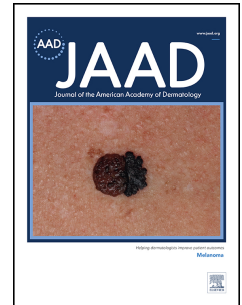


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Allergens and Marketing Claims in Commercial Hand Sanitizers: A Cross-Sectional Study

Lily Guo, BS, MS, Heidi Bai, BA, Nina Botto, MD, Carina M. Woodruff, MD.



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Lily Guo, BS, MS,¹ Heidi Bai, BA,² Nina Botto, MD,³ Carina M. Woodruff, MD.³

¹Chicago Medical School at Rosalind Franklin University, North Chicago, Illinois.

²University of Rochester School of Medicine & Dentistry, Rochester, New York.

³Department of Dermatology, University of California, San Francisco, San Francisco, California.

Corresponding author:

Carina M. Woodruff, MD
Department of Dermatology
University of California, San Francisco
1701 Divisadero Street
San Francisco, CA 94115
E-mail: carina.woodruff@ucsf.edu
Phone: 415-353-7800

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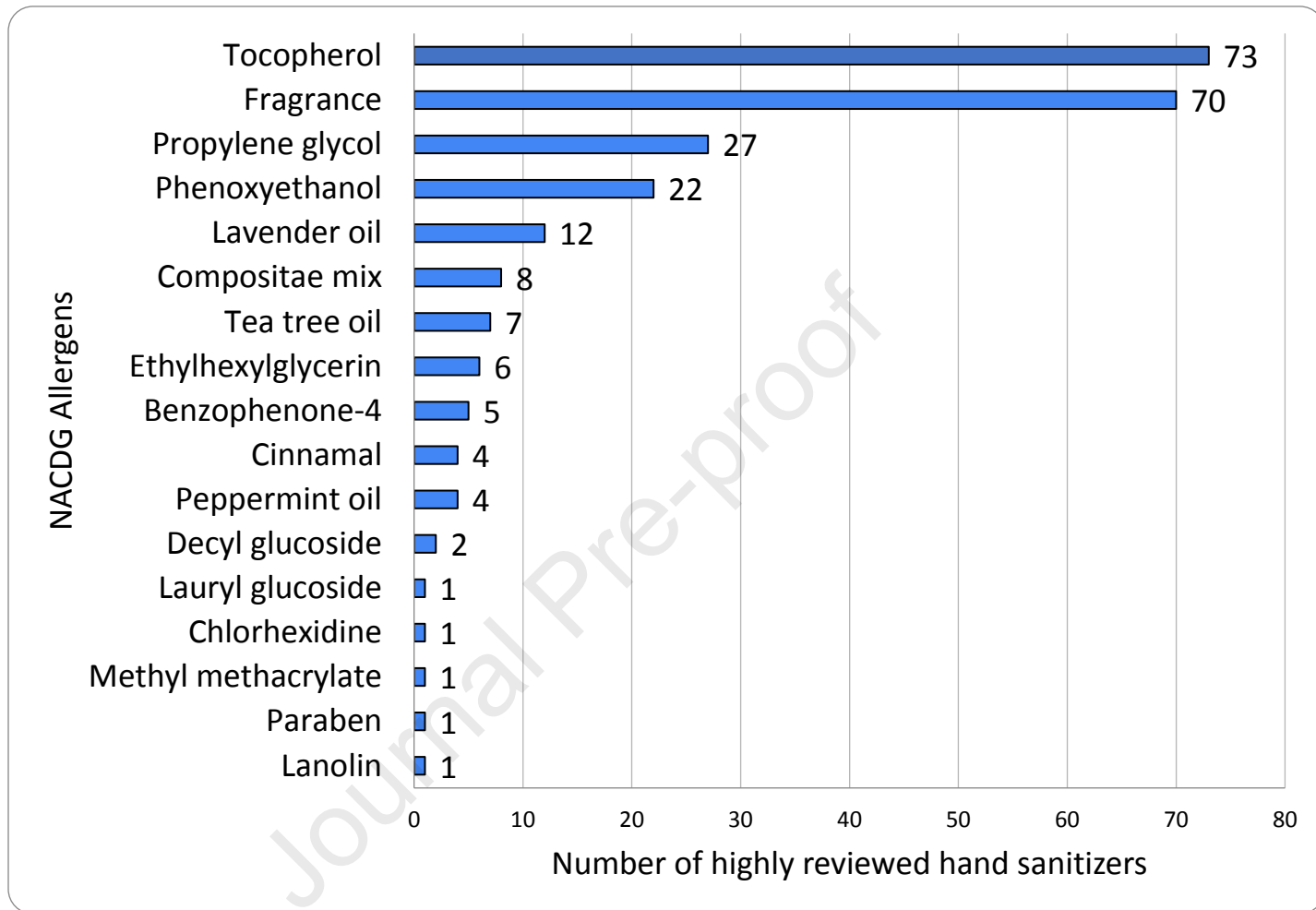
Vigorous hand hygiene measures adopted in the setting of the ongoing COVID-19 pandemic translate to an increased risk of contact dermatitis, which dermatologists can help mitigate by helping patients select effective, hypoallergenic products. We sought to identify contact allergens and salient product features in commercial hand sanitizers. In May 2021, a total of 160 top-reviewed, commercial hand sanitizers were identified among five major online retailers (Walmart, Target, Amazon, Walgreens, and CVS). Ingredients were reviewed to determine the proportion of products that had ingredients listed in the North American Contact Dermatitis Group (NACDG) 2017-2018 standard series.(1) Fragrance and cross-reactors were identified in accordance with The American Contact Dermatitis Society's (ACDS) Contact Allergen Management Program database.

All sanitizers had legally marketed active ingredients, e.g., ethyl alcohol (81.9%), benzalkonium chloride (9.4%) and isopropyl alcohol (8.8%). 71.3% of all sanitizers and 7 of the 10 most reviewed sanitizers contained at least one NACDG allergen. The most common allergens were tocopherol, fragrance, propylene glycol, and phenoxyethanol (Figure 1). 84.0% of products were sold with marketing claims such as “dermatologist recommended”, “moisturizing”, “fragrance-free”, or “hypoallergenic”, the latter three of which were verifiable from ingredient lists. All products labeled as “moisturizing” contained at least one humectant. 39.1% of products labeled “fragrance free” contained fragrance or cross-reactors. 70.0% of “hypoallergenic” sanitizers had ingredients in the NACDG series and 60% had at least one ingredient with a sensitization rate of more than 1%. Overall, 19.5% of the above verifiable claims were misleading. 83.3% of products labeled “dermatologist recommended” had at least one ingredient in the NACDG series. A quarter of sanitizers had the label “no parabens, sulfates, phthalates, or dyes”.

Our findings largely parallel studies of hospital-grade sanitizers (2) . Although tocopherol was a common ingredient, its allergenic potential is low (0.7%). Given the high rate of patch test positivity to fragrance chemicals, our findings suggest fragrance avoidance may be a high yield, empiric recommendation for patients with hand dermatitis. Overall, when one considers the dramatic changes in hand hygiene practices that have taken place among the millions of Americans that now use these products regularly, recommending low-allergen hand sanitizers becomes a relevant public health initiative (table 1).

Our findings are in keeping with other recent studies that suggest discrepancies between personal product claims and their composition, as well as drugstore product labels and online ingredient lists, is not uncommon.(3) The scope of the problem suggests more regulatory oversight of personal care product formulation and packaging by the FDA is necessary. The unintended impact of consumer demand for “natural products” is evident in the high number of products with highly sensitizing fragrances/botanical extracts and more allergenic preservatives such as phenoxyethanol (sensitization rate of 2.5%) as replacements for parabens (0.6%) due to popularized and, in some cases, dubious evidence of potential endocrine-disruption and carcinogenic effects. (4) Dermatologists should weigh in on this critical conversation, helping consumers to balance these concerns with an understanding of the rationale behind product composition, relative risks of sensitization and the limitations of marketing claims.

79 **Figure I – Frequency of NACDG Allergens in Top-reviewed, Commercial Hand Sanitizers**



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Table I – Low cost, highly-rated hand sanitizers that contain moisturizers and lack common allergens

Product Name	Active Ingredient	Retailer	Vehicle Type	Price per ounce (\$)	Number of Reviews	Consumer Ratings
SupplyAID	80% ethyl alcohol	Amazon	Gel	0.13	4331	4.6
Hello Bello	80% ethyl alcohol	Walmart	Gel	0.27	294	4.3
Wave Gel	75% alcohol	Amazon	Gel	0.30	520	4.2
SanitizeRx	75% ethyl alcohol	Amazon	Gel	0.31	338	4.5
Hydra pearl	80 Ethyl alcohol 80%	Amazon	Spray	0.34	63	4.8
Suave	65% ethyl alcohol	Target	Gel	0.37	276	4.6
Adam's	75% isopropyl alcohol	Amazon	Spray	0.56	113	4.9
Pipette	65 Ethyl alcohol	Target	Gel	0.80	350	4.7
Avagard D	61% Ethyl alcohol	Amazon	Gel	0.83	757	4.8

All products in table 1 were chosen by two dermatologists (C.M.W and N.B) based on the ACDS's recommendations for hand hygiene (5) and compliance with the CDC's recommendations (at least 60% ethyl alcohol or 70% isopropyl alcohol as the active ingredient), absence of NACDG allergens, high ratings by consumers, low cost, and the presence of emollients.

References

1. DeKoven JG, Silverberg JI, Warshaw EM, Atwater AR, Reeder MJ, Sasseville D, et al. North American Contact Dermatitis Group Patch Test Results: 2017-2018. *Dermat Contact Atopic Occup Drug*. 2021 Apr 1;32(2):111–23.
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4. Rubin CB, Brod B. Natural Does Not Mean Safe—The Dirt on Clean Beauty Products. *JAMA Dermatol*. 2019 Dec 1;155(12):1344–5.
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Corresponding author:

Carina M. Woodruff, MD
Department of Dermatology
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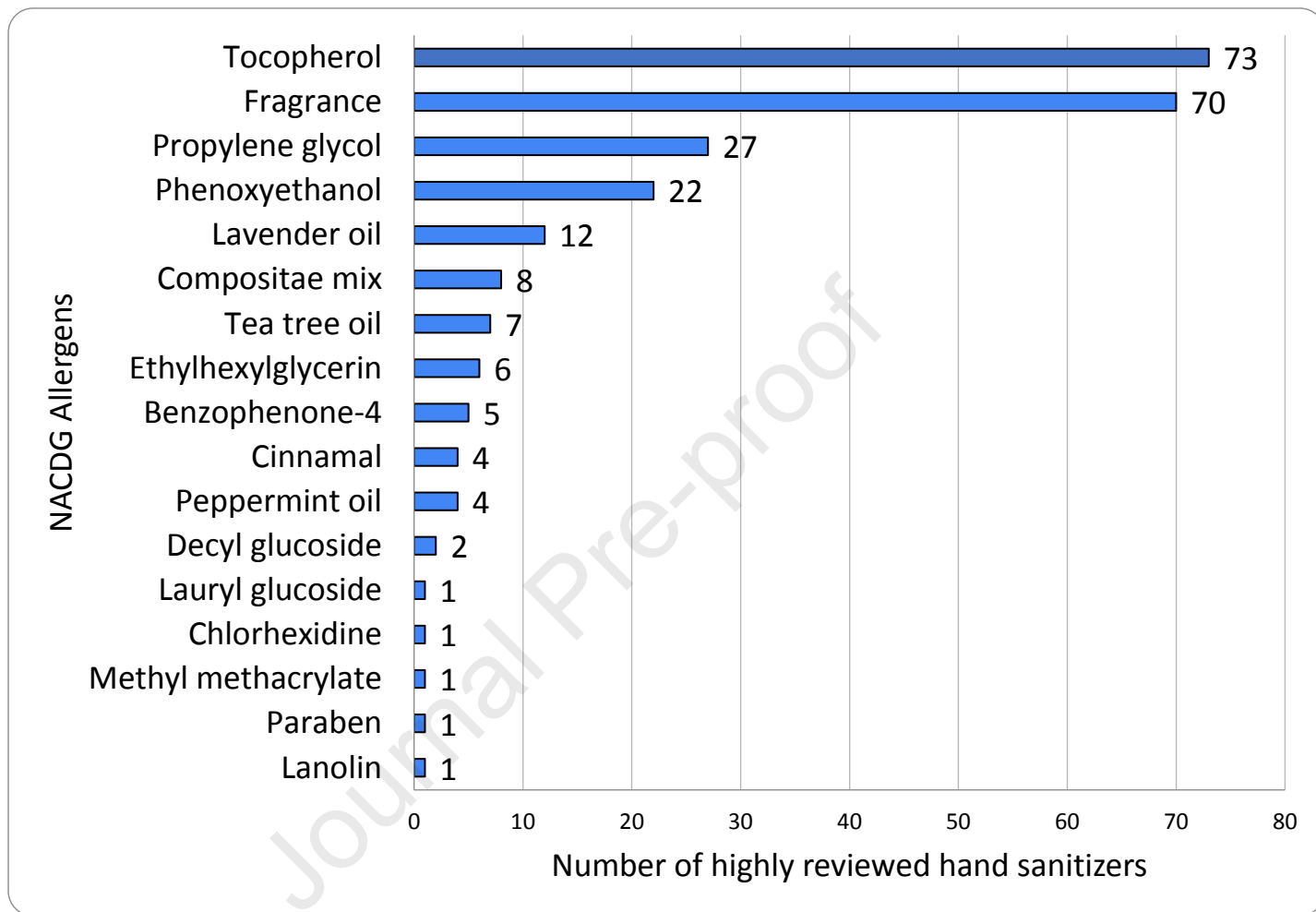


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