternal folic acid supplementation during pregnancy ( $N = 2718$ ).

| Variables     | All <sup>a</sup>     |                 |                 | Boys <sup>b</sup>    |                 |                 | Girls <sup>b</sup>   |                 |                 |
|---------------|----------------------|-----------------|-----------------|----------------------|-----------------|-----------------|----------------------|-----------------|-----------------|
|               | $\beta$ (95%CI)      | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)      | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)      | <i>p</i> -value | <i>q</i> -value |
| Al            |                      |                 |                 |                      |                 |                 |                      |                 |                 |
| 1st trimester | -0.07 (-0.97, 0.82)  | 0.88            | 0.97            | 0.01 (-1.24, 1.26)   | 0.99            | 1.00            | -0.21 (-1.49, 1.07)  | 0.75            | 0.93            |
| 2nd trimester | -0.39 (-1.26, 0.48)  | 0.38            | 0.74            | 0.16 (-1.15, 1.47)   | 0.81            | 0.93            | -0.90 (-2.05, 0.24)  | 0.12            | 0.62            |
| 3rd trimester | -0.19 (-0.79, 0.41)  | 0.54            | 0.81            | -0.13 (-1.00, 0.73)  | 0.76            | 0.93            | -0.32 (-1.15, 0.52)  | 0.46            | 0.93            |
| At delivery   | -0.24 (-0.76, 0.28)  | 0.36            | 0.73            | -0.33 (-1.08, 0.43)  | 0.40            | 0.81            | -0.14 (-0.85, 0.57)  | 0.71            | 0.93            |
| Mn            |                      |                 |                 |                      |                 |                 |                      |                 |                 |
| 1st trimester | -0.20 (-0.67, 0.28)  | 0.41            | 0.76            | -0.15 (-0.86, 0.55)  | 0.67            | 0.93            | -0.24 (-0.86, 0.39)  | 0.46            | 0.93            |
| 2nd trimester | -0.56 (-1.12, 0.00)  | 0.049           | 0.26            | -0.27 (-1.08, 0.53)  | 0.51            | 0.87            | -0.82 (-1.58, -0.05) | 0.04            | 0.58            |
| 3rd trimester | -0.34 (-0.92, 0.23)  | 0.24            | 0.62            | -0.32 (-1.17, 0.53)  | 0.46            | 0.83            | -0.42 (-1.19, 0.36)  | 0.29            | 0.93            |
| At delivery   | -0.28 (-1.11, 0.55)  | 0.51            | 0.79            | -0.17 (-1.41, 1.07)  | 0.79            | 0.93            | -0.29 (-1.39, 0.82)  | 0.61            | 0.93            |
| Co            |                      |                 |                 |                      |                 |                 |                      |                 |                 |
| 1st trimester | 0.07 (-0.53, 0.66)   | 0.82            | 0.93            | 0.34 (-0.53, 1.2)    | 0.44            | 0.83            | -0.22 (-1.03, 0.59)  | 0.59            | 0.93            |
| 2nd trimester | 0.55 (-0.02, 1.13)   | 0.06            | 0.27            | 0.69 (-0.14, 1.52)   | 0.10            | 0.57            | 0.38 (-0.41, 1.16)   | 0.34            | 0.93            |
| 3rd trimester | 0.19 (-0.49, 0.87)   | 0.59            | 0.84            | 0.05 (-0.94, 1.04)   | 0.92            | 0.97            | 0.27 (-0.66, 1.2)    | 0.57            | 0.93            |
| At delivery   | -0.15 (-0.98, 0.69)  | 0.73            | 0.93            | -0.26 (-1.51, 0.98)  | 0.68            | 0.93            | -0.04 (-1.16, 1.07)  | 0.94            | 0.96            |
| Ba            |                      |                 |                 |                      |                 |                 |                      |                 |                 |
| 1st trimester | -0.57 (-1.18, 0.05)  | 0.07            | 0.31            | -1.14 (-2.02, -0.25) | 0.01            | 0.23            | 0.03 (-0.81, 0.88)   | 0.94            | 0.96            |
| 2nd trimester | -0.28 (-0.66, 0.1)   | 0.15            | 0.52            | -0.34 (-0.86, 0.17)  | 0.19            | 0.64            | -0.13 (-0.71, 0.44)  | 0.65            | 0.93            |
| 3rd trimester | -0.35 (-0.71, 0.01)  | 0.05            | 0.27            | -0.32 (-0.86, 0.21)  | 0.23            | 0.69            | -0.39 (-0.86, 0.08)  | 0.10            | 0.62            |
| At delivery   | -0.48 (-1.28, 0.33)  | 0.25            | 0.62            | -0.48 (-1.63, 0.67)  | 0.42            | 0.82            | -0.36 (-1.48, 0.77)  | 0.54            | 0.93            |
| Tl            |                      |                 |                 |                      |                 |                 |                      |                 |                 |
| 1st trimester | -0.67 (-1.63, 0.3)   | 0.18            | 0.55            | -0.39 (-1.76, 0.99)  | 0.58            | 0.93            | -1.07 (-2.43, 0.29)  | 0.12            | 0.62            |
| 2nd trimester | -1.1 (-2.04, -0.16)  | 0.02            | 0.26            | -0.99 (-2.3, 0.31)   | 0.14            | 0.62            | -1.12 (-2.47, 0.24)  | 0.11            | 0.62            |
| 3rd trimester | -0.29 (-0.71, 0.14)  | 0.18            | 0.55            | -0.13 (-0.77, 0.51)  | 0.69            | 0.93            | -0.44 (-0.99, 0.12)  | 0.12            | 0.62            |
| At delivery   | -0.21 (-1.61, 1.18)  | 0.77            | 0.93            | 0.75 (-1.26, 2.77)   | 0.46            | 0.83            | -1.23 (-3.14, 0.68)  | 0.21            | 0.81            |
| Hg            |                      |                 |                 |                      |                 |                 |                      |                 |                 |
| 1st trimester | 0.15 (-0.41, 0.71)   | 0.60            | 0.84            | 0.21 (-0.59, 1.01)   | 0.60            | 0.93            | 0.1 (-0.69, 0.89)    | 0.81            | 0.93            |
| 2nd trimester | -0.24 (-0.71, 0.24)  | 0.33            | 0.69            | -0.52 (-1.2, 0.16)   | 0.13            | 0.62            | 0.12 (-0.54, 0.77)   | 0.72            | 0.93            |
| 3rd trimester | -0.26 (-0.74, 0.22)  | 0.28            | 0.64            | -0.41 (-1.16, 0.33)  | 0.28            | 0.69            | -0.15 (-0.76, 0.46)  | 0.62            | 0.93            |
| At delivery   | -0.66 (-1.21, -0.12) | 0.02            | 0.24            | -1.12 (-1.89, -0.36) | 0.00            | 0.17            | -0.06 (-0.84, 0.72)  | 0.89            | 0.94            |

Note: AR, adiposity rebound; Al, aluminum; Mn, manganese; Co, cobalt; Ba, barium; Tl, thallium; Hg, mercury; 1st trimester, first trimester; 2nd trimester, second trimester; 3rd trimester, third trimester.

<sup>a</sup>Adjusted for maternal age at recruitment, maternal metabolic dysfunction, pre-pregnancy BMI, folic acid supplementation during pregnancy, family monthly income per capita at enrollment, and children's sex.

<sup>b</sup>Adjusted for maternal age at recruitment, maternal metabolic dysfunction, pre-pregnancy BMI, folic acid supplementation during pregnancy, and family monthly income per capita at enrollment.

**Table S20.** Association between prenatal metal exposure and the BMI of AP after excluding children with birth defects ( $N = 2718$ ).

| Variables     | All <sup>a</sup>     |                 |                 | Boys <sup>b</sup>    |                 |                 | Girls <sup>b</sup>   |                 |                 |
|---------------|----------------------|-----------------|-----------------|----------------------|-----------------|-----------------|----------------------|-----------------|-----------------|
|               | $\beta$ (95%CI)      | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)      | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)      | <i>p</i> -value | <i>q</i> -value |
| Al            |                      |                 |                 |                      |                 |                 |                      |                 |                 |
| 1st trimester | -0.05 (-0.12, 0.03)  | 0.22            | 0.59            | -0.05 (-0.15, 0.05)  | 0.30            | 0.67            | -0.04 (-0.14, 0.07)  | 0.53            | 0.95            |
| 2nd trimester | 0.06 (-0.01, 0.14)   | 0.08            | 0.31            | 0.09 (-0.01, 0.19)   | 0.09            | 0.64            | 0.04 (-0.06, 0.14)   | 0.43            | 0.95            |
| 3rd trimester | 0.00 (-0.05, 0.05)   | 0.96            | 0.98            | 0.05 (-0.02, 0.11)   | 0.19            | 0.64            | -0.05 (-0.12, 0.02)  | 0.16            | 0.80            |
| At delivery   | -0.02 (-0.07, 0.02)  | 0.26            | 0.60            | -0.04 (-0.1, 0.02)   | 0.18            | 0.64            | -0.01 (-0.07, 0.05)  | 0.78            | 0.95            |
| Mn            |                      |                 |                 |                      |                 |                 |                      |                 |                 |
| 1st trimester | -0.01 (-0.05, 0.03)  | 0.57            | 0.80            | 0.01 (-0.04, 0.07)   | 0.68            | 0.95            | -0.03 (-0.09, 0.02)  | 0.22            | 0.84            |
| 2nd trimester | 0.06 (0.02, 0.11)    | 0.01            | 0.20            | 0.06 (0.00, 0.12)    | 0.06            | 0.64            | 0.06 (0.00, 0.13)    | 0.06            | 0.60            |
| 3rd trimester | 0.03 (-0.02, 0.08)   | 0.25            | 0.60            | 0.05 (-0.02, 0.12)   | 0.14            | 0.64            | 0.00 (-0.06, 0.07)   | 0.94            | 0.98            |
| At delivery   | -0.01 (-0.08, 0.05)  | 0.69            | 0.89            | -0.01 (-0.1, 0.09)   | 0.91            | 0.99            | -0.02 (-0.12, 0.07)  | 0.65            | 0.95            |
| Co            |                      |                 |                 |                      |                 |                 |                      |                 |                 |
| 1st trimester | 0.01 (-0.04, 0.06)   | 0.61            | 0.83            | 0.04 (-0.03, 0.11)   | 0.24            | 0.67            | -0.02 (-0.09, 0.05)  | 0.62            | 0.95            |
| 2nd trimester | 0.11 (0.07, 0.16)    | <0.001          | 0.10            | 0.14 (0.08, 0.21)    | <0.001          | 0.10            | 0.08 (0.02, 0.15)    | 0.01            | 0.45            |
| 3rd trimester | 0.05 (0.00, 0.11)    | 0.06            | 0.31            | 0.10 (0.02, 0.18)    | 0.01            | 0.26            | 0.00 (-0.08, 0.08)   | 0.95            | 0.98            |
| At delivery   | 0.02 (-0.05, 0.09)   | 0.59            | 0.81            | 0.00 (-0.10, 0.09)   | 0.94            | 0.99            | 0.04 (-0.06, 0.13)   | 0.44            | 0.95            |
| Ba            |                      |                 |                 |                      |                 |                 |                      |                 |                 |
| 1st trimester | -0.04 (-0.09, 0.01)  | 0.14            | 0.49            | -0.09 (-0.16, -0.02) | 0.01            | 0.26            | 0.02 (-0.05, 0.09)   | 0.60            | 0.95            |
| 2nd trimester | -0.03 (-0.06, 0.00)  | 0.05            | 0.31            | -0.03 (-0.07, 0.01)  | 0.13            | 0.64            | -0.03 (-0.08, 0.02)  | 0.20            | 0.82            |
| 3rd trimester | -0.04 (-0.06, -0.01) | 0.02            | 0.20            | -0.04 (-0.08, 0.01)  | 0.10            | 0.64            | -0.04 (-0.08, 0.00)  | 0.07            | 0.60            |
| At delivery   | -0.02 (-0.09, 0.05)  | 0.53            | 0.79            | -0.06 (-0.15, 0.04)  | 0.23            | 0.66            | 0.02 (-0.08, 0.11)   | 0.70            | 0.95            |
| Tl            |                      |                 |                 |                      |                 |                 |                      |                 |                 |
| 1st trimester | -0.02 (-0.1, 0.06)   | 0.69            | 0.89            | -0.02 (-0.13, 0.09)  | 0.72            | 0.95            | -0.01 (-0.13, 0.10)  | 0.84            | 0.95            |
| 2nd trimester | -0.02 (-0.09, 0.06)  | 0.70            | 0.89            | -0.02 (-0.12, 0.09)  | 0.75            | 0.95            | -0.01 (-0.13, 0.11)  | 0.86            | 0.95            |
| 3rd trimester | -0.04 (-0.07, 0.00)  | 0.05            | 0.31            | -0.01 (-0.06, 0.05)  | 0.79            | 0.96            | -0.06 (-0.11, -0.01) | 0.01            | 0.45            |
| At delivery   | -0.03 (-0.14, 0.09)  | 0.64            | 0.85            | -0.08 (-0.24, 0.08)  | 0.32            | 0.67            | 0.04 (-0.13, 0.21)   | 0.63            | 0.95            |
| Hg            |                      |                 |                 |                      |                 |                 |                      |                 |                 |
| 1st trimester | 0.02 (-0.03, 0.07)   | 0.43            | 0.77            | 0.03 (-0.04, 0.09)   | 0.40            | 0.77            | 0.01 (-0.06, 0.08)   | 0.84            | 0.95            |
| 2nd trimester | 0.05 (0.01, 0.09)    | 0.02            | 0.20            | 0.06 (0.01, 0.12)    | 0.02            | 0.31            | 0.03 (-0.03, 0.08)   | 0.35            | 0.95            |
| 3rd trimester | 0.00 (-0.04, 0.04)   | 0.87            | 0.96            | -0.01 (-0.07, 0.05)  | 0.84            | 0.97            | 0.00 (-0.05, 0.05)   | 0.94            | 0.98            |
| At delivery   | -0.02 (-0.06, 0.03)  | 0.39            | 0.75            | -0.04 (-0.1, 0.02)   | 0.20            | 0.64            | 0.01 (-0.06, 0.07)   | 0.87            | 0.95            |

Note: IP, infancy peak; Al, aluminum; Mn, manganese; Co, cobalt; Ba, barium; Tl, thallium; Hg, mercury; 1st trimester, first trimester; 2nd trimester, second trimester; 3rd trimester, third trimester.

<sup>a</sup> Adjusted for maternal age at recruitment, maternal metabolic dysfunction, pre-pregnancy BMI, family monthly income per capita at enrollment, and children's sex.

<sup>b</sup> Adjusted for maternal age at recruitment, maternal metabolic dysfunction, pre-pregnancy BMI, and family monthly income per capita at enrollment.

**Table S21.** Association between prenatal metal exposure and the age of AP after excluding children with birth defects ( $N = 2718$ ).

| Variables     | All <sup>a</sup>    |                 |                 | Boys <sup>b</sup>   |                 |                 | Girls <sup>b</sup>  |                 |                 |
|---------------|---------------------|-----------------|-----------------|---------------------|-----------------|-----------------|---------------------|-----------------|-----------------|
|               | $\beta$ (95%CI)     | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)     | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)     | <i>p</i> -value | <i>q</i> -value |
| Al            |                     |                 |                 |                     |                 |                 |                     |                 |                 |
| 1st trimester | 0.00 (-0.05, 0.04)  | 0.88            | 0.96            | -0.02 (-0.09, 0.04) | 0.48            | 0.83            | 0.02 (-0.04, 0.08)  | 0.46            | 0.95            |
| 2nd trimester | 0.04 (0.00, 0.08)   | 0.07            | 0.31            | 0.03 (-0.04, 0.09)  | 0.41            | 0.77            | 0.05 (0.00, 0.10)   | 0.07            | 0.60            |
| 3rd trimester | 0.01 (-0.02, 0.04)  | 0.36            | 0.73            | 0.01 (-0.03, 0.06)  | 0.53            | 0.83            | 0.02 (-0.02, 0.05)  | 0.42            | 0.95            |
| At delivery   | 0.02 (-0.01, 0.04)  | 0.19            | 0.58            | 0.03 (-0.01, 0.07)  | 0.15            | 0.64            | 0.00 (-0.03, 0.04)  | 0.77            | 0.95            |
| Mn            |                     |                 |                 |                     |                 |                 |                     |                 |                 |
| 1st trimester | 0.00 (-0.03, 0.02)  | 0.77            | 0.90            | -0.01 (-0.04, 0.03) | 0.69            | 0.95            | 0.00 (-0.03, 0.03)  | 0.98            | 0.99            |
| 2nd trimester | 0.03 (0.00, 0.05)   | 0.05            | 0.31            | 0.02 (-0.02, 0.06)  | 0.41            | 0.77            | 0.04 (0.00, 0.07)   | 0.049           | 0.59            |
| 3rd trimester | 0.03 (0.00, 0.05)   | 0.07            | 0.31            | 0.03 (-0.01, 0.07)  | 0.17            | 0.64            | 0.02 (-0.01, 0.06)  | 0.19            | 0.82            |
| At delivery   | 0.02 (-0.03, 0.06)  | 0.47            | 0.79            | 0.01 (-0.05, 0.08)  | 0.67            | 0.95            | 0.01 (-0.04, 0.06)  | 0.60            | 0.95            |
| Co            |                     |                 |                 |                     |                 |                 |                     |                 |                 |
| 1st trimester | -0.01 (-0.04, 0.02) | 0.55            | 0.79            | -0.02 (-0.07, 0.02) | 0.32            | 0.67            | 0.01 (-0.03, 0.04)  | 0.76            | 0.95            |
| 2nd trimester | -0.01 (-0.04, 0.01) | 0.32            | 0.68            | -0.03 (-0.07, 0.02) | 0.22            | 0.64            | 0.00 (-0.03, 0.04)  | 0.90            | 0.97            |
| 3rd trimester | -0.01 (-0.05, 0.02) | 0.39            | 0.75            | -0.02 (-0.07, 0.03) | 0.51            | 0.83            | -0.01 (-0.05, 0.03) | 0.68            | 0.95            |
| At delivery   | 0.02 (-0.02, 0.06)  | 0.27            | 0.60            | 0.00 (-0.07, 0.06)  | 0.93            | 0.99            | 0.05 (0.00, 0.11)   | 0.04            | 0.59            |
| Ba            |                     |                 |                 |                     |                 |                 |                     |                 |                 |
| 1st trimester | 0.02 (-0.01, 0.05)  | 0.22            | 0.59            | 0.03 (-0.02, 0.07)  | 0.22            | 0.64            | 0.01 (-0.03, 0.05)  | 0.65            | 0.95            |
| 2nd trimester | 0.01 (-0.01, 0.03)  | 0.16            | 0.52            | 0.02 (-0.01, 0.04)  | 0.21            | 0.64            | 0.01 (-0.02, 0.03)  | 0.66            | 0.95            |
| 3rd trimester | 0.02 (0.00, 0.04)   | 0.01            | 0.20            | 0.02 (-0.01, 0.05)  | 0.12            | 0.64            | 0.02 (0.00, 0.05)   | 0.03            | 0.51            |
| At delivery   | 0.04 (0.00, 0.08)   | 0.047           | 0.31            | 0.05 (0.00, 0.11)   | 0.07            | 0.64            | 0.02 (-0.03, 0.07)  | 0.49            | 0.95            |
| Tl            |                     |                 |                 |                     |                 |                 |                     |                 |                 |
| 1st trimester | 0.02 (-0.03, 0.06)  | 0.49            | 0.79            | -0.03 (-0.10, 0.04) | 0.44            | 0.80            | 0.07 (0.01, 0.13)   | 0.03            | 0.51            |
| 2nd trimester | 0.04 (0.00, 0.09)   | 0.08            | 0.31            | 0.04 (-0.03, 0.10)  | 0.27            | 0.67            | 0.04 (-0.02, 0.11)  | 0.18            | 0.82            |
| 3rd trimester | -0.01 (-0.03, 0.01) | 0.42            | 0.77            | 0.00 (-0.03, 0.04)  | 0.96            | 0.99            | -0.02 (-0.04, 0.01) | 0.23            | 0.84            |
| At delivery   | 0.02 (-0.05, 0.09)  | 0.50            | 0.79            | -0.02 (-0.12, 0.08) | 0.69            | 0.95            | 0.07 (-0.02, 0.16)  | 0.12            | 0.65            |
| Hg            |                     |                 |                 |                     |                 |                 |                     |                 |                 |
| 1st trimester | 0.00 (-0.03, 0.03)  | 0.98            | 0.99            | -0.01 (-0.05, 0.03) | 0.52            | 0.83            | 0.02 (-0.02, 0.05)  | 0.41            | 0.95            |
| 2nd trimester | 0.01 (-0.01, 0.04)  | 0.23            | 0.59            | 0.02 (-0.01, 0.06)  | 0.25            | 0.67            | 0.01 (-0.02, 0.04)  | 0.63            | 0.95            |
| 3rd trimester | 0.02 (0.00, 0.04)   | 0.08            | 0.31            | 0.02 (-0.02, 0.06)  | 0.26            | 0.67            | 0.02 (-0.01, 0.05)  | 0.12            | 0.65            |
| At delivery   | 0.04 (0.02, 0.07)   | 0.00            | 0.11            | 0.06 (0.02, 0.10)   | 0.00            | 0.11            | 0.01 (-0.02, 0.05)  | 0.43            | 0.95            |

Note: IP, infancy peak; Al, aluminum; Mn, manganese; Co, cobalt; Ba, barium; Tl, thallium; Hg, mercury; 1st trimester, first trimester; 2nd trimester, second trimester; 3rd trimester, third trimester.

<sup>a</sup> Adjusted for maternal age at recruitment, maternal metabolic dysfunction, pre-pregnancy BMI, family monthly income per capita at enrollment, and children's sex.

<sup>b</sup> Adjusted for maternal age at recruitment, maternal metabolic dysfunction, pre-pregnancy BMI, and family monthly income per capita at enrollment.

**Table S22.** Association between prenatal metal exposure and the BMI of AR after excluding children with birth defects ( $N = 2718$ ).

| Variables     | All <sup>a</sup>    |                 |                 | Boys <sup>b</sup>   |                 |                 | Girls <sup>b</sup>  |                 |                 |
|---------------|---------------------|-----------------|-----------------|---------------------|-----------------|-----------------|---------------------|-----------------|-----------------|
|               | $\beta$ (95%CI)     | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)     | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)     | <i>p</i> -value | <i>q</i> -value |
| Al            |                     |                 |                 |                     |                 |                 |                     |                 |                 |
| 1st trimester | -0.05 (-0.15, 0.05) | 0.33            | 0.68            | -0.07 (-0.21, 0.06) | 0.30            | 0.67            | -0.02 (-0.16, 0.13) | 0.82            | 0.95            |
| 2nd trimester | 0.09 (-0.01, 0.18)  | 0.08            | 0.31            | 0.06 (-0.07, 0.20)  | 0.36            | 0.74            | 0.11 (-0.02, 0.24)  | 0.11            | 0.65            |
| 3rd trimester | 0.02 (-0.05, 0.08)  | 0.65            | 0.86            | 0.05 (-0.04, 0.14)  | 0.29            | 0.67            | -0.02 (-0.12, 0.07) | 0.65            | 0.95            |
| At delivery   | 0.00 (-0.06, 0.05)  | 0.93            | 0.98            | -0.01 (-0.09, 0.07) | 0.84            | 0.97            | 0.00 (-0.08, 0.08)  | 0.96            | 0.98            |
| Mn            |                     |                 |                 |                     |                 |                 |                     |                 |                 |
| 1st trimester | 0.00 (-0.05, 0.05)  | 0.94            | 0.98            | 0.02 (-0.05, 0.10)  | 0.54            | 0.83            | -0.02 (-0.09, 0.05) | 0.60            | 0.95            |
| 2nd trimester | 0.11 (0.05, 0.17)   | 0.00            | 0.05            | 0.08 (0.00, 0.17)   | 0.06            | 0.64            | 0.13 (0.05, 0.22)   | 0.00            | 0.25            |
| 3rd trimester | 0.05 (-0.02, 0.11)  | 0.16            | 0.52            | 0.07 (-0.02, 0.16)  | 0.14            | 0.64            | 0.02 (-0.06, 0.11)  | 0.59            | 0.95            |
| At delivery   | 0.01 (-0.08, 0.1)   | 0.77            | 0.90            | 0.01 (-0.12, 0.14)  | 0.90            | 0.99            | 0.01 (-0.11, 0.14)  | 0.83            | 0.95            |
| Co            |                     |                 |                 |                     |                 |                 |                     |                 |                 |
| 1st trimester | 0.00 (-0.07, 0.06)  | 0.95            | 0.98            | 0.01 (-0.08, 0.10)  | 0.86            | 0.97            | -0.01 (-0.11, 0.08) | 0.80            | 0.95            |
| 2nd trimester | 0.06 (0.00, 0.12)   | 0.06            | 0.31            | 0.08 (-0.01, 0.17)  | 0.08            | 0.64            | 0.04 (-0.05, 0.13)  | 0.35            | 0.95            |
| 3rd trimester | 0.03 (-0.05, 0.11)  | 0.43            | 0.77            | 0.08 (-0.02, 0.19)  | 0.12            | 0.64            | -0.03 (-0.13, 0.08) | 0.64            | 0.95            |
| At delivery   | 0.03 (-0.06, 0.12)  | 0.51            | 0.79            | 0.02 (-0.11, 0.15)  | 0.78            | 0.96            | 0.05 (-0.08, 0.17)  | 0.49            | 0.95            |
| Ba            |                     |                 |                 |                     |                 |                 |                     |                 |                 |
| 1st trimester | 0.01 (-0.06, 0.08)  | 0.84            | 0.93            | 0.00 (-0.09, 0.10)  | 0.98            | 0.99            | 0.02 (-0.08, 0.11)  | 0.76            | 0.95            |
| 2nd trimester | -0.01 (-0.05, 0.04) | 0.79            | 0.92            | 0.00 (-0.06, 0.05)  | 0.98            | 0.99            | -0.02 (-0.08, 0.05) | 0.58            | 0.95            |
| 3rd trimester | -0.01 (-0.05, 0.03) | 0.71            | 0.89            | -0.01 (-0.07, 0.05) | 0.77            | 0.96            | -0.01 (-0.06, 0.05) | 0.82            | 0.95            |
| At delivery   | 0.01 (-0.07, 0.1)   | 0.76            | 0.90            | -0.02 (-0.14, 0.1)  | 0.74            | 0.95            | 0.05 (-0.08, 0.17)  | 0.48            | 0.95            |
| Tl            |                     |                 |                 |                     |                 |                 |                     |                 |                 |
| 1st trimester | 0.03 (-0.07, 0.14)  | 0.52            | 0.79            | 0.00 (-0.15, 0.14)  | 0.97            | 0.99            | 0.08 (-0.08, 0.24)  | 0.31            | 0.95            |
| 2nd trimester | 0.08 (-0.02, 0.19)  | 0.12            | 0.43            | 0.07 (-0.07, 0.21)  | 0.32            | 0.67            | 0.09 (-0.07, 0.24)  | 0.26            | 0.87            |
| 3rd trimester | -0.01 (-0.06, 0.04) | 0.76            | 0.90            | 0.00 (-0.07, 0.07)  | 0.96            | 0.99            | -0.02 (-0.08, 0.05) | 0.63            | 0.95            |
| At delivery   | -0.02 (-0.17, 0.14) | 0.83            | 0.93            | -0.15 (-0.36, 0.06) | 0.17            | 0.64            | 0.14 (-0.08, 0.36)  | 0.23            | 0.84            |
| Hg            |                     |                 |                 |                     |                 |                 |                     |                 |                 |
| 1st trimester | 0.00 (-0.06, 0.06)  | 0.94            | 0.98            | 0.00 (-0.08, 0.09)  | 0.94            | 0.99            | 0.00 (-0.09, 0.09)  | 0.99            | 0.99            |
| 2nd trimester | 0.07 (0.02, 0.12)   | 0.01            | 0.20            | 0.11 (0.04, 0.19)   | 0.00            | 0.11            | 0.02 (-0.06, 0.09)  | 0.65            | 0.95            |
| 3rd trimester | 0.02 (-0.03, 0.07)  | 0.50            | 0.79            | 0.03 (-0.05, 0.11)  | 0.50            | 0.83            | 0.01 (-0.06, 0.08)  | 0.72            | 0.95            |
| At delivery   | 0.04 (-0.02, 0.10)  | 0.21            | 0.59            | 0.05 (-0.03, 0.13)  | 0.20            | 0.64            | 0.02 (-0.07, 0.11)  | 0.69            | 0.95            |

Note: AR, adiposity rebound; Al, aluminum; Mn, manganese; Co, cobalt; Ba, barium; Tl, thallium; Hg, mercury; 1st trimester, first trimester; 2nd trimester, second trimester; 3rd trimester, third trimester.

<sup>a</sup> Adjusted for maternal age at recruitment, maternal metabolic dysfunction, pre-pregnancy BMI, family monthly income per capita at enrollment, and children's sex.

<sup>b</sup> Adjusted for maternal age at recruitment, maternal metabolic dysfunction, pre-pregnancy BMI, and family monthly income per capita at enrollment.

**Table S23.** Association between prenatal metal exposure and the age of AR after excluding children with birth defects ( $N = 2718$ ).

| Variables     | All <sup>a</sup>     |                 |                 | Boys <sup>b</sup>    |                 |                 | Girls <sup>b</sup>   |                 |                 |
|---------------|----------------------|-----------------|-----------------|----------------------|-----------------|-----------------|----------------------|-----------------|-----------------|
|               | $\beta$ (95%CI)      | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)      | <i>p</i> -value | <i>q</i> -value | $\beta$ (95%CI)      | <i>p</i> -value | <i>q</i> -value |
| Al            |                      |                 |                 |                      |                 |                 |                      |                 |                 |
| 1st trimester | 0.03 (-0.88, 0.94)   | 0.94            | 0.98            | 0.23 (-1.05, 1.50)   | 0.73            | 0.95            | -0.23 (-1.53, 1.06)  | 0.72            | 0.95            |
| 2nd trimester | -0.31 (-1.19, 0.57)  | 0.49            | 0.79            | 0.22 (-1.10, 1.54)   | 0.75            | 0.95            | -0.81 (-1.96, 0.35)  | 0.17            | 0.82            |
| 3rd trimester | -0.19 (-0.79, 0.42)  | 0.55            | 0.79            | -0.08 (-0.95, 0.78)  | 0.85            | 0.97            | -0.35 (-1.19, 0.49)  | 0.42            | 0.95            |
| At delivery   | -0.26 (-0.79, 0.26)  | 0.32            | 0.68            | -0.40 (-1.16, 0.37)  | 0.31            | 0.67            | -0.12 (-0.84, 0.59)  | 0.74            | 0.95            |
| Mn            |                      |                 |                 |                      |                 |                 |                      |                 |                 |
| 1st trimester | -0.15 (-0.63, 0.32)  | 0.53            | 0.79            | -0.13 (-0.84, 0.58)  | 0.72            | 0.95            | -0.18 (-0.81, 0.46)  | 0.59            | 0.95            |
| 2nd trimester | -0.56 (-1.13, 0.00)  | 0.049           | 0.31            | -0.27 (-1.08, 0.54)  | 0.52            | 0.83            | -0.84 (-1.61, -0.07) | 0.03            | 0.51            |
| 3rd trimester | -0.26 (-0.85, 0.32)  | 0.38            | 0.75            | -0.25 (-1.11, 0.62)  | 0.58            | 0.88            | -0.32 (-1.11, 0.47)  | 0.42            | 0.95            |
| At delivery   | -0.33 (-1.16, 0.51)  | 0.45            | 0.78            | -0.16 (-1.41, 1.09)  | 0.80            | 0.96            | -0.43 (-1.54, 0.68)  | 0.45            | 0.95            |
| Co            |                      |                 |                 |                      |                 |                 |                      |                 |                 |
| 1st trimester | 0.17 (-0.43, 0.77)   | 0.58            | 0.80            | 0.39 (-0.48, 1.27)   | 0.38            | 0.75            | -0.08 (-0.90, 0.75)  | 0.86            | 0.95            |
| 2nd trimester | 0.65 (0.07, 1.23)    | 0.03            | 0.27            | 0.75 (-0.09, 1.59)   | 0.08            | 0.64            | 0.47 (-0.32, 1.26)   | 0.24            | 0.84            |
| 3rd trimester | 0.29 (-0.4, 0.98)    | 0.41            | 0.77            | 0.20 (-0.80, 1.21)   | 0.69            | 0.95            | 0.31 (-0.63, 1.26)   | 0.51            | 0.95            |
| At delivery   | -0.15 (-1, 0.70)     | 0.73            | 0.90            | -0.24 (-1.49, 1.01)  | 0.71            | 0.95            | -0.13 (-1.27, 1.00)  | 0.82            | 0.95            |
| Ba            |                      |                 |                 |                      |                 |                 |                      |                 |                 |
| 1st trimester | -0.56 (-1.18, 0.07)  | 0.08            | 0.31            | -1.12 (-2.03, -0.21) | 0.02            | 0.26            | 0.02 (-0.82, 0.87)   | 0.96            | 0.98            |
| 2nd trimester | -0.31 (-0.69, 0.07)  | 0.11            | 0.42            | -0.37 (-0.89, 0.15)  | 0.16            | 0.64            | -0.16 (-0.74, 0.41)  | 0.58            | 0.95            |
| 3rd trimester | -0.36 (-0.72, 0.00)  | 0.049           | 0.31            | -0.34 (-0.88, 0.20)  | 0.21            | 0.64            | -0.40 (-0.87, 0.07)  | 0.10            | 0.63            |
| At delivery   | -0.48 (-1.29, 0.34)  | 0.25            | 0.60            | -0.48 (-1.65, 0.68)  | 0.42            | 0.77            | -0.38 (-1.50, 0.75)  | 0.51            | 0.95            |
| Tl            |                      |                 |                 |                      |                 |                 |                      |                 |                 |
| 1st trimester | -0.62 (-1.61, 0.36)  | 0.22            | 0.59            | -0.17 (-1.57, 1.23)  | 0.81            | 0.96            | -1.17 (-2.54, 0.21)  | 0.10            | 0.63            |
| 2nd trimester | -1.16 (-2.11, -0.21) | 0.02            | 0.20            | -1.02 (-2.34, 0.30)  | 0.13            | 0.64            | -1.23 (-2.60, 0.15)  | 0.08            | 0.63            |
| 3rd trimester | -0.31 (-0.74, 0.13)  | 0.17            | 0.54            | -0.11 (-0.79, 0.57)  | 0.75            | 0.95            | -0.48 (-1.04, 0.07)  | 0.09            | 0.63            |
| At delivery   | -0.16 (-1.57, 1.26)  | 0.83            | 0.93            | 0.76 (-1.27, 2.79)   | 0.46            | 0.82            | -1.16 (-3.12, 0.80)  | 0.25            | 0.84            |
| Hg            |                      |                 |                 |                      |                 |                 |                      |                 |                 |
| 1st trimester | 0.19 (-0.38, 0.76)   | 0.52            | 0.79            | 0.29 (-0.52, 1.10)   | 0.49            | 0.83            | 0.07 (-0.73, 0.87)   | 0.86            | 0.95            |
| 2nd trimester | -0.28 (-0.76, 0.21)  | 0.26            | 0.60            | -0.61 (-1.30, 0.09)  | 0.09            | 0.64            | 0.11 (-0.56, 0.78)   | 0.75            | 0.95            |
| 3rd trimester | -0.27 (-0.76, 0.21)  | 0.27            | 0.60            | -0.42 (-1.17, 0.33)  | 0.27            | 0.67            | -0.19 (-0.80, 0.43)  | 0.55            | 0.95            |
| At delivery   | -0.71 (-1.27, -0.16) | 0.01            | 0.20            | -1.15 (-1.92, -0.38) | 0.00            | 0.11            | -0.13 (-0.93, 0.66)  | 0.74            | 0.95            |

Note: AR, adiposity rebound; Al, aluminum; Mn, manganese; Co, cobalt; Ba, barium; Tl, thallium; Hg, mercury; 1st trimester, first trimester; 2nd trimester, second trimester; 3rd trimester, third trimester.

<sup>a</sup>Adjusted for maternal age at recruitment, maternal metabolic dysfunction, pre-pregnancy BMI, family monthly income per capita at enrollment, and children's sex.

<sup>b</sup>Adjusted for maternal age at recruitment, maternal metabolic dysfunction, pre-pregnancy BMI, and family monthly income per capita at enrollment.

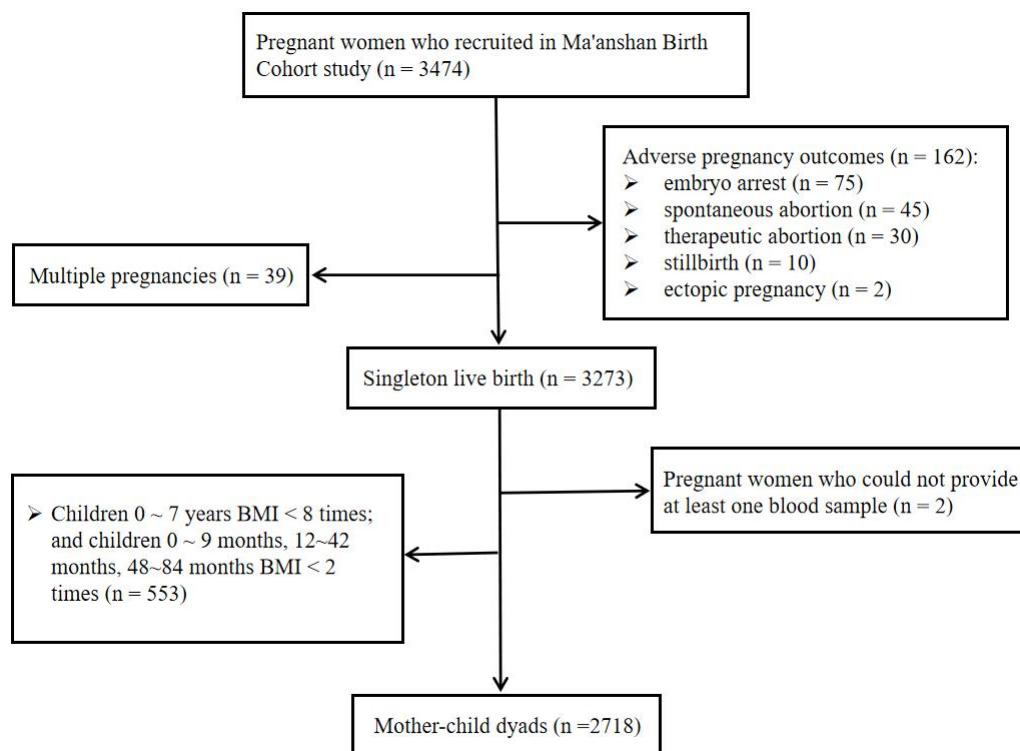


**Fig. S1.** Flow charts of participant recruitment and inclusion.

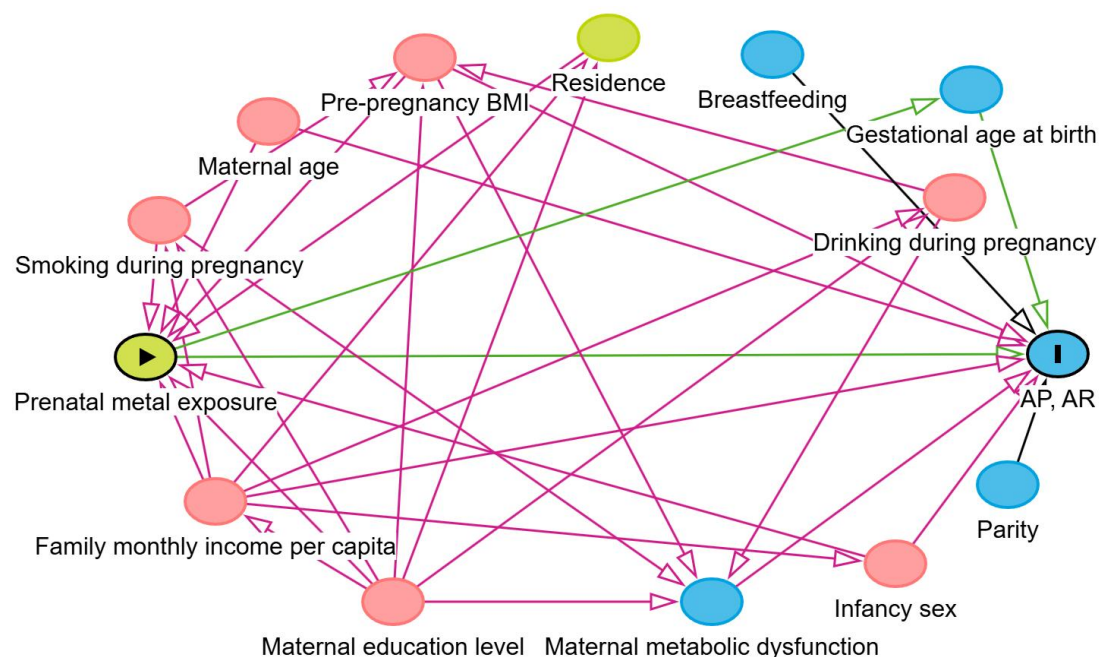


**Fig. S2.** Directed acyclic graph of prenatal metal exposure associated with AP and AR. Note: AP, adiposity peak; AR, adiposity rebound. Note: green circles (small triangles) indicate exposure; blue circles (rectangles) indicate outcome; green circles indicate ancestor of exposure; blue circles indicate ancestor of outcome; red circles indicate ancestor of exposure and outcome; green line arrows indicate causal path; red line arrows indicate biasing path.

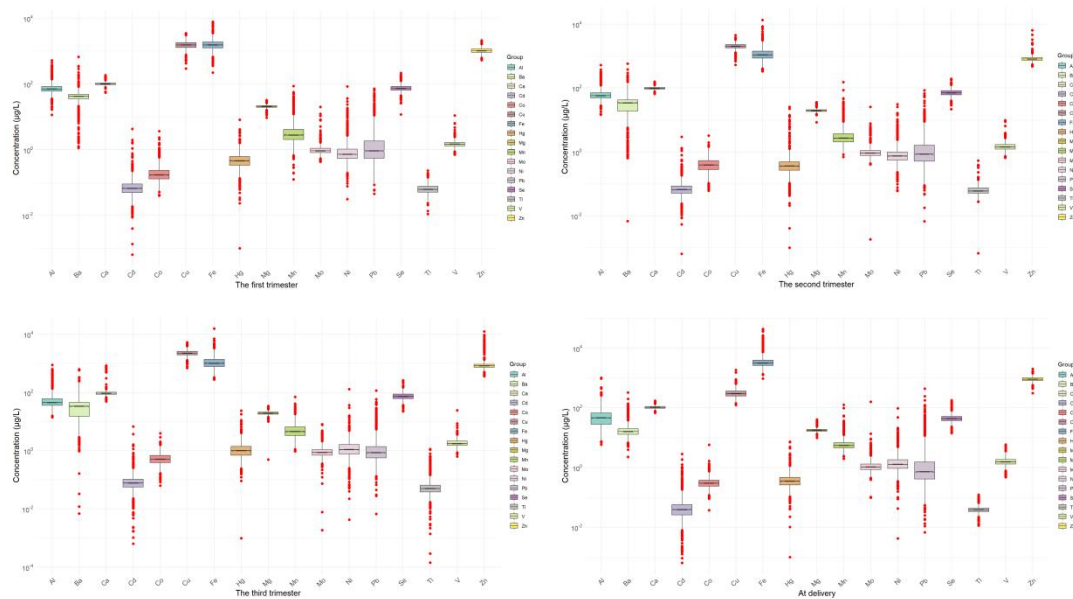


**Fig. S3.** Distribution of blood concentrations of 17 metal elements in 2718 mother-child dyads at different time points.

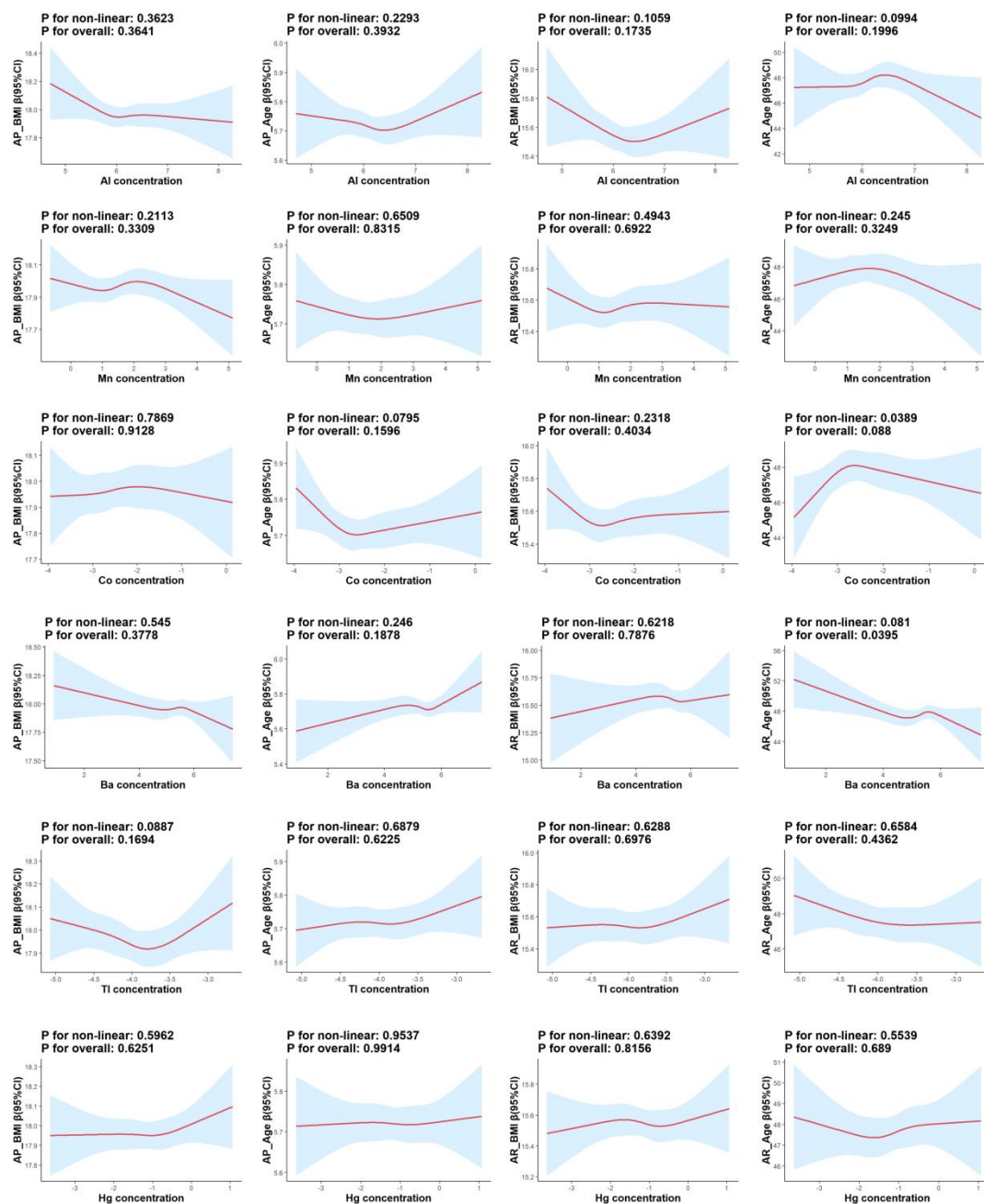


**Fig. S4.** The nonlinear relationships between prenatal metal exposure in the first trimester and the AP and AR via restricted cubic spline. Models were adjusted for maternal age at recruitment, maternal metabolic dysfunction, pre-pregnancy BMI, family monthly income per capita at enrollment, and children's sex.

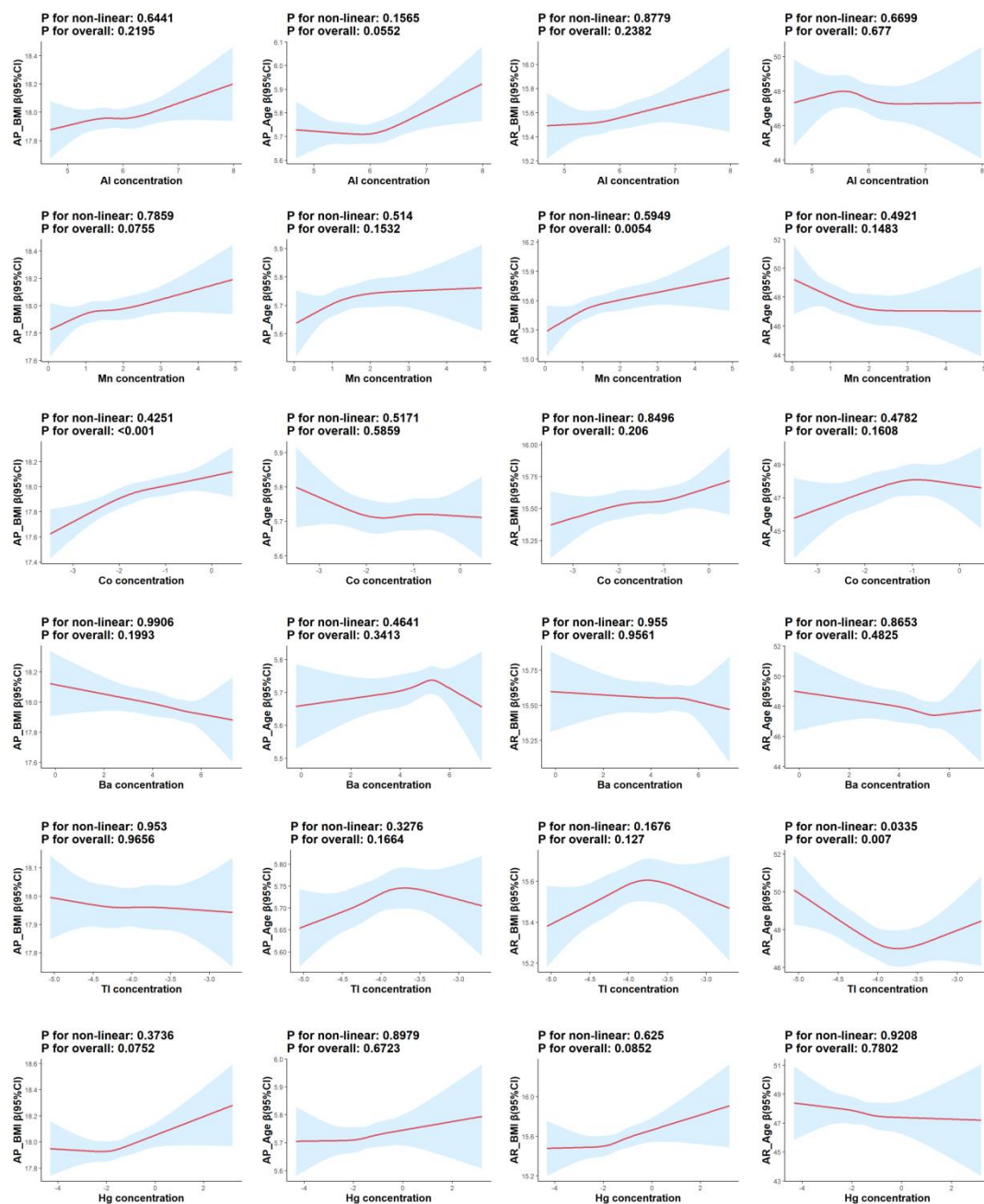


**Fig. S5.** The nonlinear relationships between maternal metal exposure in the second trimester and the AP and AR via restricted cubic spline. Models were adjusted for maternal age at recruitment, maternal metabolic dysfunction, pre-pregnancy BMI, family monthly income per capita at enrollment, and children's sex.

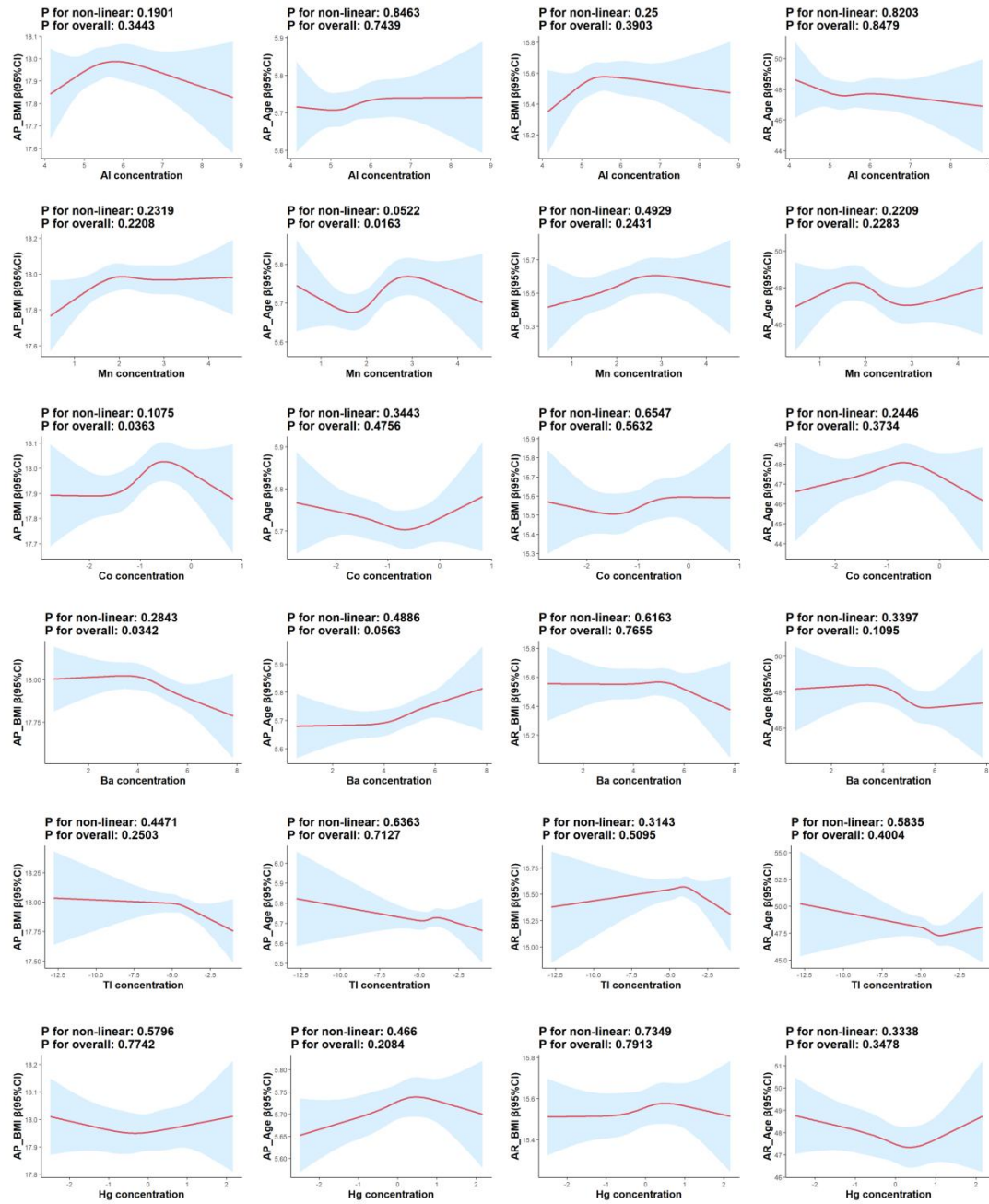


**Fig. S6.** The nonlinear relationships between maternal metal exposure in the third trimester and the AP and AR via restricted cubic spline. Models were adjusted for maternal age at recruitment, maternal metabolic dysfunction, pre-pregnancy BMI, family monthly income per capita at enrollment, and children's sex.

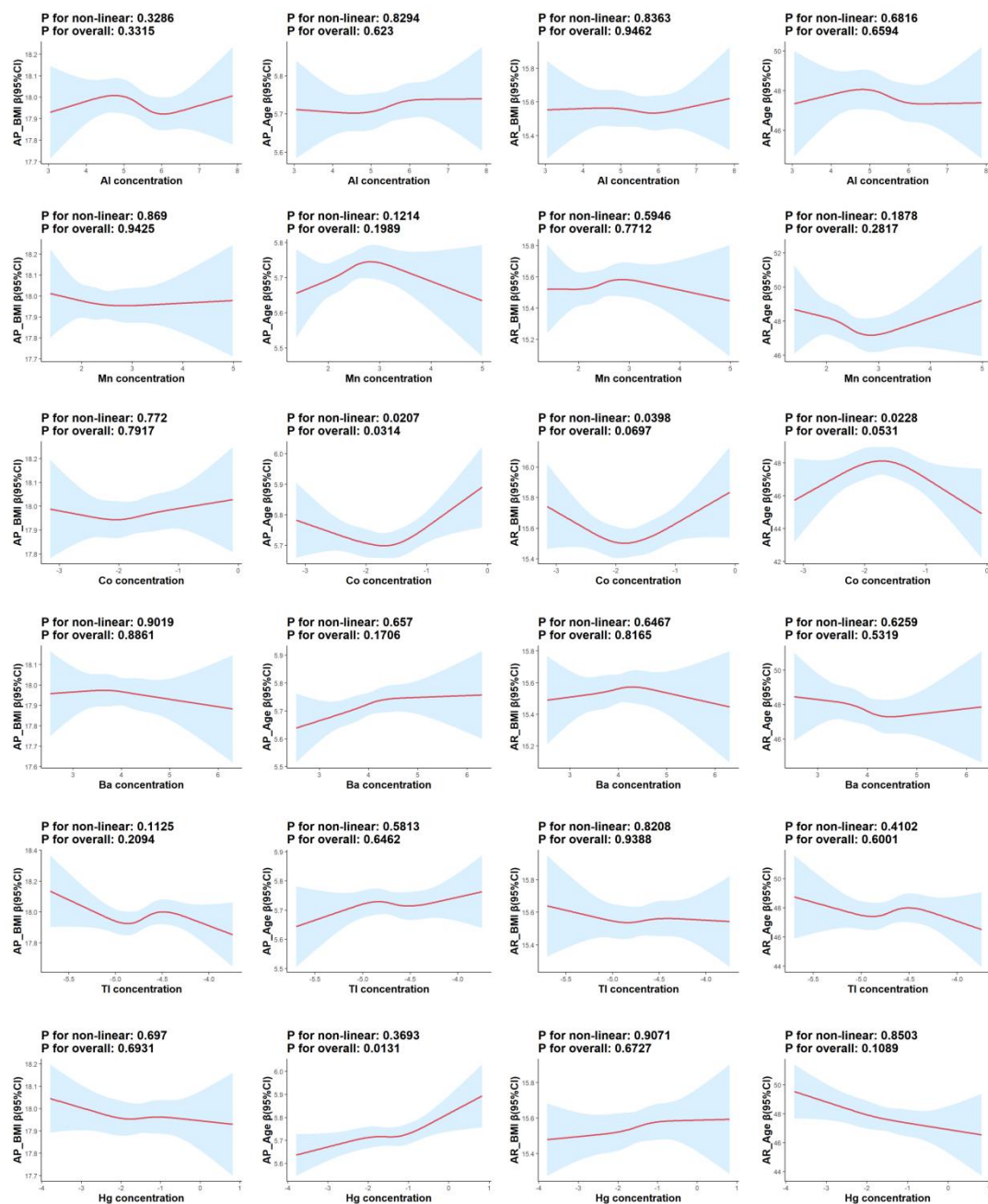


**Fig. S7.** The nonlinear relationships between maternal metal exposure at delivery and the AP and AR via restricted cubic spline. Models were adjusted for maternal age at recruitment, maternal metabolic dysfunction, pre-pregnancy BMI, family monthly income per capita at enrollment, and children's sex.

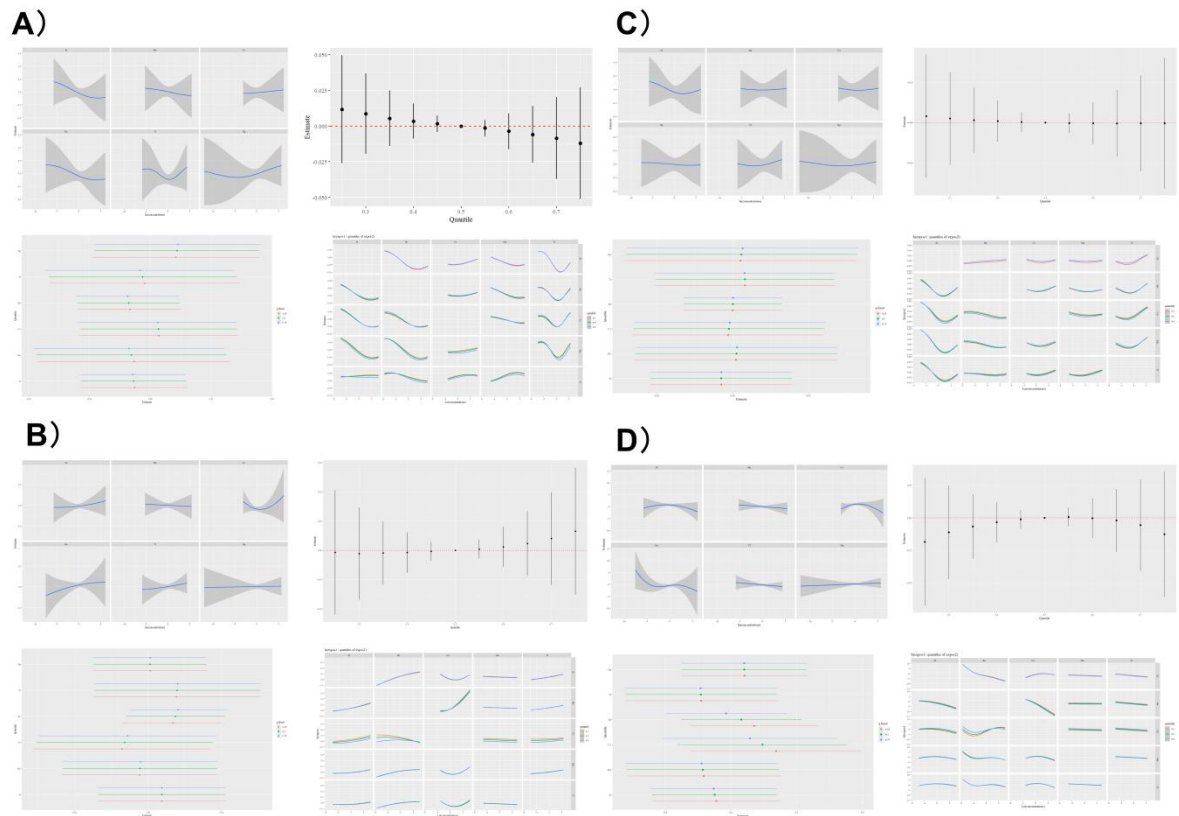


**Fig. S8.** Associations of metal mixture in the first trimester with AP and AR via Bayesian kernel machine regression. Note: A) the BMI of AP; B) the age of AP; C) the BMI of AR; D) the age of AR. Models were adjusted for maternal age at recruitment, maternal metabolic dysfunction, pre-pregnancy BMI, family monthly income per capita at enrollment, and children's sex. Al, aluminum; Mn, manganese; Co, cobalt; Ba, barium; Tl, thallium; Hg, mercury; AP, adiposity peak; AR, adiposity rebound.

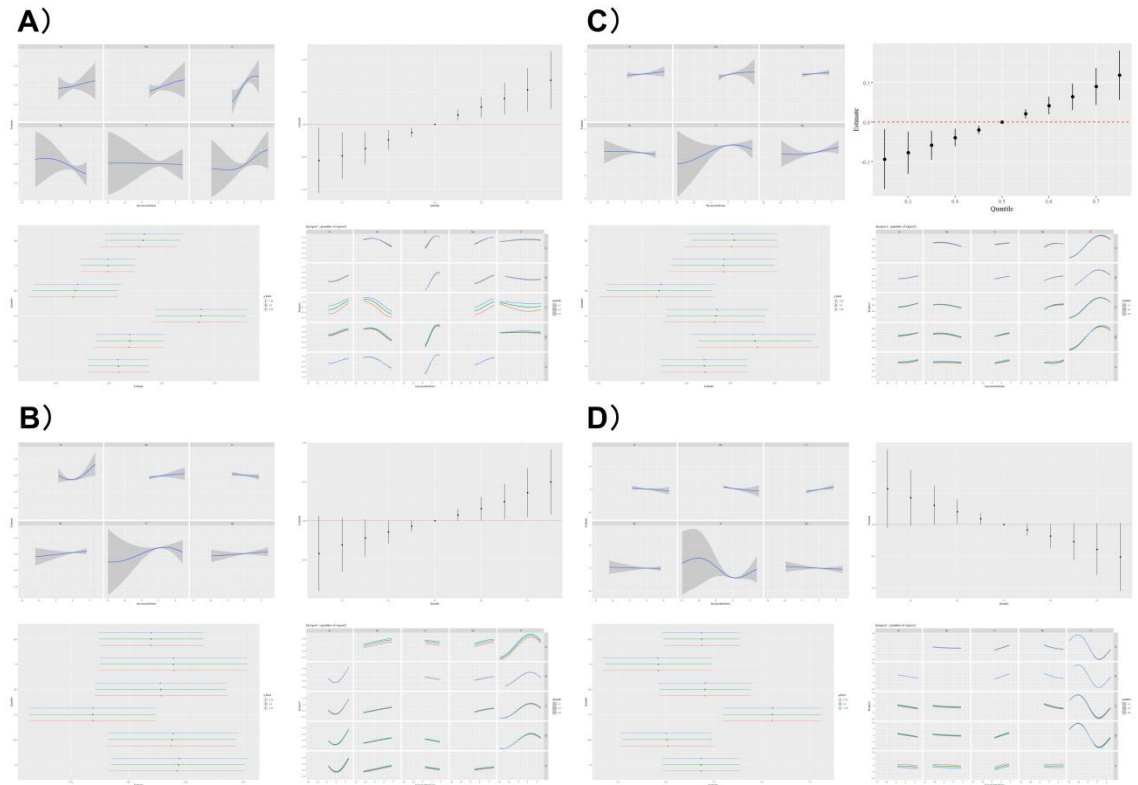


**Fig. S9.** Associations of metal mixture in the second trimester with AP and AR via Bayesian kernel machine regression. Note: A) the BMI of AP; B) the age of AP; C) the BMI of AR; D) the age of AR. Models were adjusted for maternal age at recruitment, maternal metabolic dysfunction, pre-pregnancy BMI, family monthly income per capita at enrollment, and children's sex. Al, aluminum; Mn, manganese; Co, cobalt; Ba, barium; Tl, thallium; Hg, mercury; AP, adiposity peak; AR, adiposity rebound.

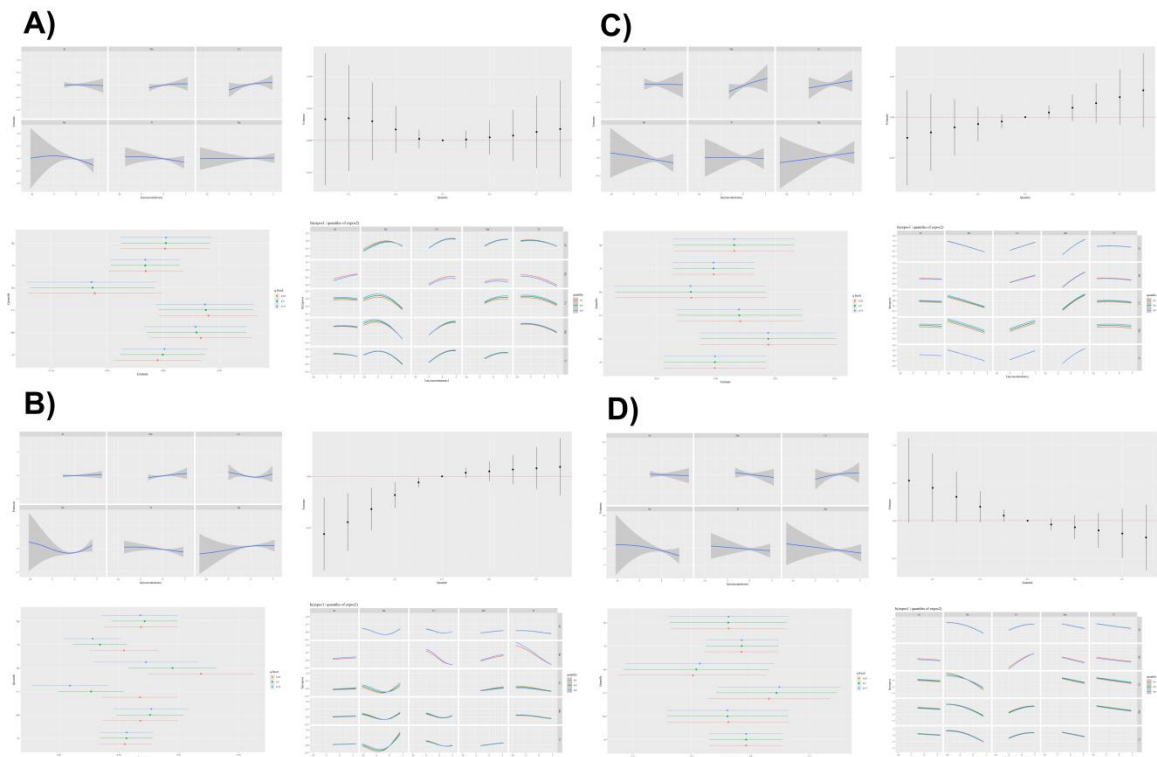


**Fig. S10.** Associations of metal mixture in the third trimester with AP and AR via Bayesian kernel machine regression. Note: A) the BMI of AP; B) the age of AP; C) the BMI of AR; D) the age of AR. Models were adjusted for maternal age at recruitment, maternal metabolic dysfunction, pre-pregnancy BMI, family monthly income per capita at enrollment, and children's sex. Al, aluminum; Mn, manganese; Co, cobalt; Ba, barium; Tl, thallium; Hg, mercury; AP, adiposity peak; AR, adiposity rebound.

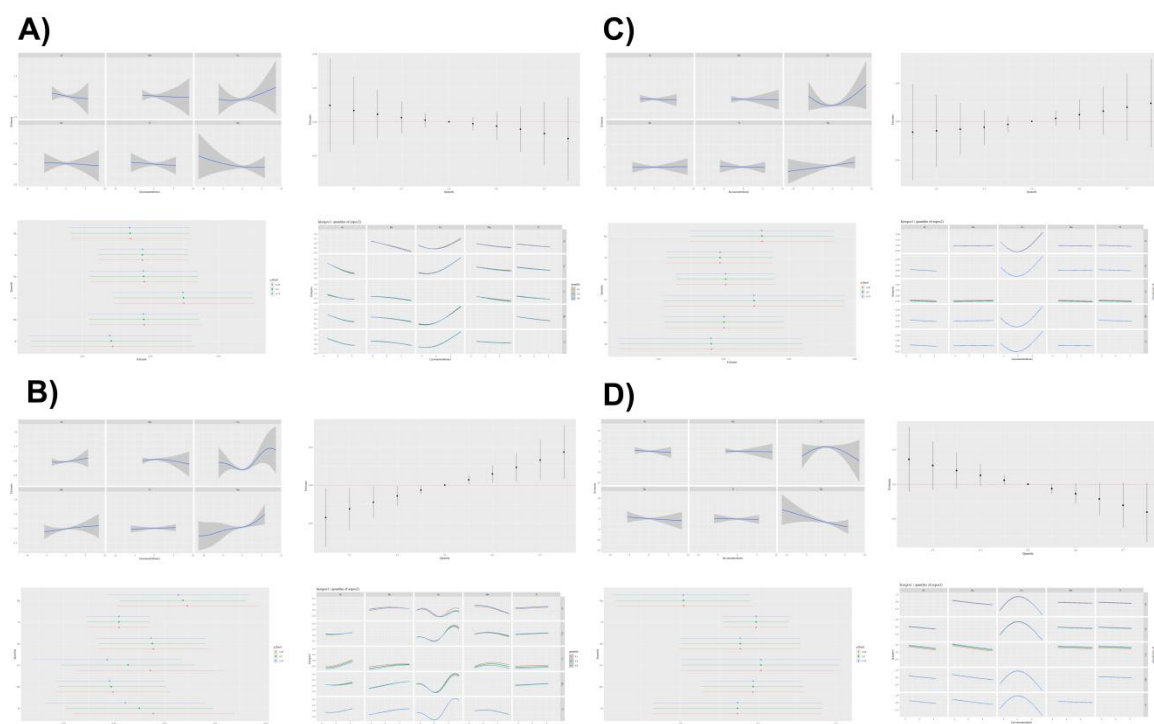


**Fig. S11.** Associations of metals mixture in the cord blood with AP and AR via Bayesian kernel machine regression. Note: A) the BMI of AP; B) the age of AP; C) the BMI of AR; D) the age of AR. Models were adjusted for maternal age at recruitment, maternal metabolic dysfunction, pre-pregnancy BMI, family monthly income per capita at enrollment, and children's sex. Al, aluminum; Mn, manganese; Co, cobalt; Ba, barium; Tl, thallium; Hg, mercury; AP, adiposity peak; AR, adiposity rebound.