**Supplemental Table 1**. Weighted distributions of specific gravity corrected urinary analytes by study visit of sample collection during pregnancy in the LIFECODES cohort (N=482 subjects).

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  | Select Percentiles | | | | |
| Urinary Analyte (ng/mL) | Visit | # samples | %>LOD | Geometric mean (geometric SD) | 25 | 50 | 75 | 90 | 95 |
| 2-4-DCP | Total | 1628 | 81.5 | 0.88 (3.45) | 0.41 | 0.69 | 1.46 | 3.84 | 8.37 |
| 1 | 460 | 82.6 | 0.92 (3.77) | 0.40 | 0.67 | 1.58 | 4.65 | 11.2 |
| 2 | 405 | 78.2 | 0.93 (3.45) | 0.42 | 0.71 | 1.46 | 3.65 | 10.8 |
| 3 | 383 | 78.7 | 0.79 (3.49) | 0.36 | 0.62 | 1.43 | 3.85 | 6.30 |
| 4 | 380 | 86.3 | 0.87 (3.03) | 0.42 | 0.70 | 1.40 | 3.05 | 5.94 |
| 2-5-DCP | Total | 1628 | 96.3 | 4.92 (6.32) | 1.40 | 3.19 | 11.4 | 57.3 | 203 |
| 1 | 460 | 96.3 | 5.02 (6.82) | 1.31 | 3.26 | 13.3 | 69.0 | 194 |
| 2 | 405 | 94.9 | 5.37 (6.52) | 1.56 | 3.65 | 13.0 | 61.0 | 225 |
| 3 | 383 | 95.9 | 4.57 (6.51) | 1.39 | 2.96 | 8.71 | 57.1 | 164 |
| 4 | 380 | 98.0 | 4.71 (5.42) | 1.42 | 2.98 | 9.59 | 45.7 | 146 |
| BP3 | Total | 1628 | 99.7 | 57.8 (8.53) | 11.8 | 42.6 | 252 | 1437 | 2927 |
| 1 | 460 | 99.6 | 54.7 (8.31) | 10.9 | 42.6 | 246 | 1262 | 2646 |
| 2 | 405 | 99.5 | 63.8 (8.47) | 13.6 | 40.0 | 332 | 1710 | 2893 |
| 3 | 383 | 100.0 | 53.1 (8.45) | 11.8 | 42.4 | 194 | 1295 | 3200 |
| 4 | 380 | 99.7 | 60.6 (8.91) | 12.2 | 42.7 | 260 | 1575 | 3244 |
| BPS | Total | 1628 | 20.6 | 0.43 (2.44) | 0.23 | 0.38 | 0.70 | 1.11 | 2.10 |
| 1 | 460 | 20.4 | 0.40 (2.48) | 0.21 | 0.32 | 0.60 | 1.15 | 2.10 |
| 2 | 405 | 23.2 | 0.48 (2.49) | 0.24 | 0.42 | 0.81 | 1.40 | 2.10 |
| 3 | 383 | 18.2 | 0.40 (2.21) | 0.22 | 0.33 | 0.60 | 1.05 | 1.47 |
| 4 | 380 | 20.6 | 0.44 (2.52) | 0.23 | 0.38 | 0.66 | 1.05 | 1.57 |
| BPB | Total | 1628 | 68.4 | 1.23 (7.07) | 0.23 | 0.85 | 6.00 | 19.4 | 32.3 |
| 1 | 460 | 71.4 | 1.24 (7.47) | 0.20 | 0.98 | 6.40 | 19.8 | 37.7 |
| 2 | 405 | 70.9 | 1.47 (6.75) | 0.29 | 1.11 | 8.25 | 20.2 | 31.4 |
| 3 | 383 | 65.6 | 1.11 (7.05) | 0.21 | 0.70 | 5.32 | 18.2 | 31.2 |
| 4 | 380 | 65.0 | 1.10 (6.91) | 0.23 | 0.68 | 4.60 | 17.7 | 34.9 |
| EPB | Total | 1628 | 59.5 | 3.73 (5.83) | 0.87 | 2.15 | 14.4 | 55.0 | 106 |
| 1 | 460 | 63.1 | 3.97 (6.35) | 0.88 | 2.19 | 17.8 | 60.5 | 116 |
| 2 | 405 | 58.7 | 4.23 (5.85) | 1.07 | 2.66 | 18.8 | 59.5 | 109 |
| 3 | 383 | 59.2 | 3.38 (5.53) | 0.88 | 2.12 | 10.2 | 53.3 | 80 |
| 4 | 380 | 56.3 | 3.36 (5.48) | 0.81 | 2.13 | 12.2 | 44.6 | 85.5 |
| MPB | Total | 1628 | 99.9 | 161 (4.28) | 69.8 | 186 | 442 | 917 | 1350 |
| 1 | 460 | 99.8 | 149 (4.19) | 65.6 | 173 | 385 | 825 | 1150 |
| 2 | 405 | 100.0 | 198 (3.99) | 79.1 | 225 | 490 | 1081 | 1699 |
| 3 | 383 | 99.7 | 149 (4.62) | 58.3 | 176 | 440 | 930 | 1320 |
| 4 | 380 | 100.0 | 154 (4.27) | 68.4 | 181 | 411 | 906 | 1346 |
| PPB | Total | 1628 | 99.0 | 36.1 (5.74) | 12.8 | 45.6 | 125 | 280 | 440 |
| 1 | 460 | 99.3 | 34.0 (5.55) | 13.8 | 43.0 | 104 | 263 | 416 |
| 2 | 405 | 99.8 | 48.2 (5.07) | 18.9 | 53.1 | 154 | 313 | 471 |
| 3 | 383 | 97.9 | 31.4 (6.32) | 11.0 | 42.6 | 120 | 263 | 359 |
| 4 | 380 | 98.7 | 32.9 (5.95) | 11.1 | 42.8 | 118 | 259 | 383 |
| TCB | Total | 1628 | 7.3 | 1.93 (2.32) | 1.06 | 1.51 | 3.02 | 5.29 | 10.6 |
| 1 | 460 | 6.5 | 1.72 (2.21) | 0.96 | 1.32 | 2.64 | 5.29 | 8.77 |
| 2 | 405 | 6.6 | 2.03 (2.30) | 1.06 | 1.63 | 3.53 | 7.05 | 10.6 |
| 3 | 383 | 9.5 | 2.05 (2.49) | 1.06 | 1.63 | 3.02 | 5.29 | 14.1 |
| 4 | 380 | 6.9 | 1.97 (2.26) | 1.11 | 1.63 | 3.02 | 5.29 | 7.12 |
| TCS | Total | 1628 | 79.5 | 16.0 (6.66) | 3.53 | 10.7 | 61.2 | 321 | 472 |
| 1 | 460 | 81.3 | 15.5 (6.75) | 3.41 | 10.8 | 61.2 | 309 | 453 |
| 2 | 405 | 79.2 | 17.6 (6.52) | 4.22 | 10.6 | 61.2 | 390 | 594 |
| 3 | 383 | 78.5 | 15.1 (6.53) | 3.53 | 11.3 | 60.3 | 301 | 458 |
| 4 | 380 | 78.7 | 16.1 (6.82) | 3.67 | 10.7 | 64.2 | 318 | 459 |

Abbreviations: Limit of Detection (LOD); 2-4-DCP (2,4-diclorophenol), 2-5-DCP (2,5-diclorophenol), BP3 (benzophenone-3), BPS (bisphenol-S), EPB (ethyl paraben), MPB (methyl paraben), PPB (propyl paraben), TCB (triclocarban), TCS (triclosan)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | CRP | IL-1β | IL-6 | IL-10 | TNF-α | 2-4-DCP | 2-5-DCP | BP3 | BPS | BPB | EPB | MPB | PPB | TCB | TCS |
| **Visit 1** | CRP | 1.00 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| IL-1β | 0.07 | 1.00 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| IL-6 | 0.27 | 0.30 | 1.00 |  |  |  |  |  |  |  |  |  |  |  |  |
| IL-10 | 0.06 | 0.15 | 0.43 | 1.00 |  |  |  |  |  |  |  |  |  |  |  |
| TNF-α | 0.15 | 0.22 | 0.30 | 0.36 | 1.00 |  |  |  |  |  |  |  |  |  |  |
| 2,4-DCP | 0.21 | -0.09 | 0.11 | 0.02 | 0.01 | 1.00 |  |  |  |  |  |  |  |  |  |
| 2,5-DCP | 0.22 | -0.12 | 0.13 | -0.01 | 0.05 | 0.74 | 1.00 |  |  |  |  |  |  |  |  |
| BP3 | -0.16 | 0.08 | -0.11 | 0.05 | -0.01 | -0.15 | -0.21 | 1.00 |  |  |  |  |  |  |  |
| BPS | -0.11 | 0.01 | -0.01 | 0.02 | 0.00 | -0.27 | -0.30 | 0.14 | 1.00 |  |  |  |  |  |  |
| BPB | -0.11 | -0.06 | -0.07 | 0.05 | -0.04 | -0.11 | -0.16 | 0.23 | 0.14 | 1.00 |  |  |  |  |  |
| EPB | -0.10 | -0.08 | -0.14 | -0.04 | -0.07 | -0.07 | -0.15 | 0.26 | 0.18 | 0.55 | 1.00 |  |  |  |  |
| MPB | 0.00 | -0.15 | 0.03 | 0.01 | -0.04 | 0.15 | 0.17 | 0.07 | 0.07 | 0.31 | 0.39 | 1.00 |  |  |  |
| PPB | 0.00 | -0.07 | -0.02 | -0.02 | -0.04 | 0.15 | 0.13 | 0.11 | 0.06 | 0.33 | 0.42 | 0.78 | 1.00 |  |  |
| TCB | -0.14 | 0.03 | -0.06 | 0.01 | 0.00 | -0.44 | -0.43 | 0.13 | 0.63 | 0.19 | 0.22 | 0.01 | -0.02 | 1.00 |  |
| TCS | 0.11 | -0.04 | 0.02 | 0.07 | 0.01 | 0.19 | 0.00 | 0.09 | 0.16 | 0.09 | 0.05 | 0.14 | 0.10 | 0.12 | 1.00 |
| **Visit 2** | CRP | 1.00 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| IL-1β | 0.06 | 1.00 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| IL-6 | 0.33 | 0.29 | 1.00 |  |  |  |  |  |  |  |  |  |  |  |  |
| IL-10 | 0.11 | 0.17 | 0.49 | 1.00 |  |  |  |  |  |  |  |  |  |  |  |
| TNF-α | 0.21 | 0.16 | 0.29 | 0.38 | 1.00 |  |  |  |  |  |  |  |  |  |  |
| 2,4-DCP | 0.13 | 0.00 | 0.14 | 0.06 | 0.06 | 1.00 |  |  |  |  |  |  |  |  |  |
| 2,5-DCP | 0.22 | -0.04 | 0.14 | 0.03 | 0.07 | 0.72 | 1.00 |  |  |  |  |  |  |  |  |
| BP3 | -0.12 | 0.15 | -0.05 | 0.05 | -0.06 | -0.11 | -0.17 | 1.00 |  |  |  |  |  |  |  |
| BPS | -0.07 | 0.01 | -0.02 | -0.05 | -0.03 | -0.36 | -0.36 | 0.08 | 1.00 |  |  |  |  |  |  |
| BPB | -0.05 | -0.04 | -0.15 | -0.12 | -0.05 | -0.13 | -0.22 | 0.18 | 0.15 | 1.00 |  |  |  |  |  |
| EPB | -0.15 | -0.08 | -0.14 | -0.07 | -0.09 | -0.15 | -0.21 | 0.24 | 0.18 | 0.59 | 1.00 |  |  |  |  |
| MPB | 0.00 | -0.09 | -0.04 | 0.00 | -0.06 | 0.17 | 0.15 | 0.05 | -0.01 | 0.30 | 0.30 | 1.00 |  |  |  |
| PPB | 0.02 | -0.08 | -0.02 | 0.00 | -0.03 | 0.11 | 0.13 | 0.04 | 0.01 | 0.32 | 0.34 | 0.84 | 1.00 |  |  |
| TCB | -0.05 | -0.06 | -0.06 | -0.06 | -0.02 | -0.55 | -0.52 | 0.14 | 0.61 | 0.17 | 0.26 | -0.02 | 0.05 | 1.00 |  |
| TCS | 0.04 | 0.00 | -0.02 | -0.01 | 0.03 | 0.17 | -0.10 | 0.09 | 0.08 | 0.09 | 0.01 | 0.09 | 0.03 | 0.10 | 1.00 |

**Supplemental Table 2**. Spearman correlation coefficients of exposure analytes and plasma inflammatory markers stratified by study visit in the LIFECODES cohort

**Supplemental Table 2** Continued.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | CRP | IL-1β | IL-6 | IL-10 | TNF-α | 2-4-DCP | 2-5-DCP | BP3 | BPS | BPB | EPB | MPB | PPB | TCB | TCS |
| **Visit 3** | CRP | 1.00 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| IL-1β | 0.08 | 1.00 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| IL-6 | 0.25 | 0.29 | 1.00 |  |  |  |  |  |  |  |  |  |  |  |  |
| IL-10 | 0.11 | 0.12 | 0.45 | 1.00 |  |  |  |  |  |  |  |  |  |  |  |
| TNF-α | 0.25 | 0.19 | 0.28 | 0.32 | 1.00 |  |  |  |  |  |  |  |  |  |  |
| 2,4-DCP | 0.20 | -0.05 | 0.14 | 0.01 | 0.03 |  |  |  |  |  |  |  |  |  |  |
| 2,5-DCP | 0.25 | -0.11 | 0.10 | -0.02 | 0.07 | 0.73 | 1.00 |  |  |  |  |  |  |  |  |
| BP3 | -0.17 | 0.15 | -0.13 | 0.01 | -0.11 | -0.19 | -0.22 | 1.00 |  |  |  |  |  |  |  |
| BPS | -0.11 | 0.07 | -0.08 | -0.06 | -0.01 | -0.43 | -0.39 | 0.12 | 1.00 |  |  |  |  |  |  |
| BPB | -0.16 | 0.02 | -0.17 | -0.09 | -0.14 | -0.14 | -0.23 | 0.24 | 0.21 | 1.00 |  |  |  |  |  |
| EPB | -0.21 | 0.03 | -0.07 | -0.01 | -0.10 | -0.15 | -0.21 | 0.22 | 0.23 | 0.55 | 1.00 |  |  |  |  |
| MPB | 0.01 | -0.07 | -0.05 | -0.07 | -0.08 | 0.13 | 0.14 | 0.14 | -0.03 | 0.32 | 0.32 | 1.00 |  |  |  |
| PPB | -0.02 | -0.03 | -0.08 | -0.09 | -0.13 | 0.08 | 0.08 | 0.14 | 0.00 | 0.33 | 0.31 | 0.82 | 1.00 |  |  |
| TCB | -0.14 | -0.02 | -0.07 | -0.02 | 0.00 | -0.38 | -0.36 | 0.09 | 0.64 | 0.08 | 0.18 | -0.04 | -0.03 | 1.00 |  |
| TCS | 0.02 | -0.01 | -0.02 | 0.04 | 0.02 | 0.13 | -0.11 | 0.14 | 0.12 | 0.18 | 0.13 | 0.13 | 0.06 | 0.14 | 1.00 |
| **Visit 4** | CRP | 1.00 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| IL-1β | 0.15 | 1.00 |  |  |  |  |  |  |  |  |  |  |  |  |  |
| IL-6 | 0.24 | 0.26 | 1.00 |  |  |  |  |  |  |  |  |  |  |  |  |
| IL-10 | 0.04 | 0.14 | 0.39 | 1.00 |  |  |  |  |  |  |  |  |  |  |  |
| TNF-α | 0.13 | 0.11 | 0.25 | 0.36 | 1.00 |  |  |  |  |  |  |  |  |  |  |
| 2,4-DCP | 0.13 | 0.03 | 0.16 | 0.07 | 0.03 | 1.00 |  |  |  |  |  |  |  |  |  |
| 2,5-DCP | 0.23 | 0.04 | 0.20 | 0.07 | 0.13 | 0.70 | 1.00 |  |  |  |  |  |  |  |  |
| BP3 | -0.14 | 0.17 | -0.14 | 0.05 | -0.08 | -0.13 | -0.22 | 1.00 |  |  |  |  |  |  |  |
| BPS | -0.12 | 0.02 | -0.11 | 0.00 | -0.01 | -0.32 | -0.34 | 0.05 | 1.00 |  |  |  |  |  |  |
| BPB | -0.10 | 0.08 | -0.04 | -0.01 | -0.08 | -0.03 | -0.11 | 0.28 | 0.09 | 1.00 |  |  |  |  |  |
| EPB | -0.13 | 0.07 | -0.03 | 0.03 | -0.06 | -0.06 | -0.14 | 0.25 | 0.18 | 0.52 | 1.00 |  |  |  |  |
| MPB | 0.00 | 0.06 | 0.04 | 0.12 | -0.02 | 0.07 | 0.03 | 0.22 | 0.03 | 0.38 | 0.39 | 1.00 |  |  |  |
| PPB | -0.01 | 0.10 | 0.04 | 0.09 | -0.02 | 0.03 | -0.01 | 0.22 | 0.02 | 0.38 | 0.36 | 0.84 | 1.00 |  |  |
| TCB | -0.12 | -0.08 | -0.14 | -0.10 | -0.07 | -0.39 | -0.39 | 0.06 | 0.68 | 0.11 | 0.25 | 0.04 | 0.03 | 1.00 |  |
| TCS | 0.04 | -0.05 | 0.06 | 0.13 | 0.00 | 0.23 | -0.10 | 0.07 | 0.12 | 0.14 | 0.08 | 0.15 | 0.15 | 0.12 | 1.00 |

Ranges of study visits in gestational weeks: visit 1 (4.71 – 19.1 weeks), visit 2 (14.9 – 32.1 weeks), visit 3 (22.9 – 36.3 weeks), and visit 4 (33.1 – 38.3 weeks). Abbreviations: 2-4-DCP (2,4-diclorophenol), 2-5-DCP (2,5-diclorophenol), BP3 (benzophenone-3), BPS (bisphenol-S), BPB (butyl paraben), EPB (ethyl paraben), MPB (methyl paraben), PPB (propyl paraben), TCB (triclocarban), TCS (triclosan), CRP (C-reactive protein), IL-1β (interleukin-1β), IL-6 (interleukin-6), IL-10 (interleukin-10), TNF-α (tumor necrosis factor-α).

**Supplemental Table 3.** Repeated measures analyses in the LIFECODES cohort: Percent change (95% CI) in plasma inflammatory marker concentrations in relation to an interquartile range difference in urinary exposure biomarkers during pregnancy

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Simple Modelsa** | | | | | | | | | |
| **Urinary Analyte** | | **CRP** | | **IL-1β** | | **IL-6** | | **IL-10** | | **TNF-α** | |
|  | IQR  (ng/mL) | %Δ (95% CI) | p-Value | %Δ (95% CI) | p-Value | %Δ (95% CI) | p-Value | %Δ (95% CI) | p-Value | %Δ (95% CI) | p-Value |
| **2-4-DCP** | 1.18 | 4.48 (-2.23, 11.7) | 0.20 | -1.79 (-7.51, 4.27) | 0.55 | -1.79 (-7.56, 4.33) | 0.56 | -0.46 (-4.89, 4.16) | 0.84 | -0.66 (-3.7, 2.48) | 0.68 |
| **2-5-DCP** | 11.0 | 15.7 (7.49, 24.5)\* | <0.001 | -4.92 (-11.2, 1.82) | 0.15 | 2.78 (-4.07, 10.1) | 0.44 | 1.43 (-3.71, 6.84) | 0.59 | 1.08 (-2.44, 4.73) | 0.55 |
| **BP3** | 192 | -3.29 (-10.2, 4.14) | 0.38 | 2.42 (-4.30, 9.61) | 0.49 | -1.98 (-8.45, 4.94) | 0.56 | 0.54 (-4.50, 5.84) | 0.84 | -3.16 (-6.49, 0.30) | 0.07 |
| **BPB** | 5.12 | 3.72 (-5.42, 13.7) | 0.44 | -5.65 (-13.2, 2.53) | 0.17 | -4.08 (-11.8, 4.30) | 0.33 | 0.51 (-5.63, 7.05) | 0.87 | -0.55 (-4.74, 3.82) | 0.80 |
| **EPB** | 10.4 | 0.11 (-7.37, 8.20) | 0.98 | -6.90 (-13.2, -0.14)\* | 0.046 | -4.33 (-10.9, 2.67) | 0.22 | -3.03 (-8.05, 2.26) | 0.26 | -2.93 (-6.39, 0.65) | 0.11 |
| **MPB** | 359 | 3.46 (-3.45, 10.9) | 0.34 | 0.24 (-5.80, 6.67) | 0.94 | 6.83 (0.36, 13.7)\* | 0.04 | 2.05 (-2.64, 6.98) | 0.40 | 1.88 (-1.35, 5.22) | 0.26 |
| **PPB** | 98.2 | 4.62 (-1.86, 11.5) | 0.17 | -1.75 (-7.18, 4.01) | 0.54 | 3.28 (-2.51, 9.44) | 0.27 | 0.49 (-3.77, 4.93) | 0.83 | 0.71 (-2.24, 3.74) | 0.64 |
| **TCS** | 55.2 | 10.6 (1.91, 20.0)\* | 0.02 | 4.59 (-2.90, 12.6) | 0.24 | 2.84 (-4.56, 10.8) | 0.46 | 8.19 (2.28, 14.4)\* | 0.006 | 8.50 (4.43, 12.7)\* | <0.001 |

Abbreviations: IQR (interquartile range), 2-4-DCP (2,4-diclorophenol), 2-5-DCP (2,5-diclorophenol), BP3 (benzophenone-3), BPB (butyl paraben), EPB (ethyl paraben), MPB (methyl paraben), PPB (propyl paraben), TCS (triclosan), CRP (C-reactive protein), IL-1β (interleukin-1β), IL-6 (interleukin-6), IL-10 (interleukin-10), TNF-α (tumor necrosis factor-α).

aLinear mixed models adjusted for specific gravity at sample collection, smoothing term for gestational age and includes random subject specific intercepts; n=1470 samples for all analyses

\* p <0.05

**Supplemental Table 4**. Repeated measures analyses in the LIFECODES cohort: Percent change (95% CI) in plasma inflammatory marker concentrations in relation to a quantile difference in exposure biomarkers

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | **Adjusted Modelsa** | | | | | | | | | |
|  |  | **CRP** | | **IL-1β** | | **IL-6** | | **IL-10** | | **TNF-α** | |
|  | n | %Δ (95% CI) | p-trend | %Δ (95% CI) | p-trend | %Δ (95% CI) | p-trend | %Δ (95% CI) | p-trend | %Δ (95% CI) | p-Value |
| **2-5-DCPb** |  |  | <0.001\* |  | 0.30 |  | 0.20 |  | 0.17 |  | 0.44 |
| Q1 | 351 | - reference - |  | - reference - |  | - reference - |  | - reference - |  | - reference - |  |
| Q2 | 353 | -3.85 (-14.8, 8.56) |  | -16.1 (-24.7, -6.58) |  | -2.49 (-12.6, 8.82) |  | 4.39 (-3.73, 13.2) |  | -1.68 (-6.97, 3.91) |  |
| Q3 | 360 | 13.4 (-1.68, 30.7) |  | -8.82 (-19.9, 3.84) |  | 7.78 (-5.54, 23.0) |  | 8.37 (-1.70, 19.5) |  | 2.35 (-4.24, 9.39) |  |
| Q4 | 362 | 29.5 (9.43, 53.3)\* |  | -10.4 (-23.4, 4.80) |  | 8.68 (-7.27, 27.4) |  | 7.88 (-4.11, 21.4) |  | 2.28 (-5.62, 10.8) |  |
| **BPBc** |  |  | 0.14 |  | 0.06 |  | 0.39 |  | 0.75 |  | 0.81 |
| < LOD | 458 | - reference - |  | - reference - |  | - reference - |  | - reference - |  | - reference - |  |
| T1 | 320 | 6.97 (-4.61, 20.0) |  | -0.09 (-9.81, 10.7) |  | -3.71 (-13.2, 6.79) |  | 1.51 (-5.98, 9.60) |  | -1.55 (-6.57, 3.75) |  |
| T2 | 325 | 9.34 (-3.26, 23.6) |  | -10.9 (-20.3, -0.39) |  | -7.86 (-17.7, 3.12) |  | -1.56 (-9.47, 7.03) |  | -0.94 (-6.44, 4.88) |  |
| T3 | 323 | 10.1 (-3.83, 26.0) |  | -8.56 (-19.3, 3.60) |  | -3.82 (-15.2, 9.06) |  | 2.83 (-6.37, 12.9) |  | -0.93 (-7.06, 5.60) |  |
| **EPBc** |  |  | 0.52 |  | 0.03\* |  | 0.11 |  | 0.24 |  | 0.04\* |
| < LOD | 600 | - reference - |  | - reference - |  | - reference - |  | - reference - |  | - reference - |  |
| T1 | 269 | 3.06 (-8.17, 15.7) |  | 4.16 (-5.97, 15.4) |  | -7.39 (-16.5, 2.71) |  | -2.91 (-10.1, 4.84) |  | -1.79 (-6.80, 3.49) |  |
| T2 | 273 | 4.52 (-7.19, 17.7) |  | -2.93 (-12.8, 8.06) |  | -10.7 (-19.9, -0.47)\* |  | -1.75 (-9.35, 6.49) |  | -4.75 (-9.83, 0.63) |  |
| T3 | 284 | 3.76 (-9.12, 18.5) |  | -12.8 (-22.9, -1.46)\* |  | -7.76 (-18.5, 4.38) |  | -6.25 (-14.5, 2.80) |  | -5.57 (-11.3, 0.55) |  |

Abbreviations: 2-5-DCP (2,5-diclorophenol), BPB (butyl paraben), EPB (ethyl paraben), CRP (C-reactive protein), IL-1β (interleukin-1β), IL-6 (interleukin-6), IL-10 (interleukin-10), TNF-α (tumor necrosis factor-α).

aLinear mixed models adjusted for SG, smoothing term for gestational age, study visit, maternal age, health insurance provider, and BMI at first study visit, and includes random subject specific intercepts

b2-5-DCP was operationalized into four quartiles

cBPB and EPB were operationalized into four groups: <LOD, and tertiles of the measurements above LOD

\* p <0.05

**Supplemental Table 5**. Repeated measures analysesa stratified by participants that delivered term (≥37 weeks gestation) and preterm (<37 weeks gestation) in the LIFECODES cohort: Percent change (95% CI) in plasma inflammatory marker concentrations in relation to an IQR difference in urinary exposure biomarkers during pregnancy

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Term Births (N=1,072 samples)** | | | | | | | | | | | |
| **Urinary Analyte** | | **CRP** | | **IL-1β** | | **IL-6** | | **IL-10** | | **TNF-α** | |
|  | IQR  (ng/mL) | %Δ (95% CI) | p-Value | %Δ (95% CI) | p-Value | %Δ (95% CI) | p-Value | %Δ (95% CI) | p-Value | %Δ (95% CI) | p-Value |
| **2-4-DCP** | 1.2 | -0.37 (-7.3, 7.07) | 0.92 | -1.98 (-8.69, 5.23) | 0.58 | -1.19 (-7.53, 5.59) | 0.72 | -0.85 (-6.16, 4.76) | 0.76 | -0.39 (-3.71, 3.04) | 0.82 |
| **2-5-DCP** | 11.5 | 3.28 (-5.36, 12.7)**†** | 0.47 | -2.32 (-10.7, 6.9) | 0.61 | -0.56 (-8.61, 8.19) | 0.90 | 0.95 (-5.88, 8.27) | 0.79 | 2.51 (-1.82, 7.02) | 0.26 |
| **BP3** | 197 | -6.61 (-13.8, 1.17)**†** | 0.09 | 2.89 (-5.05, 11.5) | 0.49 | -1.16 (-8.3, 6.53) | 0.76 | 2.86 (-3.35, 9.47)**†** | 0.38 | -2.64 (-6.3, 1.16) | 0.17 |
| **BPB** | 5.1 | -3.75 (-12.4, 5.8)**†** | 0.43 | 2.43 (-6.61, 12.3)**†** | 0.61 | -3.34 (-11.3, 5.39) | 0.44 | 1.97 (-5.08, 9.54) | 0.59 | 2.48 (-1.94, 7.1) | 0.28 |
| **EPB** | 10.5 | -5.12 (-12.5, 2.93)**†** | 0.21 | -5.91 (-13.1, 1.9) | 0.13 | -1.91 (-8.97, 5.69) | 0.61 | -0.77 (-6.73, 5.57) | 0.81 | -0.8 (-4.51, 3.06) | 0.68 |
| **MPB** | 345 | 3.93 (-3.37, 11.8) | 0.30 | -0.6 (-7.48, 6.78) | 0.87 | 1.29 (-5.28, 8.32) | 0.71 | 1.92 (-3.59, 7.74) | 0.50 | 3.9 (0.41, 7.5) | 0.03\* |
| **PPB** | 97 | 5.18 (-1.79, 12.6) | 0.15 | 0.75 (-5.79, 7.74) | 0.83 | 1.25 (-4.91, 7.81) | 0.70 | 2.19 (-2.99, 7.65)**†** | 0.41 | 3.11 (-0.13, 6.46) | 0.06 |
| **TCS** | 56 | 15.4 (6.15, 25.5) | <0.001\* | 2.94 (-5.27, 11.9) | 0.49 | 2.88 (-4.81, 11.2) | 0.47 | 10.1 (3.22, 17.4) | 0.004\* | 6.92 (2.79, 11.2) | <0.001\* |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Preterm Births (N=354 samples)** | | | | | | | | | | | |
| **Urinary Analyte** | | **CRP** | | **IL-1β** | | **IL-6** | | **IL-10** | | **TNF-α** | |
|  | IQR  (ng/mL) | %Δ (95% CI) | p-Value | %Δ (95% CI) | p-Value | %Δ (95% CI) | p-Value | %Δ (95% CI) | p-Value | %Δ (95% CI) | p-Value |
| **2-4-DCP** | 1.2 | 6.3 (-9.52, 24.9) | 0.46 | -1.55 (-14.1, 12.8) | 0.82 | -6.05 (-18.9, 8.87) | 0.41 | -1.17 (-10.3, 8.89) | 0.81 | -2.19 (-9.22, 5.38) | 0.56 |
| **2-5-DCP** | 7.2 | 15.4 (-0.16, 33.3)**†** | 0.054 | -5.36 (-16.4, 7.21) | 0.39 | -0.16 (-12.8, 14.3) | 0.98 | 0.75 (-7.8, 10.1) | 0.87 | -1.39 (-7.9, 5.58) | 0.69 |
| **BP3** | 150 | 13.1 (-3.56, 32.6)**†** | 0.13 | -2.46 (-15.4, 12.5) | 0.73 | -6.7 (-19.9, 8.71) | 0.38 | -6.42 (-15.5, 3.6)**†** | 0.20 | -5.45 (-12.5, 2.22) | 0.16 |
| **BPB** | 4.6 | 20.2 (-2.15, 47.8)**†** | 0.08 | -20.0 (-33.4, -3.81)**†** | 0.02\* | -5.4 (-22.4, 15.4) | 0.58 | -0.64 (-13.0, 13.4) | 0.92 | -4.95 (-14.1, 5.23) | 0.33 |
| **EPB** | 9.3 | 12.4 (-4.75, 32.6)**†** | 0.17 | -8.54 (-21.1, 5.99) | 0.24 | -6.17 (-19.9, 9.94) | 0.43 | -6.69 (-16.0, 3.66) | 0.20 | -6.53 (-13.8, 1.34) | 0.10 |
| **MPB** | 465 | 7.33 (-9.06, 26.7) | 0.40 | -0.36 (-13.9, 15.3) | 0.96 | 11.1 (-5.02, 29.9) | 0.19 | -2.92 (-12.5, 7.73) | 0.58 | -3.4 (-10.8, 4.66) | 0.40 |
| **PPB** | 109 | 5.69 (-8.57, 22.2) | 0.46 | -5.9 (-17.1, 6.83) | 0.35 | 2.79 (-10.3, 17.8) | 0.69 | -7.4 (-15.4, 1.35)**†** | 0.10 | -5.37 (-11.7, 1.45) | 0.12 |
| **TCS** | 45.9 | 4.4 (-12.9, 25.2) | 0.64 | 2.31 (-13.2, 20.6) | 0.79 | 2.21 (-14.3, 21.9) | 0.81 | 5.23 (-6.44, 18.3) | 0.40 | 9.59 (0.18, 19.9) | 0.047\* |

Abbreviations: IQR (interquartile range), 2-4-DCP (2,4-diclorophenol), 2-5-DCP (2,5-diclorophenol), BP3 (benzophenone-3), BPS (bisphenol-S), BPB (butyle paraben), EPB (ethyl paraben), MPB (methyl paraben), PPB (propyl paraben), TCB (triclocarban), TCS (triclosan), CRP (C-reactive protein), IL-1β (interleukin-1β), IL-6 (interleukin-6), IL-10 (interleukin-10), TNF-α (tumor necrosis factor-α).

aLinear mixed models adjusted for specific gravity at sample collection, smoothing term for gestational age, study visit, maternal age, health insurance provider, and BMI at first study visit, and includes random subject specific intercepts

\*p <0.05 for main effect term from linear mixed models of stratified populations

†p <0.05 for statistical interaction term from linear mixed models of total study population (N=1426 samples) between toxicant and preterm birth status

**Supplemental Table 6**. Repeated measures analyses adjusted for additional toxicants with mechanistic similarities in the LIFECODES cohort: Percent change (95% CI) in plasma inflammatory marker concentrations in relation to urinary exposure biomarkers during pregnancy

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Adjusted modelsa also controlling for mono-carboxypropyl phthalate as a covariate (N=1,425 samples)** | | | | | | | | | | | |
| **Urinary Analyte** | | **CRP** | | **IL-1β** | | **IL-6** | | **IL-10** | | **TNF-α** | |
|  | IQR  (ng/mL) | %Δ (95% CI) | p-Value | %Δ (95% CI) | p-Value | %Δ (95% CI) | p-Value | %Δ (95% CI) | p-Value | %Δ (95% CI) | p-Value |
| **2-4-DCP** | 1.18 | 2.83 (-3.91, 10.0) | 0.42 | -1.11 (-7.11, 5.28) | 0.73 | -4.11 (-9.94, 2.10) | 0.19 | -1.3 (-5.82, 3.43) | 0.58 | -1.20 (-4.31, 2.0) | 0.46 |
| **2-5-DCP** | 11.0 | 10.5 (2.41, 19.3) | 0.01\* | -4.01 (-10.8, 3.25) | 0.27 | -1.68 (-8.60, 5.76) | 0.65 | 0.22 (-5.11, 5.85) | 0.94 | 0.43 (-3.24, 4.23) | 0.82 |
| **BP3** | 192 | 1.55 (-5.79, 9.46) | 0.69 | 0.66 (-6.25, 8.07) | 0.86 | -3.17 (-9.80, 3.96) | 0.37 | -0.89 (-6.03, 4.53) | 0.74 | -3.54 (-6.97, 0.01) | 0.05 |
| **BPB** | 5.12 | 7.29 (-2.11, 17.6) | 0.13 | -6.27 (-13.9, 2.06) | 0.14 | -3.60 (-11.5, 4.98) | 0.40 | 0.84 (-5.39, 7.48) | 0.80 | -0.40 (-4.64, 4.03) | 0.86 |
| **EPB** | 10.4 | 3.78 (-3.93, 12.1) | 0.35 | -7.91 (-14.3, -1.07) | 0.02\* | -4.98 (-11.6, 2.11) | 0.16 | -3.59 (-8.63, 1.74) | 0.18 | -3.04 (-6.52, 0.57) | 0.10 |
| **MPB** | 359 | 6.32 (-0.82, 14.0) | 0.08 | -0.53 (-6.78, 6.15) | 0.87 | 5.24 (-1.38, 12.3) | 0.12 | -0.13 (-4.87, 4.85) | 0.96 | 1.67 (-1.64, 5.09) | 0.33 |
| **PPB** | 98.2 | 6.98 (0.27, 14.13) | 0.04\* | -2.67 (-8.34, 3.34) | 0.38 | 1.81 (-4.14, 8.12) | 0.56 | -1.92 (-6.22, 2.59) | 0.40 | 0.11 (-2.91, 3.22) | 0.94 |
| **TCS** | 55.2 | 12.4 (3.57, 21.9) | 0.005\* | 3.96 (-3.71, 12.2) | 0.32 | 3.72 (-3.94, 12.0) | 0.35 | 8.13 (2.11, 14.5) | 0.008\* | 7.89 (3.78, 12.2) | <0.001\* |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Adjusted modelsa also controlling for bisphenol-A as a covariate (N=1,426 samples)** | | | | | | | | | | | |
| **Urinary Analyte** | | **CRP** | | **IL-1β** | | **IL-6** | | **IL-10** | | **TNF-α** | |
|  | IQR  (ng/mL) | %Δ (95% CI) | p-Value | %Δ (95% CI) | p-Value | %Δ (95% CI) | p-Value | %Δ (95% CI) | p-Value | %Δ (95% CI) | p-Value |
| **2-4-DCP** | 1.18 | 2.18 (-4.54, 9.36) | 0.53 | -1.19 (-7.19, 5.19) | 0.71 | -4.08 (-9.92, 2.14) | 0.19 | -1.36 (-5.87, 3.37) | 0.57 | -1.45 (-4.55, 1.75) | 0.37 |
| **2-5-DCP** | 11.0 | 9.61 (1.52, 18.3) | 0.02\* | -4.11 (-10.8, 3.15) | 0.26 | -1.55 (-8.49, 5.91) | 0.67 | 0.18 (-5.15, 5.80) | 0.95 | 0.08 (-3.57, 3.88) | 0.96 |
| **BP3** | 192 | 0.62 (-6.61, 8.41) | 0.87 | 0.86 (-6.01, 8.23) | 0.81 | -2.10 (-8.77, 5.06) | 0.56 | -0.56 (-5.68, 4.83) | 0.83 | -3.80 (-7.20, -0.28) | 0.04\* |
| **BPB** | 5.12 | 7.01 (-2.38, 17.3) | 0.15 | -6.48 (-14.1, 1.83) | 0.12 | -4.07 (-11.9, 4.49) | 0.34 | 0.59 (-5.63, 7.22) | 0.86 | -0.52 (-4.75, 3.90) | 0.81 |
| **EPB** | 10.4 | 3.12 (-4.54, 11.4) | 0.44 | -7.96 (-14.3, -1.13) | 0.02\* | -4.82 (-11.4, 2.28) | 0.18 | -3.60 (-8.64, 1.71) | 0.18 | -3.28 (-6.75, 0.32) | 0.07 |
| **MPB** | 359 | 5.23 (-1.83, 12.8) | 0.15 | -0.43 (-6.65, 6.21) | 0.90 | 5.89 (-0.74, 13.0) | 0.08 | 0.02 (-4.70, 4.97) | 0.99 | 1.28 (-2.0, 4.67) | 0.45 |
| **PPB** | 98.2 | 6.18 (-0.46, 13.3) | 0.07\* | -2.57 (-8.21, 3.43) | 0.39 | 2.38 (-3.57, 8.71) | 0.44 | -1.76 (-6.05, 2.73) | 0.44 | -0.16 (-3.16, 2.93) | 0.92 |
| **TCS** | 55.2 | 12.3 (3.49, 21.8) | 0.005\* | 3.67 (-3.98, 11.9) | 0.36 | 2.84 (-4.76, 11.0) | 0.48 | 7.75 (1.75, 14.1) | 0.01\* | 7.85 (3.74, 12.1) | <0.001\* |

Abbreviations: IQR (interquartile range), 2-4-DCP (2,4-diclorophenol), 2-5-DCP (2,5-diclorophenol), BP3 (benzophenone-3), BPS (bisphenol-S), BPB (butyle paraben), EPB (ethyl paraben), MPB (methyl paraben), PPB (propyl paraben), TCB (triclocarban), TCS (triclosan), CRP (C-reactive protein), IL-1β (interleukin-1β), IL-6 (interleukin-6), IL-10 (interleukin-10), TNF-α (tumor necrosis factor-α).

aLinear mixed models adjusted for specific gravity at sample collection, smoothing term for gestational age, study visit, maternal age, health insurance provider, and BMI at first study visit, and includes random subject specific intercepts

\*p <0.05