

Concentrations of the Sunscreen Agent, Benzophenone-3, in Residents of the United States: National Health and Nutrition Examination Survey 2003–2004

**Supplemental Material**

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Table S1. Adjusted least square geometric mean (LSGM) concentrations (and 95% confidence intervals [CIs]) of benzophenone-3 (in µg/L) in various demographic groups of adults 20 years of age and older<sup>a</sup>: Data from the National Health and Nutrition Examination Survey, 2003–2004

| Variable                        | LSGM (95% CI)     |
|---------------------------------|-------------------|
| Male: log creatinine P25        | 8 (5.7–11.1)      |
| Male: log creatinine P50        | 15.3 (11.7–20)    |
| Male: log creatinine P75        | 24.5 (18.4–32.5)  |
| Male: log creatinine P99        | 59.4 (38.6–91.4)  |
| Female: log creatinine P25      | 27.2 (20–37)      |
| Female: log creatinine P50      | 40.2 (30.9–52.4)  |
| Female: log creatinine P75      | 53.3 (40.2–70.8)  |
| Female: log creatinine P99      | 90.9 (60.8–135.9) |
| Mexican American: 20–29 years   | 13.1 (7.1–24.2)   |
| Mexican American: 30–39 years   | 21.7 (13.6–34.7)  |
| Mexican American: 40–49 years   | 18.4 (8.5–39.6)   |
| Mexican American: ≥50 years     | 16.2 (8–32.8)     |
| Non-Hispanic white: 20–29 years | 41.7 (24.9–69.6)  |
| Non-Hispanic white: 30–39 years | 27.4 (15.6–48.1)  |
| Non-Hispanic white: 40–49 years | 41.8 (26.1–67)    |

Non-Hispanic white:  $\geq 50$  years 22.1 (16.2–30.1)

Non-Hispanic black: 20–29 years 6.3 (5–8)

Non-Hispanic black: 30–39 years 8.2 (4.6–14.6)

Non-Hispanic black: 40–49 years 10 (5.8–17.2)

Non-Hispanic black:  $\geq 50$  years 11.2 (6.6–19.2)

<sup>a</sup>Log creatinine P25, 1.81; Log creatinine P50, 2.06; Log creatinine P75, 2.24; Log creatinine P99, 2.58.

Table S2. Significant differences between adjusted least squares geometric mean concentrations of benzophenone-3 for various demographic groups of adults 20 years of age and older<sup>a</sup>: Data from National Health and Nutrition Examination Survey, 2003–2004

| Difference  | P value |
|---|---------|
| Male vs female: log creatinine P25                        | <0.001  |
| Male vs female: log creatinine P50                        | <0.001  |
| Male vs female: log creatinine P75                        | <0.001  |
| Male vs female: log creatinine P99                        | 0.04    |
| Mexican American vs non-Hispanic white: 20–39 years       | 0.01    |
| Mexican American vs non-Hispanic white: 30–39 years       | 0.58    |
| Mexican American vs non-Hispanic white: 40–49 years       | 0.08    |
| Mexican American vs non-Hispanic white: $\geq 50$ years   | 0.49    |
| Mexican American vs non-Hispanic black: 20–39 years       | 0.06    |
| Mexican American vs non-Hispanic black: 30–39 years       | 0.01    |
| Mexican American vs non-Hispanic black: 40–49 years       | 0.25    |
| Mexican American vs non-Hispanic black: $\geq 50$ years   | 0.45    |
| Non-Hispanic white vs non-Hispanic black: 20–39 years     | <0.001  |
| Non-Hispanic white vs non-Hispanic black: 30–39 years     | <0.001  |
| Non-Hispanic white vs non-Hispanic black: 40–49 years     | <0.001  |
| Non-Hispanic white vs non-Hispanic black: $\geq 50$ years | 0.01    |

<sup>a</sup>Log creatinine P25, 1.81; Log creatinine P50, 2.06; Log creatinine P75, 2.24; Log creatinine P90, 2.58.

Table S3. Adjusted least square geometric mean concentrations (LSGM) (and 95% confidence intervals [CI]) of benzophenone-3 (in µg/L) in various demographic groups of children and adolescents<sup>a</sup>: Data from National Health and Nutrition Examination Survey, 2003–2004

| Variable                    | LSGM (95% CI)    |
|-----------------------------|------------------|
| Male                        | 16.1 (13.2–19.8) |
| Female                      | 30.2 (21.4–42.6) |
| Mexican American: Age P25   | 14.8 (10.5–20.9) |
| Mexican American: Age P50   | 15.9 (12.4–20.4) |
| Mexican American: Age P75   | 17.1 (12.3–23.8) |
| Mexican American: Age P90   | 17.8 (11.8–26.9) |
| Non-Hispanic white: Age P25 | 36.1 (24.8–52.4) |
| Non-Hispanic white: Age P50 | 28.3 (20.7–38.6) |
| Non-Hispanic white: Age P75 | 22.0 (15.9–30.4) |
| Non-Hispanic white: Age P90 | 19.4 (13.5–27.8) |
| Non-Hispanic black: Age P25 | 11.4 (8.4–15.4)  |
| Non-Hispanic black: Age P50 | 11.1 (8.8–14.1)  |
| Non-Hispanic black: Age P75 | 10.9 (8.7–13.6)  |
| Non-Hispanic black: Age P90 | 10.8 (8.5–13.7)  |

<sup>a</sup>Age P25, 8.5 years; Age P50, 12 years; Age P75, 15.6 years; Age P90, 17.4 years.

Table S4. Observed statistical significance values for differences between adjusted least squares geometric mean concentrations of benzophenone-3 for various demographic groups of children and adolescents<sup>a</sup>: Data from the National Health and Nutrition Examination Survey, 2003–2004

| Difference  | P value |
|---|---------|
| Female vs. male                                   | <0.001  |
| Mexican American vs non-Hispanic white: Age P25   | <0.001  |
| Mexican American vs non-Hispanic white: Age P50   | 0.01    |
| Mexican American vs non-Hispanic white: Age P75   | 0.30    |
| Mexican American vs non-Hispanic white: Age P90   | 0.75    |
| Mexican American vs non-Hispanic black: Age P25   | 0.10    |
| Mexican American vs non-Hispanic black: Age P50   | 0.01    |
| Mexican American vs non-Hispanic black: Age P75   | 0.01    |
| Mexican American vs non-Hispanic black: Age P90   | 0.03    |
| Non-Hispanic black vs non-Hispanic white: Age P25 | <0.001  |
| Non-Hispanic black vs non-Hispanic white: Age P50 | 0.01    |
| Non-Hispanic black vs non-Hispanic white: Age P75 | <0.001  |
| Non-Hispanic black vs non-Hispanic white: Age P90 | <0.001  |

<sup>a</sup>Age P25, 8.5 years; Age P50, 12 years; Age P75, 15.6; Age P90, 17.4.

Table S5. Logistic regression coefficients and Odds ratios (and 95% confidence intervals [CI]) among NHANES 2003-2004 participants with benzophenone-3 concentrations above the 95th percentile

| Independent variable | Beta Coefficient (P-value) | Odds Ratio (95% CI) |
|----------------------|----------------------------|---------------------|
| Intercept            | -5.5                       |                     |
| Sex                  |                            |                     |
| Female               | 1.3 (<0.0001)              | 3.5 (1.9 -6.5)      |
| Male                 | Reference                  |                     |
| Race/ethnicity       |                            |                     |
| Mexican American     | 1.4 (0.04)                 | 4.04 (1.1-15.5)     |
| Non-Hispanic white   | 1.9 (< 0.0001)             | 6.9 (2.9 -16.2)     |
| Non-Hispanic black   | Reference                  |                     |