

Chemical exposures in personal care products: what can we learn from consumers?

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Environmental and Occupational Health Sciences Institute

Disclosures

- No disclosures to report.

How many products do you use on an average day?

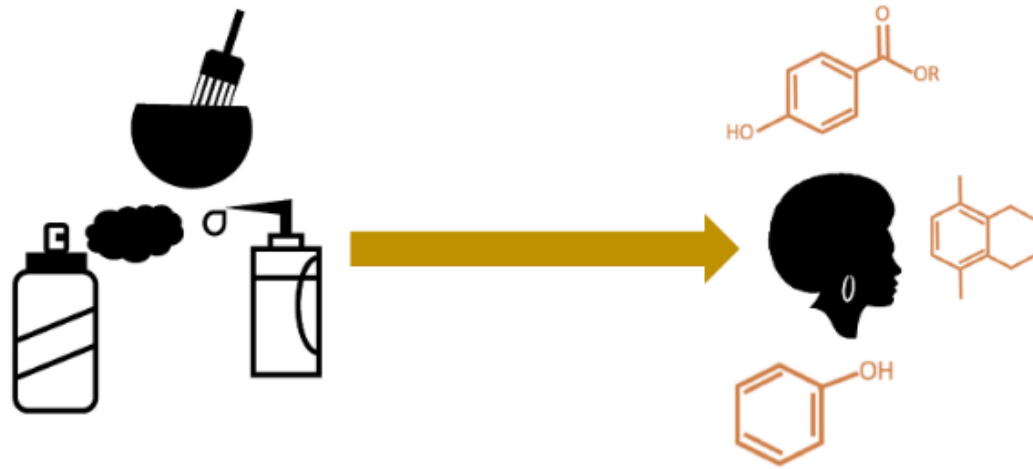


The average person is exposed to hundreds of chemicals daily through their personal care products

More products = more chemical exposures

Hair product use and urinary biomarker concentrations of non-persistent endocrine disrupting chemicals among reproductive-aged Black women[☆]

Samantha Schildroth^{a,*}, Ruth J. Geller^a, Amelia K. Wesselink^a, Sharonda M. Lovett^a, Traci N. Bethea^b, Birgit Claus Henn^c, Quaker E. Harmon^d, Kyla W. Taylor^e, Antonia M. Calafat^f, Ganesa Wegienka^g, Symielle A. Gaston^d, Donna D. Baird^d, Lauren A. Wise^a



Use of some hair products was associated with higher levels of phthalates, phenols, and parabens

Hair and skin care products expose kids to hormone disrupting chemicals, study finds

SEPTEMBER 9, 2024 · 5:00 AM ET

HEARD ON ALL THINGS CONSIDERED



Maria Godoy

Hair oils
Baby lotions



3-Minute Listen

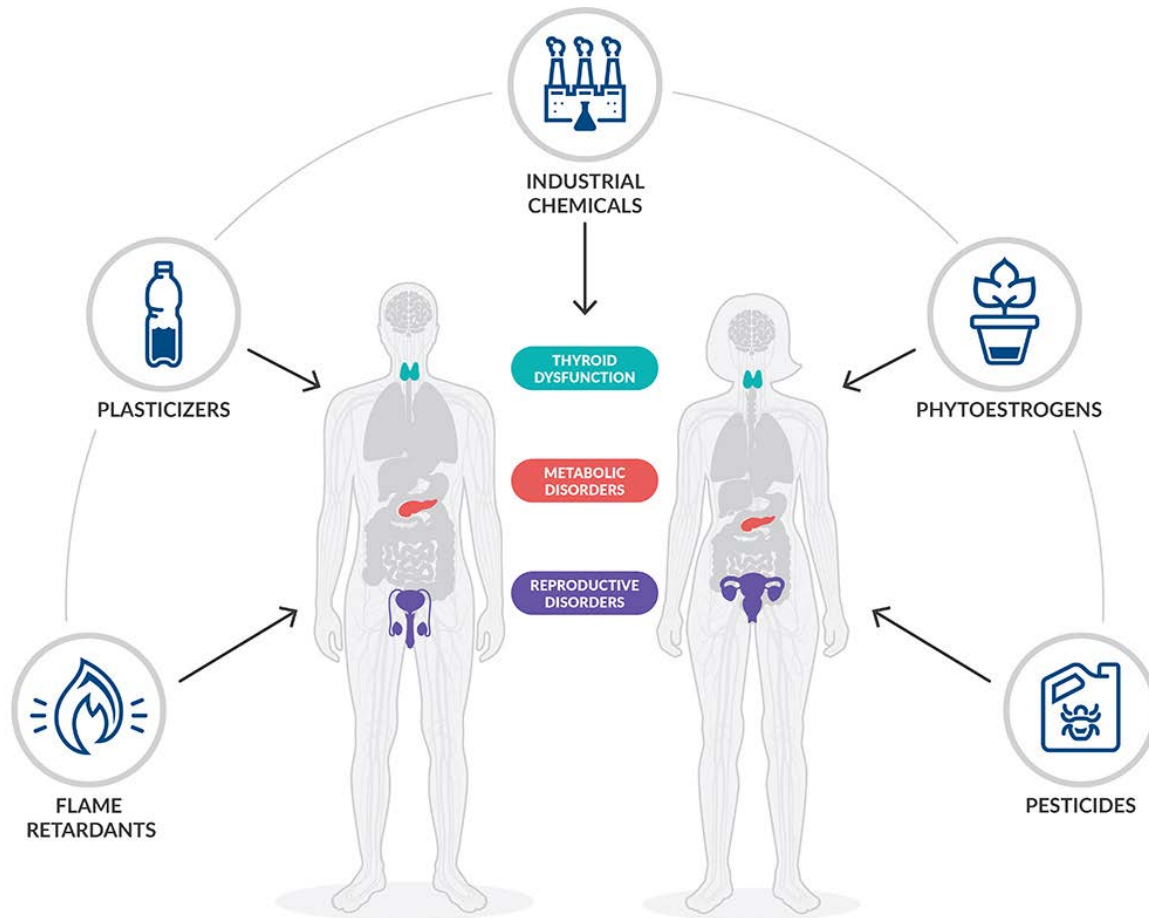
+ PLAYLIST



Recent use of hair and skin care products have been linked to higher levels of endocrine-disrupting chemicals in kids.

Allen Chen/Getty Images

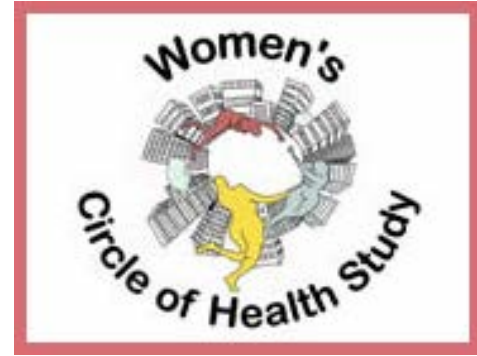
Why do we care that these chemicals are in our bodies?



- Hormone disruptors
- Carcinogens
- Developmental toxicants

Do chemicals found in PCPs contribute to breast and reproductive cancer risks?

- ~50% higher risk of breast cancer with regular use of dark hair dyes among Black women (Llanos et al 2017, Eberle et al 2020)
- Earlier use of relaxers and longer duration of use associated with larger breast cancer tumors (Rao et al 2021)
- “Moderate” and “frequent” beauty product users had up to 15% higher breast cancer risk compared to “infrequent” users (Taylor et al 2018)



Do chemicals found in PCPs contribute to preterm birth risks?

- Hair oil users deliver their babies 8 days earlier on average than non-users (Chan et al 2023, Preston et al 2021)
- Reducing disparities in phthalate exposure could reduce preterm birth by 13% among Black women and 9% among Latina women (Welch et al 2023)
- One study estimated nearly 57,000 phthalate-attributable preterm birth cases in the U.S. in 2018, resulting in costs of \$3.84 billion (Trasande et al 2024)



How do I reduce my exposure?



- What do consumers know about the safety of their products?
- Do they take precautions to reduce exposures through PCPs?
- If so, do those precautions work?

The Rutgers Personal Care Product Survey



Title: Endocrine disrupting chemicals in personal care products
PI: Emily Barrett, PhD

Do you wonder about chemicals in your personal care products?



Investigators at the Rutgers School of Public Health are doing a study about personal care products.

If you are a member of the Rutgers community (faculty, staff or student), you can help by completing a survey about the products you use.

**To take the survey, please go to:
Survey link**

What does the study involve?

- A short questionnaire to see if you are eligible
- The product survey (20 to 30 minutes)
- Optional: enter into a drawing for a \$100 Amazon gift card. 100 gift cards will be raffled.

Questions? Please email: ResearchStudy@eohsi.rutgers.edu

Version Date: August 23, 2019



Assessment of personal care product use and perceptions of use in a sample of US adults affiliated with a university in the Northeast

Adana A.M. Llanos^{a,b,*}, Amber Rockson^a, Kylie Getz^c, Patricia Greenberg^c, Eva Portillo^d, Jasmine A. McDonald^{a,b}, Dede K. Teteh^e, Justin Villasenor^d, Carolina Lozada^f, Jamirra Franklin^g, Vaishnavi More^h, Zorimar Rivera-Núñez^{c,i}, Carolyn W. Kinkadeⁱ, Emily S. Barrett^{c,i}

Environmental Research 2023

Beauty Beware: Associations between Perceptions of Harm and Safer Hair-Product-Purchasing Behaviors in a Cross-Sectional Study of Adults Affiliated with a University in the Northeast

Cathryn E. Payne¹, Amber Rockson¹, Adiba Ashrafi¹, Jasmine A. McDonald^{1,2}, Traci N. Bethea³, Emily S. Barrett^{4,5} and Adana A. M. Llanos^{1,2,*}

IJERPH 2023

ARTICLE OPEN



Evaluating personal care product use by Environmental Working Group hazard scores in relation to consumers' sociodemographic characteristics, purchasing behaviors, and product safety perceptions

Emily S. Barrett^{1,2}, Karolin Wadlie¹, Kylie Getz¹, Patricia Greenberg¹, Taina Moore^{2,3} and Adana A. M. Llanos^{4,5}

JESEE 2025

Rutgers Personal Care Product Survey Participants



Race/Ethnicity

AAPI: 20%
Non-Hispanic Black: 10%
Non-Hispanic White: 54%
Hispanic: 6%
Other: 10%



Education

Less than college: 26%
College degree: 31%
Post-graduate education: 42%



Gender

Female: 85%
Male: 14%
Other: 1%



Age

37 ± 16
years



Marital status

Married: 38%
Divorced: 11%
Single: 51%



Role

Undergrad: 15%
Grad: 25%
Faculty: 15%
Staff: 41%



Country of birth

US: 82%
Other: 17%

N=591

PCP use

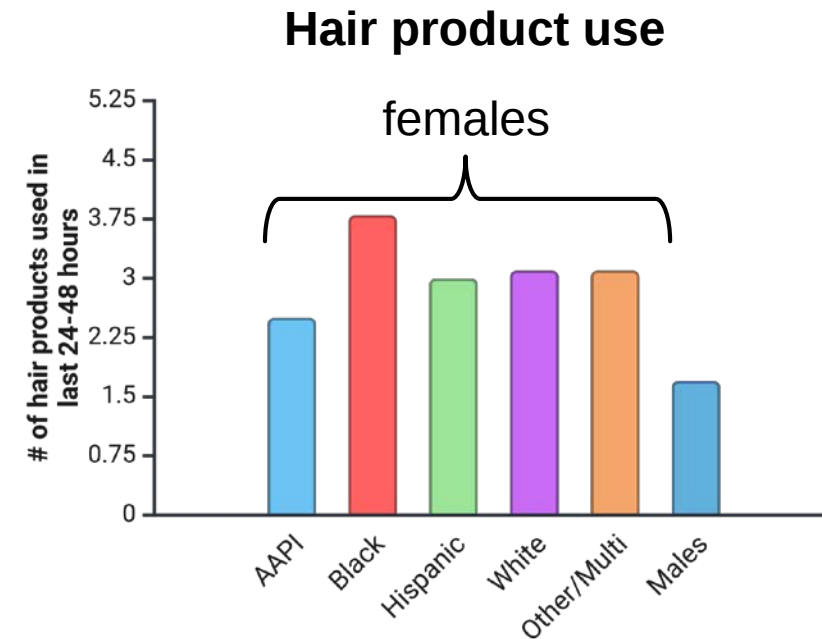
How many products did participants use in the last day?

	# of PCPs used/day	
	Females	Males
2008 (EWG)	12	6
2019 (Rutgers)	19	8

Some participants used >30 PCPs/day

- For all product types except oral care, females used more PCPs than males
- Differences by race and ethnicity for most product types

Categories of PCPs used
Hair care
Beauty
Skin Care
Perfumes/colognes
Oral care
Feminine hygiene



Perceptions about PCP safety

Likert scale: 5= strongly agree; 1=strongly disagree

Statement	Mean (SD)
"The PCPs I use affect my health"	3.4 (1.1)
"Consumers should be concerned about the health effects of PCPs"	4.1 (0.7)
"There is no reason to worry about the health effects of chemicals that may be in PCPs"	1.9 (0.8)
"The benefits of PCPs outweigh any risks from exposure to toxic chemicals that may be in the products"	2.5 (1.0)
"The FDA and other government agencies do a good job of regulating PCPs to ensure they are safe for consumers"	2.6 (1.0)

- Greater concern among females
- Greater concern among women of color



Does greater concern about chemicals in PCPs translate to differences in precautionary behaviors?



Public Health Post

People who expressed more concern about chemicals in PCPs:

- ✓ Showed no difference in the number of hair products used
- ✓ Were more likely to use apps and websites to choose safer products
- ✓ Were more likely to check ingredient lists
- ✓ Were more likely to look for eco-friendly or nontoxic labels

Evaluating the hazards of the PCPs used by participants



EWG's Skin Deep®

Find products and ingredients ▾

Learn how Skin Deep® works

Meet our experts

Discover EWG VERIFIED®

Your guide to safer personal care products

Ratings are based on known and suspected health hazards linked to the ingredients using a weight-of-evidence approach. See EWG website for more detail: https://www.ewg.org/skindeep/understanding_skin_deep_ratings/

Can't find your product?

[BUILD YOUR OWN REPORT](#)

116,428

Products

5,800

Brands

2,433

EWG Verified®
Products

Best



1

2

3

4

5

6

7

8

9

10

Worst

EWG
VERIFIED®

2

Data
Availability:
Fair

Colgate Sensitive
Toothpaste, Sensitive
Enamel Protect



WHERE TO BUY

10

Data
Availability:
Limited

Rich Oil Moisturizing Hair
Lotion (2019 formulation)

INGREDIENT CONCERNS

LABEL INFORMATION

CERTIFICATIONS

Ingredient concerns

See how this product scores for common concerns.

MODERATE Cancer

HIGH Allergies & Immunotoxicity

HIGH Developmental and Reproductive Toxicity

HIGH Use Restrictions



WHERE TO BUY

TARGET

Evaluating the safety of the PCPs used by participants

- For every PCP reported on the survey, we attempted to find a match in the Skin Deep database

PCPs used that linked to products in the Skin Deep database	Overall unique products used, N = 9349	Products used by participant self-reported race and ethnicity, n (%)					
		Asian/Pacific Islander, n = 1710	Hispanic, n = 555	Non-Hispanic Black, n = 1073	Non-Hispanic White, n = 5102	Multiracial or other ¹ , n = 881	P ²
PCPs, overall	6351 (67.9%)	1138 (66.5%)	646 (67.9%)	712 (66.4%)	3504 (68.7%)	334 (69%)	0.36
Hair products	1315 (76.6%)	219 (77.9%)	138 (76.2%)	145 (68.7%)	740 (77.5%)	72 (84.7%)	0.02
Beauty products	1416 (65.5%)	240 (62.5%)	137 (68.2%)	143 (67.1%)	828 (65.3%)	66 (70.2%)	0.50
Skincare products	2322 (75.4%)	428 (74.4%)	233 (73.7%)	264 (76.3%)	1264 (76.2%)	126 (73.7%)	0.77
Perfumes and colognes	242 (60.8%)	48 (60.8%)	26 (57.8%)	37 (63.8%)	113 (60.1%)	16 (64%)	0.97
Oral care products	980 (83.7%)	194 (88.2%)	106 (90.6%)	105 (82.0%)	522 (81.6%)	49 (81.7%)	0.04
Intimate care products	7 (1.0%)	< 5	< 5	< 5	< 5	< 5	0.32
Other PCPs	69 (53.5%)	7 (38.9%)	4 (57.1%)	16 (84.2%)	36 (46.8%)	5 (71.4%)	0.03

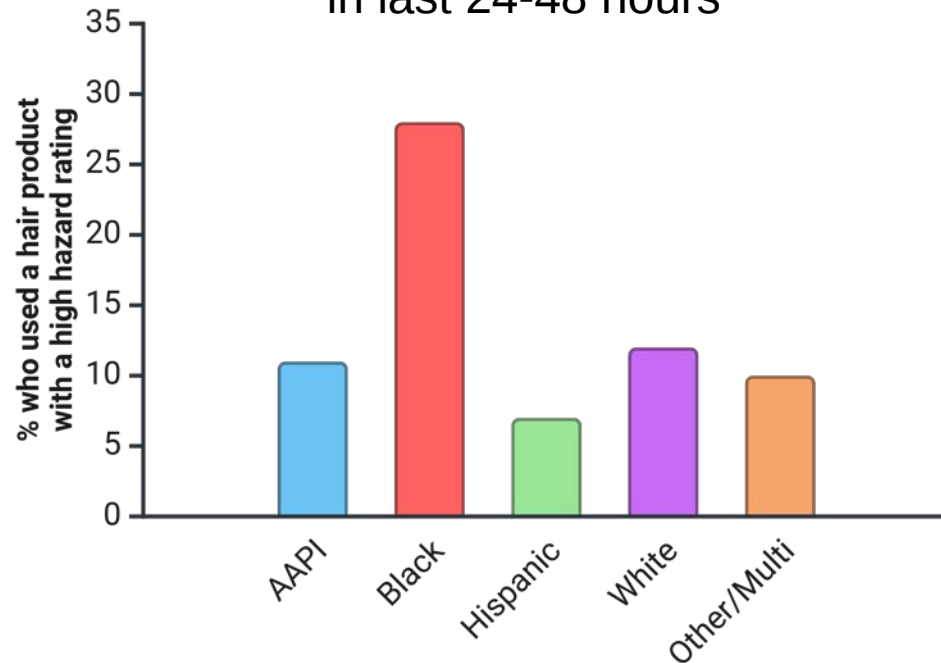


Homer Swei, EWG

Who uses the most hazardous PCPs?



Use of a hair product with a high hazard rating
in last 24-48 hours



- No disparities in risks of using PCPs with high hazard ratings for other product types
- Some differences noted by age, gender, education as well
 - Younger participants used perfumes/colognes with the highest hazard ratings
 - Females tended to use PCPs with higher hazard ratings than males

Black participants had 2x the risk of using a hair product with a high hazard rating

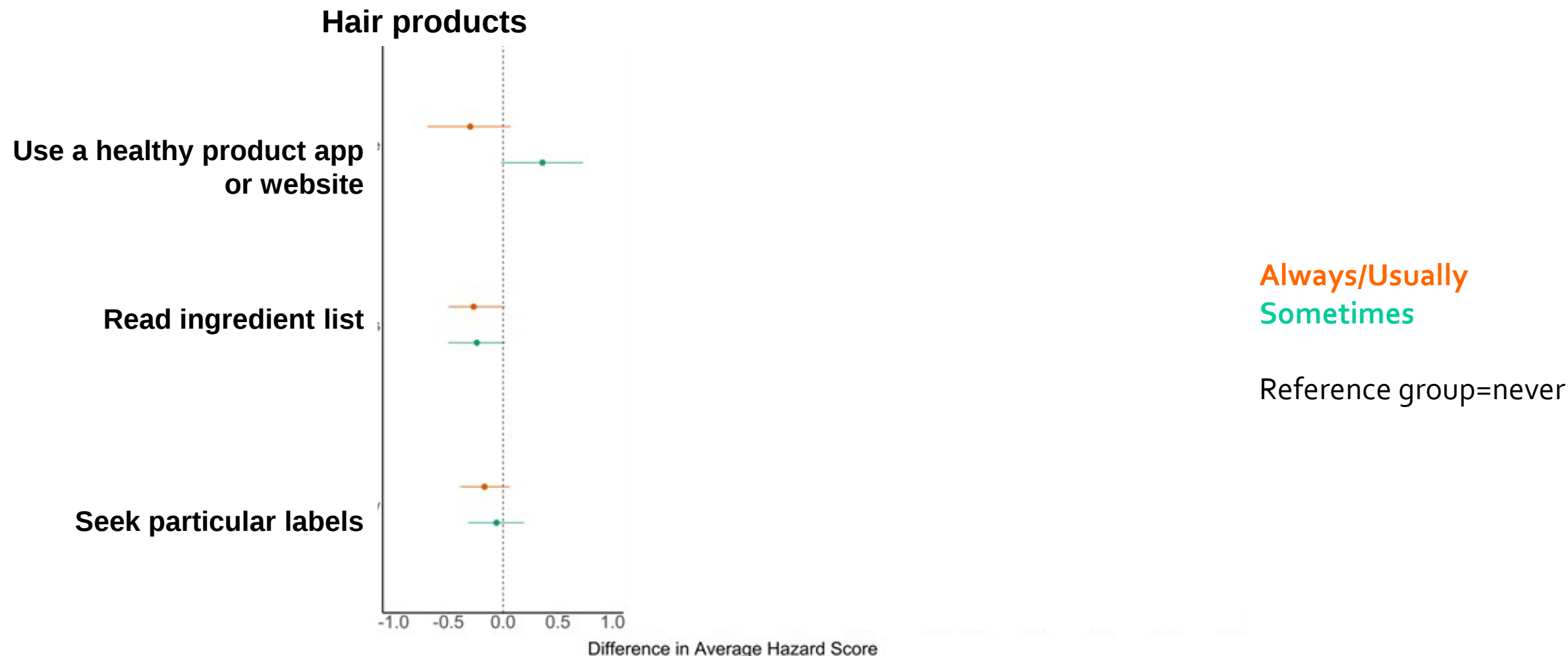
People who are concerned about PCP safety use “safer” products



Statement	On average, people who <u>strongly agree</u> use PCPs with...
“The PCPs I use affect my health”	<u>Lower</u> hazard ratings
“The FDA and other government agencies do a good job of regulating PCPs to ensure they are safe for consumers”	<u>Higher</u> hazard ratings

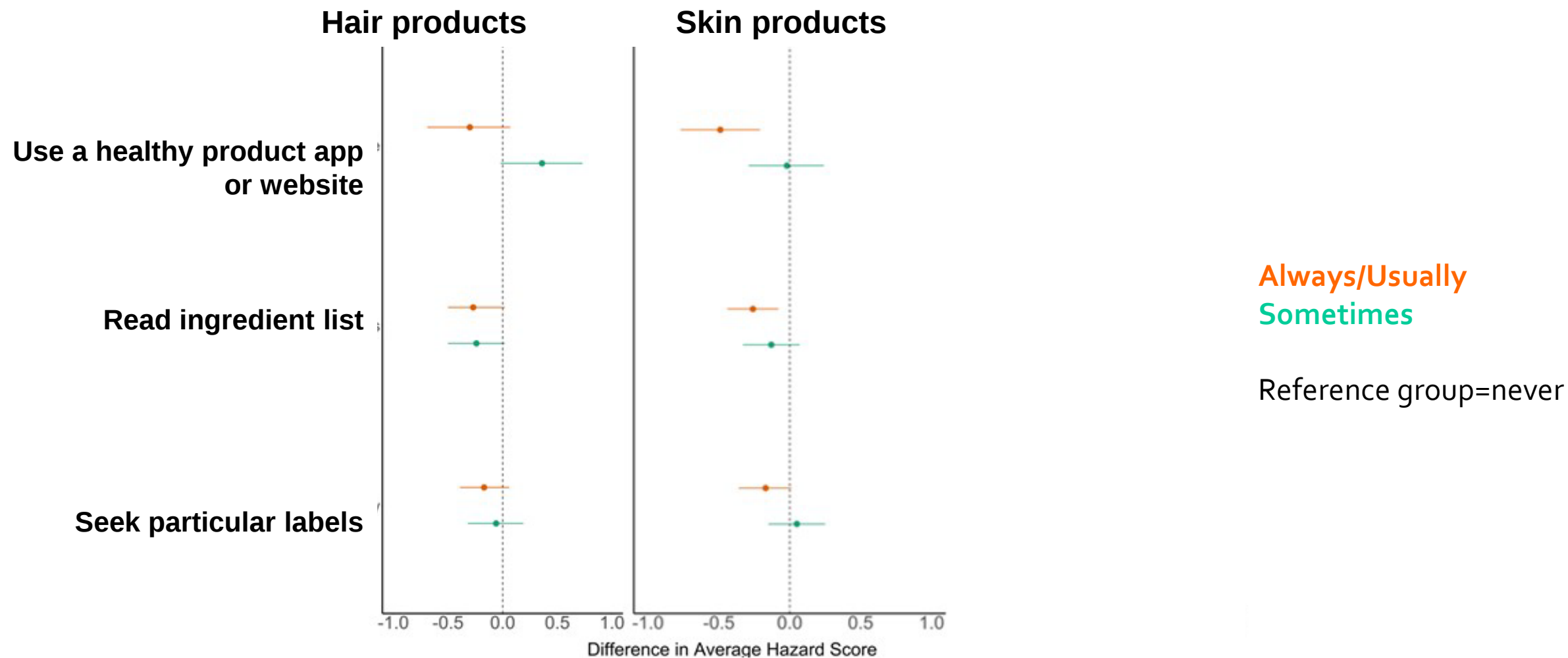
Regression models adjusted for participant sociodemographic factors; reference group is neither agree nor disagree

Precautionary behaviors and PCP hazard ratings



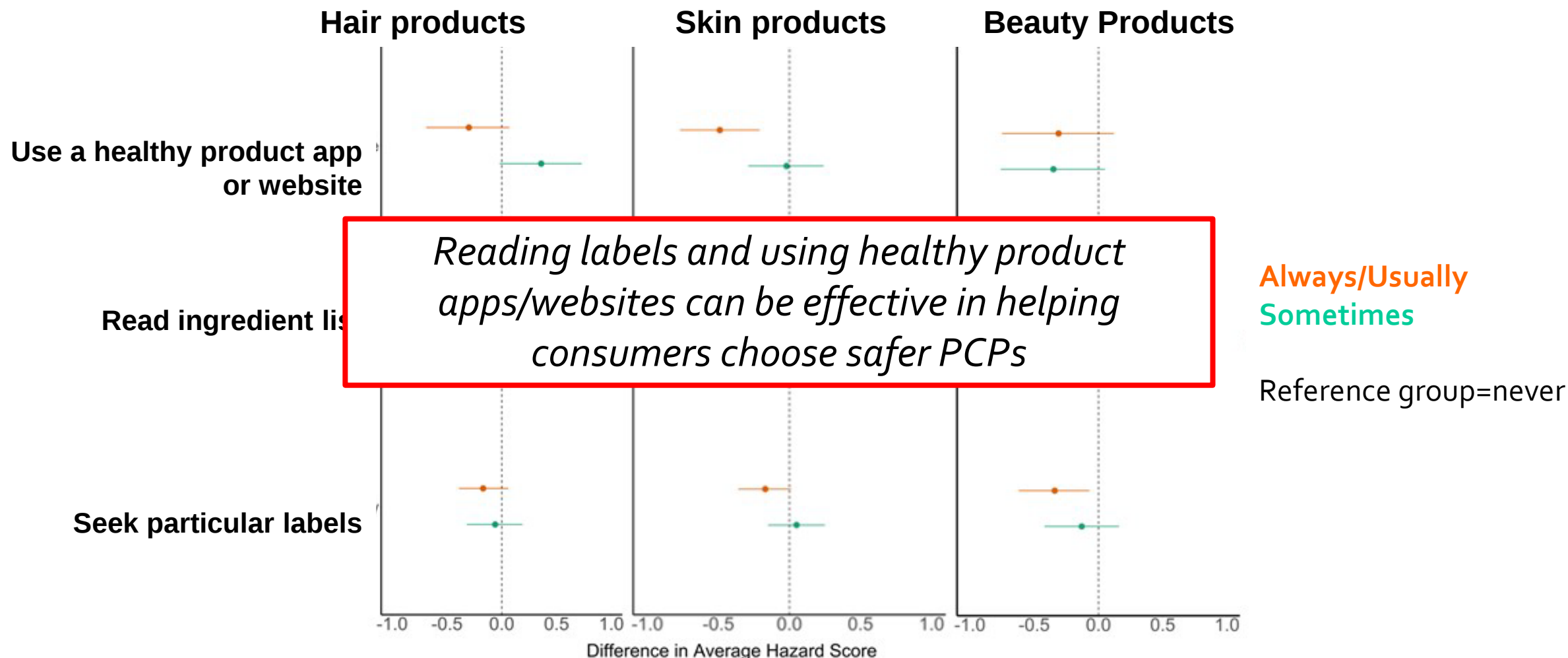
Regression models adjusted for sociodemographic characteristics; reference group rarely/never

Precautionary behaviors and PCP hazard ratings



Regression models adjusted for sociodemographic characteristics; reference group rarely/never

Precautionary behaviors and PCP hazard ratings



Regression models adjusted for sociodemographic characteristics; reference group rarely/never

Summary

In our survey of NJ adults, people who were concerned about PCP safety used just as many products as people who were less concerned, but...

... they were also more likely to use clean beauty apps/websites and read ingredient lists, and...

...the specific products they used were rated as less hazardous by the Skin Deep database.



But there are systemic barriers...

Black women in our study were 2x as likely to have used a hair product with a high hazard rating in the last 24-48 hours – why?

In a study of Boston neighborhoods, stores located in more diverse communities with more residents living below the poverty line were up to 2.3 times more likely to sell hair products rated as highly hazardous on their shelves compared to stores in wealthier communities.





THE WEEKEND ESSAY

WHAT TWEENS GET FROM SEPHORA AND WHAT THEY GET FROM US

Kids are mimicking the semi-professionals they see on their phones, imbibing ideas about beauty rooted in deep desires and capitulations.

By Jia Tolentino
August 10, 2024



The ‘Sephora kid’ trend shows tweens are psyched about skincare. But their overzealous approach is raising concerns

By Parija Kavilanz, CNN

Rutgers-Princeton High School collaboration



- What PCPs are teens using?
- How do they choose PCPs?
- Are they concerned about potential health impacts?
- Do they take precautions when choosing PCPs?
- How does social media fit in?



Co-designed with students

WHAT PERSONAL CARE PRODUCTS DO YOU USE?

Rutgers School of Public Health and Princeton High School are collaborating on a research study to learn about personal care product use in teenagers and how chemicals in these products may be harmful to your health.

Scan QR code for details about the study.



Step 1: Online survey about the products you use (20 mins)

Step 2: Take and upload photos of your products (10 mins)

All current Princeton High School students are eligible to participate in the study.

Participants will receive up to \$10 in Amazon gift cards

Questions? Please email: ResearchStudy@ehsi.rutgers.edu

The Personal Care Product Use in High School Students study is being conducted by Dr. Emily Barrett at the Rutgers Environmental and Occupational Health Sciences Institute at 370 Frelinghuysen Rd, Piscataway, NJ 08854.

Version 1: March 20, 2024

Personal Care Product Landing Page

Welcome to the Princeton High School-Rutgers personal care product study! *To make uploading photos of your personal care products at the end of the survey easier, we recommend that you complete this survey using a device with a camera and with your personal care products easily accessible.* After you complete the surveys and we have verified that you are a current PH-S student, you will receive your Amazon gift card. Each student may only participate once.

Thanks for your interest in our study of personal care product use among teenagers! Watch the short video below to learn more about our research project.

If you're using a mobile device, we suggest rotating it horizontally for an optimal viewing experience of the video. If you continue having trouble viewing the video, you may access it via the following link:
[Princeton High School Personal Care Product Study](#)

Rutgers Princeton High School Personal Care Product Study

What is the Rutgers Princeton High School Personal Care Product Study?

Watch on  YouTube

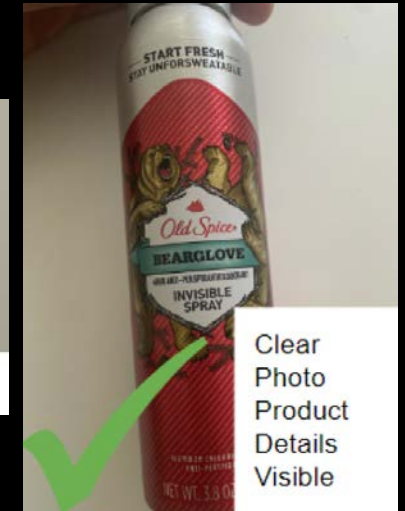
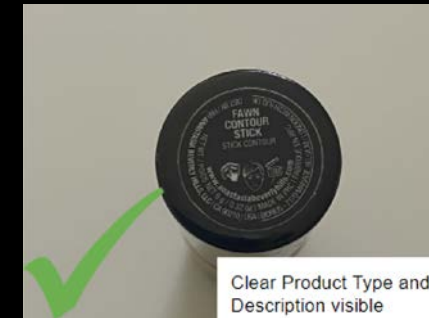
Study team contact information

- Email: researchstudy@ehsi.rutgers.edu
- Phone: (848) 445-0178

Before we get started, we need some more information about you:

Are you a current Princeton High School Student? ☐ Yes ☐ No

* must provide value



Second wave of recruitment through Rutgers summer programs in summer 2025

High school study participants (n=143)

Demographics:

- 93 females, 44 males
- Mean age 16.1 ± 1.3 yrs
- Race/ethnicity:
 - 35.7% Non-Hispanic White
 - 32.3% Non-Hispanic Asian
 - 12.6% Hispanic
 - 16.8% multiracial/other races
- Parental education
 - 5% <college
 - 30% college
 - 61% >college
 - 13% unknown

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91% own smartphone



Instagram: 75.5%
YouTube 72%
TikTok: 51%
Snapchat: 51%



30-40% engage
with beauty content
and influencers

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	# of PCPs used/day	
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Rutgers (2019)	19	8
HS (2024-5)	14	7

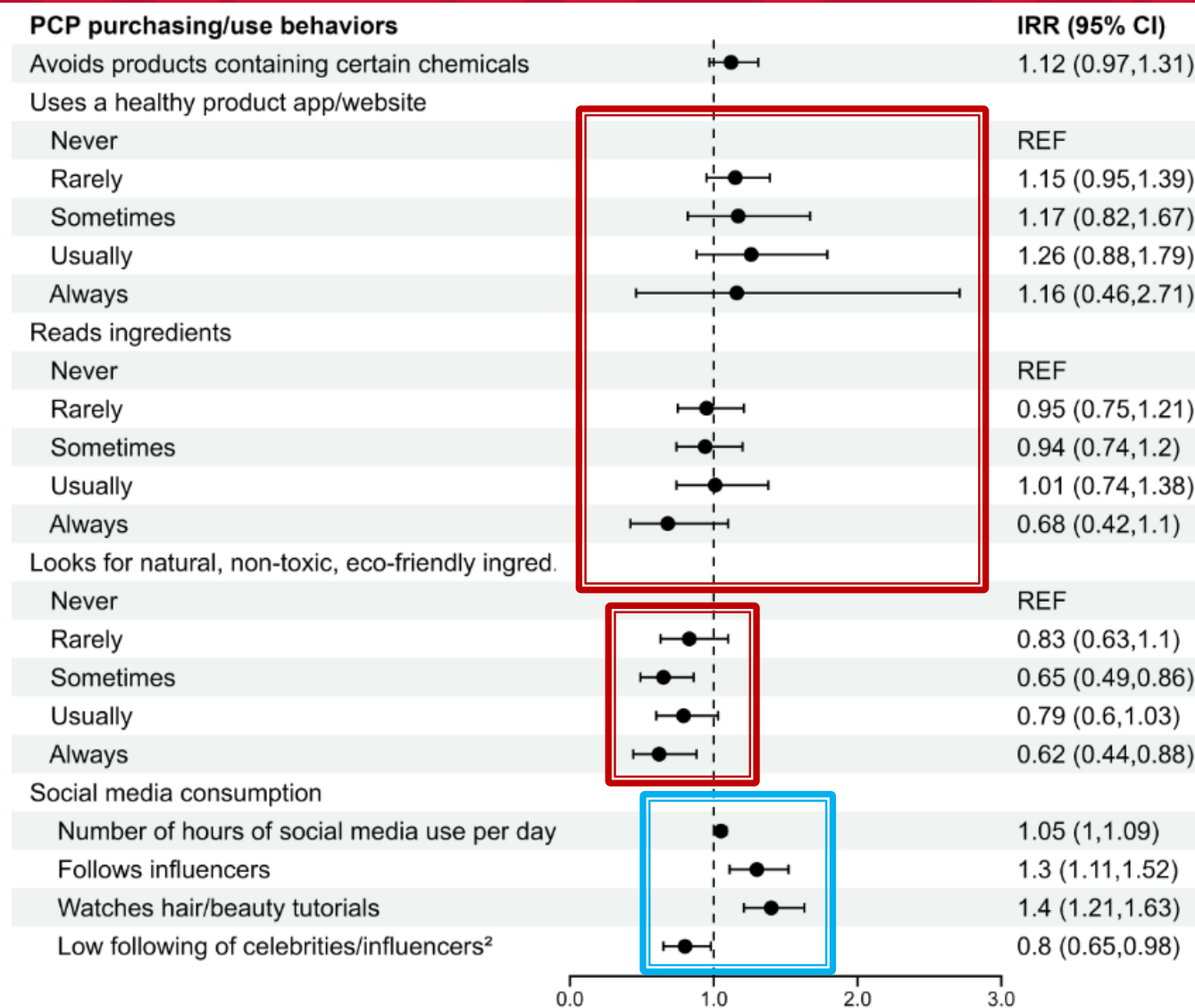
*Some participants used
>25 PCPs/day*

Precautionary behaviors

When you purchase personal care products, how often do you:	Rutgers-affiliated adults (%)	High Schoolers (%)
Use a “healthy” product apps or websites (e.g., Skin Deep, Clearya, Healthy Living, Think Dirty)	7.0%	5.0%
Check ingredient labels	38.3%	18.8%
Look for labels indicating the product was made with natural, non-toxic, or eco-friendly ingredients	37.4%	32.8%



Precautionary behaviors and PCP use



Next steps:

- **Examine Skindeep hazard scores**
- **Qualitative work**
- **Expand to more diverse populations**

Takeaway messages



- People are using more PCPs than ever and starting at younger ages
- Many products contain chemicals with known health hazards (e.g., endocrine disruptors)
- There are sociodemographic disparities in the use of hair products and some other higher hazard product types (e.g., perfumes)
- Educating people on potential hazards and providing tools to inform safer consumer choices can be effective, but structural barriers persist

Acknowledgements

Thanks to:

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Carolyn Kinkade

Jennifer Smolyn

Vita Moss-Wang

Gabby Kaputa

Natale Mazzaferro

Cathryn Payne

Amber Rockson

Our participants!



**Does using
“safer” PCPs
reduce
chemical
exposures?**



Successful PCP interventions

Reducing Phthalate, Paraben, and Phenol Exposure from Personal Care Products in Adolescent Girls: Findings from the HERMOSA Intervention Study

Kim G. Harley,¹ Katherine Kogut,¹ Daniel S. Madrigal,¹ Maritza Cardenas,¹ Irene A. Vera,¹ Gonzalo Meza-Alfaro,¹ Jianwen She,² Qi Gavin,² Rana Zahedi,² Asa Bradman,¹ Brenda Eskenazi,¹ and Kimberly L. Parra³

¹Center for Environmental Research and Children's Health (CERCH), University of California, Berkeley, Berkeley, California, USA;

²Environmental Health Laboratory, California Department of Public Health, Richmond, California, USA; ³Clinica de Salud del Valle de Salinas, Salinas, California, USA

Environmental Health Perspectives, 2016

Parabens, bisphenols, and other environmental phenols exposure from cosmetics use in Korean adolescent girls: Findings from a 2-day intervention study

Habyeong Kang^{a,1} , Sunmi Kim^{b,1}, Hyojin Lee^{c,1}, Yunsun Jeong^d, Jiwon Lee^e, Inae Lee^f, Hyo-Bang Moon^g, Kyungho Choi^h, Ki-Tae Kim^{e,*} 

Environmental Research, 2025

Levers to decrease exposure to harmful chemicals: the case of Personal Care Products and cosmetics

Nicolas Jovanovic^a , Franziska Bright^a , Cathrine Thomsen^b , Ronan Garlantezec^c, Audrey Rocabois^a , Rosemary RC McEachan^d, Tiffany C Yang^d, Amrit K Sakhi^b , Cécile Chevrier^e, Sandrine Mathy^f , Rémy Slama^{g,h}, Sarah Lyon-Caen^a, Martine Vrijheid^{i,j,k} , Claire Philippat^{a,*} 

Environment International, 2026

Key unanswered questions:

- Can self-directed PCP interventions be successful in reducing exposures?
- Are these reductions sustainable over longer periods of time?