

Skin Cancer Prevention

Progress Report 2018



**Centers for Disease
Control and Prevention**
National Center for Chronic
Disease Prevention and
Health Promotion

US Department of Health and Human Services
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National Center for Chronic Disease Prevention and Health Promotion
Division of Cancer Prevention and Control

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Skin Cancer Prevention Progress Report 2018

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2018 SKIN CANCER PREVENTION PROGRESS REPORT

Background

In July 2014, the Office of the Surgeon General released [The Surgeon General's Call to Action to Prevent Skin Cancer](#), establishing skin cancer prevention as a high priority for our nation.¹ The Call to Action described prevention strategies that work and called on all community sectors to play a role in protecting Americans from ultraviolet (UV) radiation from the sun and artificial sources, such as indoor tanning devices (Table 1).¹

Since the release of the *Call to Action*, a growing community of partners at the national, state, and local levels has taken great strides toward meeting its strategic

goals and advancing skin cancer prevention in the United States. This fourth annual *Skin Cancer Prevention Progress Report* provides a comprehensive summary of the most recent data available and highlights developments and success stories since the release of the [2017 Progress Report](#). By continuing to update the report annually, we can monitor progress, learn from successes, recognize areas that need improvement, and identify opportunities to work collaboratively with partners to protect the public against skin cancer.

Table 1. Strategic Goals and Partners to Support Skin Cancer Prevention in the United States

Strategic Goals

Goal 1: Increase opportunities for sun protection in outdoor settings.

Goal 2: Provide individuals with the information they need to make informed, healthy choices about UV exposure.

Goal 3: Promote policies that advance the national goal of preventing skin cancer.

Goal 4: Reduce harms from indoor tanning.

Goal 5: Strengthen research, surveillance, monitoring, and evaluation related to skin cancer prevention.

Partners in Prevention

- Federal, state, tribal, local, and territorial governments.
- Businesses, employers, and labor representatives.
- Health care systems, insurers, and clinicians.
- Early learning centers, schools, colleges, and universities.
- Community, nonprofit, and faith-based organizations.
- Individuals and families.

Source: *The Surgeon General's Call to Action to Prevent Skin Cancer*.¹



What's New This Year?

Over the past year, CDC researchers have led or collaborated on numerous peer-reviewed scientific publications, bringing continued attention to skin cancer prevention as a public health priority. Below are some highlights.

Sun-Safety Practices Are Uncommon In Schools

JAMA Dermatology published an [article](#) in March 2017 on the prevalence of sun-safety practices in US schools.² The findings suggest that most schools have insufficient sun-safety practices for children and adolescents and point to a need for interventions to increase adoption of such practices among schools.

Adults Who Indoor Tan or Had a Recent Sunburn Are More Likely to Tan Outdoors

An [article](#) published in *Preventive Medicine* in August 2017 described associations among demographic characteristics, behaviors, and beliefs related to skin cancer risk and outdoor tanning behaviors.³ Outdoor tanning was more prevalent among women, non-Hispanic white individuals, and those aged 18–29 years

compared with other demographic groups. Indoor tanners and those with a recent sunburn were also more likely to tan outdoors.

Clinical Counseling on Sun Protection Is Low Among Pediatricians

In December 2017, the *Journal of Pediatrics* published an [article](#) indicating that rates of clinical counseling on sun protection and avoiding indoor tanning are low among pediatricians, with time constraints being the most frequently reported barrier.⁴

Melanoma Rates on the Rise among Non-Hispanic White Adults Aged 55+

A [research letter](#) published in *JAMA Dermatology* in January 2018 examined the latest national data on melanoma incidence trends among non-Hispanic white individuals.⁵ More than 70% of the melanoma cases were diagnosed in adults aged 55 years or older. During 2005–2014, melanoma incidence rates increased among non-Hispanic white adults aged 55 years or older and decreased among non-Hispanic white individuals under the age of 45.



One in Three US Adults Were Sunburned in 2015

In March 2018, *JAMA Dermatology* published an [article](#) examining national data on use of sun protection and the prevalence of sunburn among US adults.⁶ Shade and sunscreen were the most frequently used sun protection strategies among women; shade and pants were the most frequently used strategies among men. One-third of all adults had been sunburned in the past year; whereas, about half of adults aged 30 years or younger and half of adults with sun-sensitive skin had been sunburned. Sunburn was also associated with aerobic activity, binge drinking, and use of sunless tanning products.

Seven US States Passed Legislation for Sunscreen Use Among Schools in 2017

A [research letter](#) published in the *Journal of American Academy of Dermatology* examined state legislation for sunscreen use at school.⁷ As of December 2017, 11 states had laws in place explicitly allowing students to carry and self-apply sunscreen at school. Of those 11 states, 7 passed the legislation in 2017, and only 2 states addressed other aspects of sun safety (e.g., protective clothing and sun-safety education) in their school sunscreen laws.

Research Conducted by a CDC-Funded Prevention Research Center Continues to Advance our Understanding of Indoor Tanning Behaviors

Young adults are more likely than other adults to engage in indoor tanning. In an effort to identify strategies for reducing harms from indoor tanning among this demographic group, CDC provided funds to the University of Massachusetts Medical School, Prevention Research Center, to examine frequent indoor tanning among young adults. Over time, the project team collected data on indoor tanning practices and the factors that influence tanning behaviors. Study findings led to numerous peer-reviewed publications and media attention. In addition, these research results prompted some universities to reconsider organizational policies that promoted indoor tanning among their students.

Over the past year, additional findings from this work have been published in three new papers. Below are some key findings:

- More than half of urban schools in Worcester County, Massachusetts, are located within 1 mile of a tanning salon.⁸
- Over one-third of tanners are unaware of their state's legislation for use of commercial indoor tanning devices.⁹
- Heavy tanners are twice as likely as light tanners to say that they would purchase a tanning bed if indoor tanning was banned in their state.⁹
- Male indoor tanners are more likely than female tanners to engage in other risky behaviors, such as binge drinking.¹⁰

*This research was funded by the Centers for Disease Control and Prevention, Division of Cancer Prevention and Control, Prevention Research Center grant number CDC U48 DP001933-04 to Sherry L. Pagoto.

New Recommendations for Behavioral Counseling on Skin Cancer Prevention

Getting the best health care means making smart decisions about preventive services. To help doctors and patients decide together whether a preventive service is right for a person's needs, the US Preventive Services Task Force (USPSTF) develops recommendations based on reviews of high-quality scientific evidence.

In March 2018, the USPSTF released updated recommendations for behavioral counseling on skin cancer prevention.¹¹ The recommendations are outlined in the following recommendation summary. More information is available on the USPSTF website at www.uspreventiveservicestaskforce.org/.

Recommendation Summary		
Population	Recommendation	Grade (What's this?)
Young adults, adolescents, children, and parents of young children	The USPSTF recommends counseling young adults, adolescents, children, and parents of young children about minimizing exposure to ultraviolet (UV) radiation for persons aged 6 months to 24 years with fair skin types to reduce their risk of skin cancer.	B
Adults older than 24 years with fair skin types	The USPSTF recommends that clinicians selectively offer counseling to adults older than 24 years with fair skin types about minimizing their exposure to UV radiation to reduce the risk of skin cancer. Existing evidence indicates that the net benefit of counseling all adults older than 24 years is small. In determining whether counseling is appropriate in individual cases, patients and clinicians should consider the presence of risk factors for skin cancer.	C
Adults	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of counseling adults about skin self-examination to prevent skin cancer.	I

Success Stories from the Field

Reducing Indoor Tanning on College Campuses

Many people begin tanning indoors during their youth, and this practice is most common among young people aged 15 to 25. While many states prohibit minors from using tanning salons, young adults are still vulnerable. Universities have a huge opportunity to curb indoor tanning in this age group.

The Indoor Tan-Free Skin Smart Campus is a national initiative supported by the [National Council on Skin](#)

[Cancer Prevention](#). It started in response to CDC-funded research that found that tanning beds are available on many college campuses and in nearby apartments and that tanning salons often can be paid with campus debit cards.

Led by Dr. Robert Dellavalle, Dr. Sherry Pagoto, and Nazanin Kalani, and modeled after the Tobacco-Free Campus initiative, the Indoor Tan-Free Skin Smart Campus initiative aims to break ties between universities and tanning salons and educate college students about skin cancer prevention. To qualify as a Skin Smart

Campus, colleges must meet at least one of the following criteria—

- If the college has a list of off-campus housing on its website, housing that offers indoor tanning as an amenity is not included.
- The college does not permit tanning salons to be university-affiliated debit card merchants.
- The college provides educational programming, such as a website, on the risks of exposure to ultraviolet rays and skin cancer prevention practices to students, faculty, and staff.

“Universities can play an important role in creating a culture and establishing norms around healthy behavior,” said Dr. Pagoto. “The purpose of Skin Smart is to give them the tools to do just that.”

The first Skin Smart Campuses include East Tennessee State University, University of North Florida, and Temple University. Learn more at www.skincarecampus.org/.



Shading Children from the Sun's Harmful Rays

The sun's rays can damage your skin in as little as 15 minutes. Staying in the shade is an easy way to protect your skin, but many outdoor recreation areas do not have enough shade to help visitors stay out of the sun.

Since 2003, the Shade Structure Program of the American Academy of Dermatology (AAD) has given money to schools, child care centers, parks, and nonprofit organizations to build more than 350 permanent shade structures in places where children learn and play in 46 US states, the District of Columbia, and Canada.

Despite these efforts, the demand from eligible organizations has overwhelmed the organization's resources. To help meet the demand, AAD member (and current president) Dr. Suzanne Olbricht, MD had an idea in 2015 of how to expand the program. She initiated the idea and provided seed money for a shade structure to be installed over the Seal and Sea Lion exhibit at the Smithsonian Zoo in Washington, DC. More than 2 million people visit this exhibit every year, and the high-profile exposure prompted other AAD members

to help fund shade structures in their communities. This support allowed AAD to expand the number of awards from 19 in 2016 to 26 in 2017.

"With the steady increases in skin cancer diagnoses, it's so important to educate the public about the importance of shade," said Dr. Scott Dinehart. He, along with Dr. Ray Parker and the Arkansas Foundation for Skin Cancer, donated money to install shade structures at athletic fields in their community.

AAD also worked with the City of St. Petersburg, Florida, to make shade structures part of the remodeling of the St. Petersburg Pier, which will be completed by summer 2019. About 1.7 million visitors are expected to visit the new pier each year. The city will also include sun-safety messages

in its Healthy St. Pete initiatives.

AAD will continue to look for outdoor spaces with large numbers of visitors as a way to reach—and protect—as many people as possible. To learn more about these efforts, visit www.SpotSkinCancer.org.



Building a Culture of Sun Safety for Nevada's Youth

More Nevada youth are staying sun-safe and lowering their risk of skin cancer thanks to the state's Sun Smart Schools program. The program is a collaboration between the Nevada Cancer Coalition, the state of Nevada, community partners, and schools. It teaches students about sun safety, encourages schools to adopt sun-smart policies, and promotes access to sunscreen and shade on school grounds.

Launched in seven schools across Nevada in the 2015–2016 school year, Sun Smart Schools has grown to include 42 schools and 17,150 students in just 3 years.

The program uses age-appropriate, evidence-based lessons to improve knowledge, attitudes, and behaviors

about exposure to ultraviolet rays. Schools are encouraged to adopt written policies that support sun-safe practices, like providing shade and encouraging students and staff to use sunscreen and wear sun-protective clothing.

In its first year, the seven participating schools (grades prekindergarten through 12) taught nearly 2,500 students about sun safety and changed school policies. Student surveys showed that students wore sun-protective clothing, including long-sleeved shirts,



hats, and sunglasses, more often after the program was launched.

In the 2016–2017 school year, the program expanded to include 22 public, private, and parochial schools, representing more than 10,000 students. Surveys were expanded to capture demographic characteristics, like gender, race, and grade, and include additional questions about sun-safety knowledge and attitudes. Students, parents, teachers, and school nurses were surveyed.

Survey results showed that elementary and middle school students and parents learned about sun safety and did more to protect their skin from the sun. Older students, parents, and teachers were more likely to believe that having tanned skin makes you look better.

More than 4 in 5 male teachers said they and their friends look better with a tan, and about 1 in 4 high school boys said they never use sunscreen.

“Finding effective ways to change sun-safety attitudes and to improve sun-safe behaviors among older students and male educators will be an ongoing challenge,” said Christine Thompson, Community Programs Manager of the Nevada Cancer Coalition. “But with more Nevada students receiving sun-safety education from a young age, we expect to reduce skin cancer incidence statewide for future generations.”

For more information about Nevada’s Sun Smart Schools program, visit <http://nevadacancercoalition.org/sun-smart-nevada>.



Building Shade Structures on Playgrounds and Sports Fields

In his travels around the Northeast, Neil Spiegler noticed that most of the playgrounds and sports fields he saw were “woefully unprotected from the dangerous rays of the sun,” with little shade for the players or the spectators.

As the director of the [Peggy Spiegler Melanoma Research Foundation](#) in South Jersey—and the grandfather of two boys who spend a lot of time on

playgrounds and sports fields—Spiegler was keenly aware of the need to protect children and families from the dangers of too much sun exposure. “I knew something had to be done, and fast!” he said.

In 2017, the Foundation decided to take steps to protect the public at outdoor venues. In November, it dedicated the first of what the Foundation hopes will be many shade structures in and around the community

in the future. The structure was built at the Albert Bean Elementary School in Pine Hill, New Jersey, where Neil's wife Peggy taught for almost 20 years.

Instead of covering individual pieces of playground equipment, the foundation built a free-standing shade structure that can be used as an outdoor classroom, as

well as a place for parents and their children to stay sun-safe when using the playground during lunchtime and after school. It's very popular with students, who use it often as a favorite spot to read and play.

For more information about the Peggy Spiegler Melanoma Research Foundation, visit www.psmrf.org/.

Providing Education and Sunscreen Access in Georgia

Georgia native Dr. Ravi Patel was surprised when he saw the melanoma statistics on CDC's [United States Cancer Statistics: Data Visualizations website](https://www.cdc.gov/cancer/data_visualizations/). "I was shocked to learn that Georgia is ranked number 6 in



the United States for melanoma incidence according to the CDC," he said. "I knew we could do better."

After completing a dermatology rotation at the University of Colorado under the guidance of Dr. Robert Dellavalle, the chairman of the Colorado Skin Cancer Prevention Task Force, Dr. Patel looked for ways to apply the lessons he had learned.

First, he founded the [Georgia Sunscreen Initiative](https://www.heartsandhugs.org/georgia-sunscreen-initiative/) with medical residents at Gwinnett Medical Center and his colleagues at the [Hearts and Hugs Foundation](https://www.heartsandhugs.org/). Their goal was to reduce skin cancer in local communities, and they began by working with skin cancer prevention experts to identify the leading problems in the state. Step by step, their efforts developed into active partnerships with state agencies and universities. They also drafted a resolution

titled [Skin Cancer Prevention Education and Sunscreen Access](https://www.melanomaresearch.org/skin-cancer-prevention-education-and-sunscreen-access/), which was passed unanimously by the Medical Association of Georgia.

The resolution encourages—

- Education about skin cancer prevention in communities, schools, and universities.
- Educational campaigns about the risks of indoor tanning.
- Ordinances to reduce harms from indoor tanning.
- Support for public access to sunscreen.
- Observation of the first Monday in May as Melanoma Monday.

The Georgia Sunscreen Initiative has several goals for 2018, including putting a sun-safety plan into action in all 29 of the state's public universities, expanding educational programs in schools and high sun-exposure industries (e.g., agriculture and construction), and expanding its network of partners.

"The response to our initiative has been incredible," said Dr. Patel. "We are excited about what 2018 holds for the state of Georgia and beyond."

To learn more about the Georgia Sunscreen Initiative, visit www.heartsandhugs.org/georgia-sunscreen-initiative/.

Healthy People 2020 Objectives

Table 2 presents the skin cancer-related objectives included in Healthy People 2020, the national agenda for improving the health of all Americans.

Table 2. Progress Toward the Healthy People 2020 Skin Cancer-Related Objectives

Objective for 2020	Target	Baseline	Current Data	Data Source
C-8 Reduce the melanoma cancer death rate	2.4 deaths per 100,000 population	2007: 2.7 deaths per 100,000 population	2015: 2.4 deaths per 100,000 population	National Vital Statistics System-Mortality
C-20.1 Reduce the proportion of adolescents in grades 9 through 12 who report sunburn	NA	2015: 55.8%	2017: 57.2%	Youth Risk Behavior Surveillance System
C-20.2 Reduce the proportion of adults aged 18 years and older who report sunburn	33.8%	2010: 37.5%	2015: 35.3%	National Health Interview Survey
C-20.3 Reduce the proportion of adolescents in grades 9 through 12 who report using artificial sources of ultraviolet light for tanning	14.0%	2009: 15.6%	2017: 5.6%	Youth Risk Behavior Surveillance System
C-20.4 Reduce the proportion of adults aged 18 and older who report using artificial sources of ultraviolet light for tanning	3.6%	2010: 5.6%	2015: 3.6%	National Health Interview Survey
C-20.5 Increase the proportion of adolescents in grades 9 through 12 who follow protective measures that may reduce the risk of skin cancer	11.2%	2009: 9.3%	2013: 10.1%	Youth Risk Behavior Surveillance System
C-20.6 Increase the proportion of adults aged 18 years and older who follow protective measures that may reduce the risk of skin cancer	73.7%	2008: 67.0%	2015: 70.8%	National Health Interview Survey
ECBP-4.4 Increase the proportion of elementary, middle, and senior high schools that provide school health education in sun safety or skin cancer prevention to promote personal health and wellness	79.6%	2006: 72.4%	2014: 66.0%	School Health Policies and Practices Study

Abbreviation: NA, not available.

Source: Healthy People 2020.¹²

¹²Current data for this objective refers to answers of “always” or “most of the time” to the question, “When you are outside for more than 1 hour on a sunny day, how often do you wear sunscreen with an SPF of 15 or higher?”

Disease Surveillance Indicators

Melanoma Incidence and Mortality

Health care providers and pathologists who diagnose or treat melanomas are required to report cases to a central cancer registry in all 50 states, the District of Columbia, and Puerto Rico. These melanoma surveillance data allow for long-term evaluation of skin cancer prevention efforts. Because melanomas often develop after years of exposure to UV radiation, it will likely be several decades before melanoma incidence rates reflect the effects of current prevention efforts.

Table 3 shows invasive melanoma incidence rates by sex and race/ethnicity. The highest rates are among non-Hispanic white men (33.8 per 100,000) and lowest are among black individuals (1.0 per 100,000) and Asian/Pacific Islanders (1.4 per 100,000). Non-Hispanic white men also have the highest death rates (4.8 per 100,000; Table 4).

Among both men and women, incidence rates have continued to increase over time (Figure 1), and the gender gap in overall melanoma incidence and death rates has persisted (Figures 1 and 2). Figure 3 shows recent trends in melanoma incidence rates among non-Hispanic white individuals aged 15 years or older, by sex and age group during 2006–2015. The recent declines in melanoma incidence rates among non-Hispanic white individuals under the age of 35 years contrast the steady increases observed among older age groups.

Table 3. Invasive Melanoma Incidence, by Sex and Race/Ethnicity, United States, 2011–2015a

Race/Ethnicity	US Population		Male		Female	
	Rate	Average Annual Count	Rate	Average Annual Count	Rate	Average Annual Count
All Races	21.2	74,175	27.2	43,675	16.8	30,500
White	24.1	70,000	30.5	41,477	19.4	28,523
White, Hispanic ^b	4.5	1,496	4.9	680	4.4	817
White, non-Hispanic ^b	27.0	68,499	33.8	40,794	22.0	27,705
Black	1.0	371	1.1	176	0.9	195
American Indian/Alaska Native	5.4	175	6.8	95	4.4	80
Asian/Pacific Islander	1.4	233	1.5	114	1.2	119
Hispanic ^b	4.5	1,619	4.8	734	4.4	885

Source: United States Cancer Statistics 2001–2015 Public Use Research Database.¹³

^a Data are from population areas that meet United States Cancer Statistics publication criteria for 2011–2015 and cover about 99.1% of the US population. Rates are per 100,000 population and are age-adjusted to the 2000 US Standard Population.

^b Race and ethnicity are not mutually exclusive. Counts may not always sum to the total because of rounding and because cases with other and unknown race are included in totals.



Table 4. Melanoma Death Rates, by Sex and Race/Ethnicity, United States, 2011–2015^a

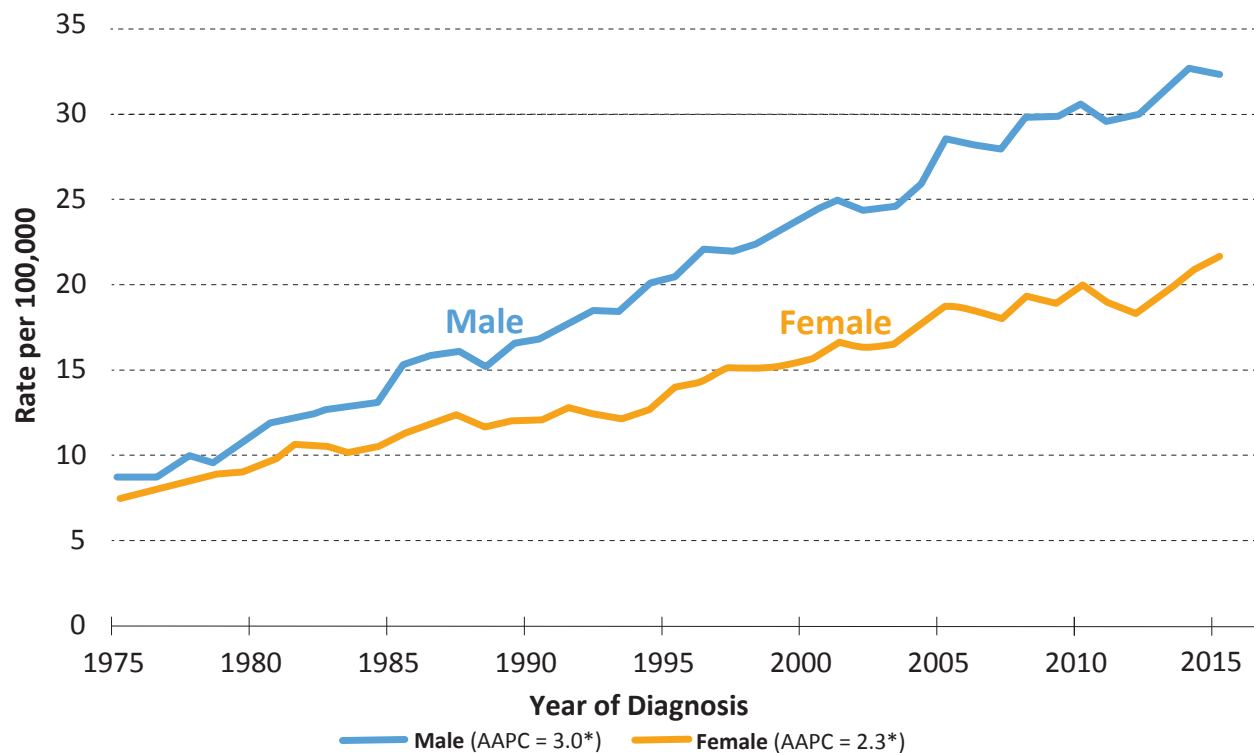
Race/Ethnicity	US Population		Male		Female	
	Rate	Average Annual Count	Rate	Average Annual Count	Rate	Average Annual Count
All Races	2.6	9,196	3.9	6,045	1.6	3,151
White	3.0	8,988	4.5	5,940	1.9	3,048
White, Hispanic ^b	0.8	234	1.0	137	0.6	97
White, non-Hispanic ^b	3.3	8,740	4.8	5,794	2.0	2,947
Black	0.4	137	0.5	69	0.3	68
American Indian/Alaska Native	0.6	16	0.7	10	0.4	6
Asian/Pacific Islander	0.3	55	0.4	26	0.3	29
Hispanic ^b	0.7	238	1.0	139	0.6	99

Source: National Cancer Institute. Surveillance, Epidemiology, and End Results Program.¹⁴

^a Data are from population areas that meet United States Cancer Statistics publication criteria for 2011–2015 and cover about 99.1% of the US population. Rates are per 100,000 population and are age-adjusted to the 2000 US Standard Population.

^b Race and ethnicity are not mutually exclusive. Counts may not always sum to the total because of rounding and because cases with other and unknown race are included in totals.

Figure 1. Age-Adjusted Melanoma Incidence Rates, by Sex, United States, 1975–2015



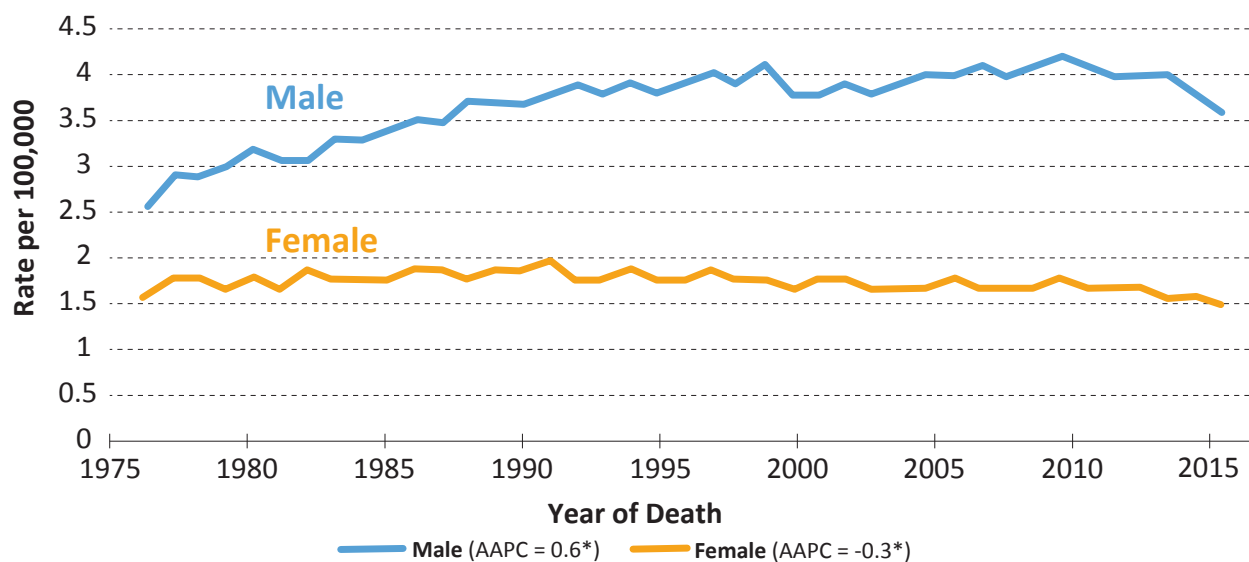
Abbreviation: AAPC, average annual percentage change.

Source: National Cancer Institute. Surveillance, Epidemiology, and End Results Program.¹⁵

Note: Rates are per 100,000 population and are age-adjusted to the 2000 US Standard Population.

*Denotes statistical significance ($P < .05$).

Figure 2. Age-Adjusted Melanoma Death Rates, by Sex, United States, 1975–2015



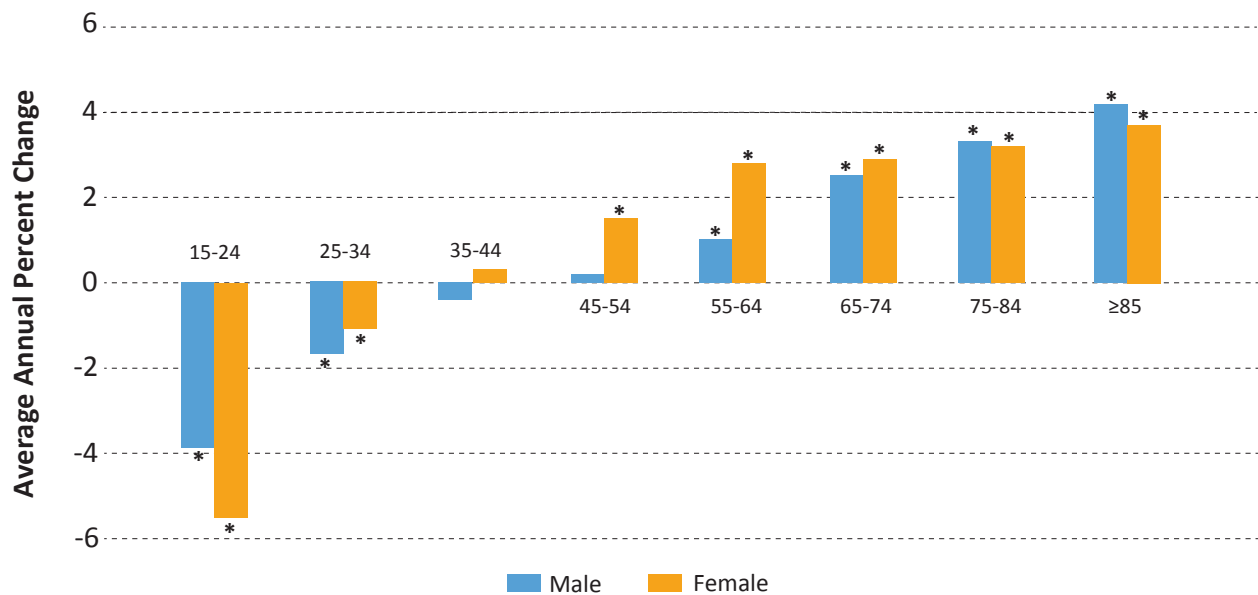
Abbreviation: AAPC, average annual percentage change.

Source: National Cancer Institute. Surveillance, Epidemiology, and End Results Program.¹⁶

Note: Underlying mortality data provided by the National Center for Health Statistics.

*Denotes statistical significance ($P < .05$).

Figure 3. Average Annual Percent Change in Melanoma Incidence Rates Among Non-Hispanic White Individuals Aged ≥ 15 Years, by Sex and Age Group, United States, 2006–2015



Source: United States Cancer Statistics 2001–2015 Public Use Research Database.¹³

*Average Annual Percent Change is statistically significant ($P < .05$).

Incidence data are from population areas that met United States Cancer Statistics publication criteria for 2006–2015 and were reported to the National Program of Cancer Registries (Centers for Disease Control and Prevention) and the Surveillance, Epidemiology, and End Results Program (National Cancer Institute), which cover about 99.1% of the US population.



United States Cancer Statistics: Data Visualizations

Explore the data further using the official federal cancer statistics, United States Cancer Statistics (USCS). USCS combines NCI Surveillance, Epidemiology and End Results (SEER) and CDC National Program of Cancer Registries (NPCR) data, providing cancer information on the entire U.S. population. You can create maps, examine trends, and more at national, state, and county level using the interactive USCS Data Visualization website (www.cdc.gov/cancer/dataviz). Cancer researchers can analyze data of over 20 million de-identified cancer patients using the USCS Public Use Databases. Information on how to access the data is available at our website: www.cdc.gov/cancer/public-use.



United States Cancer Statistics: Data Visualizations

The official federal statistics on cancer incidence and deaths, produced by the Centers for Disease Control and Prevention (CDC) and the National Cancer Institute (NCI).

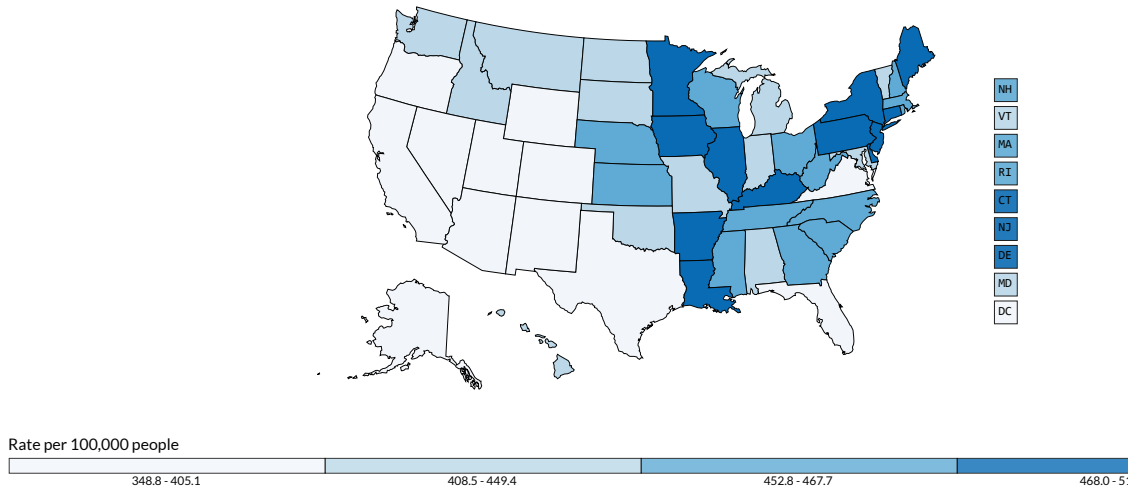
Leading Cancer Cases and Deaths, Male and Female, 2015

In 2015, the latest year for which incidence data are available, **1,633,390 new cases of cancer were reported**, and **595,919 people died of cancer in the United States**. For every 100,000 people, **438 new cancer cases were reported** and **159 died of cancer**.

Cancer is the second leading cause of death in the United States, exceeded only by heart disease. **One of every four deaths in the United States is due to cancer.**

Rate of New Cancers in the United States

All Types of Cancer, All Ages, All Races/Ethnicities, Male and Female
Rate per 100,000 people



Behavioral Surveillance Indicators

Increasing the use of sun protection and decreasing the prevalence of sunburn and indoor tanning are critical to preventing future cases of skin cancer. These behavioral surveillance indicators can provide timely information about our progress in reducing exposure to harmful UV exposure.

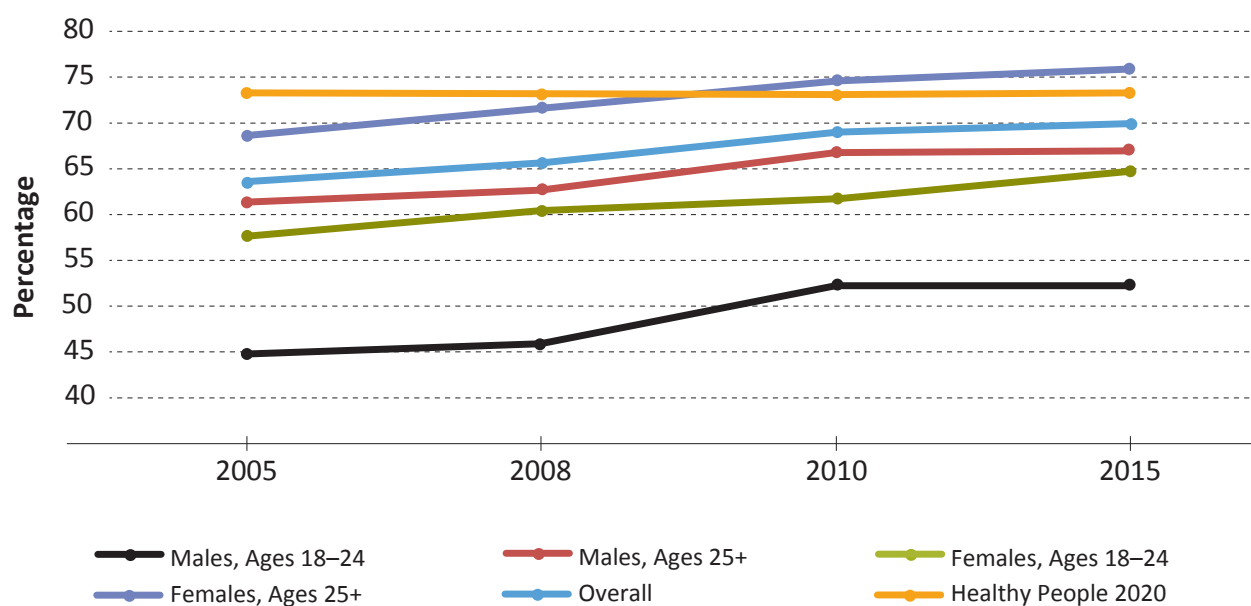
The latest data on use of sun protection (shade, clothing, wide-brimmed hats, and sunscreen), indoor tanning, and sunburn among US adults are available from the Cancer Control Supplement of the 2015 National Health Interview Survey (NHIS). The most recent data on sunscreen use, indoor tanning, and sunburn among US high school students are available from the 2013 and 2017 national Youth Risk Behavior Survey (YRBS).

Sun Protection

According to the 2013 YRBS (the latest year for which data are available), 10.1% of high school students use sunscreen with an SPF of 15 or higher when outside for more than 1 hour on a sunny day.¹⁷ Sunscreen use was higher among girls (13.2%) than boys (6.9%). The prevalence of sunscreen use among high school students did not change significantly from 2005 to 2013.

Although use of sun protection appears to be increasing slightly among adults (Figure 4), there is still room for improvement. Sun protection strategies differ by sex, and more than one-quarter of women and one-third of men do not consistently use any form of sun protection (Figure 5).

Figure 4. Percentage of US Adults Who Protect Themselves from the Sun Always or Most of the Time, by Sex and Age, 2005, 2008, 2010, 2015

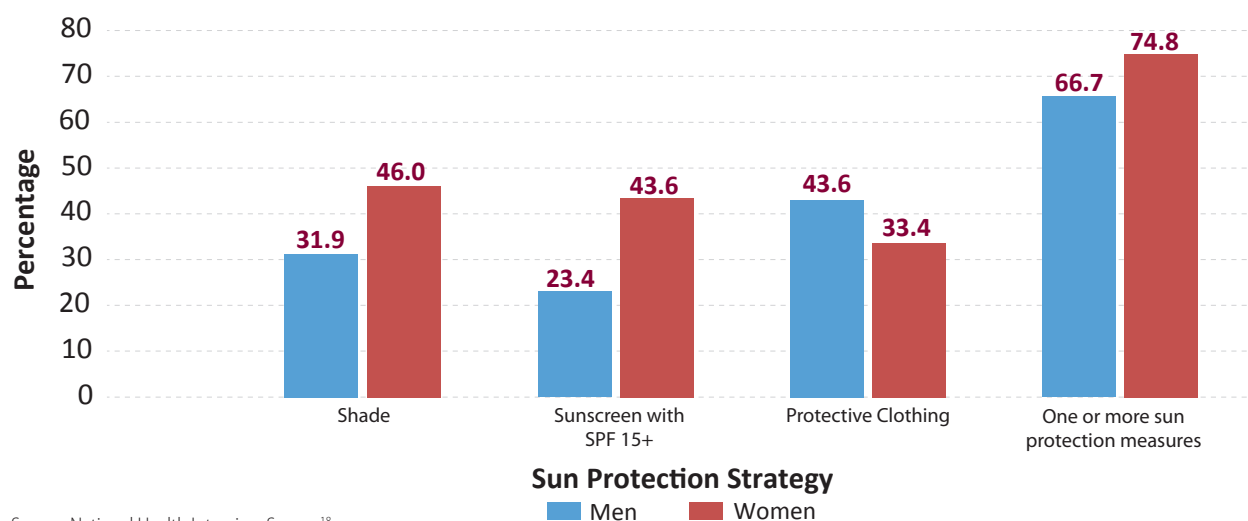


Source: National Health Interview Survey.²

Note: Data are age-adjusted to the 2000 US Standard Population. Ages 18–24 are age-adjusted using age groups 18–19 and 20–24. Ages ≥25 are age-adjusted using age groups 25–34, 35–44, 45–64, and ≥65.



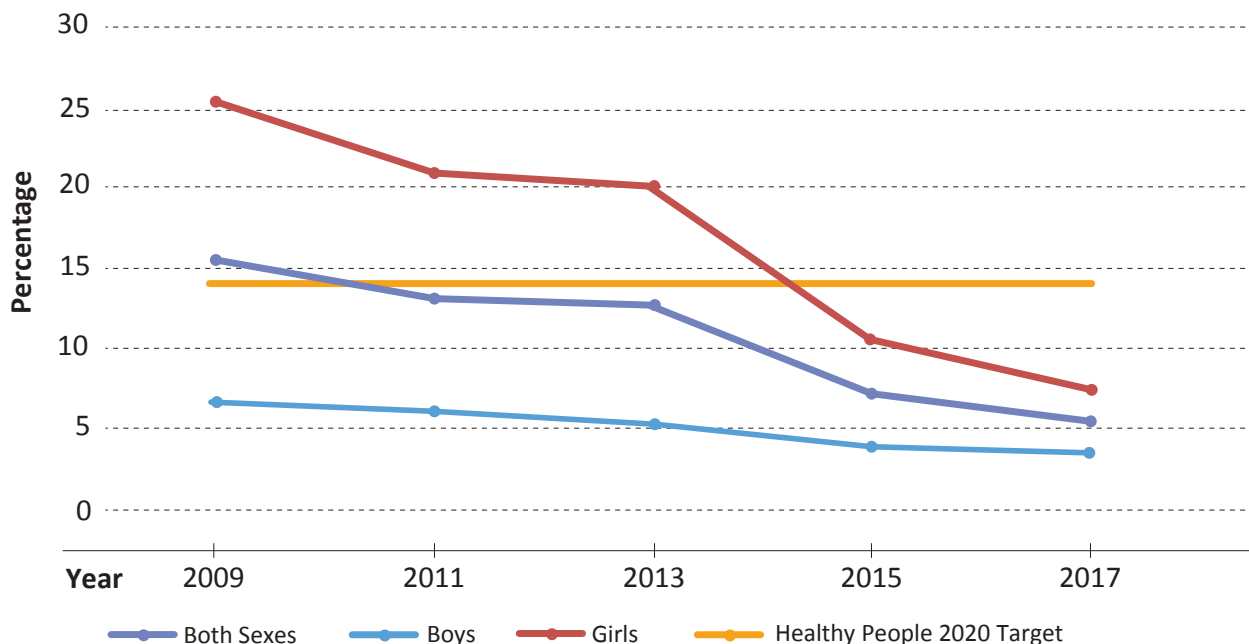
Figure 5. Percentage of US Adults Who Use Sun Protection Always or Most of the Time When Outdoors on a Warm Sunny Day for More Than 1 Hour, 2015



Indoor Tanning

Data from the national YRBS and NHIS show that indoor tanning has decreased among high school students¹⁹ (Figure 6) and adults²⁰ (Table 5). Decreases among high school students may be caused, in part, to increased state restrictions on the use of indoor tanning among minors.²¹ Indoor tanning remains highest among women aged 18 to 29 years and non-Hispanic white individuals (Table 5).

Figure 6. Percentage of US High School Students Who Used an Indoor Tanning Device in the Past Year, by Sex, 2009, 2011, 2013, 2015, 2017



Source: National High School Youth Risk Behavior Survey.¹⁹

Note: Indoor tanning is defined as using an indoor tanning device (such as a sunlamp, sunbed, or tanning booth) one or more times during the 12 months before the survey. It does not include getting a spray-on tan.



Table 5. Prevalence of Indoor Tanning^a Among Adults, 2010, 2013, and 2015

Characteristic	2010, %	2013, %	2015, %	P value ^b
Total	5.5	4.2	3.5	<.001
Sex				
Male	2.2	1.7	1.6	.004
Female	5.9	6.5	5.2	<.001
Age, y				
18–29	11.3	8.6	6.0	<.001
30–39	5.9	5.5	4.4	.004
40–49	5.9	4.3	3.8	<.001
≥50	2.1	1.5	1.8	.287
Race/ethnicity				
Non-Hispanic white	7.4	11.5	3.1	<.001
Black	0.3 ^c	0.2 ^c	0.2 ^c	.507
Hispanic	1.8	1.7	1.2	.063
Other	2.0	1.2	0.8	.033
Most common Users				
Non-Hispanic white females by age, yrs				
18–29	31.8	21.6	20.4	.011
22–25	29.6	27.0	13.9	<.001
26–29	22.1	17.3	13.8	.009

Source: National Health Interview Survey; table adapted from Guy GP, et al.²⁰

^aIndoor tanning defined as using an indoor tanning device (such as a sunlamp, sunbed, or tanning booth) one or more times during the 12 months before the survey. It does not include getting a spray-on tan. Estimates are based on weighted data. Sample sizes are unweighted and may not add to the total because of missing data. Percentages are based on weighted population estimates. Percentage of US adult who experienced at least 1 sunburn in the 12 months prior to the survey.

^bP value based on linear contrast for trend among the estimates over the 3 years. P < .05 is defined as statistically significant.

^cEstimates based on fewer than 30 observations or with a relative standard error >.30 are considered unreliable by the standards of the National Center for Health Statistics.



Sunburn

Sunburn is an indicator of both the intensity of a person's UV exposure and the person's sun sensitivity, making it a useful measure of our progress toward reducing skin cancer incidence rates. Although use of sun protection has increased slightly in recent years, sunburn prevalence remains high, with about one-third of US adults and over half of US high school students getting sunburned each year. Table 6 describes sunburn among high school students by sex, race/ethnicity, and grade in school. Table 7 describes changes in sunburn over time among adults by sex, age, and race/ethnicity.

Table 6. Prevalence of Sunburn* Among High School Students, 2017

Characteristic	Total, %	Female, %	Male, %
Total	57.2	61.6	52.8
Race/ethnicity			
Non-Hispanic white	74.8	78.8	70.5
Non-Hispanic black	13.0	15.5	10.4
Hispanic	45.0	50.1	40.3
Grade			
9	57.7	61.5	53.6
10	57.2	61.2	52.9
11	55.6	59.9	51.2
12	58.7	63.9	53.2

* Counting even a small part of the skin turning red or hurting for 12 hours or more after being outside in the sun or after using a sunlamp or other indoor tanning device, one or more times during the 12 months before the survey

Source: National High School Youth Risk Behavior Survey; table adapted from Kann et al.¹⁹



Table 7. Prevalence of Sunburn^a Among Adults, 2000, 2005, 2010, and 2015

Characteristic	2000, %	2005, %	2010, %	2015, %
Total	35.1	34.4	37.5	35.0
Sex				
Male	37.0	35.8	38.5	35.5
Female	33.5	33.1	36.8	35.2
Age, y				
18–24	49.9	46.3	50.9	46.0
≥25	32.9	32.6	35.5	33.7
Race/ethnicity				
Non-Hispanic white	42.7	43.1	47.4	46.3
Non-Hispanic black	8.9	8.0	10.9	9.9
Hispanic	21.9	20.3	24.8	22.4

Source: National Health Interview Survey.²²

^aPercentage of US adult who experienced at least 1 sunburn in the 12 months prior to the survey.

Note: Data are age-adjusted to the 2000 US standard population using age groups 18–24, 25–34, 35–44, 45–64, and ≥65.



Vitamin D

Vitamin D is needed for health and to maintain strong bones.^{23,24} The body makes vitamin D when skin is directly exposed to the sun.^{23,24} Vitamin D is also found in some foods.^{23,24} Recommended dietary intakes of vitamin D are set on the assumption of little sun exposure because of public health concerns about skin cancer.²⁴ However, improving sun protection across the population could potentially lead to reduced vitamin D concentrations for some people if they do not increase their vitamin D intake from diet or supplements.

The National Health and Nutrition Examination Survey regularly collects data on serum vitamin D concentrations in the US population.²³ These data can be used to monitor vitamin D levels and document potential unintended consequences of skin cancer prevention interventions, such as increases in vitamin D deficiency.²⁵

According to the National Academy of Medicine (formerly the Institute of Medicine), people with serum vitamin D levels less than 40 nmol/L are at increased risk for adverse health outcomes, and levels greater than 125 nmol/L may also be reason for concern.²⁴ Analyses of the prevalence of low serum vitamin D concentrations among the US population aged 12 years or older from 1988 to 2010, the most recent years for which data are available, indicated that the prevalence of low serum vitamin D concentrations has not changed significantly in recent decades.²⁵ During 1988–1994, 16% of the US population had serum vitamin D concentrations below 40 nmol/L; during 2009–2010, the prevalence was 15%.²⁵



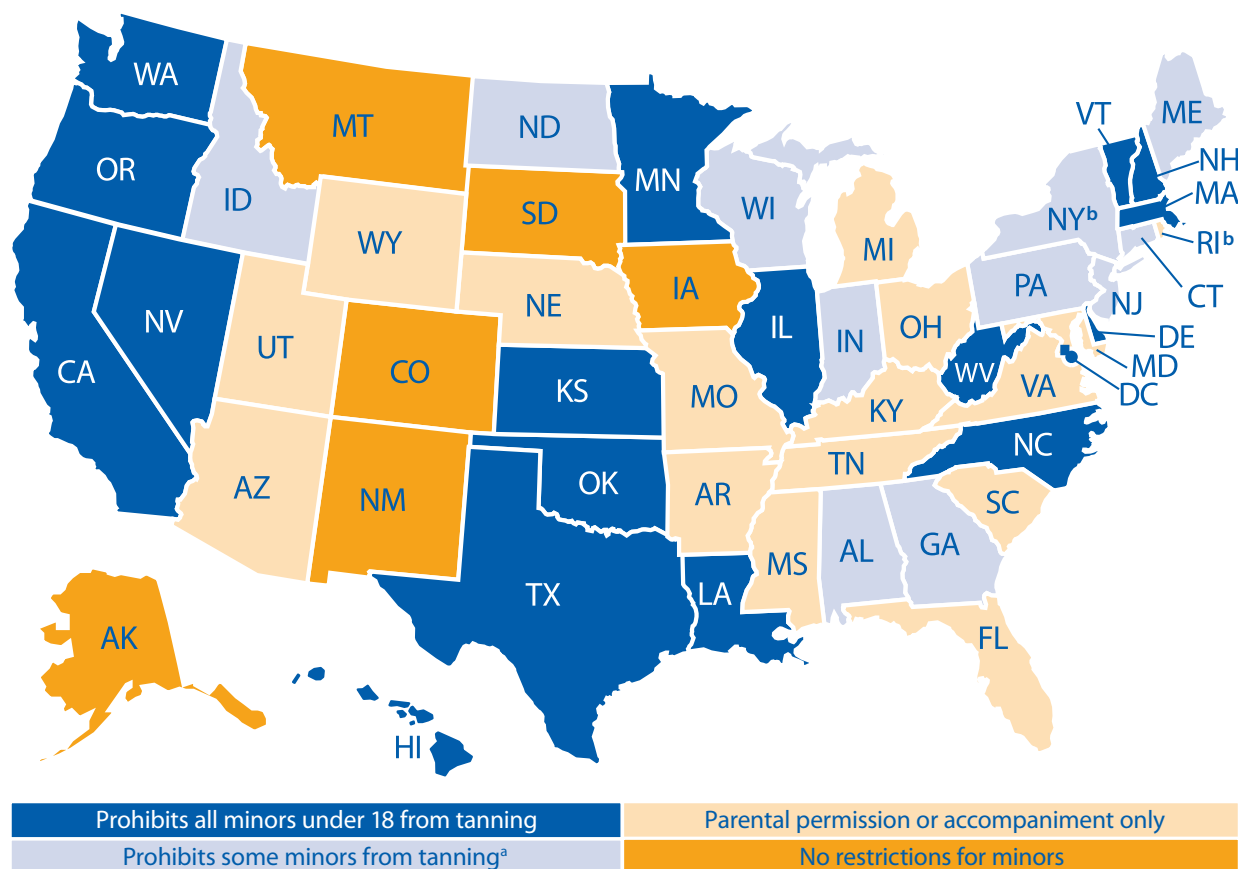
Policy and Program Indicators

Many environmental and policy interventions can decrease overexposure to UV radiation and increase use of sun protection by making it easier for people to make healthy choices.

Indoor Tanning Restrictions for Minors

The US Food and Drug Administration (FDA) states that indoor tanning devices should not be used by minors younger than 18 years.²⁶ CDC research suggests that indoor tanning laws that include age restrictions may be effective in reducing indoor tanning, particularly among high school girls.²¹ As of June 2018, 17 states and the District of Columbia have prohibited indoor tanning among minors younger than 18 (Figure 7). In December 2015, the FDA proposed a nationwide rule to restrict tanning bed use to adults aged 18 or older and require that they sign a risk acknowledgement certification before use.²⁷

Figure 7. State Indoor Tanning Restrictions for Minors Younger than 18 Years, as of June 2018



Source: National Conference of State Legislatures.²⁸

^a"Prohibits some minors from tanning" is defined as restrictions for any other age group, including for minors younger than 17, 16, 15, or 14.

^bAs of June 25, 2018, in both New York and Rhode Island, a bill prohibiting all minors under 18 from indoor tanning was awaiting the state governor's signature.

Skin Cancer Prevention Policies in Schools

Schools are an important setting for addressing skin cancer prevention among youth. Students are typically at school during midday hours, when UV radiation from the sun is strongest. Recess and other outdoor activities



during midday can put students at risk if they are not protected. School policies can promote skin cancer prevention for students and encourage behaviors that will help them avoid skin cancer later in life.

Table 8 shows the percentage of school districts that require or recommend specific sun-safety practices in 2016, based on data from CDC's School Health Policies and Practices Study. Although requirements regarding sun-safety practices are rare, almost half of school districts recommend that schools allow (46.9%) or encourage (44.3%) students to apply sunscreen while at school.²⁹ Slightly less than 40% of school districts recommended that schools encourage use of hats, visors, or protective clothing when in the sun during the school day. Even fewer districts recommended encouraging scheduling outdoor activities to avoid peak sun intensity (33.2%) or wearing sunglasses (24.1%). About 20% of school districts provided funding for professional development or offered professional development for school faculty and staff on how to implement school-wide policies and programs related to sun safety.²⁹

Table 8. Percentage of School Districts that Require or Recommend that Schools Implement Specific Sun-Safety Practices, 2016

Practice	Require (%)	Recommend (%)
Allow students to apply sunscreen while at school.	2.6	46.9
Encourage students to apply sunscreen while at school.	1.5	44.3
Encourage students to wear protective clothing (e.g., long sleeve shirts or long pants) when in the sun during the school day.	1.3	39.3
Encourage students to wear hats or visors when in the sun during the school day.	0.5	38.5
Schedule outdoor activities to avoid times when the sun is at peak intensity during the school day.	3.9	38.5
Encourage students to wear sunglasses when in the sun during the school day.	0.5	24.1

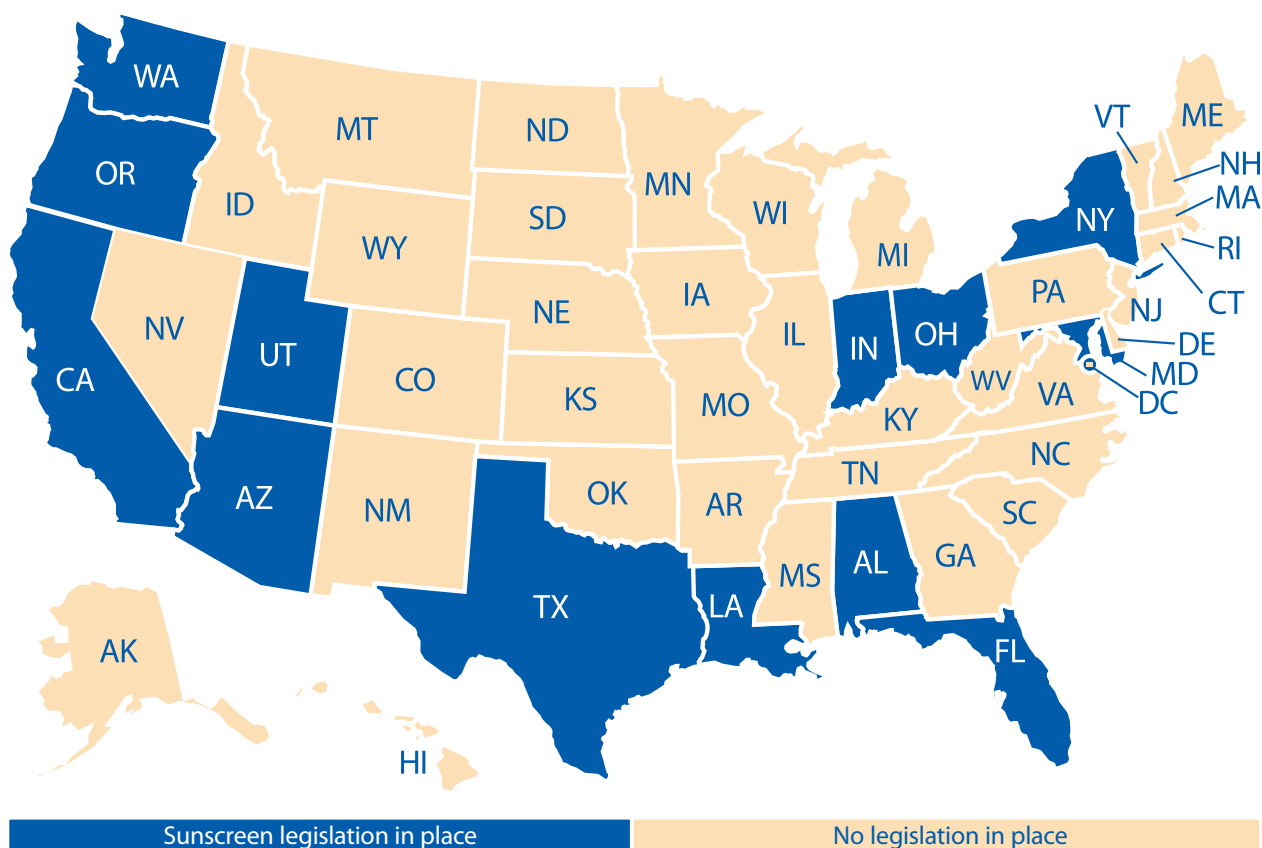
Source: School Health Policies and Practices Study, 2016.²⁹



Sunscreen Access in Schools

The FDA regulates sunscreen as an over-the-counter (OTC) drug product. In many school districts, students' ability to carry or use FDA-regulated OTC drug products of any kind while on school property is restricted, unintentionally creating barriers to adequate sun protection for students. Realizing this concern, some states have passed legislation permitting students to carry and self-apply sunscreen while at school. As of June 2018, 13 states have passed legislation allowing students to carry and self-apply sunscreen during school (Figure 8).^{7,30} Seven of those states passed their school sunscreen legislation in 2017.⁷

Figure 8. State Laws for Sunscreen Use in Schools, as of June 2018



Source: Adapted from Patel & Holman, 2018.^{7,30} Source: Adapted

Comprehensive Cancer Control Programs

Comprehensive cancer control (CCC) is a strategic approach to preventing or minimizing the impact of cancer among communities. It involves state and local health departments; state, local and community organizations; researchers; health care providers; decision makers; cancer survivors and their families; and many others all coming together to find and agree upon ways to address cancer concerns among their communities. CDC funds National Comprehensive Cancer Control Program (NCCCP) recipients in all 50 states, the District of Columbia, 6 US Associated Pacific Islands and Puerto Rico, and 8 tribes or tribal organizations.

Addressing certain key indicators related to sun protection, indoor tanning, and sunburn in NCCCP plans indicates a commitment to skin cancer prevention. Of the 66 NCCCP recipients, 21 (31.8%) included at least one skin cancer intervention in their 2017—2018 action plan. Table 9 describes the specific skin cancer prevention indicators addressed in the plans. Recipients may use multiple indicators, particularly if they use multiple intervention strategies. Therefore, the indicators are not mutually exclusive.

Table 9. National Comprehensive Cancer Control Program Recipients Reporting Interventions to Address Key Skin Cancer Prevention Indicators, 2017–2018 (N=21)

Indicator ^a	N (%)
Adolescents in grades 9–12 that follow protective measures that may reduce the risk of skin cancer	2 (9.5)
Adolescents in grades 9–12 who report a sunburn in past 12 months	1 (4.8)
Adolescents in grades 9–12 who report using artificial sources of ultraviolet light for tanning	2 (9.5)
Adults who report a sunburn	3 (14.3)
Adults that follow protective measures that may reduce the risk of skin cancer	4 (19.0)
Adults who report using artificial sources of ultraviolet light for tanning	0 (0.0)
Elementary, middle, and senior high schools that provide school health education to promote sun safety or skin cancer prevention	5 (23.8)
Knowledge of risks due to sun exposure and how to protect from effects	9 (42.9)
Melanoma incidence rate	12 (57.1)

Source: Chronic Disease Management Information System.³¹

^aIndicators are not mutually exclusive

Conclusion

Although we have seen measurable progress since The Call to Action was released, much more work still needs to be done. Recent successes include a slight decrease in the incidence of melanoma among teens and younger adults, and a reduction in the prevalence of indoor tanning among adults and high school students, including demographic subgroups with the highest use of indoor tanning. However, we have yet to achieve progress on increasing the use of sun protection or reducing sunburn, and over half of high school students and one-third of adults get sunburned each year.

The percentage of schools providing education on sun safety or skin cancer prevention has decreased in recent years. In addition, melanoma incidence rates have continued to increase steadily among older non-Hispanic white adults. The overall burden of skin cancer in the United States remains a public health problem that warrants continued prevention efforts across community sectors. Working together, we can translate what we know into action and protect more Americans from the harms of UV radiation.



References

1. U.S. Department of Health and Human Services. The Surgeon General's Call to Action to Prevent Skin Cancer. Washington, DC: U.S. Dept of Health and Human Services, Office of the Surgeon General; 2014.
2. Everett Jones S, Guy GP, Jr. Sun Safety Practices Among Schools in the United States. *JAMA Dermatol.* 2017;153(5):391-397.
3. Shoemaker ML, Berkowitz Z, Watson M. Intentional outdoor tanning in the United States: Results from the 2015 Summer ConsumerStyles survey. *Prev Med.* 2017;101:137-141.
4. Balk SJ, Gottschlich EA, Holman DM, Watson M. Counseling on Sun Protection and Indoor Tanning. *Pediatrics.* 2017;140(6).
5. Holman DM, Freeman MB, Shoemaker ML. Trends in Melanoma Incidence Among Non-Hispanic Whites in the United States, 2005 to 2014. *JAMA Dermatol.* 2018.
6. Holman DM DH, Guy GP, Jr, Watson M, Hartman AM, Perna FM,. Prevalence of sun protection use and sunburn and association of demographic and behavioral characteristics with sunburn among US adults. *JAMA Dermatol.* 2018;Published online March 14, 2018.
7. Patel RR, Holman DM. Sunscreen use in schools: a content analysis of U.S. state laws. *J Am Acad Dermatol.* 2018.
8. Feng J, Frisard C, Nahar VK, et al. Gender Differences in Indoor Tanning Habits and Location. *J Am Acad Dermatol.* 2017.
9. Nahar VK, Olendzki E, Hillhouse JJ, Pagoto SL. Tanners' awareness and perceptions of legislation for tanning bed use. *Photodermatol Photoimmunol Photomed.* 2017;33(6):338-340.
10. Nahar VK, Rosenthal M, Lemon SC, et al. Youth access to indoor tanning salons in urban versus rural/suburban communities. *Photodermatol Photoimmunol Photomed.* 2017.
11. U.S. Preventive Services Task Force. Final Update Summary: Skin Cancer Prevention: Behavioral Counseling. March 2018. Available online: www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/skin-cancer-counseling2.
12. U.S. Department of Health and Human Services. Healthy People 2020 Topics and Objectives. Available from: www.healthypeople.gov/2020/topics-objectives/. Accessed March 14, 2018.
13. National Program of Cancer Registries and Surveillance, Epidemiology, and End Results SEER*Stat Database: NPCR and SEER Incidence – USCS 2001-2015 Public Use Research Database, United States Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute. Released June 2018, based on November 2017 submissions. Available at www.cdc.gov/cancer/npcr/public-use/.
14. National Cancer Institute. Surveillance, Epidemiology, and End Results (SEER) Program (<https://seer.cancer.gov/>) SEER*Stat Database: Mortality – All COD, Aggregated Total U.S. (1990-2015) <Katrina/Rita Population Adjustment>.
15. National Cancer Institute. Surveillance, Epidemiology, and End Results (SEER) Program (<https://seer.cancer.gov/>) SEER*Stat Database: Incidence – SEER 9 Regs Research Data, Nov 2017 Sub (1973-2015) <Katrina/Rita Population Adjustment>.
16. National Cancer Institute. Surveillance, Epidemiology, and End Results (SEER) Program (<https://seer.cancer.gov/>) SEER*Stat Database: Mortality – All COD, Aggregated Total U.S. (1969-2015) <Katrina/Rita Population Adjustment>.
17. Kann L, Kinchen S, Shanklin SL, et al. Youth risk behavior surveillance--United States, 2013. *MMWR Suppl.* 2014;63(4):1-168.
18. National Cancer Institute. Cancer Trends Progress Report. Sun-Protective Behavior. Available at: https://progressreport.cancer.gov/prevention/sun_protection. Accessed March 14, 2018.
19. Kann L, McManus T, Harris WA, et al. Youth risk behavior surveillance--United States, 2017. *MMWR Suppl* 2018;67(No. SS-8).
20. Guy GP, Jr., Watson M, Seidenberg AB, Hartman AM, Holman DM, Perna F. Trends in indoor tanning and its association with sunburn among US adults. *J Am Acad Dermatol.* 2017;76(6):1191-1193.
21. Guy GP, Jr., Berkowitz Z, Jones SE, et al. State indoor tanning laws and adolescent indoor tanning. *Am J Public Health.* 2014;104(4):e69-74.
22. National Cancer Institute. Cancer Trends Progress Report. Sunburn. Available at: <https://progressreport.cancer.gov/prevention/sunburn>. Accessed March 14, 2018.
23. Centers for Disease Control and Prevention. Second National Report on Biochemical Indicators of Diet and Nutrition in the U.S. Population. Atlanta, GA: Centers for Disease Control and Prevention, U.S. Dept of Health and Human Services; 2012.
24. Institute of Medicine. Dietary Reference Intakes for Calcium and Vitamin D. Washington, DC: Committee to Review Dietary Reference Intakes for Vitamin D and Calcium, Food and Nutrition Board; 2010.
25. Schleicher RL, Sternberg MR, Lacher DA, et al. The vitamin D status of the US population from 1988 to 2010 using standardized serum concentrations of 25-hydroxyvitamin D shows recent modest increases. *Am J Clin Nutr.* 2016;104(2):454-461.
26. U.S. Food and Drug Administration. Rule. General and Plastic Surgery Devices: reclassification of ultraviolet lamps for tanning, Henceforth To Be Known as Sunlamp Products and Ultraviolet Lamps Intended for Use in Sunlamp Products. Fed Regist. 2014;79:31205-31214.
27. Regulations.gov. General and Plastic Surgery Devices: Restricted Sale, Distribution, and Use of Sunlamp Products. 2015 December 22, 2015 [cited 2016 March 7]; Available from: www.regulations.gov/document?D=FDA-2015-N-1765-0001.
28. National Conference of State Legislatures. Indoor Tanning Restrictions for Minors: A State-By-State Comparison. Available at: www.ncsl.org/research/health/indoor-tanning-restrictions.aspx. Accessed May 4, 2017.
29. Centers for Disease Control and Prevention. Results from the School Health Policies and Practices Study, 2016. Available online at www.cdc.gov/healthyyouth/data/shpps/pdf/shpps-results_2016.pdf. Accessed March 15, 2018.
30. Indiana General Assembly. Senate Bill 24 <https://iga.in.gov/legislative/2018/bills/senate/24#document-181a8ce2>. 2018.
31. Centers for Disease Control and Prevention. Chronic Disease Management Information System. Available online at <https://nccdc.cdc.gov/CDMIS/>



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