State SUNucate Laws, the Popularity of Google Searches for Terms Related to Sun Protection, and Youth Sunscreen Use

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Objective: Our objective was to determine whether state SUNucate laws – which have been adopted by 27 states and require schools to permit youths to carry and apply sunscreen on school grounds – were associated with changes in Google Search behavior for words and phrases related to sun protection as well as self-reported sunscreen use by youths. **Methods:** This was an observational study examining: (1) Google Trends search popularity for terms such as "sunscreen" and "SPF" by state, month, and year for 2004-2022; and (2) self-reported sunscreen use by high school youth in the national Youth Risk Behavior Survey during 2009-2019. **Results:** State SUNucate laws were associated with increased Google search popularity of terms related to sun protection. Google search popularity for 'sunscreen' increased by 27.2% (95% CI 12.67% to 41.7%; $p < .001$). State SUNucate laws were also associated with increased sunscreen use among high school youths by 8.3% (95% CI 0.014% to 15.0%; $p < .05$). **Conclusion:** State SUNucate laws may be effective tools for increasing population search behavior for sun protection terms and youth sunscreen use.

Key words: sunscreen; adolescent health; school health; school policy; SUNucate laws; Youth Risk Behavior Survey; Google Trends data
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In 2016, only 20% of school districts provided resources for school staff to implement sun protective policies.[1] Moreover, because sunscreen is considered an over-the-counter drug by the US Food and Drug Administration (FDA), many states prohibit students from possessing and applying sunscreen in school as part of broader "medication bans." In these states, students wishing to use sunscreen at school must obtain a note from a physician and apply it in front of a school nurse.[2,3] In response, the American Society for Dermatologic Surgery Association (ASDSA) has assembled a coalition of over 50 stakeholders to promote legislation increasing sun protective behaviors in schools. Drawing on existing laws in a handful of states, the coalition constructed a model "SUNucate" bill that permits students to apply sunscreen at schools and wear sun protective clothing; the model bill has an optional section that allows schools to incorporate sun protective education into their curriculum.[4]

Figure 1, which shows the states adopting SUNucate policies over time, reveals that the ASDA's advocacy has been effective. As of June 2023, 27 states have adopted a SUNucate policy.[5] These laws have been adopted in every region of the country, leading the Society for Behavioral Medicine to explicitly call for research examining the impact of legislative and policy changes on sun-safety knowledge, attitudes, beliefs, and behaviors.[6] Despite these developments, there is little research on the

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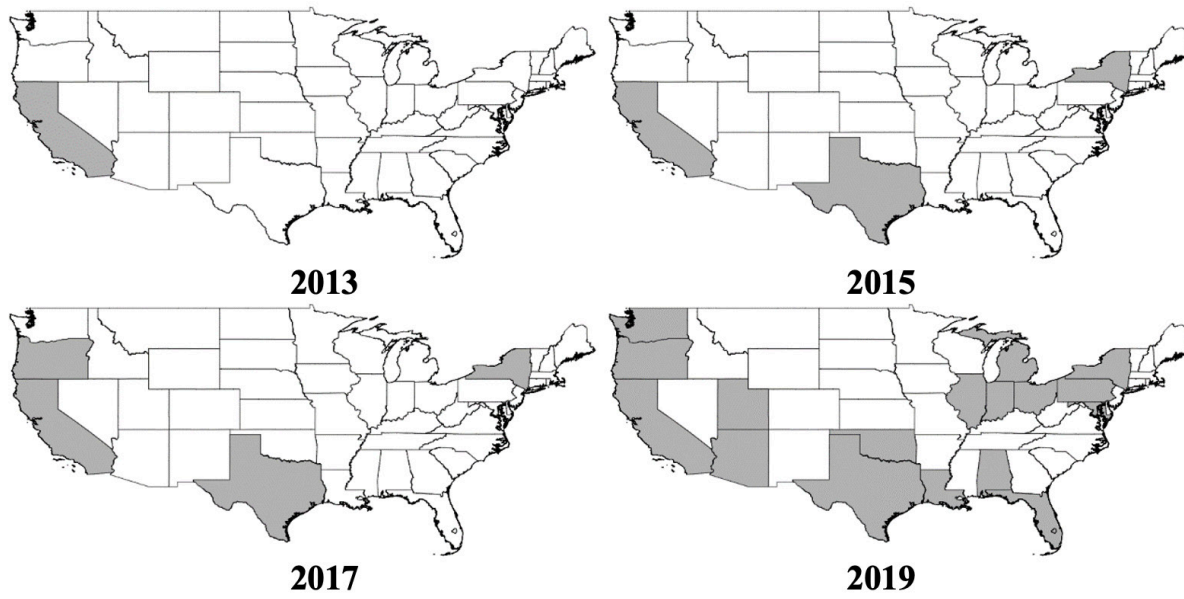
Figure 1
Spatial and Temporal Variation in SUNucate Legislation



Note.
Figure shows states which have adopted SUNucate legislation in grey for selected years in our sample.

Source: American Society for Dermatologic Surgery Association (2021)

effects of these policies, though one recent study showed that SUNucate laws are not significantly associated with state UV levels.[7]

In this study we provide the first evidence on whether state SUNucate laws are associated with changes in information-seeking behavior regarding sun protection and youth sunscreen use. We hypothesize that SUNucate laws increase demand for information about sun protection from teachers and students, as well as from parents. Some state SUNucate laws include sun-safe education provisions that recommend that instruction includes information about skin cancer prevention; in other states the SUNucate policy requires parents to be informed about and/or to provide written consent for teachers to be able to apply sunscreen to the student.[8] Both of these are likely to increase the demand for sun protection-related information. We also hypothesize that SUNucate policies will increase sunscreen use by youths by lowering the indirect costs of possessing and applying sunscreen at school (eg, students will no longer be required to obtain a physician's note or to visit the school nurse) and increasing knowledge about the benefits of sunscreen. We are not aware of any prior studies of how SUNucate laws relate to information on sun protection within a state nor to sunscreen use rates by children.

METHODS

Google Trends Data

We use Google Trends data for years 2004-2022 to understand how state SUNucate laws were related to the relative popularity of searches for various sun protection terms. Google Trends data are increasingly used by researchers as a proxy for consumer demand for particular products or services,[9-11] and researchers have begun using these data to understand the effects of public policies on the demand for various types of information in the population,[12,13] including in the context of skin cancer risks.[14-16] For every month of the sample period, Google randomly samples searches performed

in each state and constructs an index by dividing the number of searches for a specific term—such as "sunscreen"—by the total number of searches. For each state, the month when the relative search rate is maximized is assigned 100. The index for the rest of the period is determined by taking the ratio of the relative search rate to the maximum relative rate.

We study the relationship between these data and SUNucate laws using the following difference-in-differences multivariate regression specification estimated with Ordinary Least Squares:

$$(1)\ Y_{st} = \beta_0 + \beta_1(\text{SUNUCATE LAW})_{st} + \beta_2 Z_{st} + \beta_3 S_s + \beta_4 T_t + \varepsilon_{st}$$

where the dependent variable, Y_{st}, is the relative popularity of the sun protection-related search terms in state s during time t. Our independent variable of interest, *SUNUCATE LAW*, is an indicator variable equal to one in states and times when a SUNuncate law is in effect. We obtained information on the timing of state SUNucate policies from the SUNucate Coalition website of the ASDSA.

To account for state-level time-varying factors which may be concurrent with both SUNucate laws and sun-protection-related Google searches, the vector Z_{st} includes time-varying controls for the broader sun-related policy environment, including: share of minors prohibited from using indoor tanning beds, share of minors requiring parental presence for every tanning session, share of minors requiring parental consent for indoor tanning, and state laws requiring tanning salons to ensure a safe tanning experience by providing goggles and/or displaying informational material related to tanning risks.[17-20] The vector also includes an indicator for whether the state had a graduated driver's license law to account for teen access to indoor tanning, the monthly state unemployment rate to account for local economic conditions,[21] the natural log of the real value of the minimum wage to account for economic opportunities of youths and young adults who are more likely to be in minimum wage jobs, the natural log of the real value of cigarette taxes to account for another salient state-level cancer-related risk factor,[22] and an indicator for whether the state had expanded Medicaid as part of the Patient Protection and Affordable Care Act to account for access to health insurance coverage which may be related to demand for skin cancer screenings.

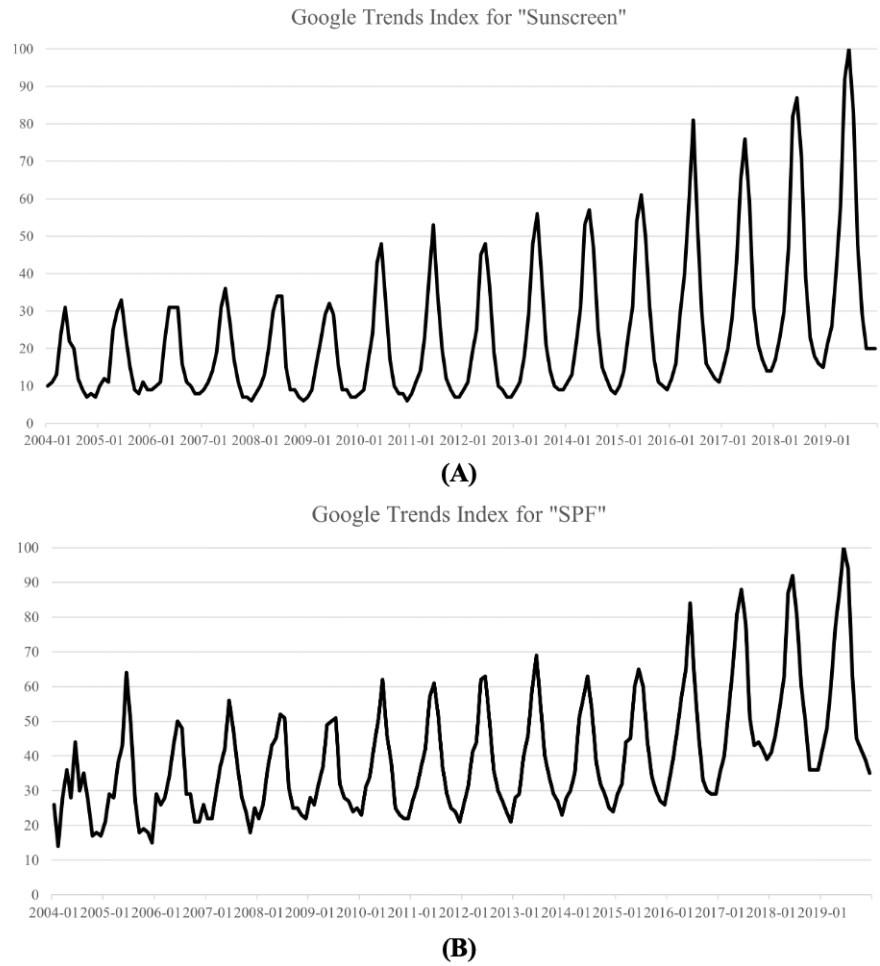
We include a vector of state fixed effects, S_s, to control for all time-invariant characteristics that may be related to sun protection search behavior in a state, such as a state's latitude/longitude or its attitudes toward sun-related activities. We also include a vector, T_t, of year-by-month effects to account for the strong seasonality in sun exposure and national shocks to Google search behavior that are not place-specific, such as secular trends in sunscreen popularity. In some models we additionally control for Census region-by-year-by-month fixed effects or Census division-by-year-by-month fixed effects, which are not shown in equation 1. These controls further ensure that our estimates compare within state over time changes in Google search popularity for states that adopt SUNucate laws with the associated changes for nearby states, such as those in the same Census region or Census division that are thus more likely to share similar culture, geography, and norms about sun protection and outdoor activities. In the presence of the covariates, our key identifying assumption is that information-seeking behavior in states with SUNucate laws would have evolved similarly to behavior in states without these laws, conditional on covariates, in the absence of the policy. Standard errors are clustered at the state level.[23]

National Youth Risk Behavior Survey Data

We use national Youth Risk Behavior Survey (YRBS) data for 2009-2019 to understand how state SUNucate laws were related to sunscreen use by high school youths. The national YRBS is sponsored by the US Centers for Disease Control and Prevention and is fielded in schools in the spring during odd-numbered years. Students are asked the following question: *When you are outside for more than one hour on a sunny day, how often do you wear sunscreen with an SPF of 15 or higher?* Response options include *never*, *rarely*, *sometimes*, *most of the time*, and *always*. We consider an outcome that equals one if the youth reported any sunscreen use and zero otherwise.

We estimate the relationship between SUNucate laws and this sunscreen outcome using similarly specified difference-in-differences models as in equation (1), augmented with controls for individual demographic characteristics. We estimate

Figure 2
Google Trends Search Popularity for "Sunscreen" and "SPF", 2004-2019



Note.
Figure shows national trend in Google searches for "sunscreen" and "SPF" at the year-by-month level. The y-axis shows relative search popularity on a scale of 1 to 100, where the data are normalized relative to the highest point, which is given a value of 100.

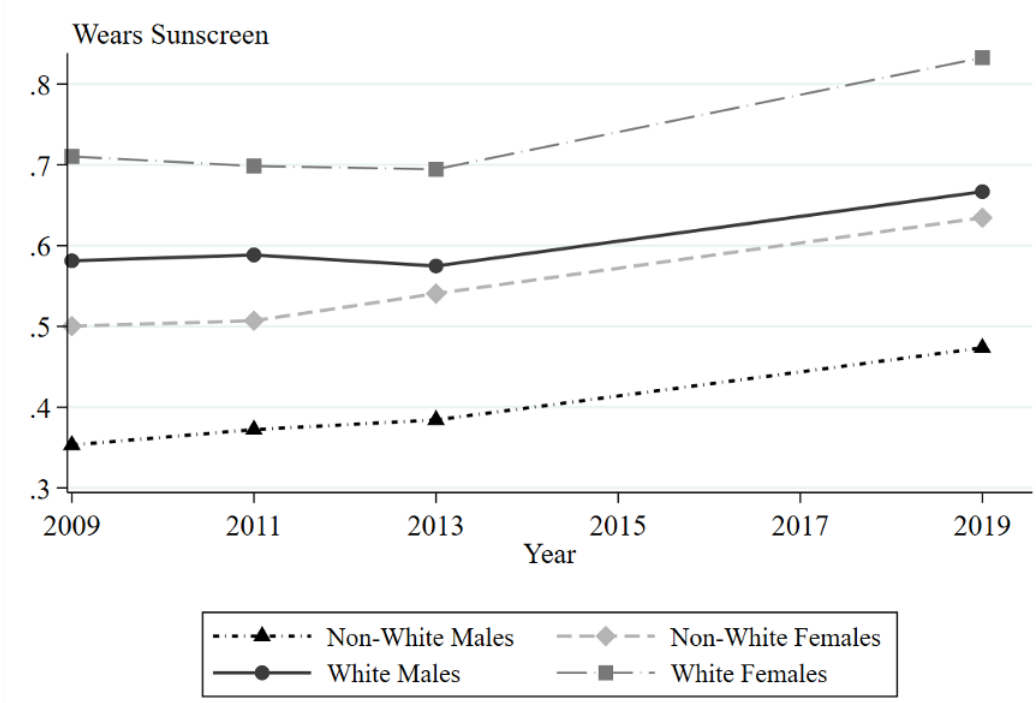
Source: Google Trends Data, 2004-2019

the following linear probability models for ease of interpretation, though our results are robust to estimating logit or probit models:

$$(2)\ Y_{ist} = \beta_0 + \beta_1(\text{SUNUCATE LAW})_{st} + \beta_2 X_{ist} + \beta_3 Z_{st} + \beta_4 S_s + \beta_5 T_t + \beta_6 D_d T_t + \varepsilon_{ist}$$

where the dependent variable, Y_{ist}, is sunscreen use for student i in state s at time t, and time is measured in years. All other variables are as described above. X_{ist} is a vector of individual covariates that includes indicators for each age (12 and under through 17, with 18 and up omitted), grades (9, 10, and 11, with 12 omitted), and race/ethnicity (white, black, Hispanic, Asian, with "other" omitted). Using respondent age and state policies, we include indicators for whether the respondent is bound by a youth indoor tanning prohibition, is required to have parental presence for tanning,

Figure 3
Trends in Youth Sunscreen Use, National YRBS 2009, 2011, 2013, and 2019



Note.
Figure shows national trends in the likelihood that high school youths report that they wear sunscreen with an SPF of 15 or higher when they are outside in the sun for more than an hour.

Source: National YRBS (2009, 2011, 2013, and 2019)

or must first obtain parental consent, rather than control for the share of teens in the state bound by these policies as in equation (1). For the YRBS analyses we control for the full set of Census division-by-time fixed effects ($D_d T_t$) to match the most saturated model for the Google Trends analyses. We weight the estimates with the YRBS sample weights, and standard errors are clustered at the state level.[23]

RESULTS

Figure 1 provides snapshots of the state SUNucate law variation for 2013, 2015, 2017, and 2019. This figure shows there was a substantial amount of activity between 2017 and 2019, and that by 2019 a broad range of states had adopted SUNucate policies, including Alabama, Utah, Oregon, and Ohio, among others.

Figure 2 shows monthly national trends in Google search popularity for the terms "sunscreen" (top panel) and 'SPF' (bottom panel) for 2004-2019. Both series show a clear seasonal pattern whereby searches increase significantly in March and April of each year. These peaks demonstrate the importance of the year-by-month fixed effects in our multivariate regression models. Both panels also show an upward trend over time.

Figure 3 shows trends in youth sunscreen use from the national YRBS data in the years the sunscreen question was asked (2009, 2011, 2013, and 2019), overall and separately by sex and race/ethnicity. All series show a noticeable upward trend over time.

Table 1 presents the estimates from our multivariate regression models linking state SUNucate policies to state-specific Google Trends popularity for searches relating to "sunscreen" (top panel)

Table 1
State SUNucate Laws Increased Sun Protection-related Searches, Google Trends, 2004-2022

	(1)	(2)	(3)	(4)
Panel A. Searches for "Sunscreen"				
SUNucate Law	3.976***	3.316***	3.530***	3.264***
	(1.156)	(1.047)	(1.075)	(1.161)
Mean	17.54	17.54	17.54	17.54
R2	0.758	0.760	0.782	0.808
Observations	11,628	11,628	11,628	11,628
Panel B. Searches for "SPF"				
SUNucate Law	6.347***	5.987***	5.942***	4.758**
	(1.869)	(1.592)	(1.741)	(1.843)
Mean	22.02	22.02	22.02	22.02
R2	0.608	0.616	0.638	0.687
Observations	11,628	11,628	11,628	11,628
State and Month-by-Year FE?	Y	Y	Y	Y
State-Level Policy Controls?		Y	Y	Y
Census Region-by-Month-by-Year FE?			Y	
Census Division-by-Month-by-Year FE?				Y

Note.
The dependent variable in Panel (A) is the Google Trends Index for the word 'sunscreen'; the dependent variable in Panel (B) is the Google Trends Index for the term 'SPF'. The independent variable of interest is an indicator for the state having a SUNucate law. Column (1) includes full sets of time-invariant state fixed effects and location-invariant year-by-month fixed effects. Column (2) controls for state-level time-varying policies, including the share of teens prohibited from indoor tanning, the share of teens requiring parental presence for indoor tanning, the share of teens requiring parental consent for indoor tanning, and an indicator whether indoor tanning establishments must adhere to specified safety standards. Column (2) also controls for the natural log of the real value of the effective minimum wage, the natural log of the real value of cigarette taxes, the monthly state unemployment rate, an annual indicator for the presence of a graduated driver's license law, and a monthly indicator for whether the state had expanded Medicaid as part of the Affordable Care Act. Column (3) augments the specification with a full set of census region-by-year-by-month fixed effects, and column (4) includes a full set of census division-by-year-by-month fixed effects. Standard errors, shown in parentheses, are clustered at the state level.
***** p < .01, ** p < .05, * p < .10**

Source: Google Trends Data, 2004-2022

and "SPF" (bottom panel). Each entry is from a separate regression and shows the coefficient and state-clustered standard error on the SUNucate variable. Each column is from a different regression specification including the additional control variables listed at the bottom of the table. Column 1 shows results with state and year-by-month fixed effects; column 2 adds the time-varying state controls for other sun-related policies and state economic characteristics; columns 3 and 4 add a set of 4 Census region-by-year-by-month fixed effects and 9 Census division-by-year-by-month fixed effects, respectively. The inclusion of these latter fixed effects allows the time effects to vary for each of the Census regions or divisions, assuring comparisons occurring between geographically proximate, and arguably more comparable, states.

The results in Table 1 indicate that state SUNucate laws were significantly associated with increased relative Google Trends search popularity

Table 2
State SUNucate Laws Increased Sunscreen Use among High School Youths, 2009-2019 National YRBS

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Full Sample	White Teens			Non-White Teens		
		Overall	Boys	Girls	Overall	Boys	Girls
SUNucate Law	0.048**	0.027	0.056*	-0.018	0.079**	0.039	0.114*
	(0.020)	(0.027)	(0.029)	(0.038)	(0.030)	(0.032)	(0.059)
Mean	0.58	0.66	0.60	0.73	0.47	0.40	0.55
R2	0.103	0.058	0.042	0.049	0.095	0.061	0.102

Note.
The dependent variable is an indicator for whether the teen reported wearing sunscreen of at least SPF 15 when outside on a sunny day for more than an hour. The independent variable of interest is an indicator for the state having a SUNucate law. Each column reports the coefficient from a regression using the sample restriction in the column header. Column 1 examines the full sample of teens, column 2 white teens, column 3 white teen boys, and column 4 white teen girls. Column 5 examines non-white teens, column 6 non-white teen boys, and column 7 non-white teen girls. All columns use the full set of controls from equation (2). Standard errors, shown in parentheses, are clustered at the state level. Estimates utilize the sample weights.
***** p < .01, ** p < .05, * p < .10**

Source: State Youth Risk Behavior Survey, 2009-2019

for searches of "sunscreen" and "SPF", respectively. For example, in our baseline specification (column 2) for the "sunscreen" outcome in the top panel, we estimate that a SUNucate law was associated with a 3.32 unit increase off a mean of 18.54, or approximately a 19% effect. Examining "SPF" relative search popularity in the bottom panel of Table 1 returns similar estimates. For example, column 2 suggests that a SUNucate law was associated with a 5.99 unit increase off a mean of 22.02, or about a 27% increase. The results in the other columns confirm that this result is robust to rich controls for region-by-year-by-month or division-by-year-by-month fixed effects, in addition to state fixed effects. Even in our most conservative specification of column 4 with division-by-year-by-month fixed effects, we estimate that SUNucate policies are associated with statistically significant increases in relative Google search popularity of about 19% and 22% for "sunscreen" and "SPF", respectively. Given prior work using Google Trends data as a proxy for consumer demand, these results suggest that SUNucate laws were associated with increased demand for sun-protective information.[9-13]

We present the results on youth sunscreen use in Table 2. Each entry is the coefficient on the state SUNucate law, and each column is from a separate regression where the sample is described in the column header. We follow the most saturated specification from column 4 of Table 1, where the state SUNucate law effect is estimated conditional on state and year fixed effects, state- and individual-level covariates, and a full set of Census-division-by-year fixed effects, as shown in equation (2). In these models, the key comparison is the over-time change in high school youths' sunscreen use coincident with a state SUNucate law being adopted, controlling for the associated changes in sunscreen use for high school youths in that same Census division. We present results separately by sex and race/ethnicity.

The results in Table 2 return evidence that state SUNucate laws are associated with increased sunscreen use by high school youths of about 4.8 percentage points in the full sample. Relative to the sample mean (58.1% of high school youths reported sunscreen use), this is an 8.3% effect. Interestingly, columns 2-7 of Table 2 show that these associations are larger and stronger for white boys (5.6 percentage point increase) and non-white girls (11.4 percentage point increase).

DISCUSSION

We provide the first evidence that state SUNucate laws were associated with increases in Google search popularity for terms related to sun protection as well as increases in self-reported sunscreen use by high school youths. In so doing, our results begin to build an evidence base for the effectiveness of these policies at improving sun protection behaviors and outcomes related to skin cancer risks.

Our study is subject to some limitations that are worth noting. First, although the results from models that adjust for multiple plausible confounding variables clearly indicate that SUNucate policies are significantly associated with increased relative search popularity for terms related to sun protection, Google Trends data serve as a proxy for demand and cannot tell us whose search behavior within the state is affected. For example, we cannot know if it is the students, parents, teachers, school administrators, or community activists (or some combination of these) who are more intensely searching for "sunscreen" after SUNucate laws are adopted. Second, due to the recent adoption of SUNucate laws, our estimates necessarily focus on short-run effects on Google search popularity; it is possible that the medium- or longer-run effects may differ. Third, our national YRBS data are self-reported, and as such, are subject to possible recall and social desirability biases. Finally, we could not examine potentially important effects of outreach by organizations such as the American Academy of Dermatology. It could be that the laws reflect changes in sentiments toward sun protection.

Despite these limitations, our research represents some of the first evidence regarding increasingly popular state SUNucate policies. A changed information environment is necessary for policies to have meaningful effects. Our results suggest that state SUNucate policies may be effective at achieving this goal and provide some of the first evidence that the laws may be protective with respect to sunscreen use by high school youths.

IMPLICATIONS FOR HEALTH BEHAVIOR OR POLICY

SUNucate laws were an effective policy tool to increase interest in sun protective behaviors and adolescent sunscreen use in the short run. Future research should explore the effect of SUNucate laws on other sun protective behaviors, such as time spent outdoors, and the longer run impacts on skin cancer. Adopting SUNucate laws can increase sunscreen use by children and adolescents to help achieve the Healthy People 2030 goal of reducing the proportion of students in grades 9-12 reporting sunburn.[24]

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Human Subjects Approval Statement

This study was exempt due to being secondary analysis of de-identified publicly available data. This study was reviewed and approved by Vanderbilt University's IRB #192244.

Conflict of Interest Disclosure Statement

The authors of this article declare they have no conflicts of interest.

References

1. US Centers for Disease Control and Prevention. Results from the School Health Policies and Practices Study. 2017. https://cdc.gov/healthyyouth/data/shpps. Published May 7, 2019. Archived version accessed August 15, 2023.
2. Washington Post. Many school systems say kids need a doctor's note to use sunscreen. https://washingtonpost.com/national/health-science/many-school-systems-say-kids-need-a-doctors-note-to-use-sunscreen/2017/08/04/19c4a420-72de-11e7-8f39-eeb7d3a2d304_story.html. Published August 4, 2017. Accessed July 23, 2023.
3. PBS News Hour. Sunscreen is banned from many schools. State legislators are working to change that. https://pbs.org/newshour/education/states-getting-serious-sunscreen. Published July 17, 2017. Accessed July 23, 2023.
4. American Society for Dermatologic Surgery Association. About the SUNucate coalition. https://asds.net/asdsa-advocacy/advocacy-activities/sunucate-coalition. Published 2023. Accessed July 23, 2023.
5. American Society for Dermatologic Surgery Association. Current state legislation and regulation. https://asds.net/asdsa-advocacy/advocacy-activities/sunucate-coalition/state-legislation. Published 2023. Accessed July 23, 2023.
6. Heckman CJ, Riley M, Coups EJ, Niu Z, Stapleton JL. Society of Behavioral Medicine position statement: promote sun-safety policies and practices for youth in educational, childcare, and recreational settings. *Transl Behav*

Med. 2020;10(2):498-501.
7. Patterson B, Holman DM, Qin J, Smith K, Zhou Y. Examination of laws allowing sunscreen use in schools in the context of UV levels by state. *J Adolesc Health*. 2021;68(2):407-410.
8. American Society for Dermatologic Surgery Association. Read the SUNucate model bill. https://asds.net/asdsa-advocacy/policies-positions/model-legislation/sunucate. Published 2016. Accessed July 23, 2023.
9. Oster E. Does disease cause vaccination? Disease outbreaks and vaccination response. *J Health Econ*. 2018;57:90-101.
10. Burchardi KB, Chaney T, Hassan TA. Migrants, ancestors, and foreign investments. *Rev Econ Stud*. 2019;86(4):1448-1486.
11. Gift P. Moving the needle in MMA: on the marginal revenue product of UFC fighters. *J Sports Econom*. 2020;21(2):176-209.
12. Brodeur A, Clark A, Fleche S, Powdthavee N. COVID-19, lockdowns and well-being: evidence from Google Trends. *J Public Econ*. 2021;193:104346.
13. Carpenter CS, Lawler E. Direct and spillover effects of middle school vaccination requirements. *Am Econ J Econ Policy*. 2019;11(1):95-125.
14. Singh G, Feng H, Geronemus R. Evaluating the impact of indoor tanning legislation in the United States. *Dermatol Surgery*. 2021;47(2):303-305.
15. Carpenter CS, Churchill BF, Marcus MM. Bad lighting: effects of youth indoor tanning prohibitions. *J Health Econ*. 2023;88:102738.
16. Heckman C, Lin Y, Riley M, Wang Y, Bhurosy T, Mitarotondo A, et al. Association between state indoor tanning legislation and Google search trends data in the United States from 2006 to 2019: time-series analysis. *JMIR Dermatol*. 2021;4(1):e26707.
17. Hester E, Heilig L, D'Ambrosia R, Drake A, Schilling L, Dellavalle R. Compliance with youth access regulations for indoor UV tanning. *Arch Dermatol*. 2005;141(8):959-962.
18. Pichon L, Mayer J, Hoerster K, Woodruff SI, Slymen DJ, Belch GE, et al. Youth access to artificial UV radiation exposure: practices of 3647 US indoor tanning facilities. *Arch Dermatol*. 2009;145(9):997-1002
19. Watson M, Holman D, Fox K, Guy GP Jr, Seidenberg AB, Sampson BP et al. Preventing skin cancer through reduction of indoor tanning: current evidence. *Am J Prev Med*. 2013;44(6):682-689.
20. Guy GP, Berkowitz Z, Jones SE, Olsen EO, Miyamoto JN, Michael SL, Saraiya M. State indoor tanning laws and adolescent indoor tanning. *Am J Public Health*. 2014;104(4): e69-e74.
21. Asgeirsdottir TL, Corman H, Noonan K, Reichman NE. Lifecycle effects of a recession on health behaviors: boom, bust, and recovery in Iceland. *Econ Hum Biol*. 2016;20:90-107. doi: 10.1016/j.ehb.2015.11.001
22. Carpenter CS, Cook P. Cigarette taxes and youth smoking: evidence from the national, state, and local Youth Risk Behavior Surveys. *J Health Econ*. 2008;27(2):287-299.
23. Bertrand M, Duflo E, Mullainathan S. How much should we trust difference-in-differences estimates? *Q J Econ*. 2004;119(1):249-275. doi: 10.1162/003355304772839588
24. Office of the Assistant Secretary for Health. Healthy People 2030: reduce the proportion of students in grades 9 through 12 who report sunburn – C-10. https://health.gov/healthypeople/objectives-and-data/browse-objectives/cancer/reduce-proportion-students-grades-9-through-12-who-report-sunburn-c-10. Published 2021. Accessed July 31, 2023.