

Maternal Urinary Benzophenone-3 Concentrations During Pregnancy and Duration of Breastfeeding

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Overview

Exposure to benzophenone-3, an endocrine disrupting chemical, is ubiquitous throughout the United States due to its use in sunscreens and personal care products. It is unknown if this exposure is associated with human mammary gland function and morphology.

Background

- Benzophenone-3 is an ultraviolet-protectant used in sunscreens and personal care products
- Benzophenone-3 has been detected in the urine of virtually all Americans, indicating widespread exposure
- In animal models, gestational benzophenone-3 exposure leads to alterations in mammary gland morphology and function
- It is unknown if benzophenone-3 exposure affects mammary gland function in humans
- We estimated the association between maternal urinary benzophenone-3 concentrations during gestations and subsequent breastfeeding duration

Methods

- Data from the Health Outcomes and Measures of the Environmental (HOME) of 302 mother-infant dyads were recruited from a general population cohort from the greater Cincinnati, Ohio area
- Urinary concentrations estimating exposure to benzophenone-3 during gestation were calculated in two urine samples collected at ~16 weeks and ~26 weeks
- We ascertained duration of any breastfeeding via maternal self-report
- We used a multivariable Poisson regression model with robust standard errors to estimate the relative risk (RR) of discontinuing breastfeeding by age 3 or 6 months

Results

Figure 1. Study Demographics

Percentages of study sample demographic information

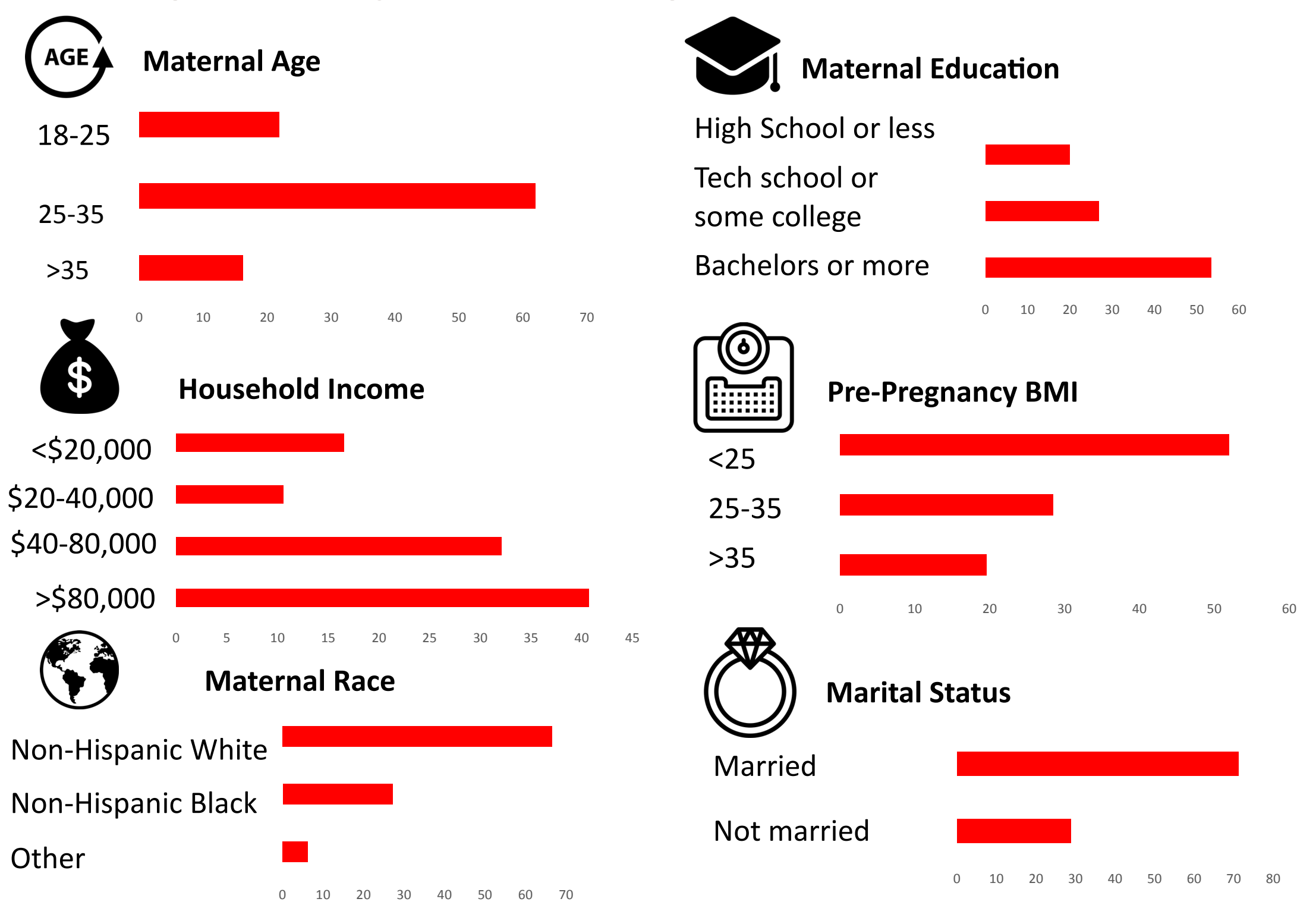


Figure 2. The relative risk of quitting breastfeeding by 3 months

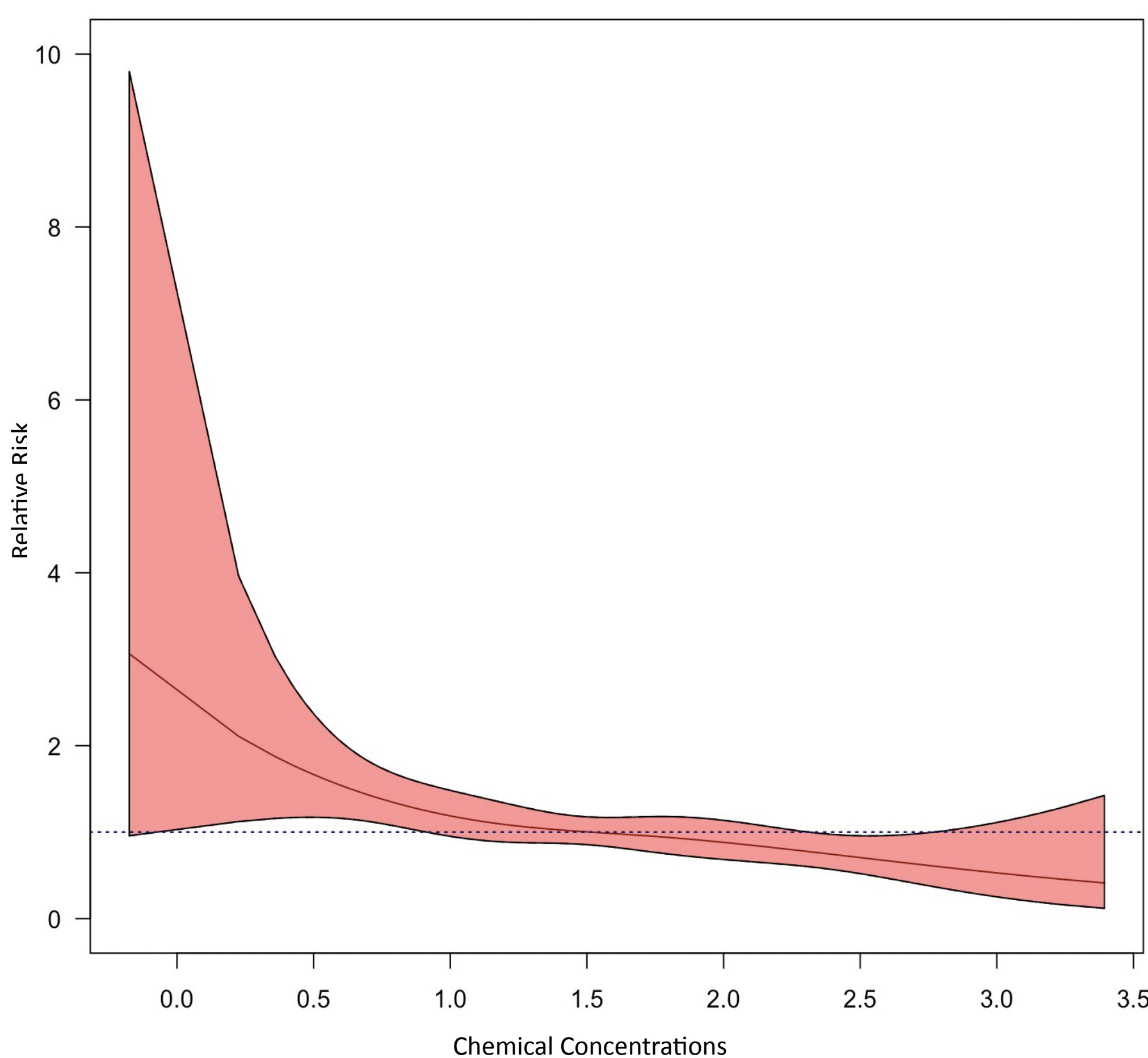
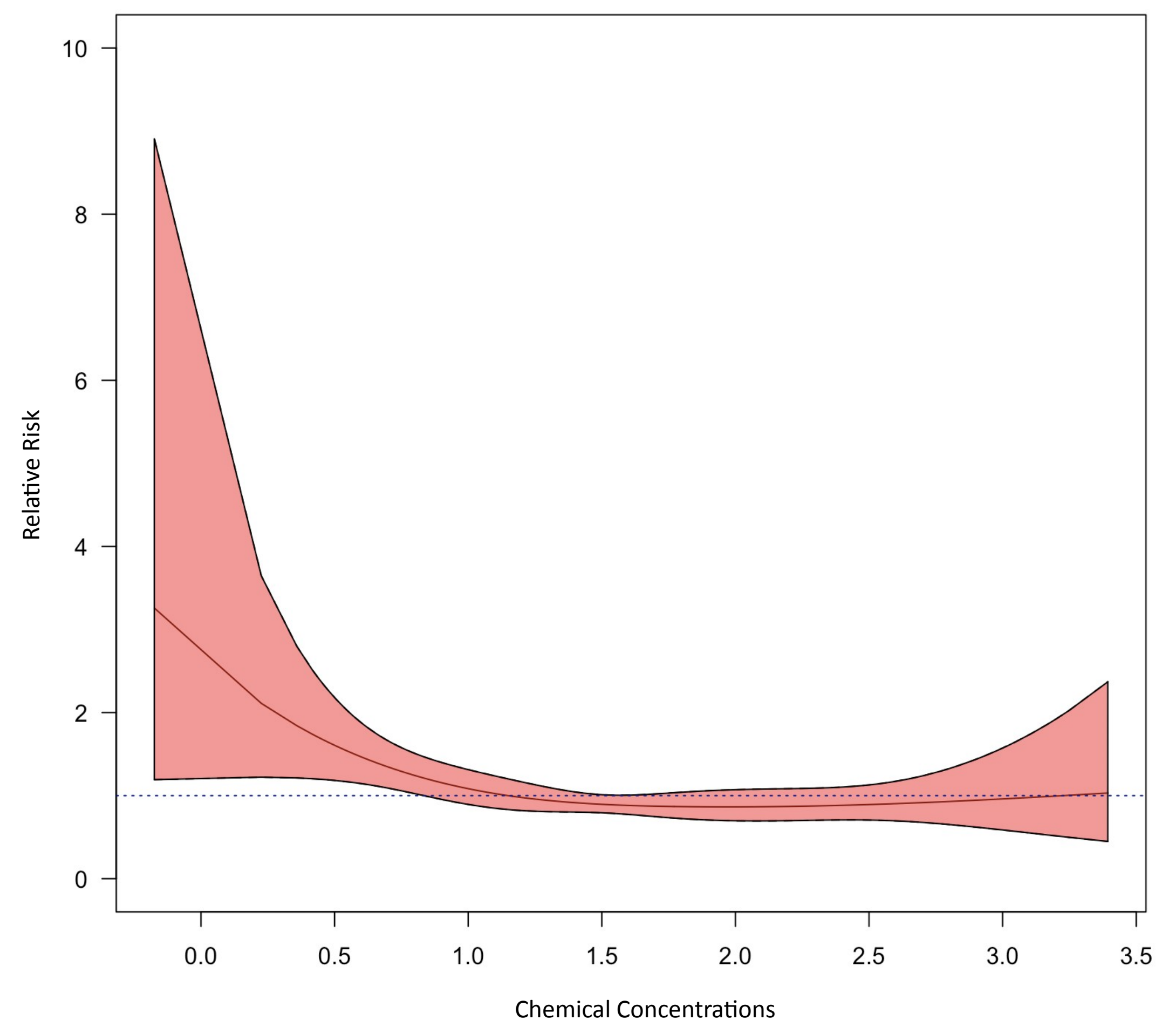


Figure 3. The relative risk of quitting breastfeeding by 6 months



Models were adjusted for marital status, maternal education, maternal race, household income, maternal age, serum cotinine, and parity

Results

- Median urinary benzophenone-3 concentrations were 35 ng/mL (25th-75th percentile: 11-107)
- Approximately 57% (n= 171) and 44% (n=133) of women fed their infants some breastmilk until 3 and 6 months, respectively
- Higher benzophenone-3 concentrations were not associated with a higher risk of breastfeeding cessation at:
 - 3 months RR=0.93 (95% CI: 0.75-1.17) per IQR (increase in log₁₀-transformed benzophenone-3)
 - 6 months RR=1.02 (95% CI: 0.86-1.21) per IQR (increase in log₁₀-transformed benzophenone-3)

Conclusion

- In this cohort, gestational urinary benzophenone-3 concentrations were not associated with duration of breastfeeding.
- These findings suggest that exposure to benzophenone-3 may not lead to alterations in mammary gland function and morphology in humans

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