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Authors

Burshtein, Joshua

Shah, Milaan

Zakria, Danny

et al.

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United States public interest in melanoma and prevention and its association with incidence, mortality, and dermatologist density

Joshua Burshtein, MD^{1a}, Milaan Shah, MD², Danny Zakria, MD, MBA³, Lauren DeBusk, MD⁴, Angela Rosenberg, DO⁴, Darrell Rigel, MD, MS⁵

¹ Department of Dermatology, University of Illinois Chicago, Chicago, Illinois, USA, ² Department of Dermatology, Medical University of South Carolina, Charleston, South Carolina, USA, ³ Department of Dermatology, Icahn School of Medicine at Mount Sinai, New York, New York, USA, ⁴ Department of Dermatology, UT Southwestern Medical Center, Dallas, Texas, USA, ⁵ Department of Dermatology, NYU Grossman School of Medicine, New York, New York, USA

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To the Editor

Melanoma has the highest mortality rate among skin cancers. Analyzing public interest can inform dermatologists regarding risk factors for melanoma and uncover educational gaps. United States (US) public search trends for melanoma were previously analyzed using Google Trends, which has been a useful tool for establishing correlations in dermatology.^{1,2} These analyses found a seasonal correlation of public interest in melanoma, skin cancer, and sunscreen.^{1,2} Though the relationship between melanoma search interest with melanoma outcomes has been reported, a prior study utilized melanoma outcomes from years that did not directly align with Google Trends search data.² In addition, there is limited literature on the relationship between dermatologist density and public health information.

The purpose of this study was to assess search interest in melanoma by state to explore its relationship with melanoma mortality, incidence, and dermatologist density.

Data was collected based on a query of Google Trends performed on March 17, 2024. Similar methodology to prior studies was implemented.^{1,2} The search terms utilized were *melanoma*, *skin cancer*, *sunscreen*, and *sunburn*. A previously published checklist for selection criteria was utilized to ensure transparency of data.³ Search was limited to the US with the date range of January 1, 2016 to December 31, 2020, as this is the timeframe with the most recent melanoma statistics.⁴ The category was restricted to *health*. Google Trends calculates the “search volume index” (SVI) to denote the number of searches of a unique term normalized to the total number of searches (scale of 0 to 100).⁵

Melanoma mortality and incidence rates for US states were obtained from the Centers of Disease Control cancer statistics.⁴ All ages, sexes, and races were included. Dermatologist density per state was calculated via section code and 2020 population statistics.⁶ Data was analyzed using SPSS v29.0.1.0.

Significant positive correlations were found between the search term *melanoma* and melanoma mortality ($r=0.29$, $p=0.04$), melanoma incidence ($r=0.31$, $p=0.03$), and dermatologist density ($r=0.39$, $p<0.01$) (**Figure 1**). *Melanoma* SVI was also significantly correlated to *skin cancer* ($r=0.31$, $p=0.03$).

Sunscreen SVI was significantly correlated to the SVI for *sunburn* ($r=0.63$, $p<0.001$) and dermatologist density ($r=0.47$, $p<0.001$), and inversely correlated with melanoma mortality ($r=-0.45$, $p<0.01$) (**Figure 1**). The SVI for *skin cancer* was significantly correlated to melanoma mortality ($r=0.33$, $p=0.02$) and melanoma incidence ($r=0.33$, $p=0.02$).

At the state level, melanoma mortality was significantly correlated to melanoma incidence ($r=0.44$, $p<0.01$) and inversely correlated with dermatologist density ($r=-0.41$, $p<0.01$).⁷ Dermatologist density was not found to be correlated with melanoma incidence.

The level of public interest for *melanoma* in the US is directly correlated with melanoma mortality, incidence, and dermatologist density. Although some studies found varying results for relationship of *melanoma* SVI with mortality and incidence,¹ our findings of a positive correlation are consistent with prior reported long-term data.² This may indicate increased desire for knowledge on melanoma in regions with higher melanoma burden and educational initiatives may be more effectively targeted to these areas.

The significant correlation of *sunscreen* SVI with dermatologist density indicates that the presence of derma-

a Corresponding Author: Joshua Burshtein MD, 808 South Wood Street, Chicago, IL 60612, Tel: 845-596-9482, Email: jburshtein13@gmail.com

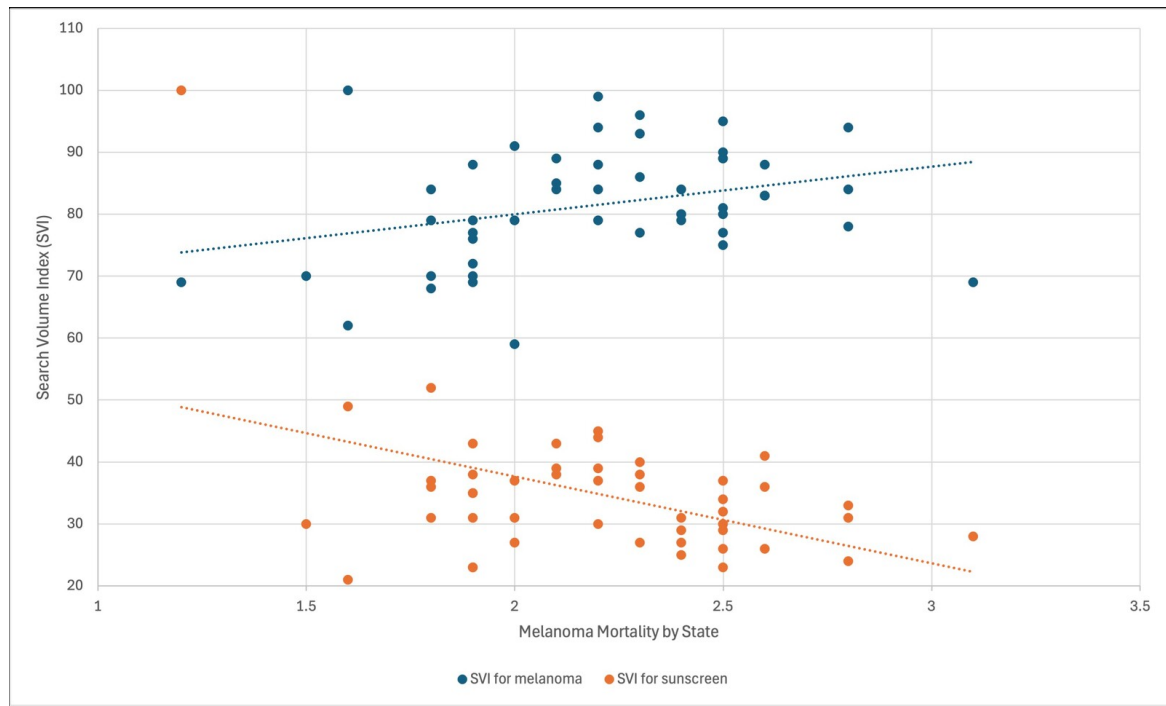


Figure 1. Association of search volume index for melanoma and sunscreen with melanoma mortality.

tologists may enhance public interest in sunscreen and therefore overall sun protection. A recent survey study found that dermatologist recommendation is an important characteristic for patient selection of sunscreen.⁸ In addition, the inverse relationship of public interest in *sunscreen* to melanoma mortality supports the potential benefit of educational programs regarding consistent sunscreen usage.

Further, we found that *skin cancer* searches were significantly correlated with melanoma mortality and incidence, adding to the association between *sunscreen* and *melanoma* SVI with incidence that was previously reported.² This further supports the fact that patients may

be more interested in education regarding skin cancer in regions where it has a higher prevalence.

US public interest in melanoma based on Google online searches significantly correlates with melanoma mortality, incidence, and dermatologist density. The findings of this study can be used by physicians and public health organizations to more efficiently target educational programs.

Potential conflicts of interest

The authors declare no conflicts of interest.

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