**Supporting Information**

**Use of personal care products during pregnancy in relation to urinary concentrations of select phenols: a longitudinal analysis from the SEPAGES feasibility study**

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# Table S1: Summary of the results of previous epidemiological studies looking at the associations between PCPa used in the previous 24 to 48 hours and urinary concentrations of phenols during pregnancy and PCP survey studies.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Epidemiological studies** | | | | | | | **PCP survey studies** | | |
| **Author** | **Current study**  **Nakiwala et al,** | **(Meeker et al., 2013)** | **(Braun et al., 2014)** | **(Larsson et al., 2014)** | **(Fisher et al., 2017)** | **(Ashrap et al., 2018)** | **(Dodson et al., 2012)** | **(Liao and Kannan, 2014)** | **(Lu et al., 2018)** |
| **N** | 8 women, France  PCP types reported = 23 | 105 women, Puerto Rico | 170 women, USA  PCP types reported= 13 | 98 women, Sweden | 31 women , Canada  PCP types reported = 16 | 1003 Women, Puerto Rico | USA | China and USA | China |
| **BPA** | Makeup remover | Mouthwash | NA | Colored cosmetics  Lotion/creams  Mouthwash | NA |  | Cleanser  Hair products  Lotions/creams  Nail polish  Shower gel  Sunscreen | Colored cosmetics  Hair products  Liquid soap  Lotions/creams  Shower gel  Toothpaste | Cleaner  Lotions/creams  Hair products  Masks  Shower gel  Sunscreen |
| **BPS** | Shower gel  Lip/chap stick  Cleanser |  | NA | NA | NA |  | NA | Colored cosmetics  Liquid soap  Lotions/creams  Shower gel  Toothpaste | Cleanser  Hair products  Toothpaste |
| **TCS** | Lotions/creams  Lip/chap stick | Liquid soap  Hair products | NA | NA | NA | Lotions/creams  Liquid soap | Hand soap  Toothpaste | Colored cosmetics  Hair products  Liquid soap  Lotions/creams  Shower gel  Toothpaste | Cleaner  Lotions/creams Hair products  Masks  Shower gel  Sunscreen Toothpaste |
| **BP-3** | NA | Lotions/creams  Mouthwash  Sunscreen | NA | NA | NA | Colored cosmetics Sunscreen  Lotions/creams | Sunscreen | NA | NA |
| **MP** | Makeup remover  Colored cosmetics  Bar soap  Hair products | Colored cosmetics  Lotions/creams | Total number of PCP  Colored cosmetics  Hair products Perfume /cologne  Lotions/creams, | Colored cosmetics  Lotions/creams  Mouthwash | Total number of PCP  Lotions/creams  Bar soap | Lotion  Colored cosmetics  Hair products | Colored cosmetics  Hair products  Liquid soap  Lotions/creams  Sunscreen | NA | NA |
| **EP** | Toothpaste  Lotions/creams  Deodorant  Makeup remover  Colored cosmetics  Bar soap  Hair products  Cleanser | NA | NA | Sunscreen | Total number of PCP  Lotions/creams  Cleanser | Lotions/creams  Colored cosmetics  Hair products  Nail polish | Lotions/creams  Cleanser  Colored cosmetics | NA | NA |
| **PP** | Lotions/creams  Colored cosmetics  Hair products | Colored cosmetics  Lotions/creams | Lotions/creams Colored cosmetics | Lotions/creams  Colored cosmetics, Mouthwash | Total number of PCP  Lotions/creams  Bar soap | Lotions/creams  Colored cosmetics  Hair products | NA | NA | NA |
| **BP** | Toothpaste  Deodorant Makeup remover Perfume  Lotions/creams  Colored cosmetics  Hair products | Lotions/creams  Colored cosmetics | Colored cosmetics  Hair products  Lotions/creams | NA | Total number of PCP  Lotions/creams Colored cosmetics  Deodorant  Bar soap  Toothpaste | Lotions/creams  Colored cosmetics  Nail polish | Lotions/creams  Colored cosmetics | NA | NA |

Abbreviations PCP: personal care products, BP3:benzophenone-3, BPA: bisphenol A, BPS: bisphenol S, MP: methylparaben, EP: ethylparaben, PP: propylparaben, BP: butylparaben, TCS: triclosan

N : sample size /location of study

PCP groups: hair products (shampoo and conditioner), colored cosmetics (Mascara, eyeliner, lipstick, foundation, contour, eye shadow), perfume (cologne and perfume), Lotions/creams (Body, face, hand creams), cleanser: Face or body cleanser

NA: not assessed, aOnly the PCP associated with a rise in urinary concentrations are displayed in the table.

# Table **S2**: Mediansa of phenol urinary concentrations in previous studies of epidemiological studies of pregnant women that assessed associations between PCP used in the previous 24 to 48 hours and urinary concentrations of phenols during pregnancy and PCP survey studies

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Reference | Country | N | Benzophenone-3 | Bisphenol A | Bisphenol S | Methylparaben | Ethylparaben | Propylparaben | Butylparaben | Triclosan |
| Current study | France | 8 | <LOD (<LOD- 2.4) | 1.6 (0.2-2.8) | 0.3 (0.1-0.5) | 128 (3.7- 445.5) | 6.1 (<LOD-27) | 14.9 (0.2- 94.2) | 2.0 (<LOD-10) | 1.8 (<LOD-3.4) |
| Meeker et al., 2013 | Puerto Rico | 105 | 31.3(11.5-172) | 2.5(1.3-4.4) | NA | 153 ( 57.6-381) | NA | 36.7( 10.1-130) | 0.4 (<0.2-5.5) | 26.2(1.3 -121) |
| Braun et al., 2014 | USA | 170 | NA | NA | NA | 146 (52.5-538) | NA | 39.9 (8.2-149) | NA |  |
| Larsson, 2014 | Sweden | 98 | NA | 1.29 (0.80-5.02) | NA | 11(40-680) | 2.4 (0.89-84) | 18 (3.5-280) | <LOD (<LOD-11) | <LOD (<LOD-7.3) |
| Fisher, 2017 | Canada | 31 | NA | NA | NA | 27.21 (9.73-102.5 ) | 1.87 ( 0.14- 10.72) | 4.46 ( 1.06-18.6) | 0.35 (0.5-1.83) |  |
| Ashrap, 2018 | Puerto Rico | 1003 | 27.3(11.2-119.8) | 2.0 (1.3-3.5) | 0.4 (0.2-0.9) | 92.8 (25.70-245.4) | 1.50 (0.70-8.9) | 17.8 (3.30-75.4) | 0.20 (0.10-1.8) | 15.4(3.6 ; 867.1) |

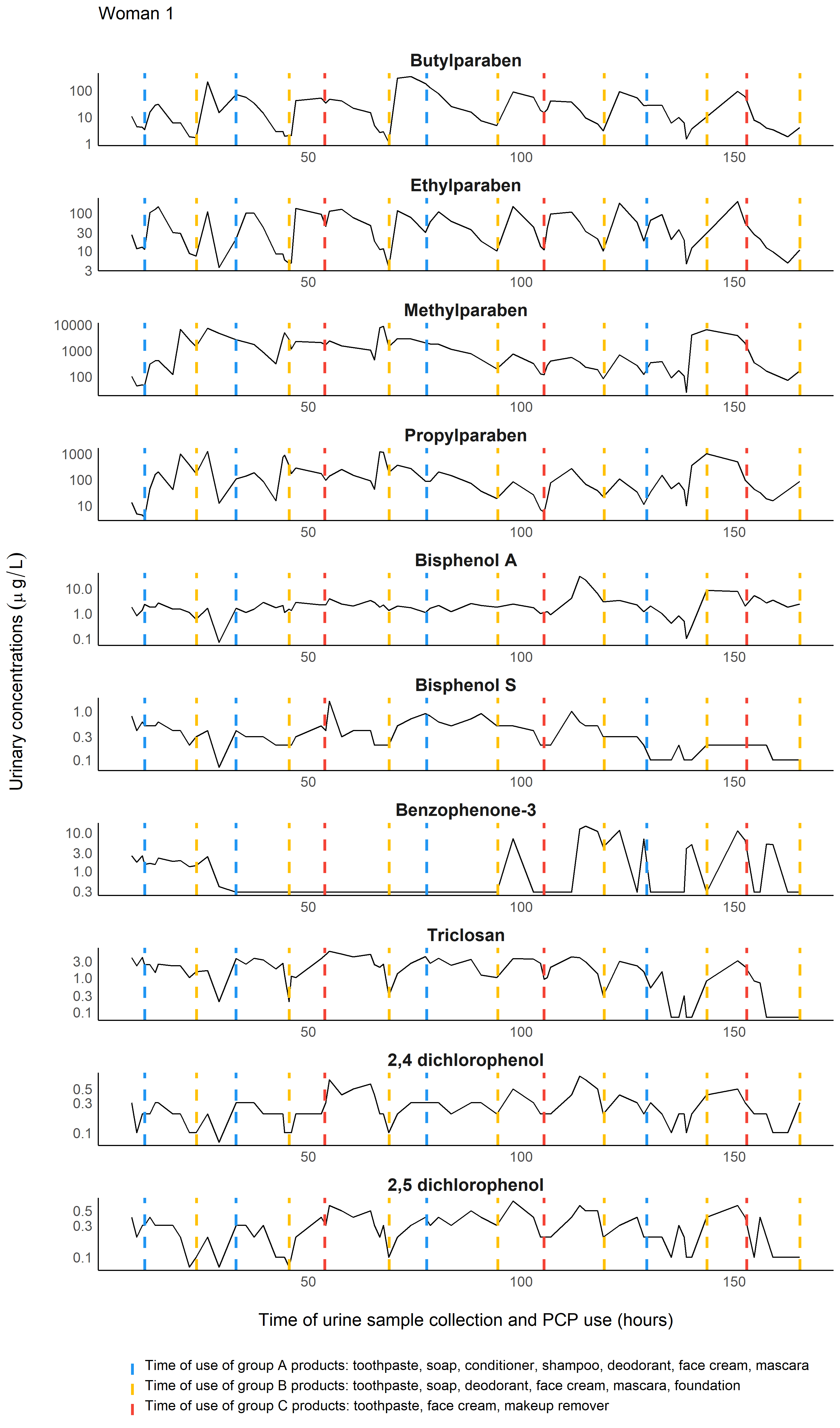
Abbreviations: LOD: Limit of detection, NA: not analyzed

aMedians with 5th -75th percentiles in parenthesis

# **Table S3**: Spearman’s correlation coefficients between phenol concentrations and specific gravity (178 urine samples of 8 pregnant women)

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **BP3** | **BPA** | **BPS** | **DC4** | **DC5** | **MP** | **EP** | **PP** | **BP** | **TCS** | **SG** |
| BP3 | 1.00 |  |  |  |  |  |  |  |  |  |  |
| BPA | 0.15 | 1.00 |  |  |  |  |  |  |  |  |  |
| BPS | 0.04 | 0.23 | 1.00 |  |  |  |  |  |  |  |  |
| DC4 | 0.04 | 0.50 | 0.42 | 1.00 |  |  |  |  |  |  |  |
| DC5 | -0.12 | 0.10 | 0.36 | 0.67 | 1.00 |  |  |  |  |  |  |
| MP | 0.24 | 0.33 | 0.19 | 0.11 | -0.40 | 1.00 |  |  |  |  |  |
| EP | 0.03 | 0.28 | 0.09 | 0.10 | -0.36 | 0.62 | 1.00 |  |  |  |  |
| PP | 0.09 | 0.29 | 0.04 | -0.08 | -0.51 | 0.64 | 0.80 | 1.00 |  |  |  |
| BP | 0.19 | 0.24 | 0.16 | 0.08 | -0.38 | 0.94 | 0.58 | 0.57 | 1.00 |  |  |
| TCS | -0.06 | 0.26 | 0.31 | 0.53 | 0.49 | 0.15 | 0.13 | -0.02 | 0.14 | 1.00 |  |
| SG | 0.01 | 0.44 | 0.32 | 0.79 | 0.67 | -0.02 | 0.03 | -0.12 | -0.01 | 0.48 | 1.00 |

Abbreviations; BP3:benzophenone-3, BPA: bisphenol A, BPS: bisphenol S, DC4; 2,4-dichlorophenol, DC5: 2,5-dichlorophenol, MP: methylparaben, EP: ethylparaben, PP: propylparaben, BP: butylparaben, TCS: triclosan, SG: specific gravity



# **Figure S1:** Variability of urinary concentrations of 10 phenols (μg/L) in spot urine samples for one woman collected over a week of follow up (N of woman 1 =72 )

# **Table S4**: Adjusted percent change (*β*) in the ln-transformed phenol urinary concentrations in relation to the total number of times PCPs were used in last 0 to 24 (N= 178 urine samples of 8 women); adjusted for time since last meal

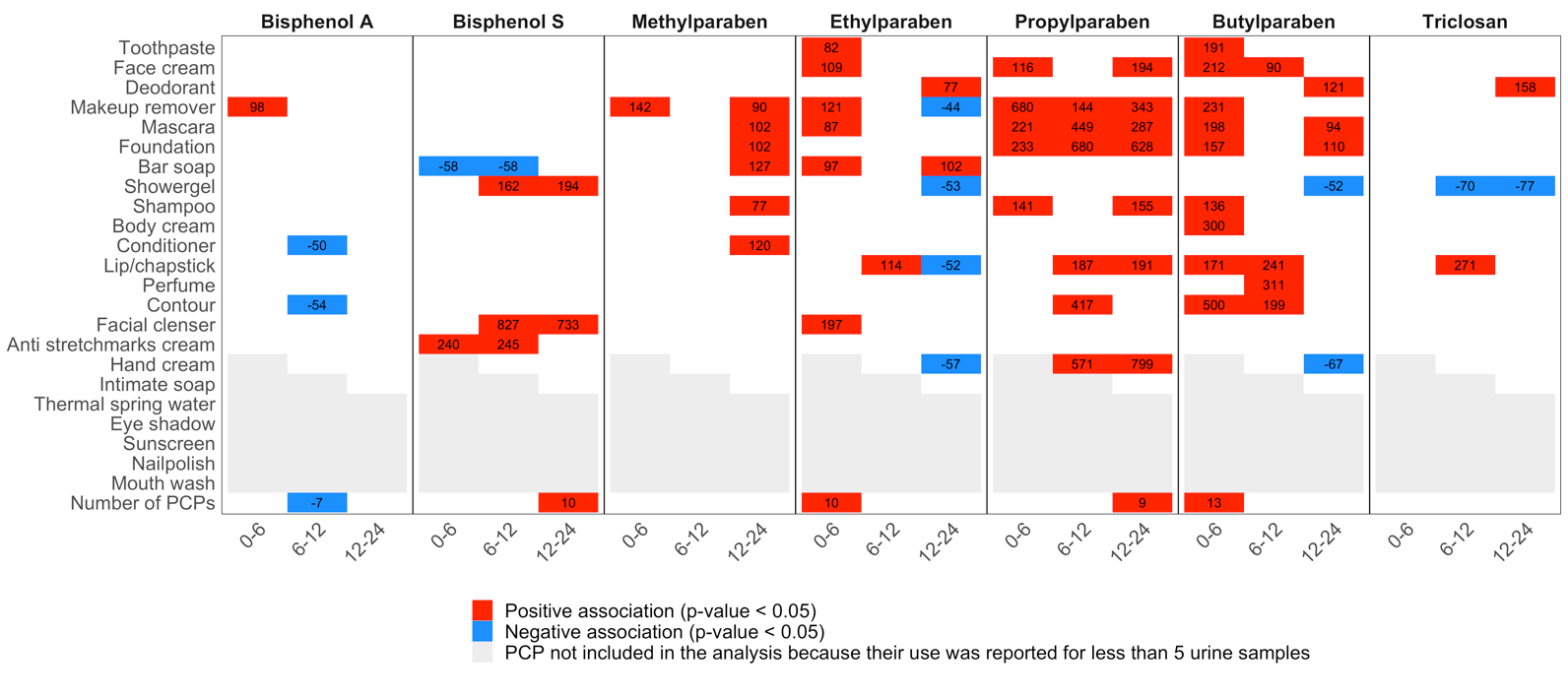
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|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 0 to 6 | |  | 6 to 12 | |  | 12 to 24 | |
|  | *β* | 95%CI |  | *β* | 95%CI |  | *β* | 95%CI |
| Bisphenol A | -2.0 | [-7.8 ; 4.3] |  | -6.8 | [-12.3 ; -0.9] |  | 3.7 | [-0.6 ; 8.1] |
| Bisphenol S | -3.4 | [-10.4 ; 4.2] |  | -4.6 | [-11.5 ; 2.8] |  | 10.0 | [4.5 ; 15.7] |
| Methylparaben | -4.2 | [-11.3 ; 3.5] |  | -0.2 | [-7.6 ; 7.8] |  | 2.7 | [-2.5 ; 8.3] |
| Ethylparaben | 10.0 | [1.8 ; 18.8] |  | 0.2 | [-7.2 ; 8.2] |  | -1.3 | [-6.3 ; 4.0] |
| Propylparaben | -3.1 | [-12.9 ; 7.6] |  | 1.0 | [-9.1 ; 12.1] |  | 8.7 | [1.2 ; 16.8] |
| Butylparaben | 12.9 | [2.9 ; 23.8] |  | 9.4 | [-0.1 ; 19.8] |  | -4.4 | [-10.2 ; 1.7] |

Effect estimates are reported as the percent change in phenol urinary concentration for an additional PCP application in the studied time window.

Adjustment factors were woman (fixed effect), specific gravity, time of urine sample collection, hour of urine sample collection, time elapse since last meal, and use of PCP in other windows other than the window considered.

Effect estimates correspond to the change in the ln concentration of phenols for one additional application of PCPs in the given time windows.

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**Figure S2**: Adjusted percent change in phenol urinary concentrations with specific PCP (yes / no) and the total number of PCP applications in the past 0 to 6, 6 to 12 and 12 to 24 hours, additionally adjusted for time since last meal.

Adjustment factors were woman (fixed effect), specific gravity, time of urine sample collection, hour of urine sample collection time since last meal and use of PCP in windows other than the window considered.

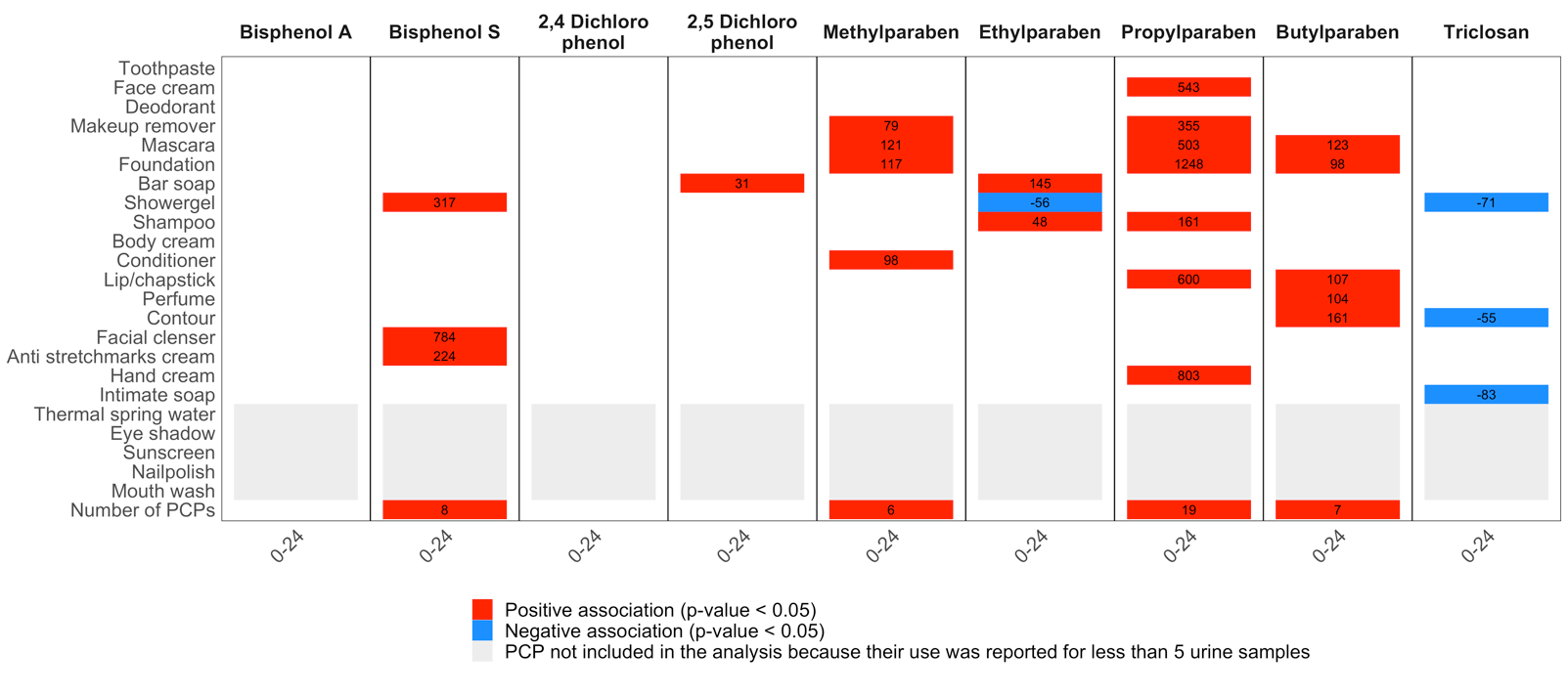
**Table S5**: Adjusted percent change (*β*) in the ln-transformed phenol urinary concentrations in relation to the total number of times PCPs were used in last 0 to 24 (N= 178 urine samples of 8 women); adjusted for gestational age

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 0 to 6 -hours | |  | 6 to 12-hours | |  | 12 to 24-hours | |
|  | *β* | 95%CI |  | *β* | 95%CI |  | *β* | 95%CI |
| Benzophenone-3 | -23.9 | [-42.4 ; 0.4] |  | -13.8 | [-34.0 ; 12.6] |  | 2.4 | [-17.3 ; 26.7] |
| Bisphenol A | -2.0 | [-7.6 ; 4.0] |  | -7.2 | [-12.6 ; -1.4] |  | 3.9 | [-0.3 ; 8.3] |
| Bisphenol S | -3.6 | [-10.3 ; 3.5] |  | -4.3 | [-11.0 ; 3.0] |  | 9.8 | [4.4 ; 15.5] |
| 2,4 dichlorophenol | -1.8 | [-4.6 ; 1.1] |  | -1.6 | [-4.4 ; 1.4] |  | 1.3 | [-0.7 ; 3.4] |
| 2,5 dichlorophenol | -1.1 | [-4.0 ; 1.8] |  | -3.1 | [-6.0 ; -0.2] |  | 1.9 | [-0.2 ; 4.1] |
| Methylparaben | -2.2 | [-9.2 ; 5.3] |  | 0.3 | [-7.0 ; 8.2] |  | 2.4 | [-2.8 ; 7.9] |
| Ethylparaben | 8.9 | [1.1 ; 17.3] |  | 0.1 | [-7.2 ; 8.0] |  | -1.2 | [-6.2 ; 4.0] |
| Propylparaben | -2.3 | [-11.6 ; 8.0] |  | 0.2 | [-9.6 ; 11.0] |  | 9.1 | [1.7 ; 17.1] |
| Butylparaben | 10.7 | [1.4 ; 20.9] |  | 6.2 | [-2.8 ; 16.0] |  | -3.0 | [-8.8 ; 3.1] |
| Triclosan | -4.0 | [-13.7 ; 6.9] |  | 1.0 | [-9.4 ; 12.6] |  | 3.1 | [-4.4 ; 11.0] |

Effect estimates are reported as the percent change in phenol urinary concentration for an additional PCP application in the studied time window.

Adjustment factors were woman (fixed effect), specific gravity, time of urine sample collection, hour of urine sample collection, gestational age, and use of PCP in other windows other than the window considered.

Effect estimates correspond to the change in the ln concentration of phenols for one additional application of PCPs in the given time windows

**Figure S3**: Adjusted percent change in phenol urinary concentrations with total number of PCP applications or single PCP used in the previous 0 to 24 hours

Adjustment factors were woman (fixed effect), specific gravity, time of urine sample collection and hour of urine sample.

# **Table S6**: Adjusted percent change (*β*) in phenol urinary concentrations with use of specific PCP (yes / no) in the past 0 to 6, 6 to 12 and 12 to 24 hours (corresponding to Figure 1)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Bisphenol A** | | | | | | | |
|  | 0-6 hours | |  | 6-12 hours | |  | 12-24 hours | |
|  | *β* | 95%CI |  | *β* | 95%CI |  | *β* | 95%CI |
| Toothpaste | -16.6 | [-42.2 ; 20.3] |  | -11.6 | [-39.7 ; 29.4] |  | -15.8 | [-52.2 ; 48.3] |
| Face cream | -22.3 | [-48.4 ; 17.2] |  | -24.8 | [-50.1 ; 13.4] |  | -10.6 | [-41.8 ; 37.4] |
| Deodorant | -31.2 | [-55.1 ; 5.6] |  | -22.2 | [-52.2 ; 26.7] |  | -11.7 | [-42.4 ; 35.1] |
| Makeup remover | 98.1 | [5.0 ; 273.8] |  | 12.8 | [-33.2 ; 90.4] |  | -9.8 | [-41.7 ; 39.8] |
| Mascara | -10.5 | [-42.2 ; 38.6] |  | -7.6 | [-46.5 ; 59.6] |  | 22.1 | [-22.8 ; 93.1] |
| Foundation | -15.0 | [-46.0 ; 33.7] |  | -21.5 | [-55.1 ; 37.1] |  | 0.4 | [-38.1 ; 62.9] |
| Bar soap | -5.5 | [-44.1 ; 59.7] |  | -3.3 | [-46.2 ; 73.8] |  | 18.4 | [-27.0 ; 92.0] |
| Shower gel | -35.4 | [-59.4 ; 2.7] |  | -7.4 | [-50.3 ; 72.4] |  | -16.4 | [-46.9 ; 31.6] |
| Shampoo | -37.2 | [-61.7 ; 2.8] |  | -32.3 | [-61.5 ; 18.9] |  | 5.8 | [-30.3 ; 60.5] |
| Body cream | -21.9 | [-58.6 ; 47.1] |  | -2.9 | [-46.8 ; 77.3] |  | -5.2 | [-39.5 ; 48.5] |
| Conditioner | -44.1 | [-69.6 ; 2.7] |  | -48.8 | [-73.2 ; -2.3] |  | -15.7 | [-50.7 ; 44.1] |
| Lip/Chapstick | -44.9 | [-67.6 ; -6.5] |  | -41.6 | [-66.7 ; 2.6] |  | 8.0 | [-32.7 ; 73.4] |
| Perfume | -35.7 | [-64.8 ; 17.5] |  | 33.4 | [-32.7 ; 164.6] | | 50.7 | [-14.9 ; 167.0] |
| Contour | -16.2 | [-54.5 ; 54.4] |  | -53.4 | [-77.3 ; -4.5] |  | -26.5 | [-56.8 ; 25.3] |
| Facial cleanser | -26.9 | [-65.3 ; 53.9] |  | -12.8 | [-56.5 ; 75.2] |  | 2.9 | [-45.0 ; 92.5] |
| Anti-stretchmarks' cream | 3.4 | [-60.5 ; 170.5] |  | -50.1 | [-81.3 ; 32.9] |  | -46.5 | [-73.7 ; 8.7] |
| Hand cream |  |  |  | 0.2 | [-59.8 ; 149.9] | | 44.6 | [-21.0 ; 164.4] |
| Intimate soap |  |  |  |  |  |  | 35.9 | [-50.9 ; 275.7] |
| Thermal spring water |  |  |  |  |  |  |  |  |
|  | **Bisphenol S** | | | | | | | |
| Toothpaste | -9.2 | [-42.0 ; 42.2] |  | 19.2 | [-25.3 ; 90.2] |  | 41.3 | [-29.4 ; 182.8] |
| Face cream | -1.7 | [-40.9 ; 63.5] |  | 11.7 | [-32.8 ; 85.7] |  | 11.7 | [-34.4 ; 90.3] |
| Deodorant | -1.2 | [-40.9 ; 65.0] |  | -7.7 | [-48.6 ; 65.7] |  | 46.5 | [-12.2 ; 144.2] |
| Makeup remover | 0.8 | [-54.8 ; 124.7] |  | 51.9 | [-21.6 ; 194.1] | | -2.0 | [-43.6 ; 70.3] |
| Mascara | -4.9 | [-44.1 ; 61.9] |  | -6.5 | [-51.8 ; 81.5] |  | 64.3 | [-5.9 ; 186.9] |
| Foundation | -0.5 | [-42.7 ; 72.9] |  | -12.0 | [-55.4 ; 73.7] |  | 51.5 | [-16.0 ; 173.1] |
| Bar soap | -58.2 | [-77.1 ; -23.6] |  | -58.3 | [-78.7 ; -18.1] | | -2.3 | [-44.0 ; 70.3] |
| Shower gel | 28.1 | [-27.0 ; 124.9] |  | 162.4 | [23.4 ; 458.2] |  | 195.3 | [70.3 ; 412.3] |
| Shampoo | -33.3 | [-63.1 ; 20.5] |  | -25.6 | [-62.2 ; 46.2] |  | 42.2 | [-13.8 ; 134.5] |
| Body cream | 61.6 | [-27.6 ; 260.4] |  | 40.6 | [-34.4 ; 201.5] | | 21.7 | [-31.0 ; 115.0] |
| Conditioner | -46.8 | [-74.4 ; 10.5] |  | -51.2 | [-77.5 ; 6.1] |  | 14.5 | [-39.9 ; 118.0] |
| Lip/Chapstick | 80.8 | [-7.7 ; 254.2] |  | -7.5 | [-54.7 ; 89.2] |  | 64.8 | [-9.7 ; 200.5] |
| Perfume | -17.9 | [-61.6 ; 75.4] |  | 45.2 | [-38.6 ; 243.4] | | -18.5 | [-60.3 ; 67.4] |
| Contour | 70.6 | [-21.4 ; 270.1] |  | 100.0 | [-19.6 ; 397.8] | | 83.7 | [-6.5 ; 261.1] |
| Facial cleanser | 24.9 | [-39.6 ; 158.3] |  | 799.0 | [355.0 ; 1676.2] | | 749.0 | [360.3 ; 1466.0] |
| Anti-stretchmarks' cream | 234.2 | [2.3 ; 991.7] |  | 238.0 | [1.2 ; 1028.9] |  | 119.7 | [-8.3 ; 426.4] |
| Hand cream |  |  |  | -9.2 | [-70.9 ; 182.9] | | -5.5 | [-55.4 ; 100.2] |
| Intimate soap |  |  |  |  |  |  | 6.2 | [-70.3 ; 279.5] |
| Thermal spring water |  |  |  |  |  |  | 541.6 | [-48.7 ; 7922.8] |
|  | **2,4 Dichlorophenol** | | | | | | | |
| Toothpaste | 1.1 | [-15.0 ; 20.2] |  | -2.6 | [-18.7 ; 16.7] |  | 8.5 | [-17.0 ; 41.8] |
| Face cream | -9.1 | [-25.1 ; 10.3] |  | 1.0 | [-16.8 ; 22.5] |  | -9.7 | [-26.3 ; 10.6] |
| Deodorant | 16.8 | [-4.2 ; 42.3] |  | 28.7 | [2.7 ; 61.2] |  | 24.4 | [2.2 ; 51.6] |
| Makeup remover | 11.9 | [-17.6 ; 51.8] |  | 0.6 | [-21.8 ; 29.4] |  | -6.5 | [-24.3 ; 15.4] |
| Mascara | -9.5 | [-26.4 ; 11.1] |  | -0.8 | [-23.2 ; 28.3] |  | 11.9 | [-9.8 ; 38.8] |
| Foundation | -9.0 | [-26.6 ; 12.7] |  | -1.9 | [-24.6 ; 27.7] |  | 5.9 | [-15.7 ; 33.0] |
| Bar soap | -9.9 | [-29.4 ; 15.0] |  | 16.3 | [-11.5 ; 52.9] |  | 5.8 | [-15.5 ; 32.5] |
| Shower gel | -22.2 | [-37.4 ; -3.2] |  | -18.1 | [-38.8 ; 9.7] |  | -15.6 | [-31.8 ; 4.5] |
| Shampoo | -13.3 | [-31.4 ; 9.7] |  | -1.1 | [-24.4 ; 29.3] |  | 4.8 | [-14.1 ; 27.8] |
| Body cream | -0.4 | [-26.2 ; 34.2] |  | 24.2 | [-6.5 ; 65.0] |  | 4.3 | [-15.6 ; 28.9] |
| Conditioner | -18.9 | [-39.4 ; 8.4] |  | -1.4 | [-27.6 ; 34.2] |  | -2.3 | [-24.4 ; 26.2] |
| Lip/Chapstick | -1.8 | [-24.0 ; 26.9] |  | 14.6 | [-12.8 ; 50.6] |  | 0.4 | [-20.2 ; 26.3] |
| Perfume | -1.9 | [-26.6 ; 31.1] |  | 2.4 | [-26.3 ; 42.2] |  | -8.8 | [-30.7 ; 20.0] |
| Contour | -6.3 | [-30.1 ; 25.6] |  | -23.8 | [-46.0 ; 7.5] |  | -6.4 | [-27.5 ; 20.8] |
| Facial cleanser | -15.2 | [-39.9 ; 19.6] |  | 33.0 | [-3.7 ; 83.6] |  | 32.2 | [-1.1 ; 76.7] |
| Anti-stretchmarks' cream | -34.5 | [-58.3 ; 2.9] |  | -41.0 | [-62.7 ; -6.5] |  | -17.9 | [-41.2 ; 14.5] |
| Hand cream |  |  |  | -3.7 | [-37.7 ; 48.8] |  | -6.5 | [-29.8 ; 24.7] |
| Intimate soap |  |  |  |  |  |  | -33.6 | [-57.2 ; 3.2] |
| Thermal spring water |  |  |  |  |  |  | 44.4 | [-45.5 ; 282.6] |
|  | **2,5 Dichlorophenol** | | | | | | | |
| Toothpaste | -4.4 | [-20.1 ; 14.4] |  | 0.6 | [-16.5 ; 21.2] |  | 23.7 | [-6.2 ; 63.1] |
| Face cream | -12.1 | [-28.2 ; 7.5] |  | -7.1 | [-24.1 ; 13.7] |  | 5.8 | [-14.4 ; 30.7] |
| Deodorant | -8.4 | [-25.6 ; 12.9] |  | 11.3 | [-12.3 ; 41.3] |  | 19.7 | [-2.8 ; 47.5] |
| Makeup remover | 6.3 | [-23.1 ; 46.9] |  | 16.2 | [-11.0 ; 51.7] |  | 15.9 | [-7.3 ; 44.8] |
| Mascara | -14.0 | [-30.5 ; 6.4] |  | -6.7 | [-28.5 ; 21.7] |  | 10.6 | [-11.5 ; 38.3] |
| Foundation | -14.1 | [-31.1 ; 7.2] |  | -7.9 | [-29.8 ; 21.0] |  | 6.9 | [-15.6 ; 35.4] |
| Bar soap | -5.2 | [-26.5 ; 22.4] |  | 3.3 | [-22.4 ; 37.3] |  | 22.4 | [-3.2 ; 54.9] |
| Shower gel | -9.7 | [-28.6 ; 14.3] |  | 4.9 | [-23.5 ; 43.9] |  | -0.1 | [-20.6 ; 25.8] |
| Shampoo | -3.8 | [-24.8 ; 22.9] |  | -8.2 | [-30.7 ; 21.5] |  | 12.0 | [-9.0 ; 37.8] |
| Body cream | -12.6 | [-36.4 ; 20.1] |  | 2.2 | [-24.5 ; 38.3] |  | 5.3 | [-15.9 ; 32.0] |
| Conditioner | -6.5 | [-31.0 ; 26.8] |  | -5.5 | [-31.6 ; 30.6] |  | 15.1 | [-12.0 ; 50.6] |
| Lip/Chapstick | -0.5 | [-24.3 ; 30.7] |  | 3.0 | [-23.0 ; 37.7] |  | -5.5 | [-25.9 ; 20.7] |
| Perfume | 5.8 | [-22.2 ; 44.0] |  | 5.9 | [-25.3 ; 50.2] |  | 3.6 | [-22.6 ; 38.8] |
| Contour | 10.4 | [-19.1 ; 50.6] |  | 23.9 | [-14.1 ; 78.7] |  | 4.6 | [-20.2 ; 37.2] |
| Facial cleanser | -14.0 | [-40.6 ; 24.5] |  | 14.8 | [-18.8 ; 62.4] |  | 26.2 | [-7.6 ; 72.4] |
| Anti-stretchmarks' cream | -38.2 | [-61.8 ; -0.1] |  | -15.4 | [-48.2 ; 38.1] |  | 16.5 | [-18.3 ; 66.2] |
| Hand cream |  |  |  | -0.5 | [-61.7 ; -5.4] |  | -12.5 | [-35.1 ; 18.1] |
| Intimate soap |  |  |  |  |  |  | 11.4 | [-32.9 ; 84.9] |
| Thermal spring water |  |  |  |  |  |  | 40.3 | [-50.1 ; 294.6] |
|  | **Methylparaben** | | | | | | | |
| Toothpaste | 35.3 | [-12.2 ; 108.6] |  | 17.1 | [-25.3 ; 83.8] |  | 45.9 | [-25.2 ; 184.8] |
| Face cream | 51.9 | [-6.5 ; 146.8] |  | 27.3 | [-21.6 ; 106.6] | | 16.4 | [-29.9 ; 93.4] |
| Deodorant | -16.9 | [-49.8 ; 37.5] |  | 39.5 | [-21.4 ; 147.9] | | 51.0 | [-8.6 ; 149.4] |
| Makeup remover | 142.1 | [9.5 ; 435.1] |  | 54.2 | [-19.9 ; 196.6] | | 91.7 | [10.9 ; 231.2] |
| Mascara | 45.9 | [-12.4 ; 142.9] |  | 44.4 | [-23.5 ; 172.9] | | 93.5 | [13.4 ; 230.2] |
| Foundation | 19.5 | [-29.6 ; 102.9] |  | 35.6 | [-29.2 ; 159.9] | | 95.3 | [11.1 ; 243.2] |
| Bar soap | 12.4 | [-38.7 ; 106.2] |  | 17.8 | [-40.2 ; 132.2] | | 108.2 | [19.0 ; 264.1] |
| Shower gel | -26.2 | [-58.9 ; 32.6] |  | -4.6 | [-56.6 ; 109.4] | | -29.6 | [-60.3 ; 25.0] |
| Shampoo | 11.3 | [-38.1 ; 99.9] |  | 29.0 | [-33.9 ; 151.8] | | 71.4 | [4.5 ; 181.3] |
| Body cream | 16.4 | [-47.5 ; 157.9] |  | 15.6 | [-45.8 ; 146.3] | | 28.6 | [-26.8 ; 126.0] |
| Conditioner | 6.5 | [-48.3 ; 119.5] |  | 10.3 | [-48.8 ; 137.9] | | 113.6 | [12.9 ; 304.2] |
| Lip/Chapstick | 21.1 | [-38.3 ; 137.7] |  | 71.4 | [-16.3 ; 251.2] | | -30.8 | [-62.1 ; 26.5] |
| Perfume | -5.1 | [-55.9 ; 104.4] |  | 51.9 | [-36.4 ; 262.8] | | -21.3 | [-62.0 ; 62.8] |
| Contour | 49.0 | [-31.5 ; 224.1] |  | -17.7 | [-67.0 ; 105.3] | | -17.7 | [-58.2 ; 62.1] |
| Facial cleanser | 25.5 | [-50.6 ; 219.0] |  | 50.5 | [-37.2 ; 260.8] | | -10.0 | [-59.0 ; 97.6] |
| Anti-stretchmarks' cream | -64.8 | [-89.6 ; 18.6] |  | -44.7 | [-84.0 ; 90.9] |  | -7.3 | [-62.2 ; 127.5] |
| Hand cream |  |  |  | 10.0 | [-65.1 ; 246.7] | | 65.1 | [-22.7 ; 252.8] |
| Intimate soap |  |  |  |  |  |  | 48.8 | [-56.6 ; 410.7] |
| Thermal spring water |  |  |  |  |  |  | -55.2 | [-96.7 ; 509.6] |
|  | **Ethylparaben** | | | | | | | |
| Toothpaste | 70.8 | [10.5 ; 164.1] |  | -0.8 | [-36.9 ; 56.2] |  | 46.2 | [-25.4 ; 186.6] |
| Face cream | 90.3 | [16.4 ; 211.1] |  | 23.9 | [-24.2 ; 102.4] | | -8.5 | [-45.3 ; 53.1] |
| Deodorant | 37.1 | [-17.8 ; 128.4] |  | -4.4 | [-46.6 ; 71.2] |  | 71.8 | [3.3 ; 185.7] |
| Makeup remover | 121.2 | [2.3 ; 378.0] |  | -36.0 | [-66.1 ; 20.8] |  | -44.1 | [-67.1 ; -4.9] |
| Mascara | 82.8 | [10.1 ; 203.6] |  | -41.5 | [-68.9 ; 10.2] |  | 14.3 | [-32.9 ; 94.4] |
| Foundation | 72.8 | [2.0 ; 192.6] |  | -44.4 | [-70.9 ; 6.3] |  | 15.6 | [-34.1 ; 102.7] |
| Bar soap | 103.5 | [9.6 ; 277.7] |  | 64.9 | [-17.5 ; 229.3] | | 91.5 | [8.3 ; 238.7] |
| Shower gel | -38.6 | [-65.5 ; 9.1] |  | -43.0 | [-73.6 ; 23.5] |  | -53.8 | [-73.7 ; -18.8] |
| Shampoo | 75.4 | [-3.6 ; 219.2] |  | 10.5 | [-44.2 ; 119.0] | | 42.3 | [-14.2 ; 136.1] |
| Body cream | 114.5 | [-2.7 ; 372.5] |  | 30.0 | [-38.6 ; 175.5] | | -9.9 | [-48.5 ; 57.7] |
| Conditioner | 42.2 | [-32.8 ; 200.8] |  | 8.1 | [-51.2 ; 139.4] | | 44.7 | [-25.3 ; 180.1] |
| Lip/Chapstick | 41.1 | [-27.2 ; 173.3] |  | 114.5 | [6.2 ; 333.6] |  | -52.1 | [-73.5 ; -13.5] |
| Perfume | 72.5 | [-19.5 ; 269.8] |  | -3.1 | [-59.2 ; 130.2] | | 8.0 | [-47.6 ; 122.5] |
| Contour | 86.6 | [-13.1 ; 300.8] |  | -0.8 | [-59.6 ; 143.9] | | -37.9 | [-68.1 ; 20.9] |
| Facial cleanser | 201.4 | [21.8 ; 646.1] |  | -49.1 | [-78.2 ; 19.0] |  | -32.0 | [-68.3 ; 45.8] |
| Anti-stretchmarks' cream | -66.3 | [-89.9 ; 12.5] |  | -15.1 | [-75.1 ; 189.9] | | 26.4 | [-48.1 ; 207.7] |
| Hand cream |  |  |  | 68.5 | [-44.4 ; 410.5] | | -57.2 | [-79.4 ; -10.9] |
| Intimate soap |  |  |  |  |  |  | 169.2 | [-23.2 ; 844.0] |
| Thermal spring water |  |  |  |  |  |  | 363.4 | [-62.9 ; 5684.6] |
|  | **Propylparaben** | | | | | | | |
| Toothpaste | 11.5 | [-39.4 ; 104.9] |  | 6.7 | [-43.4 ; 101.0] | | 143.6 | [-4.9 ; 524.1] |
| Face cream | 112.3 | [9.4 ; 312.0] |  | 52.0 | [-21.6 ; 194.9] | | 196.1 | [47.9 ; 492.7] |
| Deodorant | -21.8 | [-61.9 ; 60.5] |  | 46.2 | [-35.5 ; 231.6] | | 44.6 | [-29.3 ; 195.7] |
| Makeup remover | 679.6 | [173.0 ; 2126.4] | | 146.9 | [3.9 ; 486.7] |  | 341.5 | [114.1 ; 810.3] |
| Mascara | 217.8 | [60.6 ; 528.9] |  | 449.3 | [134.3 ; 1187.6] | | 288.8 | [90.1 ; 695.0] |
| Foundation | 236.6 | [71.6 ; 560.0] |  | 680.2 | [240.8 ; 1686.2] | | 625.4 | [253.8 ; 1387.6] |
| Bar soap | -16.4 | [-65.2 ; 101.1] |  | -41.8 | [-78.2 ; 55.3] |  | -3.3 | [-56.9 ; 117.0] |
| Shower gel | 51.1 | [-33.4 ; 242.8] |  | 82.7 | [-39.1 ; 448.3] | | -8.4 | [-58.9 ; 104.2] |
| Shampoo | 139.9 | [6.6 ; 440.1] |  | 102.3 | [-19.9 ; 411.1] | | 150.9 | [26.4 ; 398.2] |
| Body cream | 11.2 | [-63.4 ; 237.4] |  | 87.2 | [-34.8 ; 437.6] | | 15.8 | [-47.3 ; 154.2] |
| Conditioner | 37.7 | [-51.2 ; 288.4] |  | 1.6 | [-66.2 ; 205.6] | | 80.0 | [-27.9 ; 349.1] |
| Lip/Chapstick | -1.7 | [-60.5 ; 144.9] |  | 187.9 | [9.0 ; 660.3] |  | 190.2 | [28.3 ; 556.2] |
| Perfume | -39.5 | [-79.3 ; 77.0] |  | 15.5 | [-65.8 ; 290.1] | | 59.8 | [-42.2 ; 342.0] |
| Contour | 117.2 | [-24.9 ; 528.3] |  | 416.5 | [48.0 ; 1702.8] | | 69.8 | [-32.8 ; 328.8] |
| Facial cleanser | 125.6 | [-38.2 ; 723.3] |  | 74.9 | [-48.0 ; 488.1] | | -22.5 | [-74.0 ; 130.6] |
| Anti-stretchmarks' cream | -23.5 | [-86.2 ; 325.5] |  | 57.5 | [-72.6 ; 804.2] | | 14.9 | [-67.6 ; 307.9] |
| Hand cream |  |  |  | 569.8 | [61.7 ; 2674.0] | | 802.7 | [252.8 ; 2209.6] |
| Intimate soap |  |  |  |  |  |  | -21.7 | [-86.5 ; 354.9] |
| Thermal spring water |  |  |  |  |  |  | 47.6 | [-96.1 ; 5431.1] |
|  | **Butylparaben** | | | | | | | |
| Toothpaste | 142.0 | [42.6 ; 310.6] |  | 22.4 | [-29.4 ; 112.2] | | 32.6 | [-41.6 ; 201.2] |
| Face cream | 138.3 | [33.0 ; 327.0] |  | 73.0 | [-3.5 ; 210.0] |  | -17.2 | [-55.0 ; 52.5] |
| Deodorant | 30.6 | [-28.5 ; 138.6] |  | 12.9 | [-43.5 ; 125.7] | | 117.6 | [18.6 ; 299.2] |
| Makeup remover | 230.8 | [31.2 ; 734.1] |  | 7.2 | [-50.3 ; 131.4] | | -41.6 | [-69.3 ; 10.9] |
| Mascara | 174.3 | [50.6 ; 399.5] |  | 19.5 | [-43.7 ; 153.6] | | 103.8 | [8.9 ; 281.5] |
| Foundation | 141.7 | [29.9 ; 349.7] |  | -0.5 | [-54.0 ; 115.1] | | 114.8 | [10.8 ; 316.2] |
| Bar soap | 71.9 | [-17.4 ; 257.7] |  | -5.4 | [-58.6 ; 115.8] | | 83.8 | [-7.5 ; 265.4] |
| Shower gel | -14.8 | [-58.3 ; 74.2] |  | 54.8 | [-41.6 ; 309.8] | | -51.1 | [-75.6 ; -2.0] |
| Shampoo | 135.6 | [16.6 ; 376.0] |  | 4.8 | [-53.4 ; 135.7] | | 41.5 | [-21.6 ; 155.6] |
| Body cream | 275.9 | [43.5 ; 884.7] |  | -3.9 | [-62.5 ; 146.1] | | -14.0 | [-56.5 ; 69.9] |
| Conditioner | 56.3 | [-35.0 ; 275.6] |  | -48.7 | [-79.6 ; 28.6] |  | 44.1 | [-32.9 ; 209.4] |
| Lip/Chapstick | 151.8 | [10.7 ; 472.8] |  | 231.6 | [39.9 ; 686.2] |  | -33.5 | [-67.8 ; 37.3] |
| Perfume | 102.8 | [-18.0 ; 401.4] |  | 310.2 | [46.2 ; 1050.4] | | 36.4 | [-42.7 ; 224.7] |
| Contour | 447.2 | [126.5 ; 1222.2] | | 205.1 | [8.2 ; 760.3] |  | -27.0 | [-66.2 ; 57.5] |
| Facial cleanser | 100.6 | [-34.1 ; 510.2] |  | -47.5 | [-81.4 ; 48.4] |  | -5.3 | [-64.0 ; 149.0] |
| Anti-stretchmarks' cream | -63.3 | [-91.4 ; 57.2] |  | -51.4 | [-89.7 ; 129.3] | | -64.6 | [-88.5 ; 8.8] |
| Hand cream |  |  |  | 31.6 | [-64.2 ; 384.3] | | -67.2 | [-86.8 ; -18.5] |
| Intimate soap |  |  |  |  |  |  | 22.7 | [-77.9 ; 582.3] |
| Thermal spring water |  |  |  |  |  |  | 41.4 | [-93.3 ; 2885.1] |
|  | **Triclosan** | | | | | | | |
| Toothpaste | 45.8 | [-23.3 ; 177.0] |  | 26.5 | [-35.3 ; 147.4] | | 89.6 | [-29.7 ; 411.4] |
| Face cream | 34.9 | [-34.2 ; 176.7] |  | 36.8 | [-33.4 ; 180.9] | | -26.8 | [-65.5 ; 55.2] |
| Deodorant | 63.5 | [-22.3 ; 243.8] |  | 57.7 | [-32.8 ; 270.4] | | 144.3 | [16.6 ; 412.2] |
| Makeup remover | -3.6 | [-70.9 ; 219.8] |  | -31.2 | [-74.4 ; 85.2] |  | -25.8 | [-67.6 ; 69.9] |
| Mascara | -25.7 | [-65.5 ; 60.1] |  | 2.7 | [-60.8 ; 168.7] | | 5.4 | [-52.9 ; 135.9] |
| Foundation | -29.1 | [-67.8 ; 56.5] |  | 14.7 | [-56.8 ; 204.9] | | 38.8 | [-40.2 ; 222.3] |
| Bar soap | 18.1 | [-52.3 ; 192.6] |  | 146.4 | [-11.3 ; 584.2] | | 94.5 | [-15.6 ; 348.4] |
| Shower gel | -24.5 | [-67.1 ; 73.2] |  | -69.6 | [-90.2 ; -5.9] |  | -77.8 | [-90.1 ; -49.9] |
| Shampoo | 34.9 | [-43.9 ; 224.5] |  | 51.6 | [-45.2 ; 319.1] | | 27.6 | [-39.0 ; 167.2] |
| Body cream | -9.7 | [-72.2 ; 193.9] |  | -1.7 | [-68.1 ; 202.8] | | -15.8 | [-63.5 ; 94.5] |
| Conditioner | -40.1 | [-79.9 ; 78.5] |  | 6.7 | [-67.2 ; 247.8] | | 10.4 | [-57.6 ; 187.1] |
| Lip/Chapstick | 109.8 | [-21.7 ; 461.9] |  | 283.9 | [34.6 ; 995.0] |  | 2.4 | [-57.5 ; 146.9] |
| Perfume | 23.7 | [-60.3 ; 285.2] |  | 59.7 | [-55.9 ; 479.0] | | -13.9 | [-71.0 ; 155.7] |
| Contour | -14.7 | [-72.7 ; 166.8] |  | -21.1 | [-79.4 ; 201.5] | | -57.5 | [-84.3 ; 15.0] |
| Facial cleanser | 6.9 | [-73.3 ; 327.3] |  | 126.1 | [-37.6 ; 718.5] | | 53.9 | [-51.6 ; 390.0] |
| Anti-stretchmarks' cream | -65.4 | [-94.2 ; 106.5] |  | -82.1 | [-97.1 ; 11.9] |  | -38.2 | [-83.5 ; 131.4] |
| Hand cream |  |  |  | 114.2 | [-60.3 ; 1056.5] | | 20.4 | [-60.5 ; 266.9] |
| Intimate soap |  |  |  |  |  |  | -86.0 | [-97.8 ; -9.0] |
| Thermal spring water |  |  |  |  |  |  | 186.5 | [-93.8 ; 13210.6] |

Effect estimates are reported as the percent change in phenol urinary concentration in a period in which a PCP had been used, compared to a period without PCP use.

Adjustment factors were woman (fixed effect), specific gravity, day and hour of urine sample collection and use of PCP in other windows than the window considered

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