



Hormone Disruptors and Asthma-Associated Chemicals in Consumer Products

Study Fact Sheet:

R.E. Dodson, M. Nishioka, L.J. Standley, L.J. Perovich, J.G. Brody, R.A. Rudel. 2012. Endocrine Disruptors and Asthma-Associated Chemicals in Consumer Products. *Environmental Health Perspectives*. <http://dx.doi.org/10.1289/ehp.1104052>

Many everyday products contain hormone disruptors and chemicals associated with asthma. This study set out to learn more about chemicals in common products and whether consumers can avoid these exposures. Results showed consumers can avoid some exposures, but others are hard to avoid, because some ingredients aren't listed on the product label.

The study tested 50 types of cleaning, personal care, and other household products for 66 hormone disruptors and chemicals associated with asthma. We found 55 of the chemicals, showing that people are exposed to a wide range of potentially harmful chemicals from common products. This is the first peer-reviewed assessment of a large number of hormone disruptors and asthma-related chemicals in a variety of household products and the first of ingredients in sunscreens, as far as we know.

What was the purpose of this study?

To find out which consumer products might be contributing most to people's exposure, we tested a range of personal care, cleaning, and other products for chemicals associated with asthma and hormone disruption. A second goal was to see if it is possible to identify products with fewer chemicals of concern by reading product labels.

What chemicals did you test for?

We tested for 66 hormone disruptors -- also known as endocrine disrupting compounds, EDCs -- and chemicals associated with asthma. EDCs are chemicals that can mimic or otherwise alter the body's hormone system. Evidence from laboratory and human studies suggests that EDCs can affect developing reproductive and nervous systems, metabolism, and cancer. Past studies have shown that some of the chemicals we tested for may trigger or exacerbate asthma. Many other chemicals have never been tested for these effects.

The study included chemicals that are hormone disruptors or associated with asthma

parabens	UV filters	phthalates	ethanolamines
triclosan	cyclosiloxanes	fragrances	
alkylphenols	BPA	glycol ethers	
Endocrine disrupting compounds			Asthma associated

What types of products did you test?

We tested 50 product types, including personal care products (e.g., lotion, toothpaste, sunscreen), cleaning products (e.g., laundry detergent, all-purpose cleaner), and other household items (e.g., shower curtain, pillow protector, cat litter).

We classified products as either “conventional” or “alternative.” “Alternative” products met a set of criteria, including: 1) the label indicated primarily plant-based ingredients and 2) the label did not list the study’s target chemicals and/or the label indicated the product was free of the target chemicals (e.g., “fragrance-free”). Products that did not meet these criteria were classified as “conventional.” To reduce study costs while learning more about typical exposures, we combined several conventional products of the same type and tested the composited samples. The samples included 213 products altogether.

What did you find?

- We found 55 target chemicals. All of the conventional product types and 32 of the alternative products contained target chemicals. Eleven alternative products had no detectable target chemicals.
- The chemicals found at the highest concentrations were DEHP (in vinyl), fragrance, DEA, glycol ethers, and UV filters.
- Sunscreens and fragranced products -- including air fresheners, dryer sheets, and perfume -- had the largest number of target chemicals and some of the highest concentrations.
- Product labels did not identify all of the products that contained phthalates, MEA and DEA, alkylphenols, parabens, glycol ethers, or fragrance. Fourteen alternative and 12 conventional product types contained a natural fragrance that was not indicated on the label. DEA, found in alternative shampoo, is not allowed in cosmetics in Europe.
- The alternative sunscreen with the highest number of target chemicals was a product marketed for babies and children and favorably rated by a popular environmental website. This finding highlights the limitations of buying guides that have to rely on label information provided by the manufacturer.
- Vinyl products had substantial concentrations of the phthalate DEHP, at 28% by weight in the shower curtains and 14% in the pillow protector. Nylon and cotton shower curtains had no detectable target chemicals. The high concentration of phthalates in pillow protectors -- used to reduce exposure to dust mites that trigger asthma -- is worrisome, because phthalates may increase respiratory symptoms. Vinyl pillow or mattress protectors may lead to high exposures, because the phthalates are released into the air from the vinyl while people are sleeping (many hours/day) -- and breathing -- in close contact with these products.
- Some alternative products that didn’t contain the well-known phthalates contained other phthalates that are also endocrine disruptors. These results may indicate that companies have replaced worrisome chemicals that are regulated or targets of consumer campaigns with substitutes that aren’t any better.

The charts at the end of this fact sheet provide additional results.

What are the public health implications?

The findings show that people are widely exposed to hormone disruptors and asthma-associated chemicals from common consumer products. People who use multiple products can be exposed to mixtures of compounds, demonstrating the importance of considering the combined health

effects of chemicals from different sources. Considering potential health effects is important, because chemical exposure can be substantial for products applied directly to skin and those used indoors, where chemicals accumulate in the air and dust.

Consumers can avoid some chemicals of concern—including antimicrobials and some fragrances—in some products by reading labels. Other chemicals cannot be easily avoided, because they are not listed on labels or in online rating systems, which are based on product labels.

Study results show that current testing and labeling requirements do not prevent the use of hormone disruptors or asthma-associated chemicals in products or provide enough information for consumers to consistently avoid them. Many organizations are advocating for modernizing chemical safety laws that apply to consumer products. These laws are implemented by the Environmental Protection Agency (EPA) and Food and Drug Administration (FDA). In the meantime, full disclosure of product ingredients would allow consumers to make more informed choices. This information also would help researchers and policymakers who are trying to evaluate health risks.

What are the limitations of this study?

Although the study adds significantly to knowledge about chemicals in consumer products, we still were able to test only a small fraction of consumer products and a small number of the chemicals used in products. In addition, since manufacturers are constantly reformulating their products and products may vary in different regions of the U.S., results from these tests may not apply to current products on the shelves.

Because the study combined the conventional products into composite samples for testing, the results for conventional products cannot be linked to a specific product. We combined products into composites to keep costs down while giving a broad picture of exposures from U.S. products.

How can I reduce my exposures?

You can reduce your exposures to EDCs and asthma-associated chemicals in consumer products by using fewer products and avoiding fragranced products, vinyl (including vinyl shower curtains), and antimicrobials (e.g., triclosan, triclocarban). You can use plain water and simple ingredients like baking soda and vinegar for many cleaning tasks. Sometimes, you can avoid certain harmful chemicals, such as parabens and cyclosiloxanes, by reading product labels. To download a **tips card**, visit the Silent Spring Institute website at www.silentspring.org/product-test. In addition, consider joining state and national advocacy efforts to make consumer products safer. To find out what you can do, visit silentspring.org/take-action.

Can I learn the brand names of products in this study?

Products are listed at www.silentspring.org/product-test.

Who funded the study?

The study was funded by the U.S. Centers for Disease Control and Prevention, the Goldman Fund, and Hurricane Voices Breast Cancer Foundation.

How can I get more information?

Visit the Silent Spring Institute website at www.silentspring.org/product-test.

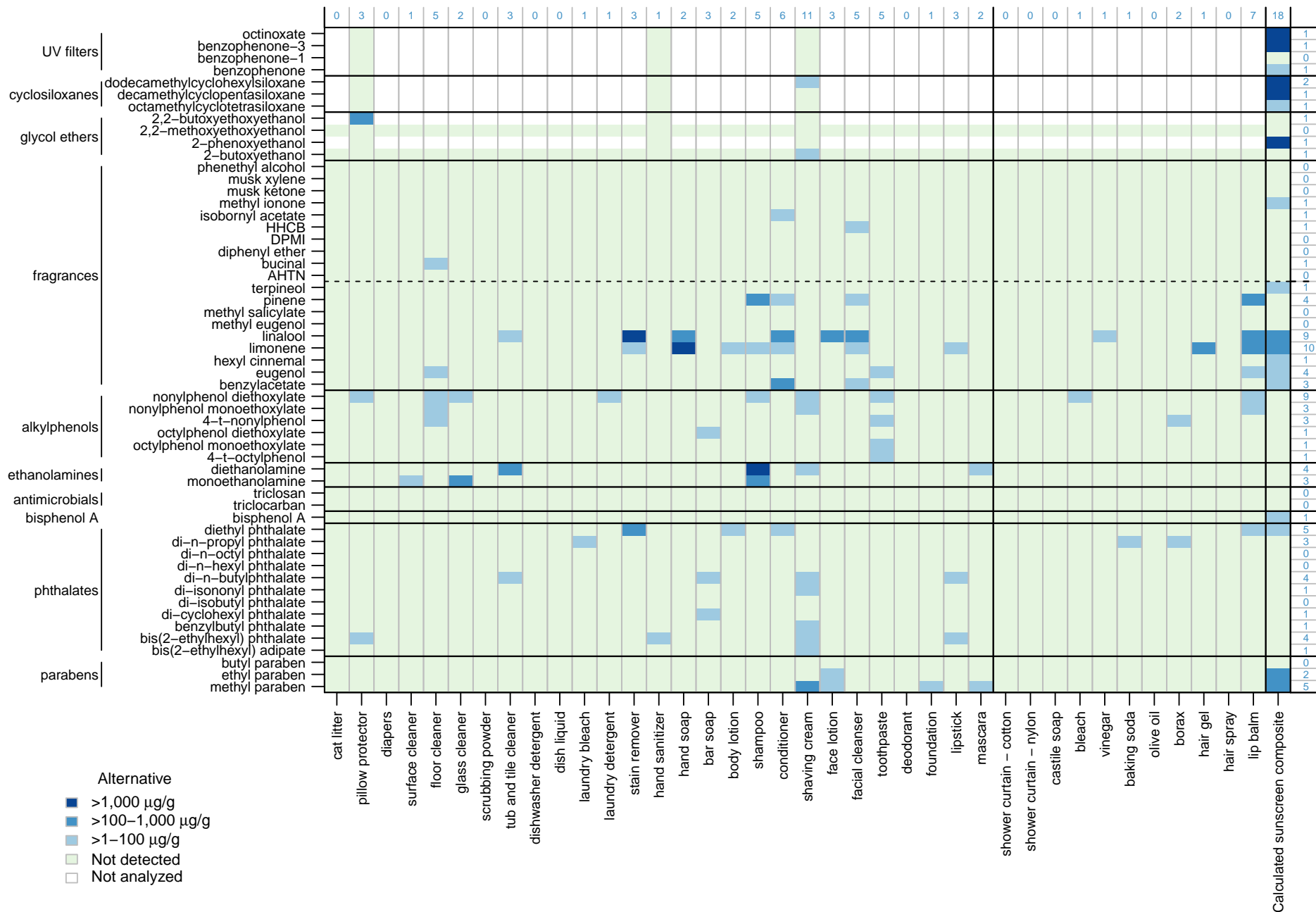


Figure 2. Concentrations of target compounds in “alternative” consumer products by product type. Compounds are grouped by chemical class, with natural and synthetic fragrances distinguished by dashed horizontal line. Numbers in the top margin count the number of chemicals detected in each product type; numbers in the right margin count number of products containing each compound. The first 27 product types (left of the solid line) and the last product type are the same in Figures 1 and 2; the remaining product types differ.

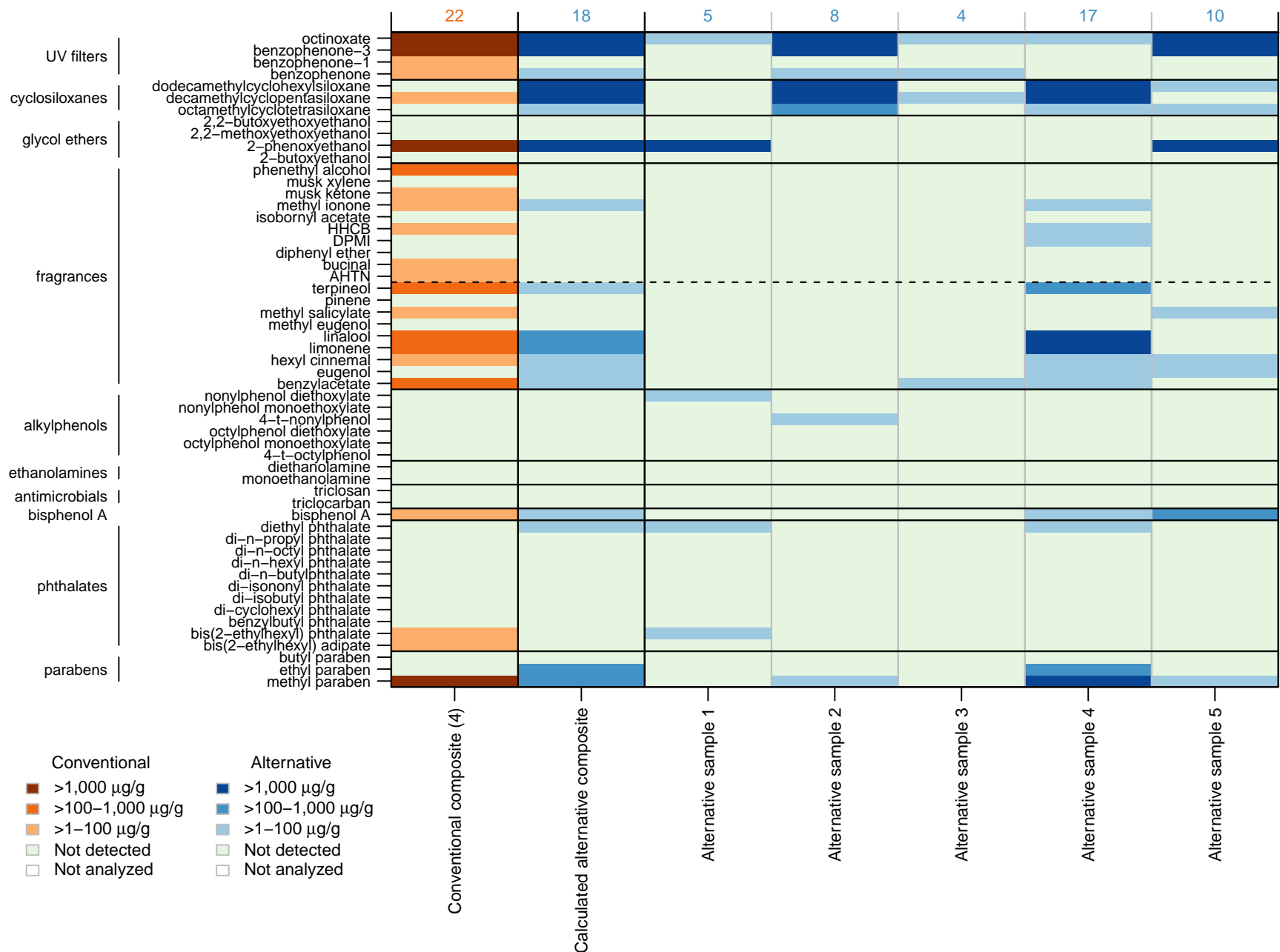


Figure S1. Concentrations of target compounds in sunscreen samples. Compounds are grouped by chemical class, with natural and synthetic fragrances distinguished by a dashed horizontal line. Horizontal (x-axis) shows the conventional sunscreen sample, which was a composite of 4 sunscreens; the calculated composite of 5 alternative sunscreens that were analyzed individually; and then results for each of the 5 alternative sunscreens. Numbers in the top margin count the number of chemicals detected in each sample; numbers in the right margin count number of products containing each compound.