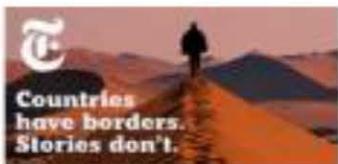


PHTHALATES IN OUR DIET AND IN OUR HOMES: PERSONAL CARE PRODUCTS

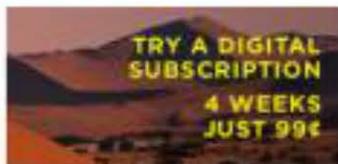
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Patz Case Ends in Mistrial, 36 Years After Boy Was Killed

By JAMES C. MCKIDLEY Jr. 40 minutes ago

For a third time, jurors said that they could not reach a verdict on the defendant accused of killing the six-year-old boy, whose case has haunted New York City since 1979.

26 Comments

UNVARNISHED | PART 2 OF 2



Photo: Sangwon/The New York Times

Perfect Nails, Poisoned Workers

Some ingredients used in nail products have been tied to cancer, miscarriages, lung diseases and other ailments. The industry has long fought regulations.

By SARAH MASLIN NIE

362 Comments

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GRAY MATTER | GREGORY HICKOK

It's Not a 'Stream' of Consciousness

It's more like a rhythm.

- Mom, the Designated Worrier



The Good News....and the Bad

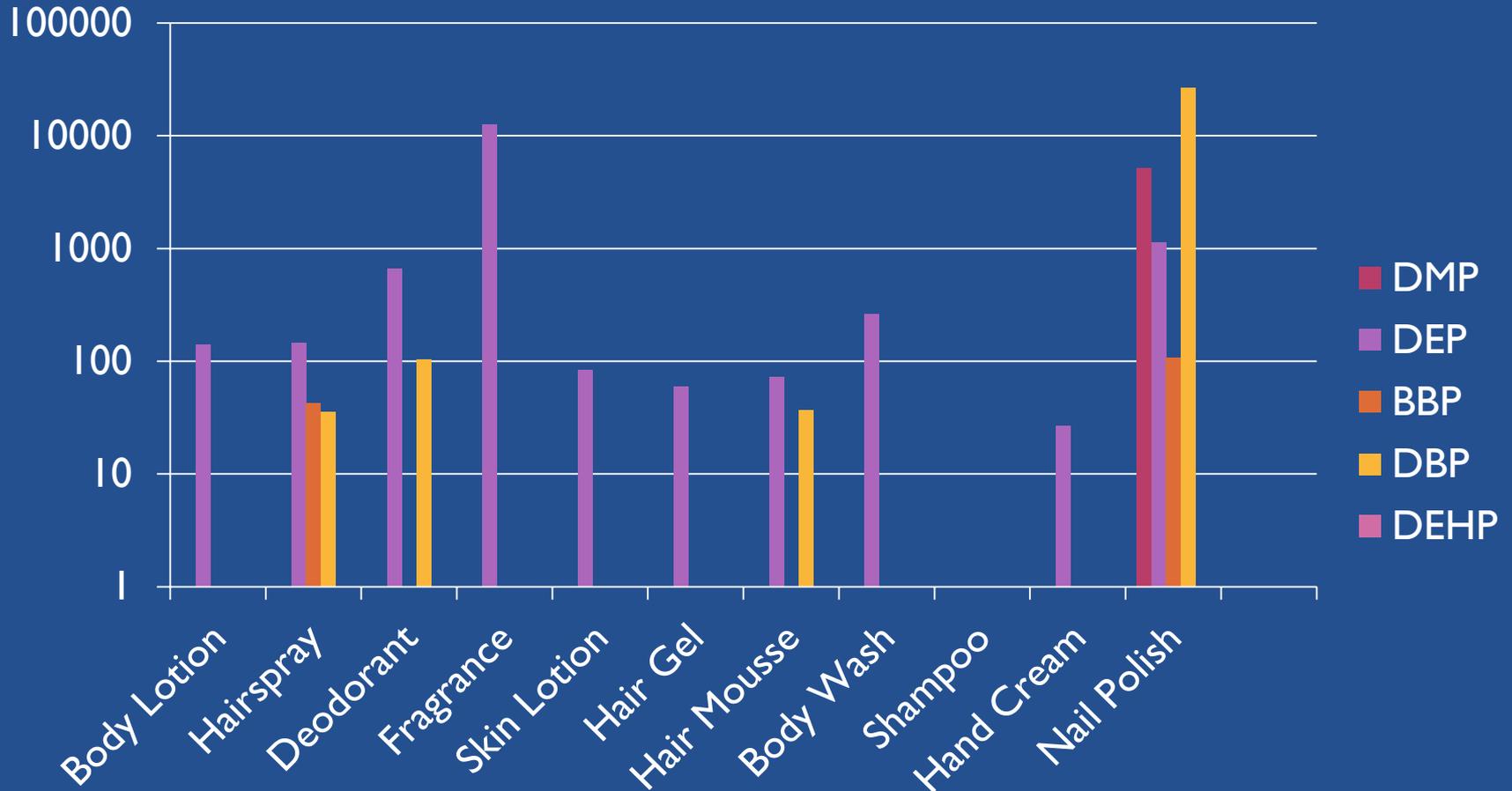
Phthalate trends in U.S. people 2001-2010		
Phthalate	Common sources	Trend
DEP	Fragrance, cosmetics, medication	↓42%
DnBP	Cosmetics, medication, food packaging, PVC plastics	↓17%
BBzP	PVC flooring, food packaging	↓32%
DEHP	Toys, cosmetics, food packaging, PVC plastics	↓37%
DiBP	Cosmetics, food packaging	↑ 206%
DnOP	Food packaging, PVC plastics	↑25%
DiNP	Toys, flooring, wall coverings, PVC plastics	↑ 149%
DiDP	Toys, wire and cables, flooring, PVC plastics	↑ 15%

Exposure Assessment: Issues to Consider

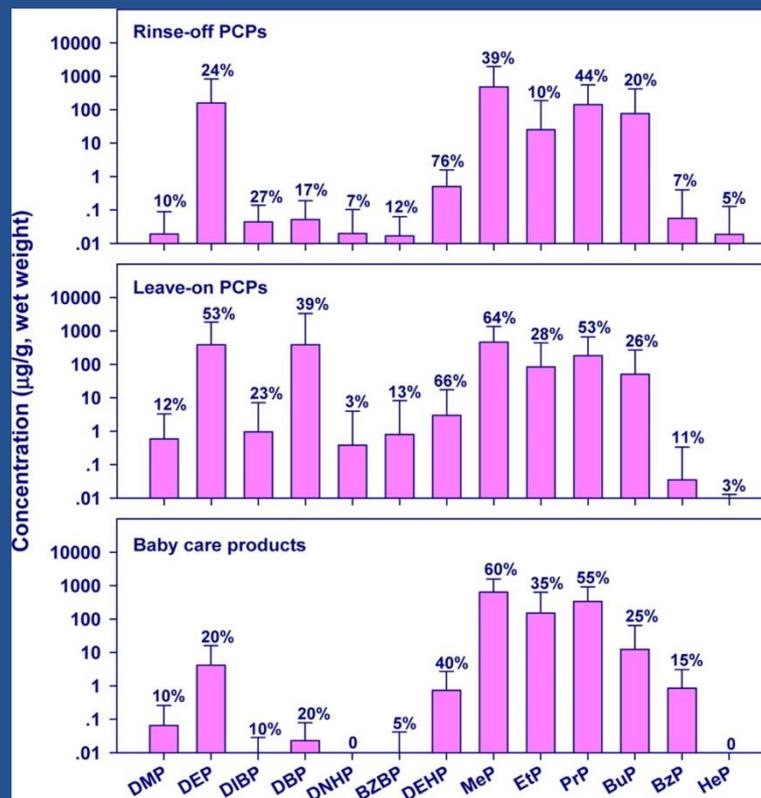
- Who is exposed?
- How does exposure occur, i.e. route of exposure?
- How much exposure occurs?
- How often does the exposure occur and at what dose?

Source: USEPA

What Products? What Dose?

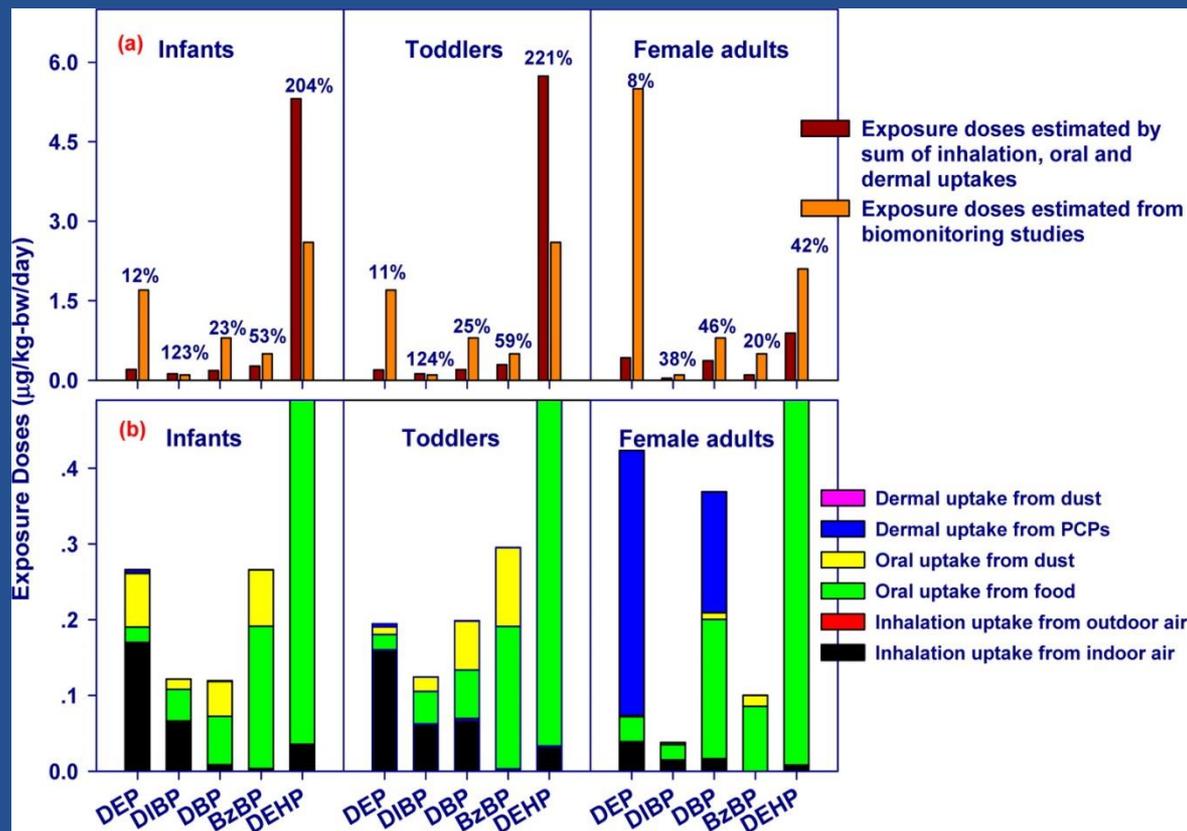


Source: Hubinger and Havery, 2006

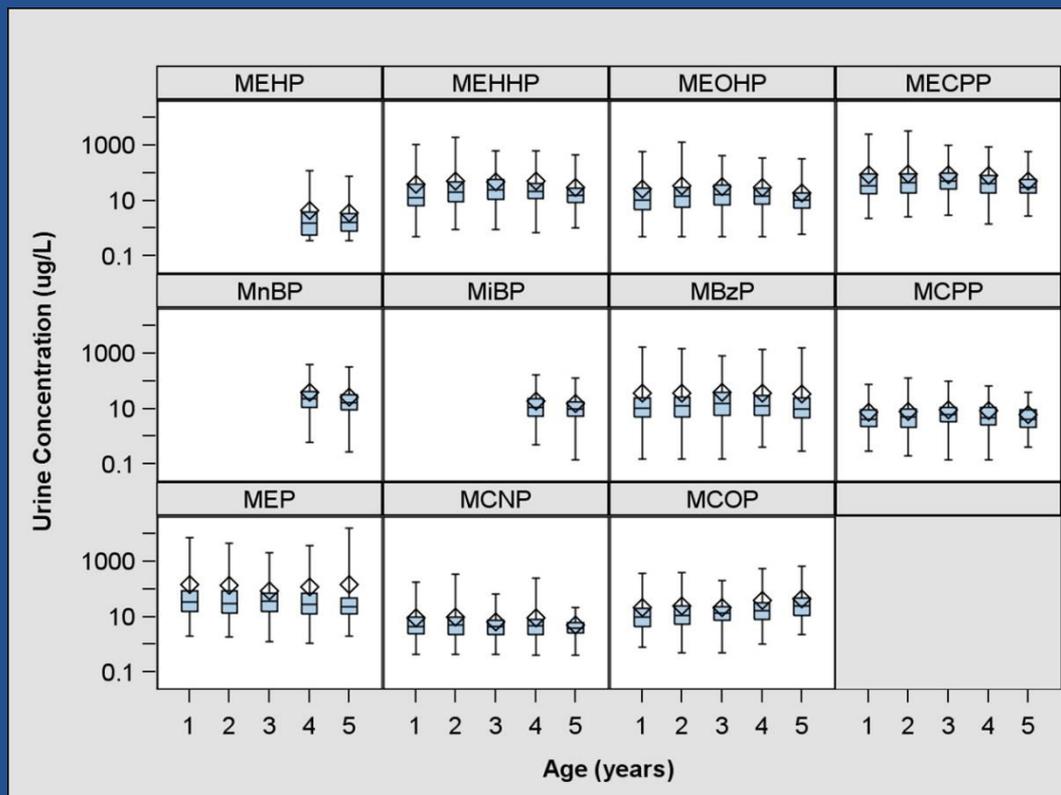


Concentrations ($\mu\text{g/g}$, mean and standard deviation) of phthalates and parabens in personal care products from New York state, United States ($n = 170$) (values above the bar are the detection frequencies of the analytes).

Published in: Ying Guo; Kurunthachalam Kannan; *Environ. Sci. Technol.* **2013**, 47, 14442-14449.
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Cumulative exposure doses of phthalates through various pathways for the United States populations ($\mu\text{g}/\text{kg bw}/\text{day}$). Values on the column indicate the ratios of exposure doses calculated using an environmental monitoring approach to exposure doses estimated using a biomonitoring approach (see details in Table S5, Supporting Information).



Unadjusted urinary phthalate metabolite concentrations in HOME Study children ($\mu\text{g/L}$). Diamond indicates arithmetic mean, whiskers indicate minimum and maximum, edges of box indicate 25th and 75th percentile, and middle line indicates median. One year $n = 277$, 2 year $n = 232$, 3 year $n = 234$, 4 year $n = 170$, 5 year $n = 201$ (All subjects with at least 1 phthalate measurement).

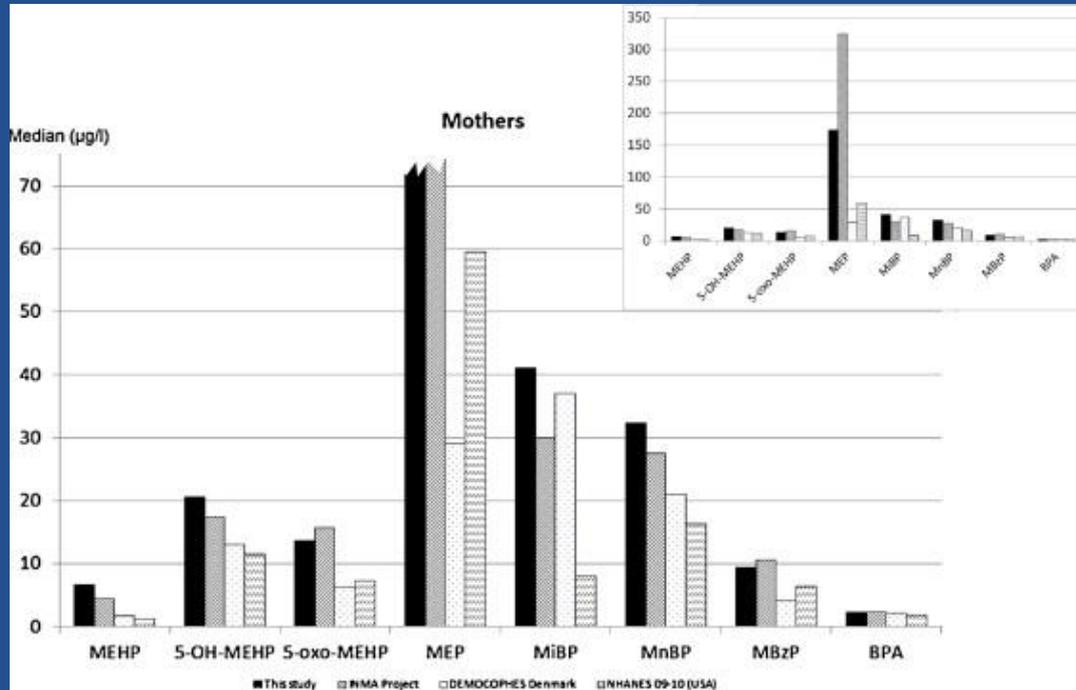


Fig. 1 Median urinary concentrations ($\mu\text{g/L}$) of phthalate metabolites in mothers in this study, pregnant women results from the INMA cohorts, mothers from DEMOCOPHES Denmark, and females from the NHANES survey (09–10).

Francisco Cutanda , Holger M. Koch , Marta Esteban , Jinny Sánchez , Jürgen Angerer , Argelia Castaño

Urinary levels of eight phthalate metabolites and bisphenol A in mother child pairs from two Spanish locations

International Journal of Hygiene and Environmental Health, Volume 218, Issue 1, 2015, 47–57

<http://dx.doi.org/10.1016/j.ijheh.2014.07.005>

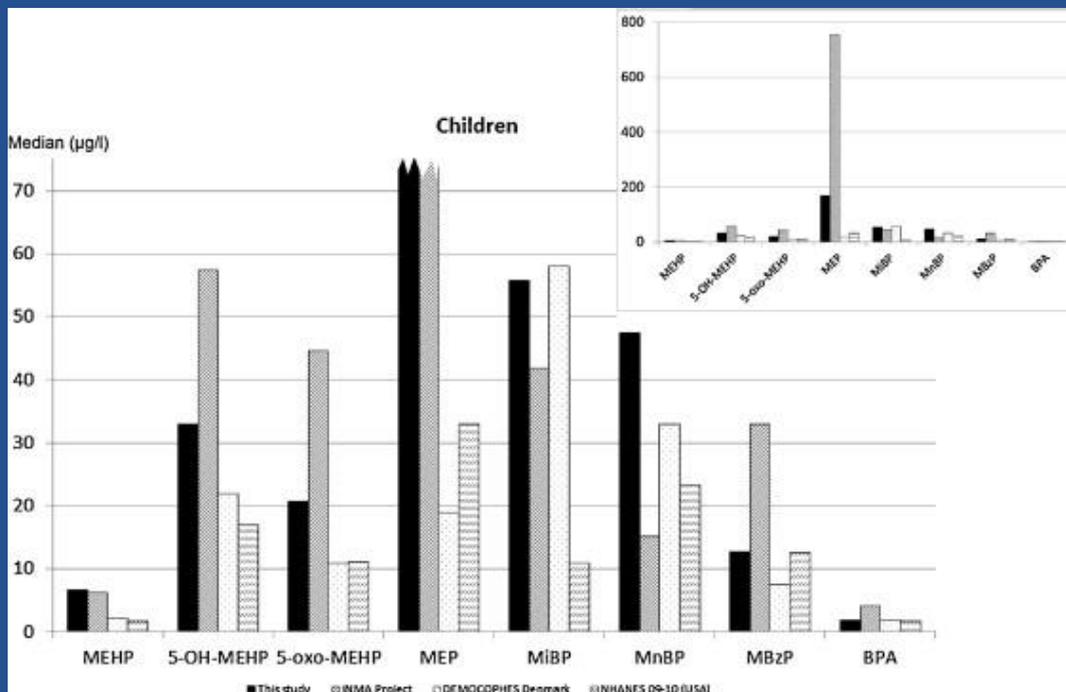


Fig. 2 Median urinary concentrations ($\mu\text{g/L}$) of phthalate metabolites in children in this study, children results from the INMA and DEMOCOPHES Denmark cohorts, and age group 6–11 years from the NHANES survey (09–10).

Francisco Cutanda , Holger M. Koch , Marta Esteban , Jinny Sánchez , Jürgen Angerer , Argelia Castaño

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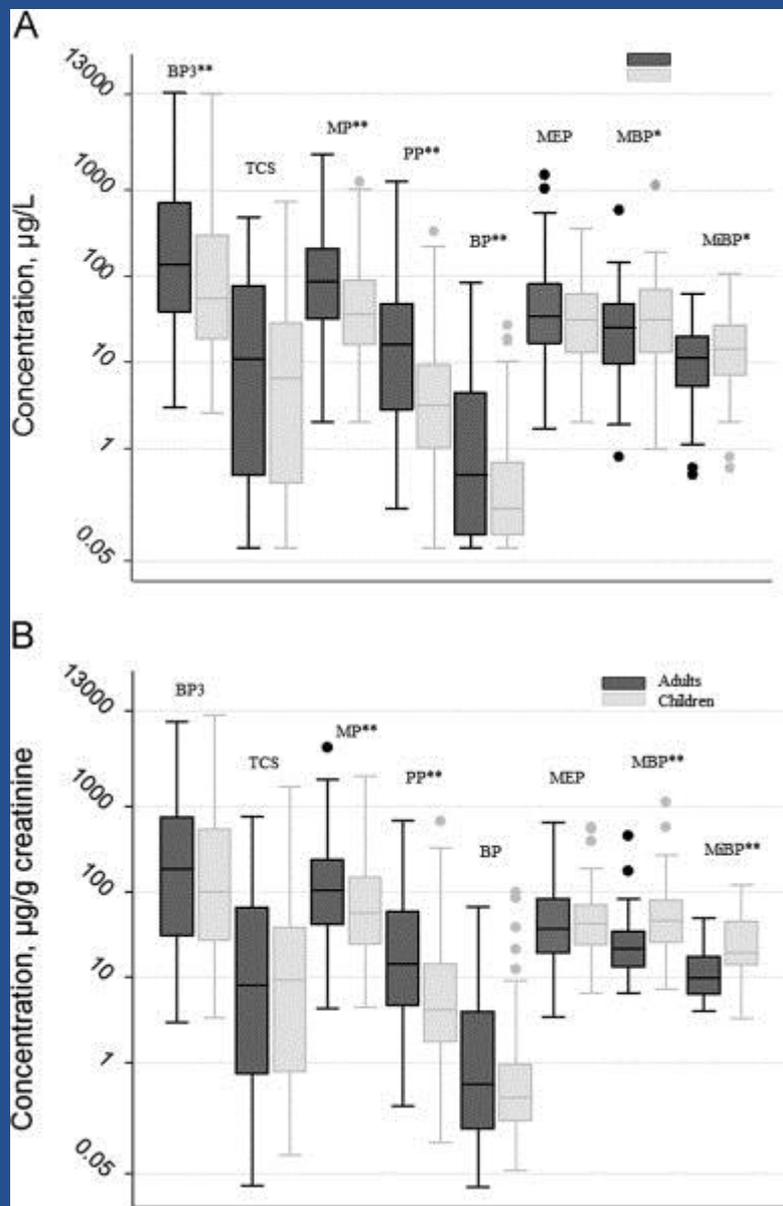


Fig. 1. Urinary concentrations of phenols and phthalate metabolites uncorrected (A) and corrected (B) for creatinine among adults and their children (first visit of the SUPERB study 2007–2009, $n=81^a$).

^aRestricted to adult–child pairs with urine sample for both the adults and the children. Two adult–child pairs were excluded from this analysis because the parent and the child collected their urine sample several days apart.

Abbreviations: BP: butyl paraben, BP3: benzophenone 3, MBP: mono-*n* butyl phthalate, MEP: monoethyl phthalate, MiBP: mono isobutyl phthalate, MP: methyl paraben, PP: propyl paraben, TCS: triclosan.

***p* Values for Mann–Whitney test ≤ 0.05 ,

**p* Values for Mann–Whitney test ≤ 0.10 .

Exposure to select phthalates and phenols through use of personal care products among Californian adults and their children

[Claire Philippat^{a, b, ,}](#)

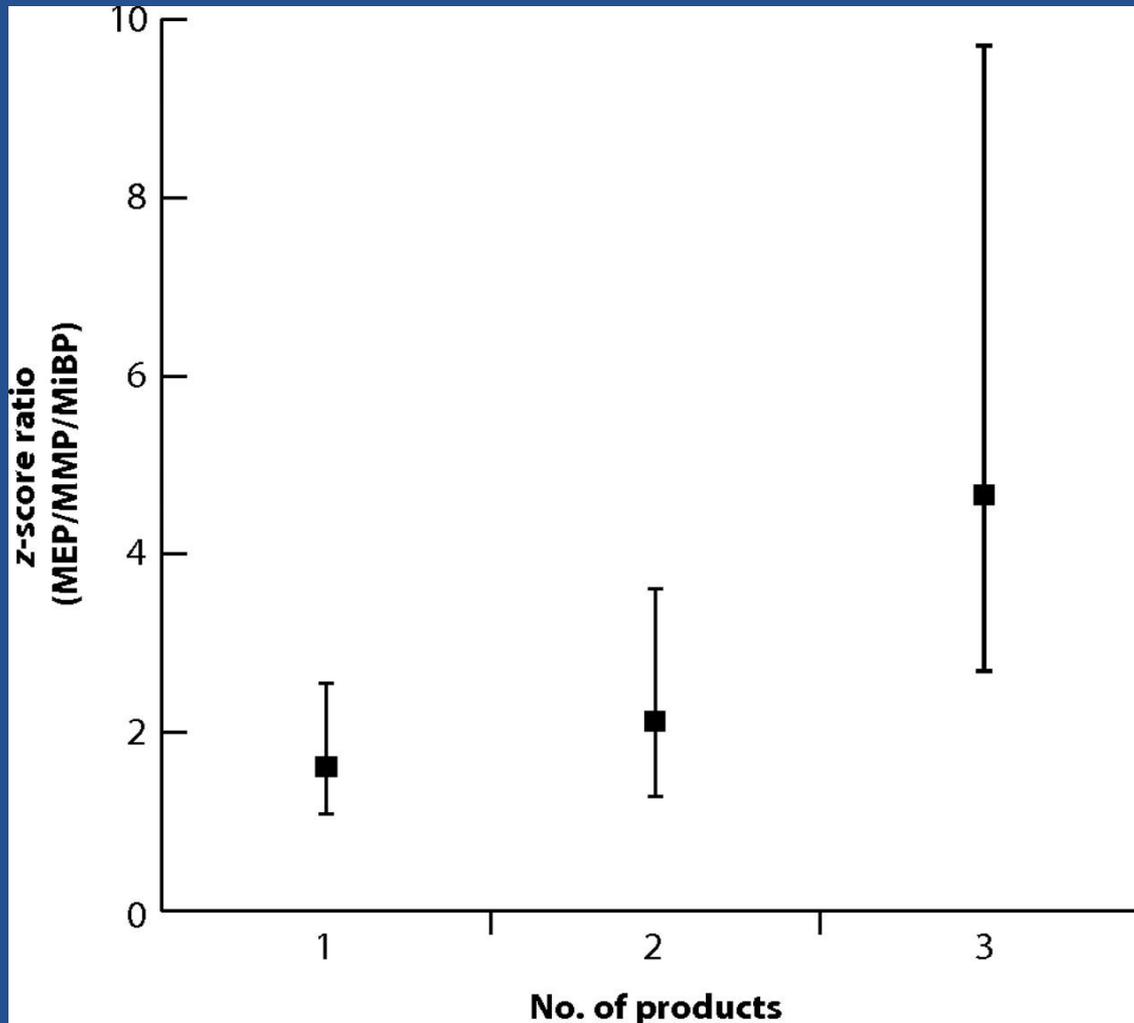
[Deborah Bennett^a,](#)

[Antonia M. Calafat^c,](#)

[Irva Hertz Picciotto^{a, b}](#)

Environmental Research 2015; 140:369–376

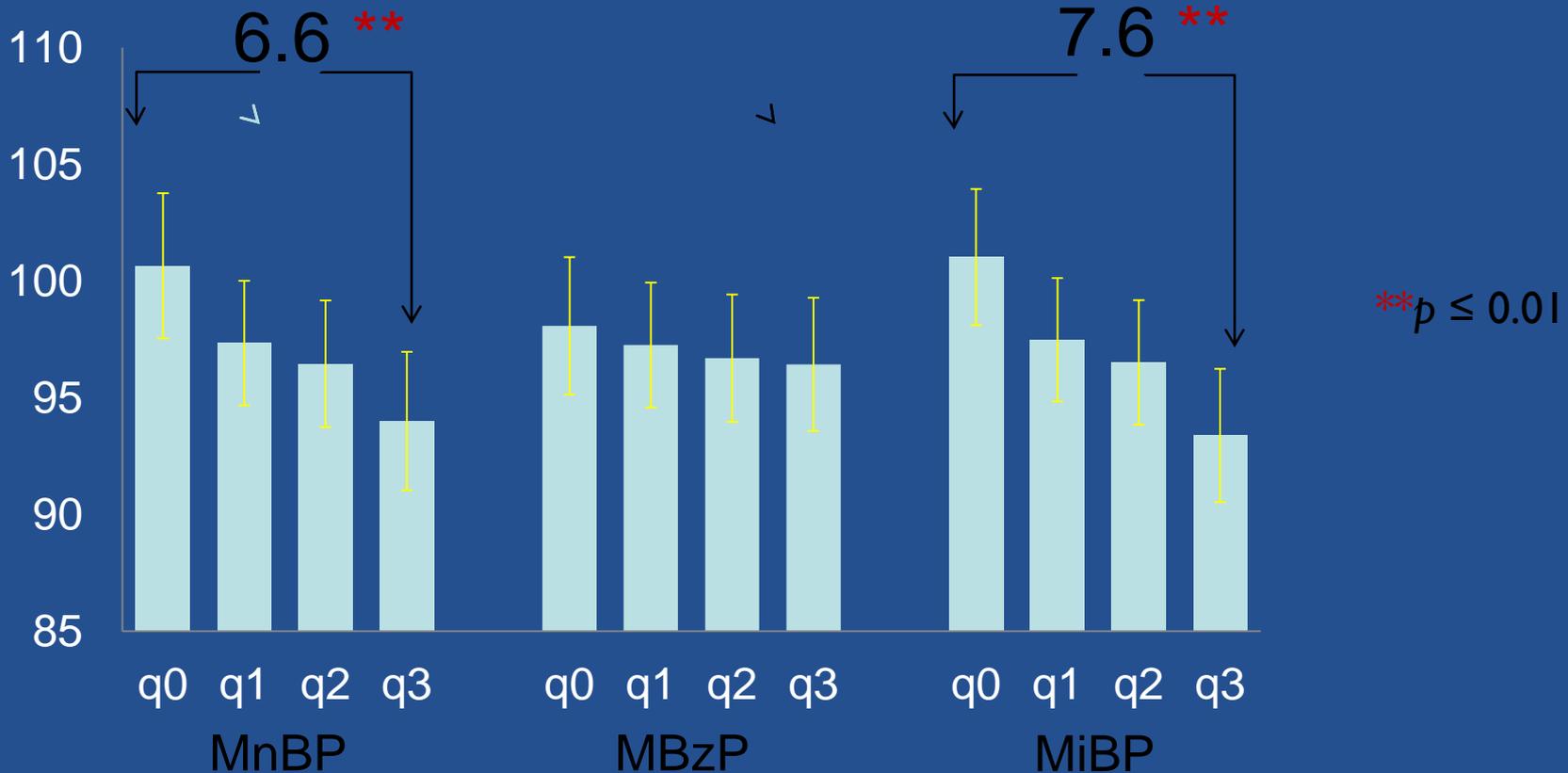
Ratio of z score for combined phthalate metabolite concentrations for MEP, MiBP, and MMP in exposed and unexposed infants by number of infant products used (N = 154).



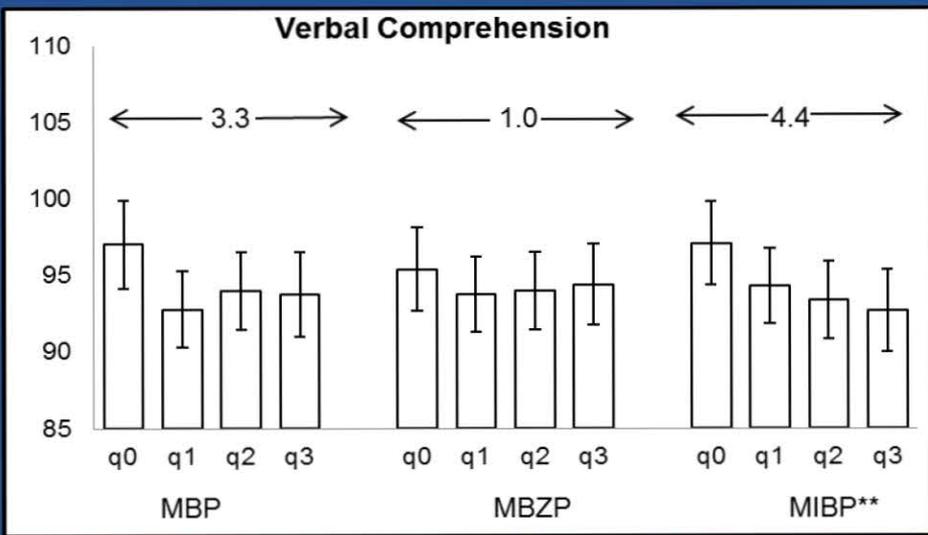
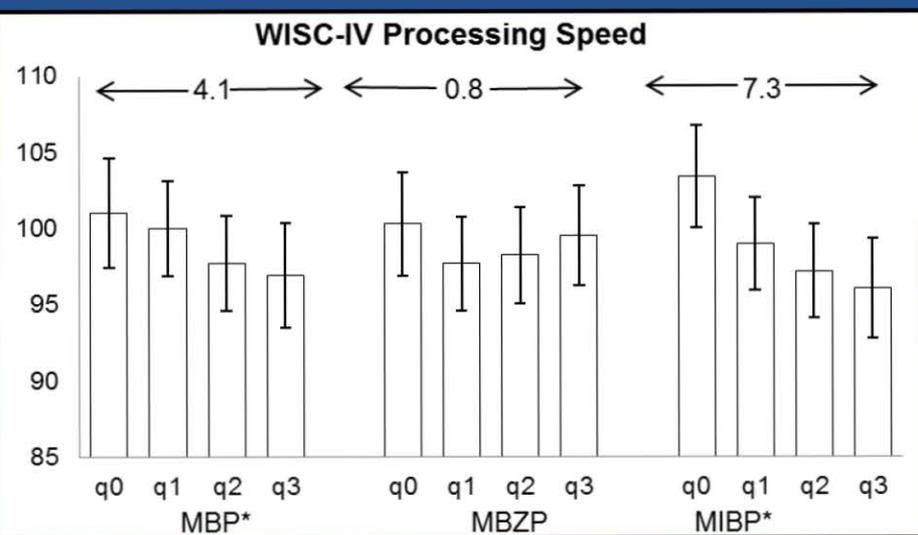
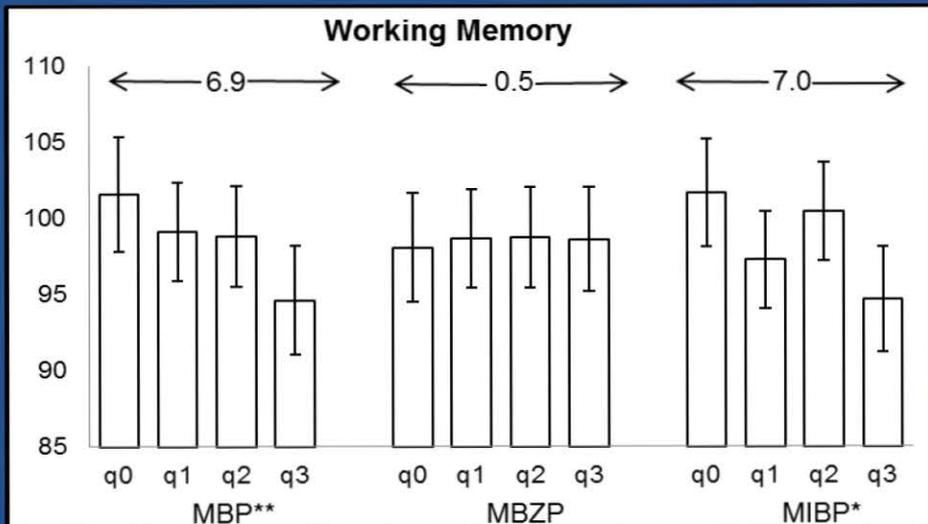
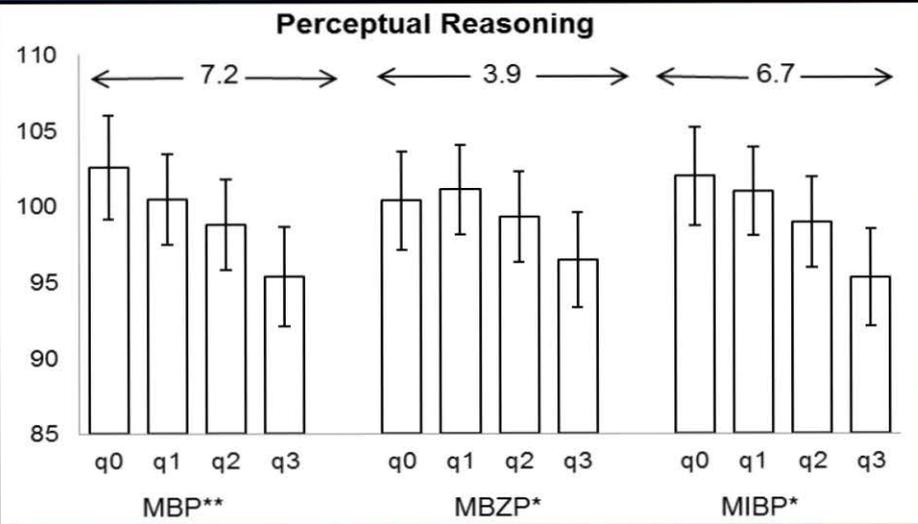
Why is this Important

- Purported health effects of phthalate exposure
 - Cognitive
 - Behavioral
 - Thyroid dysfunction
 - Asthma and respiratory symptoms
- Not known if these effects are persistent
 - Some evidence that prenatal exposure is related to outcomes in toddlers, preschool and older children

Full scale IQ by quartiles of maternal phthalate metabolite concentrations (n=328)



Models controlled for maternal IQ, Home scale, child sex, race/ethnicity, maternal prenatal alcohol consumption, education, marital status and specific gravity



* $p < 0.05$
 ** $p \leq 0.01$

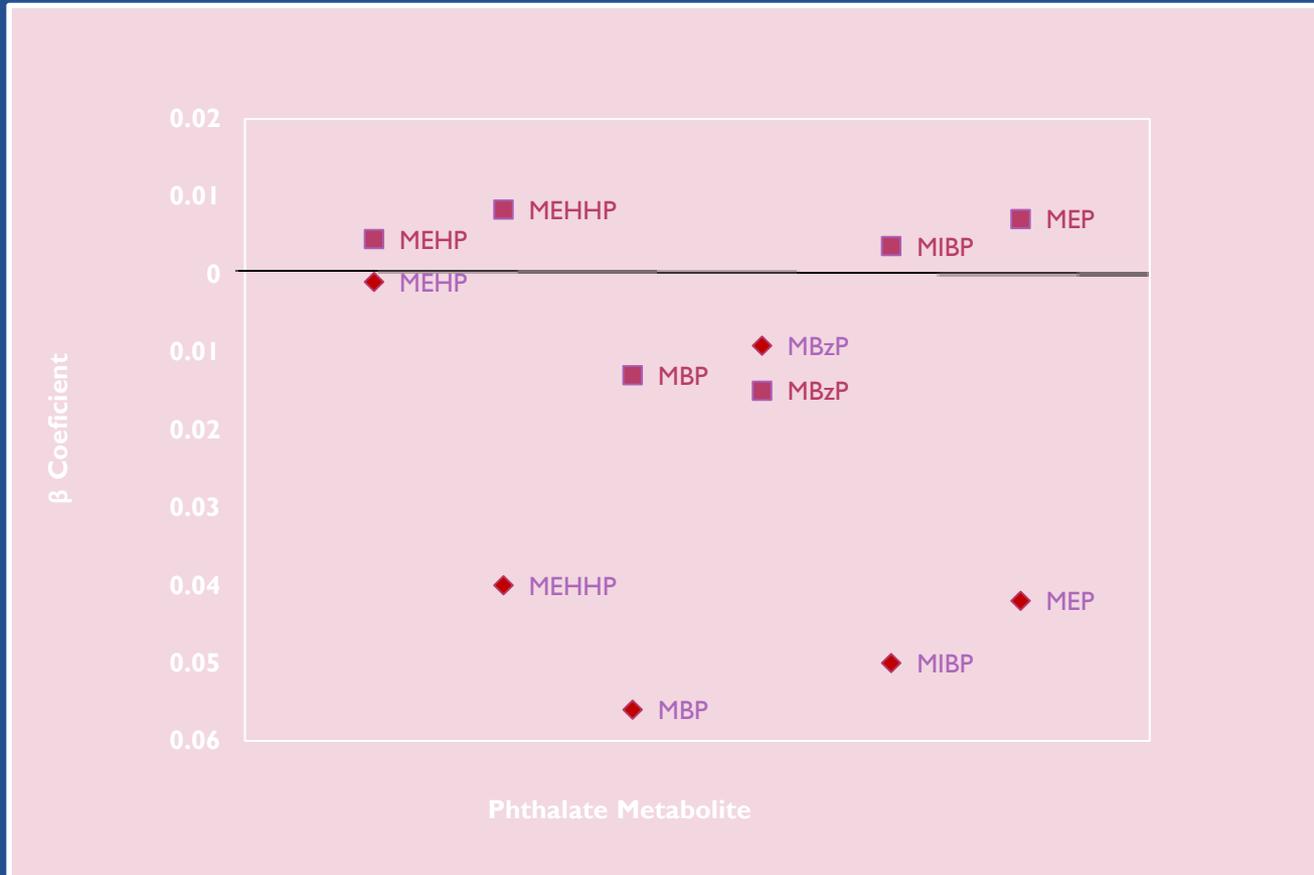


Figure 1. Beta estimates from linear regressions relating phthalate metabolite exposure and FT4 levels in males and females.

Squares represent male beta coefficients and diamonds represent female beta coefficients. There are significant associations between phthalate metabolites and FT4 in females only.

Conclusions

- Exposure to phthalates is ubiquitous in adults and in children.
- It is highly likely that exposure from personal care products can be from multiple routes of exposure: dermal, inhalation, ingestion.
- Exposure in mothers and children appear to be correlated, likely due to similar uses of products, similar diets, etc.
- Exposure in children is more variable, likely due to changes in product use and perhaps metabolic differences.
- It is possible that a simple count of product use in the past 24 hours is a good surrogate for phthalate biomarkers.
- There appear to be persistent and concurrent associations between phthalate metabolite measures and outcomes in children.

Acknowledgments

Robin M. Whyatt, Beverly Insel, Virginia Rauh, Xinhua Liu, Antonia Calafat, Lori Hoepner, David Camann, Frederica Perera



The research staff



Our study participants
Our funders: NIEHS and EPA

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The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention