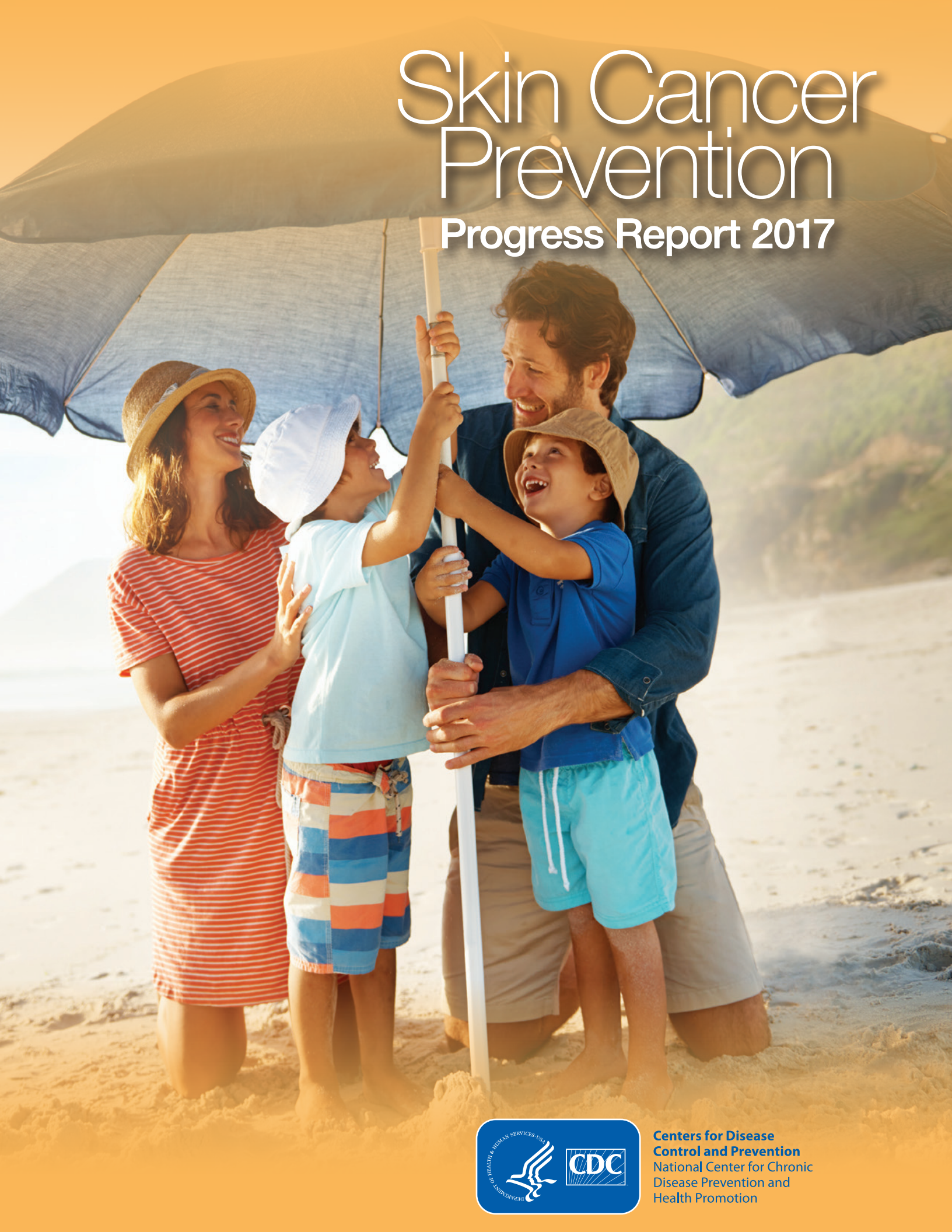


# Skin Cancer Prevention

## Progress Report 2017



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

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

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# Skin Cancer Prevention

## Progress Report 2017

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## 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.<sup>1</sup> *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).<sup>1</sup>

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 third annual Skin Cancer Prevention Progress Report provides a comprehensive summary of the most recent data available and highlights developments and success stories following *The Call to Action* and since the release of the [2016 Progress Report](#). By continuing to update the

report annually, we can monitor progress, celebrate and learn from successes, recognize areas that need improvement, and identify opportunities to work with partners in government, health care, education, business, and the community.



**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*.<sup>1</sup>



## What's New This Year?

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

### Review Article Synthesizes the Latest Science on Melanoma Screening and Prevention

In May 2016, *CA: A Cancer Journal for Clinicians* published an [article](#) reviewing the state of the science on prevention and early detection of melanoma and current areas of scientific uncertainty and ongoing debate.<sup>2</sup> The article reiterates the importance of a coordinated, multi-sector approach to reduce the melanoma burden in the United States.

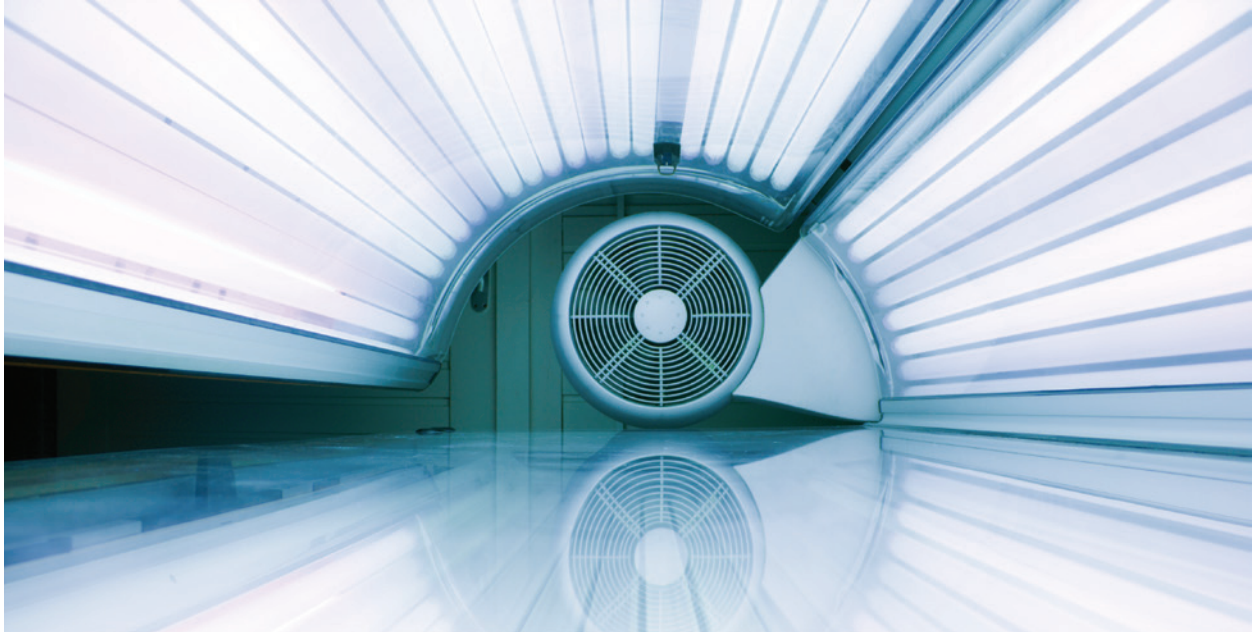
### Multicomponent Community-Wide Interventions to Prevent Skin Cancer Work

The *American Journal of Preventive Medicine* published findings from [two Community Guide systematic reviews](#) related to skin cancer prevention in October 2016—one for mass media campaigns and another

for multicomponent community-wide interventions to prevent skin cancer.<sup>3</sup> The evidence showed that multicomponent community-wide interventions are effective in reducing the harms of UV exposure by increasing sunscreen use. There was insufficient evidence to determine the effectiveness of mass media interventions alone, indicating a need for more research in this area.

### Schools Play a Crucial Role in Skin Cancer Prevention

A [Viewpoint paper](#) on the important role schools play in the prevention of skin cancer was published in *JAMA Dermatology* in October 2016.<sup>4</sup> The article described the potential benefit of implementing skin cancer prevention strategies such as policies that would allow students to use sun protection on campus, environmental changes such as providing shaded areas outside, and educational programs to increase use of sun protection and prevent overexposure to UV radiation among youth.



### **More Than 30,000 People Visit Emergency Departments for Sunburn Each Year**

In January 2017, *JAMA Dermatology* published a [research letter](#) estimating the annual number of sunburn-associated emergency department (ED) visits and the associated costs.<sup>5</sup> In 2013, there were an estimated 33,826 sunburn-associated ED visits corresponding to a total cost of \$11.2 million. The estimates demonstrate the burden of injuries from sunburn and highlight the importance of continued monitoring of sunburn and sun protection behaviors.

### **Prohibiting Indoor Tanning Among Minors Could Save Lives and Reduce Health Care Costs**

An [article](#) published in the *Journal of the American Academy of Dermatology* in February 2017 estimated the potential health and economic benefits of reducing indoor tanning in the United States.<sup>6</sup> The study estimated that prohibiting the use of indoor tanning among minors younger than 18 years could prevent 61,839 melanoma cases and 6,735 melanoma deaths over the lifetime of youth currently aged 14 years or younger in the United States. The estimated reduction would save more than \$342 million in treatment costs.

### **Indoor Tanning Is Significantly Associated With Sunburn Among US High School Students**

In March 2017, the *Journal of the American Academy of Dermatology* published an [article](#) on the latest trends in indoor tanning among US high school students and the association between indoor tanning and sunburn.<sup>7</sup> The prevalence of indoor tanning decreased from 15.6% in 2009 to 7.3% in 2015. Decreases were observed in males, females, and across all age groups. Indoor tanning was significantly associated with sunburn, with 82.3% of indoor tanners having had a sunburn in the past year compared to 53.7% of those who did not engage in indoor tanning.

### **Young Indoor Tanners Often Start Tanning With a Family Member**

A [research letter](#) published in *JAMA Dermatology* in March 2017 indicated that most tanners began indoor tanning before the age of 21 (52.5%), and nearly one-third started before age 18.<sup>8</sup> Those who started before age 16 often started with a family member—usually their mother. Older teens and young adults often began tanning alone or with a friend. Females younger than 16 were more likely than any other demographic group to start tanning with a friend or family member.



### Beliefs About Vitamin D Are Associated With Sun Protection and Tanning Behaviors

*Preventive Medicine* published an [article](#) in March 2017 on the association between beliefs about vitamin D and skin cancer risk behaviors.<sup>9</sup> People who believed they could get most of their vitamin D from dietary sources were more likely to protect their skin from the sun when spending time outdoors. Those who believed that indoor tanning is an effective way to get vitamin D were more likely to use indoor tanning devices and seek a tan outdoors from the sun. These findings suggest that interventions promoting sun protection and the avoidance of overexposure to UV radiation may benefit from the inclusion of information about ways to get adequate vitamin D while minimizing skin cancer risk.

### Adult Indoor Tanning Has Gone Down, Even Among the Most Common Users

In June 2017, *Journal of the American Academy of Dermatology* published a [research letter](#) describing trends in indoor tanning among US adults during 2010–2015 and its association with sunburn.<sup>10</sup> Adult indoor tanning decreased from 5.5% in 2010 to 3.5% in 2015. The decreases were statistically significant across sexes, across age groups younger than 50, and among non-Hispanic white females younger than 30 (the most common users). Even with these latest decreases, an estimated 7.8 million adults were still engaging in indoor tanning in 2015, pointing to the need for continued efforts to reduce harms from indoor tanning.



## Success Stories from the Field

### Partnering With Nurses to Put Skin Cancer Prevention Into Action

As an oncology nurse for nearly 40 years, Maryellen Maguire-Eisen, founder and executive director of the [Children's Melanoma](#)



[Prevention Foundation](#) (CMPF), had seen firsthand the impact that attention from the Office of the Surgeon General could have on health promotion. The publication of a Surgeon General's report on the harms of tobacco, followed by decades of tobacco control efforts, had led to changes in social norms and policies, and ultimately, decreases in smoking rates. Maguire-Eisen had high hopes that a Surgeon General's Call to Action focused on skin cancer prevention would finally make this important public health issue a priority for Americans. "Wouldn't it be great to see drastic changes in societal attitudes about the real hazards of sunburns and tanning, as well as policies that promote sun protection and provide shade in public places?" said Maguire-Eisen.

CMPF is committed to preventing skin cancer one child at a time through education and advocacy. *The Call to Action* provided the foundation with an opportunity to partner with colleagues in public health, dermatology, education, and oncology nursing to educate Americans to be [SunAWARE](#). CMPF presented "Heeding The

Surgeon General's Call to Action to Prevent Skin Cancer" at national conventions, regional meetings, schools, and hospitals to raise awareness about *The Call to Action* goals and strategies. Maguire-Eisen coauthored an

[article](#) that highlighted *The Call to Action* titled, "UV Radiation Exposure and Its Impact on Skin Cancer Risk" in a special Cancer Prevention and Control issue of *Seminars in Oncology Nursing*.

To promote *The Call to Action* goal of education, CMPF coordinated Don't Fry Day activities among nursing organizations both locally and nationally, reaching thousands of children and families with this important skin cancer prevention message. In Massachusetts, they successfully petitioned lawmakers to have the governor proclaim [Don't Fry Day](#) (the Friday before Memorial Day) as an official day of skin cancer prevention awareness.

"Our hope," said Maguire-Eisen, "is that these partnerships will engage thousands of nurses nationally to respond to *The Call to Action* by educating their communities about skin cancer prevention, thereby impacting health outcomes for millions of Americans."



## Decreasing Barriers to Sun Protection Through Sun-Safety Legislation

In May 2016, the [American Society for Dermatologic Surgery Association](#) (ASDSA) published model legislation that would help guide states to allow for the use of sunscreen in schools and camps in a nationwide effort to decrease barriers to sun protection in youth settings. The bill, titled “[SUNucate](#)” or “Reducing the Risk of Skin Cancer and Excessive UV Exposure in Children Act,” provides state governments with a framework to permit the use of sunscreen in these settings.

The model bill allows students to possess and use topical sunscreens while on school property, at school-sponsored events, and at youth camp without



a physician’s note or prescription if the product is approved by the US Food and Drug Administration (FDA) for over-the-counter use. The bill also encourages the use of sun-protective clothing, such as hats, and calls for states to look at ways to best educate children on the dangers of skin cancer. In its pilot year, multiple states, including [Arizona](#), [Utah](#), and [Washington](#), passed variations of ASDSA’s SUNucate Model Bill.

ASDSA President Thomas E. Rohrer, MD, said, “As dermatologic surgeons, we feel it is imperative to help teach children about the risks of sun exposure and why sun protection efforts such as sunscreen are important in preventing skin cancer.”

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## Planning for Shade in Colorado Communities

The Colorado Department of Public Health & Environment (CDPHE) is encouraging local communities to consider shade in their planning and policy processes. In Colorado, skin cancer rates are nearly double the national average because of the high altitude, active lifestyles, and sunny weather. Shade provided by an increased tree canopy can protect Coloradans from UV overexposure while they participate in active transportation and recreational activities. CDPHE can help local governments to integrate shade into community master plans, design guidelines, and zoning ordinances.



Policy aimed at increasing a community tree canopy can take a variety of forms. Communities can set goals and identify strategies to increase shade tree canopy through master planning documents such as comprehensive plans, parks and recreation plans, and transportation plans. Policies such as design guidelines and zoning regulations offer an opportunity for communities to shape and increase shade tree canopy. The design guidelines and landscape requirements of streetscapes, parks, playgrounds, and recreational facilities can set standards for shade coverage in public and private developments.

“CDPHE is helping communities elevate the importance of shade trees. Trees not only serve to beautify communities, they are

integral to community infrastructure, reducing UV overexposure and helping to foster participation in physical activity,” said Cate Townley, a built environment specialist with CDPHE.

As an example of this work, CDPHE partnered with the Denver Regional Council of Governments (DRCOG), a planning organization that creates guidelines on transportation and mobility. DRCOG recently adopted the [Metro Vision 2040 Master Plan](#) and, with guidance from CDPHE, included policy language promoting a natural and built environment shade canopy to create and maintain a safe, comfortable pedestrian environment. The Metro Vision 2040 plan provides best practice strategies on built environment policies to counties within the Denver region, potentially reaching 2.8 million Colorado residents.

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## Reducing UV Exposure through State-of-the-Art Behavioral Interventions and Public Policy Initiatives

In September 2012, The University of Texas MD Anderson Cancer Center launched its ambitious [Moon Shots Program](#), a comprehensive effort to rapidly and dramatically lower deaths from cancer by forging new models for research and patient care that rely on innovation in prevention, early detection, and the development of new therapies. One aim of the [Melanoma Moon Shot](#) (MMS) is to reduce UV exposure among children, adolescents, and young adults through innovative behavioral interventions and public policy initiatives.

**Legislation and public policy:** The MMS is the primary scientific and clinical resource for Texas legislators to educate policy makers on skin cancer risks from UV exposure. These educational activities have been complemented by op-eds in relevant news media and invited [commentaries](#) and [reviews](#) in prominent scientific journals. The Texas Legislature enacted state law [SB329](#), which went into effect in September 2013 and restricts minors younger than 18 from using UV tanning devices in tanning facilities, making Texas the fourth state to enact an under-18 ban. Sixteen other states and the District of Columbia now have similar legislation. The MMS evaluated over 600 Texas indoor tanning facilities and found that 81% were compliant with the under-18 ban, supporting bans as an effective strategy.<sup>11</sup> The Texas Legislature also enacted state law [SB265](#), which went into effect in June 2015 and permits children to possess and use sunscreen on school property and at school events. Texas is one of at least ten states with similar sunscreen legislation.



**Targeted education initiatives:** The MMS developed an evidence-based program, [Ray and the Sunbeatables: A Sun Safety Curriculum](#) for preschoolers, kindergarteners and first-grade students, which launched in May 2015. Through a partnership between MD Anderson and the CATCH Global Foundation, over 1,000 communities in 23 states and 1 Canadian province are teaching the curriculum. The program has reached over 100,000 children, and communities are continuing to adopt it. Patricia Osborn, director of youth development of the YMCA of Greater Houston, states, “Melanoma took my husband’s life. A day does not go by that I don’t think about him. MD Anderson’s *Sunbeatables* program is an opportunity for the YMCA of Greater Houston to impact and teach our young children how to protect themselves from the sun



and potentially save a life.”

Indoor tanning devices are prevalent on college campuses and in off-campus housing, and some campus cash card programs permit students to purchase tanning sessions at off-campus facilities. The MMS developed the first [Skin Cancer Prevention Toolkit for Institutions of Higher Education](#) to increase awareness of skin cancer risks associated with UV exposure and inform colleges about model sun protection policies to prevent indoor tanning. In partnership with the

American Cancer Society Cancer Action Network, this toolkit was distributed to 288 college campuses across the country. Through collaboration with the National Council on Skin Cancer Prevention, the toolkit is a featured resource in the [Indoor Tan-Free Skin Smart Campus Initiative](#)

## Educating Youth and Those Who Influence Them About Sun Safety

With skin cancer rates rapidly increasing, there is a need to educate young people about how to stay safe in the sun. The Enright Sun Safety Certification program, designed by skin cancer professionals from the Enright Melanoma Foundation in Summit, NJ, provides interactive online courses that allow anyone to get educated about this important health issue in about 20 minutes on any electronic device.

Launched in 2015, this program has helped to educate thousands of lifeguards, camp counselors, public health and school nurses, coaches, parents, and teachers, along with the children they serve. The [Enright Sun Safety ACE](#) (Apply Cover Enjoy) course teaches children aged 5 and older about the effects of

UV radiation, the types of skin cancers it can cause, the importance of protecting themselves from too much UV exposure, and how to educate others about melanoma prevention. These courses are free to the public.

According to Janet Horowitz, executive director of the Enright Melanoma Foundation, “The Enright Sun Safety Certification program is transforming the way we learn about sun safety. Our hope is that our courses will change educational strategies as they have the potential

for broad public health impact by informing youth, and those who influence youth, about healthy choices regarding sun safety.”

Note: The use of trade names is for identification only and does not imply endorsement by the US Department of Health and Human Services.

If you would like more information about these success stories, please see the list of contacts on [page 23](#).



# Outcome Indicators

## 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
<b>C-8</b> Reduce the melanoma cancer death rate	2.4 deaths per 100,000 population	2007: 2.7 deaths per 100,000 population	2014: 2.6 deaths per 100,000 population	<a href="#">National Vital Statistics System – Mortality</a>
<b>C-20.1</b> Reduce the proportion of adolescents in grades 9 through 12 who report sunburn	NA	2015: 55.8%	2015: 55.8%	<a href="#">Youth Risk Behavior Surveillance System</a>
<b>C-20.2</b> Reduce the proportion of adults aged 18 years and older who report sunburn	33.8%	2010: 37.5%	2015: 35.3%	<a href="#">National Health Interview Survey</a>
<b>C-20.3</b> 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%	2015: 7.3%	<a href="#">Youth Risk Behavior Surveillance System</a>
<b>C-20.4</b> 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%	<a href="#">National Health Interview Survey</a>
<b>C-20.5</b> Increase the proportion of adolescents in grades 9 through 12 who follow protective measures that may reduce the risk of skin cancer <sup>a</sup>	11.2%	2009: 9.3%	2013: 10.1%	<a href="#">Youth Risk Behavior Surveillance System</a>
<b>C-20.6</b> 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%	<a href="#">National Health Interview Survey</a>
<b>ECBP-4.4</b> 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%	<a href="#">School Health Policies and Practices Study</a>

Abbreviations: NA, not available.

Note: Highlighted rows indicate Healthy People 2020 objects that have been met or exceeded.

Source: Healthy People 2020.<sup>12</sup>

<sup>a</sup> Current 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

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 decades before melanoma incidence rates reflect the impact 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 (32.8 per 100,000) and lowest are among blacks (1.0 per 100,000) and Asian/Pacific Islanders (1.3 per 100,000). Non-Hispanic white men also have the highest death rates (4.9 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 among non-Hispanic white adults by age group. The steady increase in incidence rates among non-Hispanic white adults aged 65 years and older contrasts the slight decrease in incidence rates among non-Hispanic white teens and young adults under age 40.

**Table 3. Invasive Melanoma Incidence, by Sex and Race/Ethnicity, United States, 2010–2014<sup>a</sup>**

Race/Ethnicity	US Population		Male		Female	
	Rate	Average Annual Count	Rate	Average Annual Count	Rate	Average Annual Count
All Races	20.7	70,618	26.7	41,465	16.4	29,153
White	23.5	66,500	29.7	39,290	18.9	27,210
White, Hispanic <sup>b</sup>	4.5	1,413	4.9	650	4.3	763
White, non-Hispanic <sup>b</sup>	26.2	65,081	32.8	38,637	21.4	26,444
Black	1.0	363	1.1	166	1.0	197
American Indian/Alaska Native	5.2	160	6.7	88	4.2	72
Asian/Pacific Islander	1.3	215	1.5	108	1.2	107
Hispanic <sup>b</sup>	4.4	1,528	4.9	3,512	4.3	4,129

Source: United States Cancer Statistics: 1999–2014 Incidence and Mortality Web-based Report.<sup>13</sup>

<sup>a</sup> Data are from population areas that meet United States Cancer Statistics publication criteria for 2010–2014 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.

<sup>b</sup> 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, 2010–2014<sup>a</sup>**

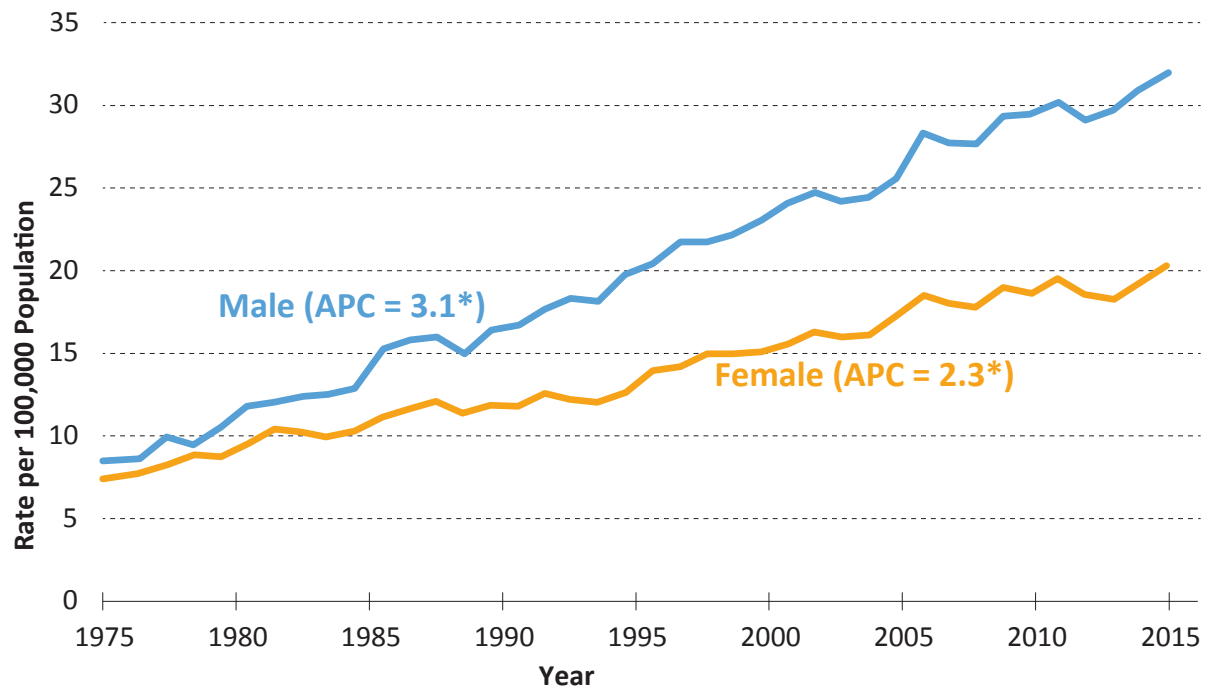
Race/Ethnicity	US Population		Male		Female	
	Rate	Average Annual Count	Rate	Average Annual Count	Rate	Average Annual Count
All Races	2.7	9,250	4.0	6,083	1.7	3,167
White	3.1	9,041	4.6	5,982	1.9	3,059
White, Hispanic <sup>b</sup>	0.8	230	1.1	134	0.6	95
White, non-Hispanic <sup>b</sup>	3.3	8,799	4.9	5,841	2.1	2,959
Black	0.4	138	0.5	65	0.4	72
American Indian/Alaska Native	0.7	18	1.0	12	0.4	7
Asian/Pacific Islander	0.4	53	0.4	24	0.3	29
Hispanic <sup>b</sup>	0.8	233	1.0	136	0.6	97

Source: Surveillance, Epidemiology, and End Results (SEER) Mortality Database.<sup>13</sup>

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

<sup>a</sup> Rates are per 100,000 people and are age-adjusted to the 2000 US Standard Population.

<sup>b</sup> 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.

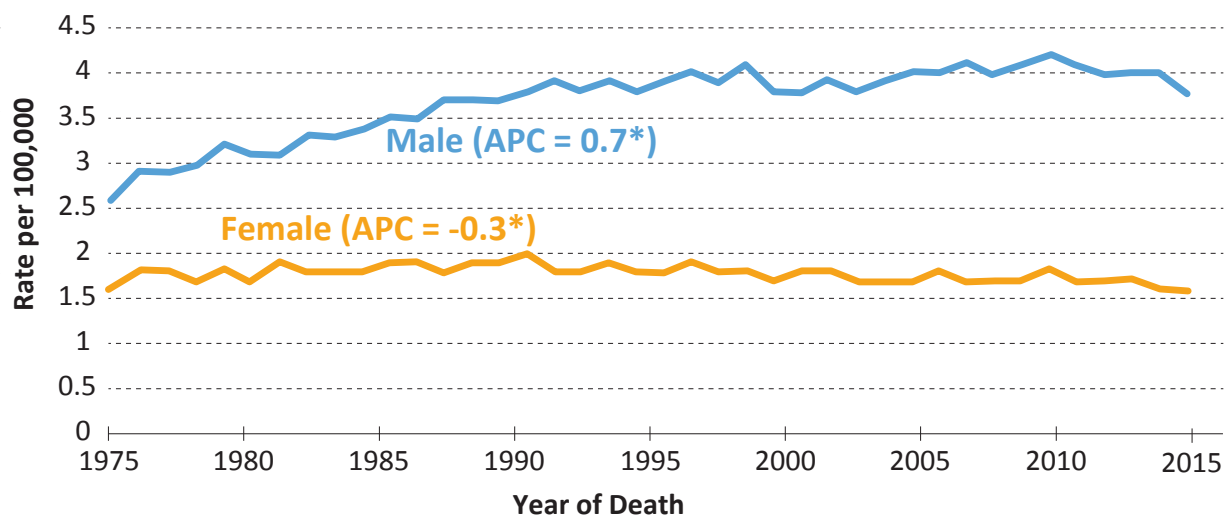
**Figure 1. Age-Adjusted Melanoma Incidence Rates, by Sex, United States, 1975–2014**

Abbreviation: APC, annual percentage change. Source: Surveillance, Epidemiology, and End Results (SEER) Incidence Database<sup>14</sup>

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

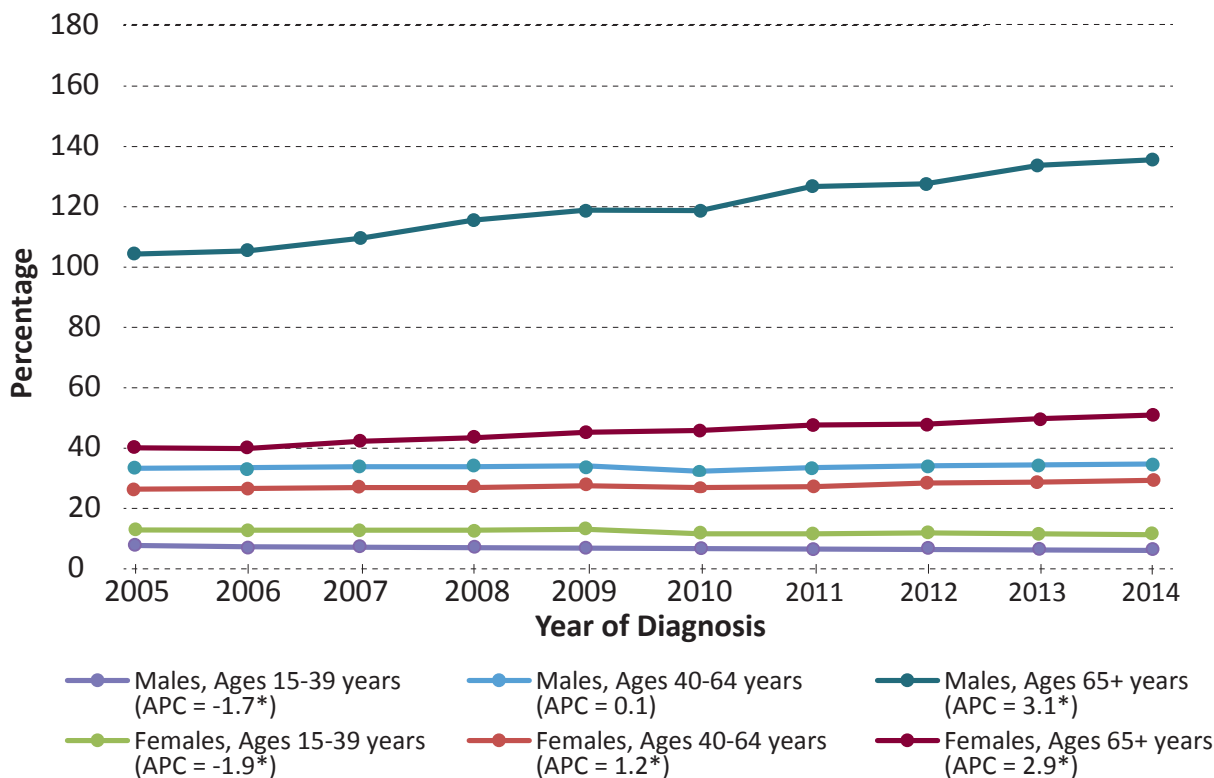
\* Denotes statistical significance ( $P < .05$ ).

**Figure 2. Age-Adjusted Melanoma Death Rates, by Sex, United States, 1975–2014**



Abbreviation: APC, annual percentage change.  
 Source: Surveillance, Epidemiology, and End Results (SEER) Incidence Database.<sup>14</sup>  
 Note: Underlying mortality data provided by the National Center for Health Statistics.  
 \* Denotes statistical significance ( $P < .05$ ).

**Figure 3. Age-Adjusted Melanoma Incidence Rates Among Non-Hispanic Whites Aged  $\geq 15$  Years, by Sex and Age Group, United States, 2005–2014**



Abbreviations: APC, annual percentage change.  
 Source: United States Cancer Statistics: 1999–2014 Incidence and Mortality Web-based Report.<sup>13</sup>  
 \* Denotes statistical significance ( $P < .05$ ).

# 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. While it may be decades before skin cancer incidence rates reflect the impact of prevention efforts, these behavioral surveillance indicators can provide more immediate information about our progress.

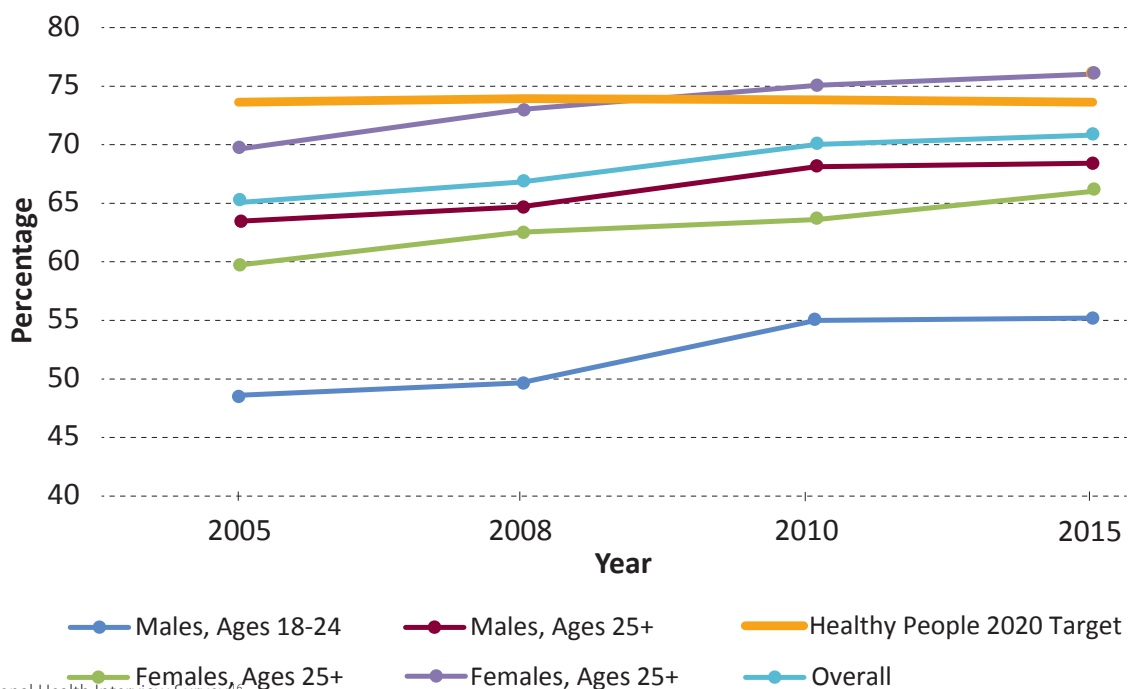
The latest data on use of sun protection (shade, clothing, wide-brimmed hats, and sunscreen), indoor tanning, and sunburn among US adults are available from the Cancer Control Supplement of the 2015 National Health Interview Survey (NHIS). The most recent data on sunscreen use, indoor tanning, and sunburn among US high school students are available from the 2013 and 2015 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.<sup>15</sup> 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**

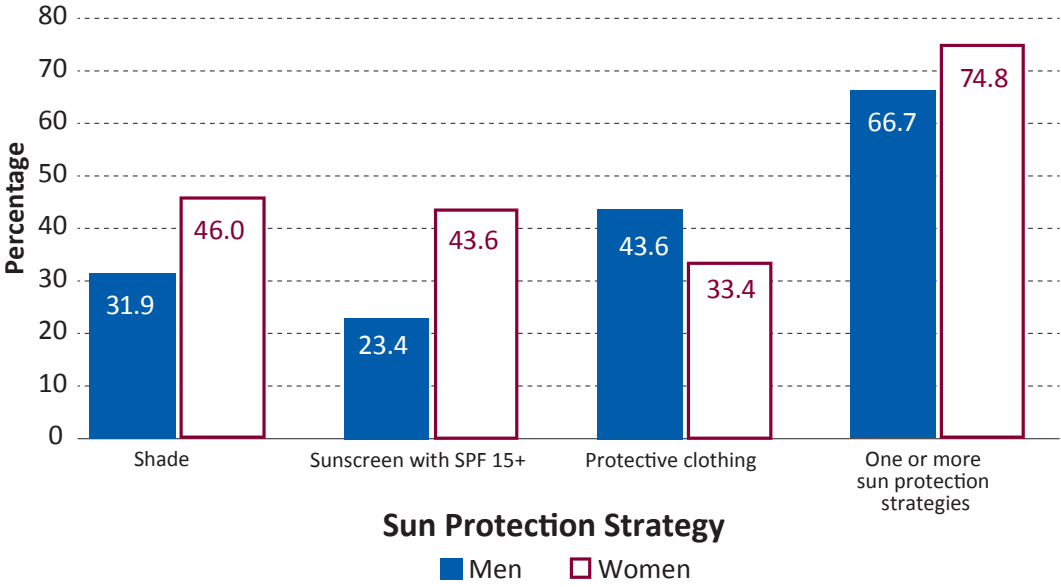


Source: National Health Interview Survey.<sup>16</sup>

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



Source: National Health Interview Survey.<sup>17</sup>  
Note: Data are age-adjusted to the 2000 US Standard Population.

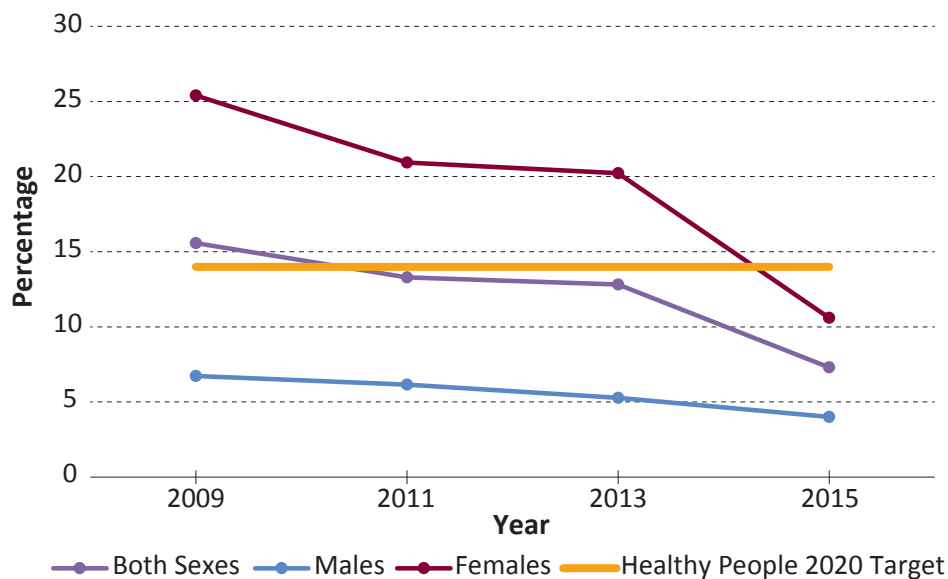


## Indoor Tanning

Data from the national YRBS and NHIS show that indoor tanning has decreased among high school students<sup>18</sup> (Figure 6) and adults<sup>10</sup> (Table 5). Decreases among high school students may be due in part to increased state restrictions on the use of indoor tanning among minors.<sup>19</sup> Indoor tanning remains highest among women aged 18 to 29 years and non-Hispanic whites (Table 5).



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



Source: National High School Youth Risk Behavior Survey.<sup>20</sup>

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 Among Adults, 2010, 2013 and 2015<sup>a</sup>**

Characteristic	2010, %	2013, %	2015, %	P value <sup>b</sup>
Total	5.5	4.2	3.5	<.001
<b>Sex</b>				
Male	2.2	1.7	1.6	.004
Female	8.6	6.5	5.2	<.001
<b>Age, y</b>				
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
<b>Race/ethnicity</b>				
Non-Hispanic white	7.4	5.7	4.9	<.001
Black	0.3 <sup>c</sup>	0.2 <sup>c</sup>	0.2 <sup>c</sup>	.507
Hispanic	1.8	1.7	1.2	.063
Other	2.0	1.2	0.8	.033
<b>Most Common Users</b>				
<b>Non-Hispanic white female by age, y</b>				
18–21	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.<sup>21</sup> Table adapted from Guy GP, et al.<sup>10</sup>

<sup>a</sup> Indoor 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. <sup>b</sup> P value based on linear contrast for trend among the estimates over the 3 years. P < .05 is defined as statistically significant. <sup>c</sup> Estimates 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, 2015**

Characteristic	Total, %	Girls, %	Boys, %
Total	55.8	59.8	52.0
<b>Race/ethnicity</b>			
Non-Hispanic white	72.5	77.7	67.6
Non-Hispanic black	15.0	16.2	13.4
Hispanic	40.8	43.8	38.0
<b>Grade</b>			
9	54.9	60.0	50.4
10	55.9	58.9	52.9
11	56.4	60.7	52.4
12	55.8	59.5	52.2

Source: National High School Youth Risk Behavior Survey<sup>20</sup>; table adapted from Kann et al.<sup>18</sup>

**Table 7. Prevalence of Sunburn Among Adults**

Characteristic	2000, %	2005, %	2010, %	2015, %
Total	35.1	34.4	37.5	35.0
<b>Sex</b>				
Male	37.0	35.8	38.5	35.5
Female	33.5	33.1	36.8	35.2
<b>Age, y</b>				
18–29	49.9	46.3	50.9	46.0
≥25	32.9	32.6	35.5	33.7
<b>Race/ethnicity</b>				
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.<sup>22</sup>

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.<sup>23,24</sup> The body makes vitamin D when skin is directly exposed to the sun.<sup>23,24</sup> Vitamin D is also found in some foods.<sup>23,24</sup> Recommended dietary intakes of vitamin D are set on the assumption of little sun exposure because of public health concerns about skin cancer.<sup>24</sup> 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.<sup>23</sup> 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.<sup>25</sup>

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.<sup>24</sup> Linear trend analyses of the prevalence of low serum vitamin D concentrations from 1988 to 2010, the most recent years for which data are available, among the US population aged 12 years and older indicated that the prevalence of low serum vitamin D concentrations has not changed significantly in recent decades.<sup>25</sup> During 1988–1994, 16% of the US population had serum vitamin D concentrations below 40 nmol/L; during 2009–2010, the prevalence was 15%.<sup>25</sup>

## Policy and Program Indicators

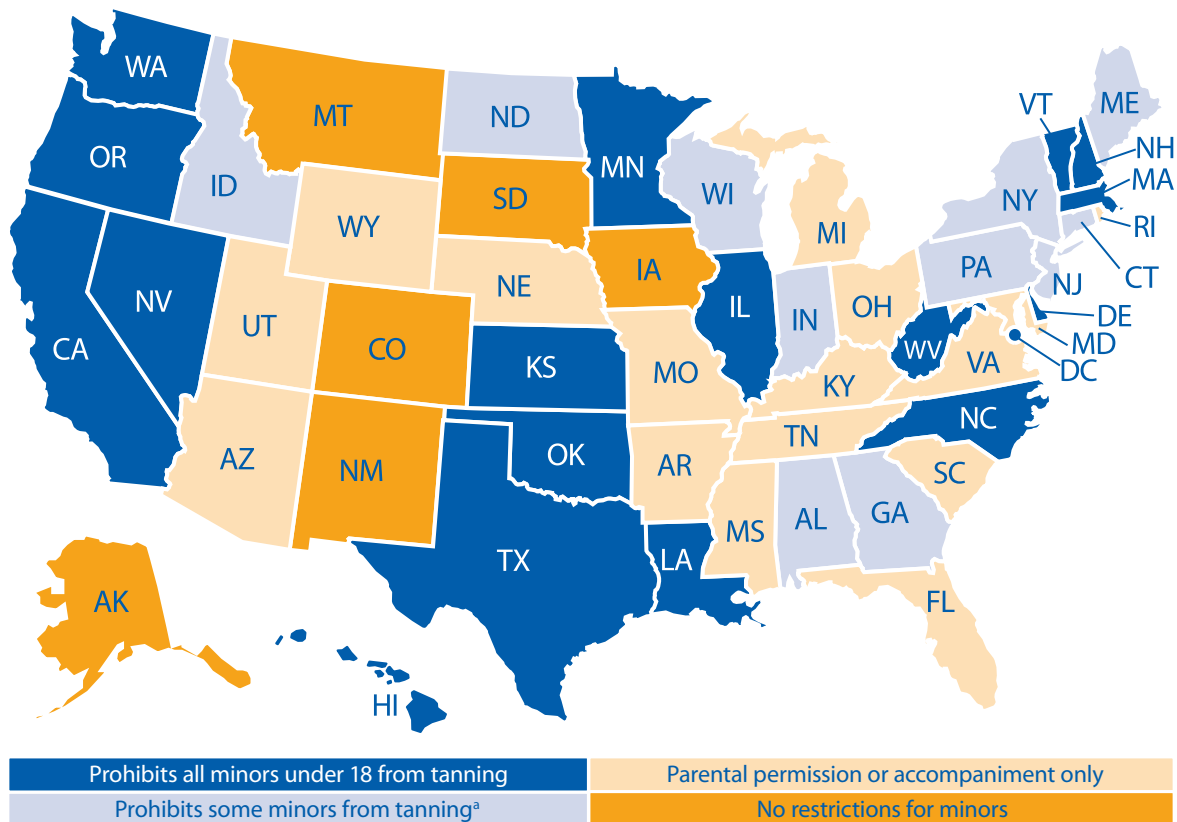
Interventions that change the context in which health behaviors occur can help make the healthy choice the default or easy choice. Many potential points of intervention can decrease overexposure to UV radiation and increase use of sun protection.

### Indoor Tanning Restrictions for Minors

The FDA states that indoor tanning devices should not be used by minors younger than 18 years.<sup>26</sup> CDC research suggests that indoor tanning laws that include

age restrictions may be effective in reducing indoor tanning, particularly among high school girls.<sup>19</sup> As of June 2017, 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 and older and require that they sign a risk acknowledgement certification before use.<sup>27</sup>

**Figure 7. State Indoor Tanning Restrictions for Minors Younger than 18 Years, as of July 2017**



Source: National Conference of State Legislatures.<sup>28</sup>

Note: State law in Oregon and Washington allows minors younger than age 18 to use indoor tanning facilities with a doctor's prescription.

<sup>a</sup>Defined as restrictions for any other age group, including for minors younger than 17, 16, 15, or 14.

## 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.

Almost half (47.6%) of schools allow students time to apply sunscreen at school, and 66.0% teach about sun safety or skin cancer prevention as part of required instruction (Table 8). Other practices related to sun safety are uncommon in US schools, representing missed opportunities for prevention. In addition, some schools have practices that may create barriers to sun safety for students. For example, some schools prohibit students from wearing hats or visors (7.5%) or sunglasses (6.6%) when in the sun during the school day.

**Table 8. Percentage of US Schools With Specific Practices Related to Sun Safety, by School Level, 2014**

Practices Related to Sun Safety	Total, %	Elementary Schools, %	Middle Schools, %	High Schools, %
Outdoor activities almost always or always scheduled to avoid times when the sun was at peak intensity <sup>a</sup>	15.0	14.7	18.2	11.8
Parents asked to ensure students apply sunscreen before school	16.4	20.9	16.9	4.2
Teachers allow time for students to apply sunscreen at school	47.6	49.5	51.6	37.5
Teachers remind students to apply sunscreen before going outside at school	28.2	27.2	30.3	28.2
Sunscreen made available for students to use	13.3	11.9	12.9	17.2
Students encouraged to wear protective clothing (e.g., long sleeved shirts or long pants) when in the sun during the school day	30.4	33.4	30.8	22.2
Students encouraged to wear hats or visors when in the sun during the school day	33.1	35.0	37.3	22.4
Students prohibited from wearing hats or visors when in the sun during the school day	7.5	7.5	7.8	7.2
Students encouraged to wear sunglasses when in the sun during the school day	20.7	22.7	17.5	19.8
Students prohibited from wearing sunglasses when in the sun during the school day	6.6	7.5	7.8	2.9
Weather-related safety (e.g., avoiding heat stroke, hypothermia, and sunburn while physically active) taught in at least one required physical education class or course	65.2	62.2	74.8	61.5
Sun safety or skin cancer prevention taught as part of required instruction	66.0	63.4	59.4	77.1
Skin cancer screening offered to faculty and staff <sup>b</sup>	3.1	3.3	2.0	4.3

Source: School Health Policies and Practices Study.<sup>29</sup>

<sup>a</sup> During the 12 months before the study.

<sup>b</sup> Regardless of what is covered through their health insurance.

## Comprehensive Cancer Control Program Objectives

CDC funded Comprehensive Cancer Control (CCC) Programs in all 50 states, the District of Columbia, 7 tribes and tribal organizations, and 7 US territories to form or support existing coalitions to fight cancer during 2012–2017. These coalitions use data to determine the greatest cancer-related needs in their area and develop and carry out cancer plans to meet those needs.

Including skin cancer prevention in CCC plans or objectives indicates commitment to skin cancer prevention (Table 9). Using evidence-based interventions and monitoring and evaluating activities also helps to ensure success.

**Table 9. State Comprehensive Cancer Control (CCC) Programs That Mention “Melanoma” or “Skin Cancer” in Their Current Plans or Objectives, 2016–2017**

Plan/Objective	No. of Programs
Long-term objective <sup>a</sup>	15
Short-term objective <sup>b</sup>	18
Long-term objective OR short-term objective	18
CCC plan (2016 or later)	33
Long-term objective OR short-term objective OR CCC plan	38

Source: Chronic Disease Management Information System<sup>30</sup> and Comprehensive Cancer Control Plans searchable database.<sup>31</sup>

Note: Numbers of programs are reported for the 2016–2017 funding period. Numbers are based on the 50 US states, and do not include the District of Columbia, tribal organizations, or US territories.

<sup>a</sup> Set by CCC Program awardees at the beginning of the 5-year project period.

<sup>b</sup> Set by CCC Program awardees each year in their annual action plans. Conclusion







## Conclusion

Although we have seen real progress and successes since *The Call to Action* was released, there is still work 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 make much progress on increasing 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. And melanoma incidence rates have continued to increase steadily among older non-Hispanic white adults. The burden of skin cancer in the United States remains a public health problem that warrants continued prevention efforts across community sectors. We need to continue working together to translate what we know into action and make skin cancer prevention a higher priority for all Americans.

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## Success Story Contacts

**American Society for Dermatologic Surgery Association**  
[advocacy@asds.net](mailto:advocacy@asds.net)

**Children's Melanoma Prevention Foundation**  
Maryellen Maguire-Eisen, RN, MSN [maryellen@melanomaprevention.org](mailto:maryellen@melanomaprevention.org)

**Colorado Department of Public Health & Environment**  
Cate Townley [cate.townley@state.co.us](mailto:cate.townley@state.co.us)

**Enright Melanoma Foundation**  
Janet Horowitz [janet@enrightmelanomafoundation.org](mailto:janet@enrightmelanomafoundation.org)

**The University of Texas MD Anderson Cancer Center**  
Mary Tripp, PhD, MPH [mtripp@mdanderson.org](mailto:mtripp@mdanderson.org)





Centers for Disease Control and Prevention  
Telephone: 1-800-CDC-INFO (232-4636)/TTY: 1-888-232-6348  
CDC-INFO: <https://wwwn.cdc.gov/dcs/ContactUs/Form>  
Web: <https://www.cdc.gov/cancer/skin/index.htm>

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