

# GSA Webinar Series

## Sun Protection and Sunburn Among U.S. Older Adults

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# SUN PROTECTION AND SUNBURN AMONG U.S. OLDER ADULTS

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## Research Article

### Association Between Sun Protection Behaviors and Sunburn Among U.S. Older Adults

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Co-decision Editors: Richard A. Goodman, MD, JD, MPH and Mary C. White, ScD

#### Abstract

**Background and Objectives:** Skin cancer incidence rates are highest among U.S. older adults. However, little is known about sun protection behaviors and sunburn among adults aged 65 years and older.

**Research Design and Methods:** We used data from the 2015 National Health Interview Survey to examine the association between sun protection behaviors (sun avoidance, wearing protective clothing, and sunscreen use) and likelihood of having experienced sunburn in the past year.

**Results:** Just over one in ten older adults (13.2%) had experienced sunburn in the past year; sunburn prevalence was nearly twice as high (20.4%) among sun-sensitive older adults. Men, ages 65–69 years, non-Hispanic whites, and those with skin that burns or freckles after repeated sun exposure were more likely to have been sunburned in the past year compared with the respective comparison groups. The only sun protection behavior significantly associated with sunburn was sunscreen use. None of the sun protection behaviors were significantly associated with a decreased risk of sunburn.

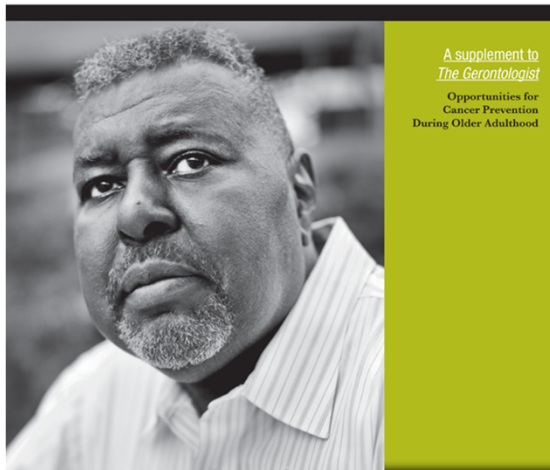
**Discussion and Implications:** The prevalence of sunburn among older adults suggests opportunities to reduce skin cancer risk within this demographic group by preventing overexposure to the sun. The lack of reduced sunburn risk among those who regularly used sun protection may be related to inadequate or inconsistent use of sun protection or the way the sun protection behaviors were measured. Multi-sector approaches to facilitate sun-safety among older adults are warranted and could include targeted efforts focused on those most likely to get sunburned, including men and those with sun-sensitive skin.

**Keywords:** Skin cancer, Sun safety, Sunscreen, Shade, Health promotion

<https://doi.org/10.1093/geront/gny173>

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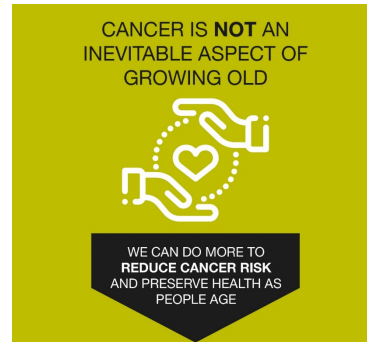
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### Opportunities for Cancer Prevention During Older Adulthood

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## Skin Cancer: A Serious Public Health Problem

- Nearly 5 million adults are treated for skin cancer each year in the United States.
- \$8.1 billion is spent in treatment costs annually.
- Annual spending for skin cancer treatment has increased rapidly.
- Skin cancer can often be prevented by avoiding overexposure to UV radiation.



Source: Guy GP Jr, et al. *Am J Prev Med.* 2015;48(2):183-187.

## Most Common Types of Skin Cancer

- **Basal Cell Carcinoma**
  - Arises from the cells in the bottom, or basal, layer of the epidermis
- **Squamous Cell Carcinoma**
  - Arises from the outer layers of the epidermis
- **Cutaneous Melanoma**
  - Arises from melanocytes, the melanin-producing cells that gives skin and eyes their color



Source: U.S. Department of Health and Human Services. *The Surgeon General's Call to Action to Prevent Skin Cancer*, 2014. Available at <http://www.surgeongeneral.gov>.

## Skin Cancer Risk Factors

- **Risk factors**
  - Fair skin, light hair, and light eyes
  - Skin that burns or freckles
  - Certain types or a large number of moles
  - Family or personal history of skin cancer
  - Age
  - Sex
- **Overexposure to ultraviolet (UV) radiation is most avoidable cause**
  - Classified by WHO/IARC as "carcinogenic to humans" (Group 1 carcinogen)
  - Chronic exposure
  - Intermittent exposure; sunburn



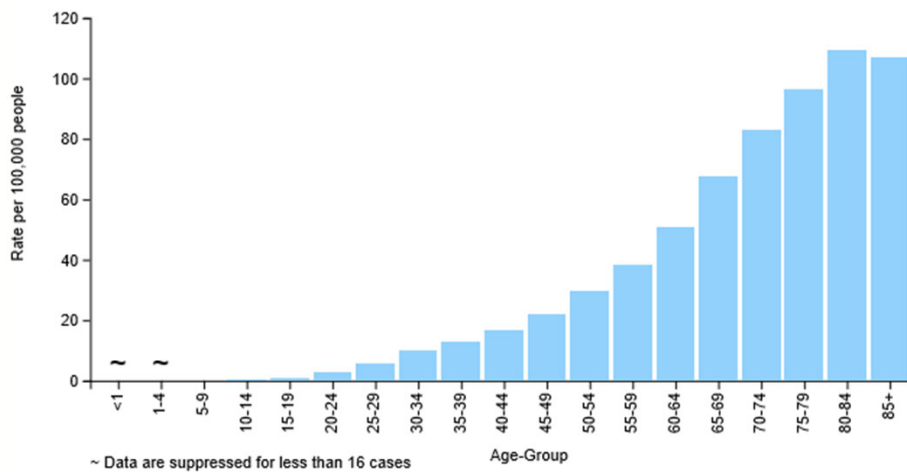
Source: U.S. Department of Health and Human Services. *The Surgeon General's Call to Action to Prevent Skin Cancer*, 2014. Available at <http://www.surgeongeneral.gov>.

# Skin Cancer Prevention Strategies

**Shade**  
**Long-Sleeved Shirt/Pants**  
**Wide-Brimmed Hat**  
**Sunglasses**  
**Broad Spectrum Sunscreen SPF 15**

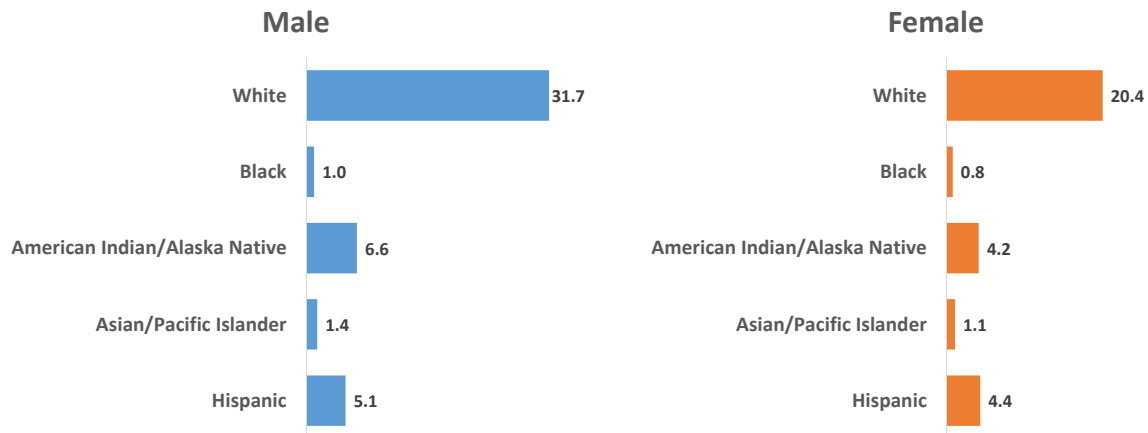


## Rate of New Melanoma Cases by Age Group, 2016



Source: <https://www.cdc.gov/cancer/dataviz>

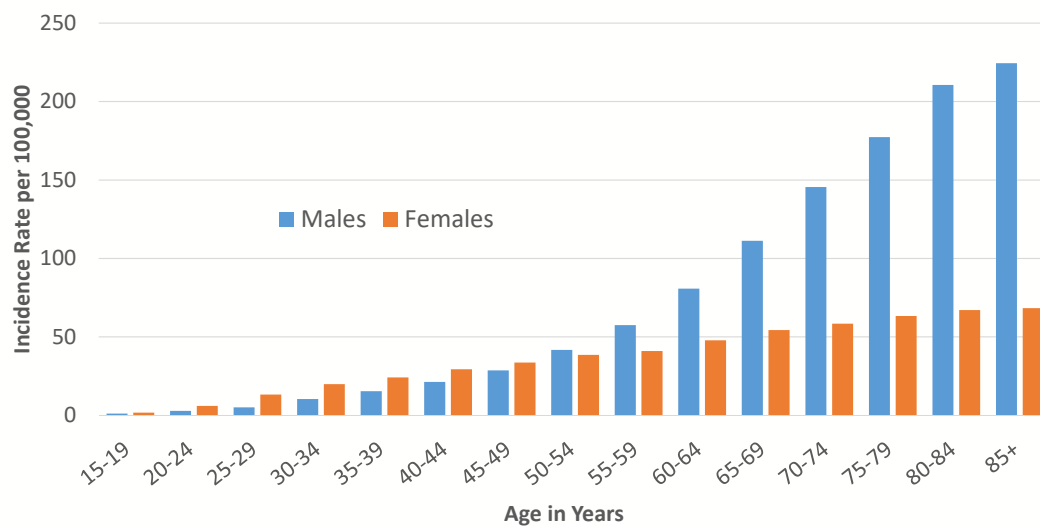
## Rate of New Melanoma Cases by Sex and Race/Ethnicity, 2016



(Rate per 100,000 people)

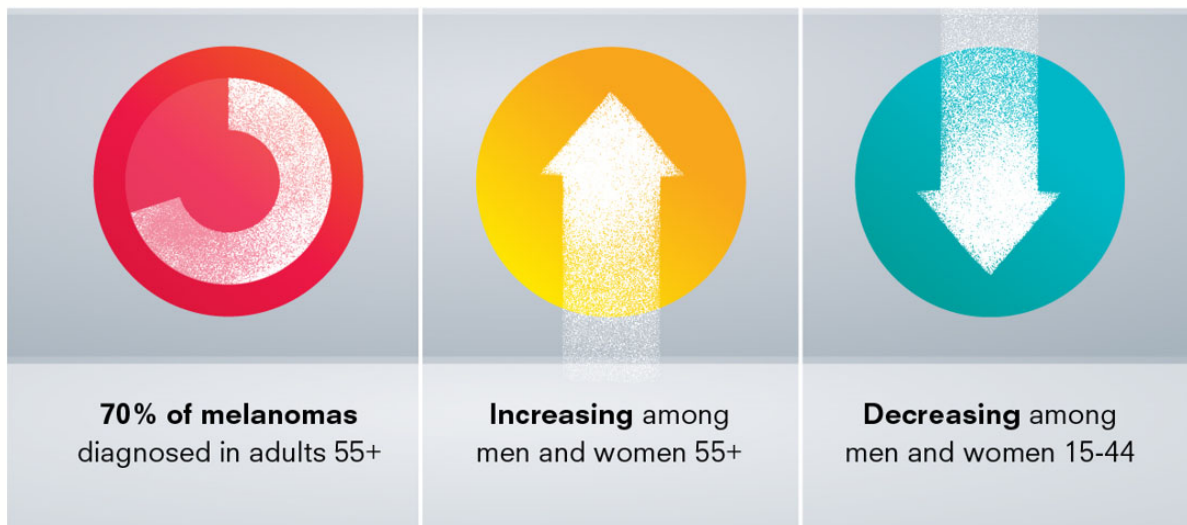
Source: <https://www.cdc.gov/cancer/dataviz>

## Rate of New Melanoma Cases Among Non-Hispanic Whites by Sex and Age Group, 2016



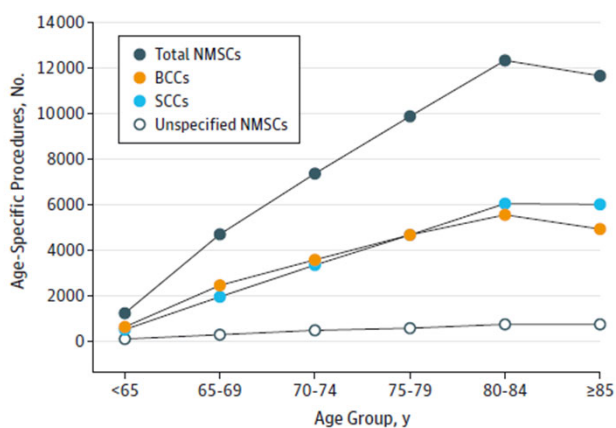
Source: U.S. Cancer Statistics, 2016; <https://www.cdc.gov/cancer/uscs/>

## A Look at Melanoma Diagnoses in Non-Hispanic Whites



Source: Holman DM, et al. *JAMA Dermatol.* 2018;154(3):361-362.

## Number of Non-Melanoma Skin Cancer Procedures Per 100,000 Medicare Fee-for-Service Beneficiaries in 2012



NMSC = non-melanoma skin cancer

BCC = basal cell carcinoma

SCC = squamous cell carcinoma

### During 2006 to 2012

- The overall number of NMSC-specific procedures increased 14%.
- The number of persons undergoing at least 1 procedure for NMSC increased 14%.
- The average number of procedures per beneficiary remained stable.

Source: Rogers HW, et al. *JAMA Dermatol.* 2015;151(10):1081-1086.





## Why Sun Exposure Still Matters Later in Life



- Older adults are often more susceptible to UV damage
  - Age-related changes in the skin<sup>1</sup>
  - Use of certain prescription medications and topical skin products<sup>2</sup>
- Sunburn at any age increases skin cancer risk<sup>3</sup>
- U.S. adult who reaches the age of 65 years can expect to have on average about two more decades of life<sup>4</sup>

Sources: <sup>1</sup>Syrgios KN et al., *In Vivo*. 2005;19:643-652 <sup>2</sup>U.S. FDA 2018; <sup>3</sup>Dennis LK, et al. *Annals of Epidemiology*. 2008;18:614-627. <sup>4</sup>Arias E, et al. *National Vital Statistics Reports*. 2017;66:1117-1120.



## Study Hypothesis

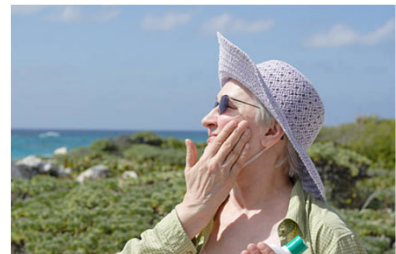
We hypothesized that after controlling for appropriate covariates, regular use of sun protection would be associated with a decreased likelihood of having experienced sunburn.



**SUN AVOIDANCE**



**CLOTHING**



**SUNSCREEN**

## Data Source: 2015 National Health Interview Survey

- Annual, cross-sectional household survey
- Nationally representative sample
- In-person interviews
- One adult in the household is randomly selected to answer additional questions



Source: <https://www.cdc.gov/nchs/nhis/index.htm>

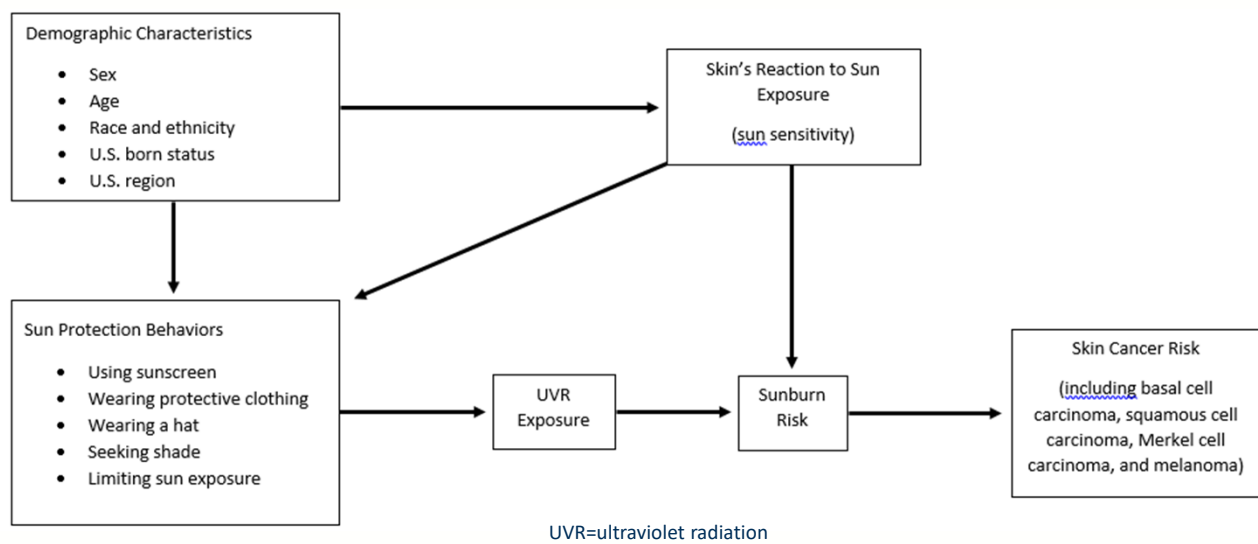
## Survey Measures of Interest

- Number of sunburns in the past 12 months
- When outdoors on a warm, sunny day for one hour or more, how often do you...
  - Stay in the shade
  - Wear a hat that shades the face, ears, and neck
  - Wear a long-sleeved shirt
  - Wear long pants or other clothing that reaches the ankles
  - Use sunscreen



Source: <https://www.cdc.gov/nchs/nhis/>

## Conceptual Framework



## Analyses

- N=7,765 respondents
- Calculated weighted, unadjusted percentages
- Used multivariable logistic regression to calculate adjusted prevalence ratios for experiencing one or more sunburns in the past 12 months



## Demographic Characteristics (N=7,765)

- 58.7% women
- 78.1% non-Hispanic white
- 86.2% born in the United States
- 47.8% had sun-sensitive skin



### Age Breakdown

85+ years (11.4%)

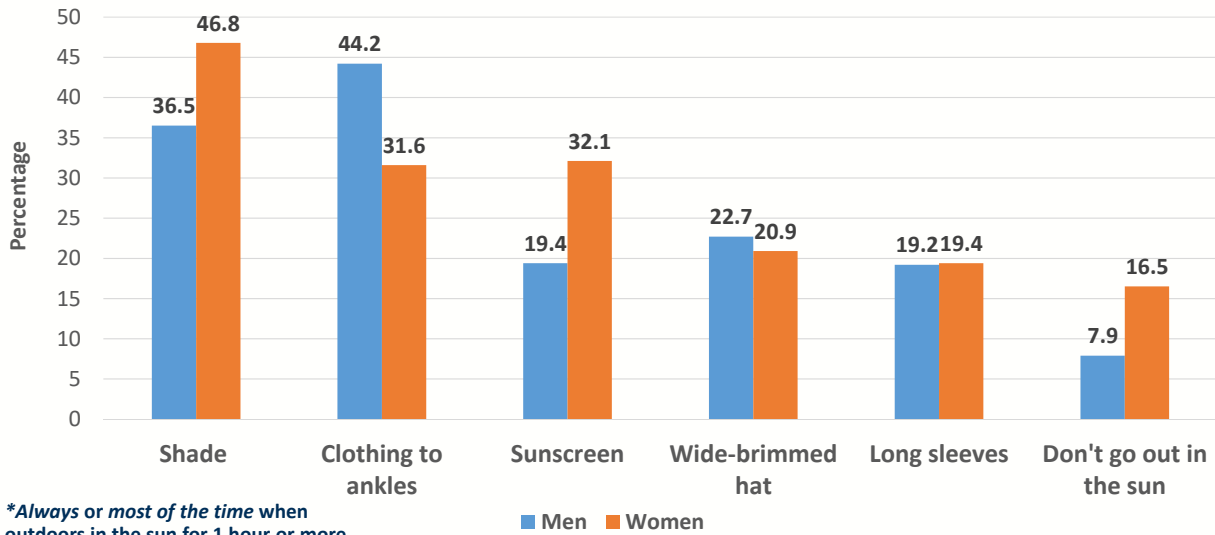
80-84 years (12.3%)

75-79 years (17.3%)

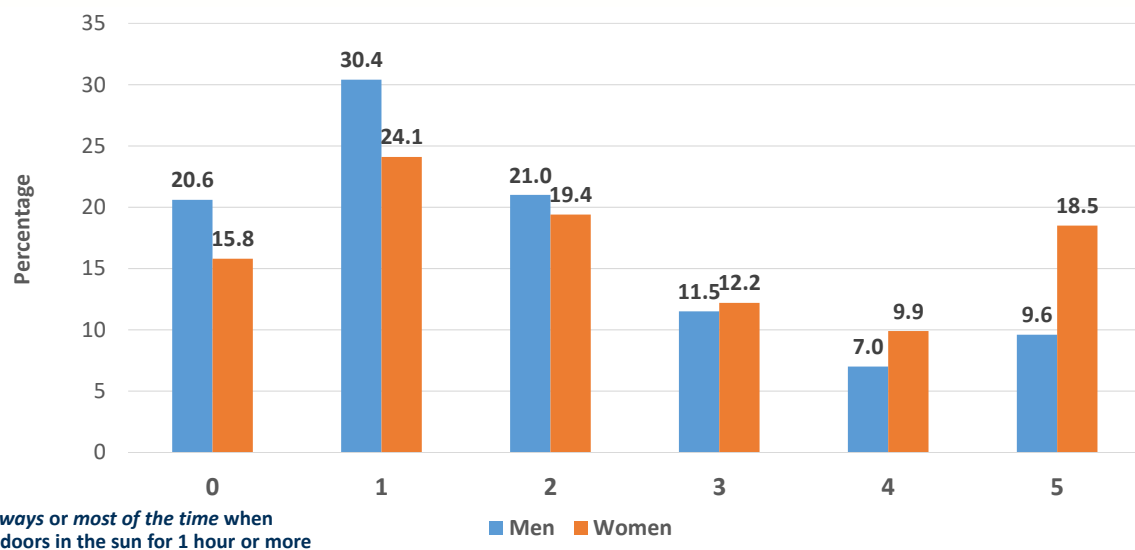
70-74 years (25.8%)

65-69 years (33.3%)

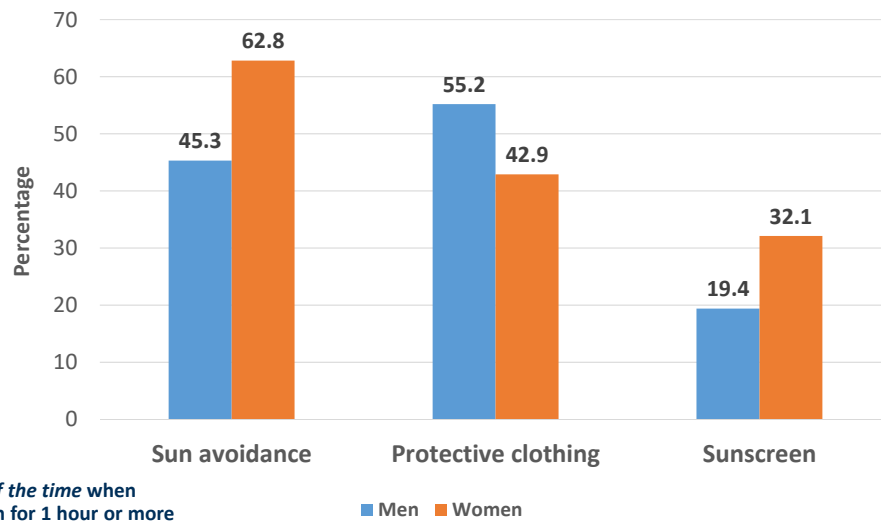
### Percentage of U.S. Adults Aged 65+ Who Use Sun Protection\*



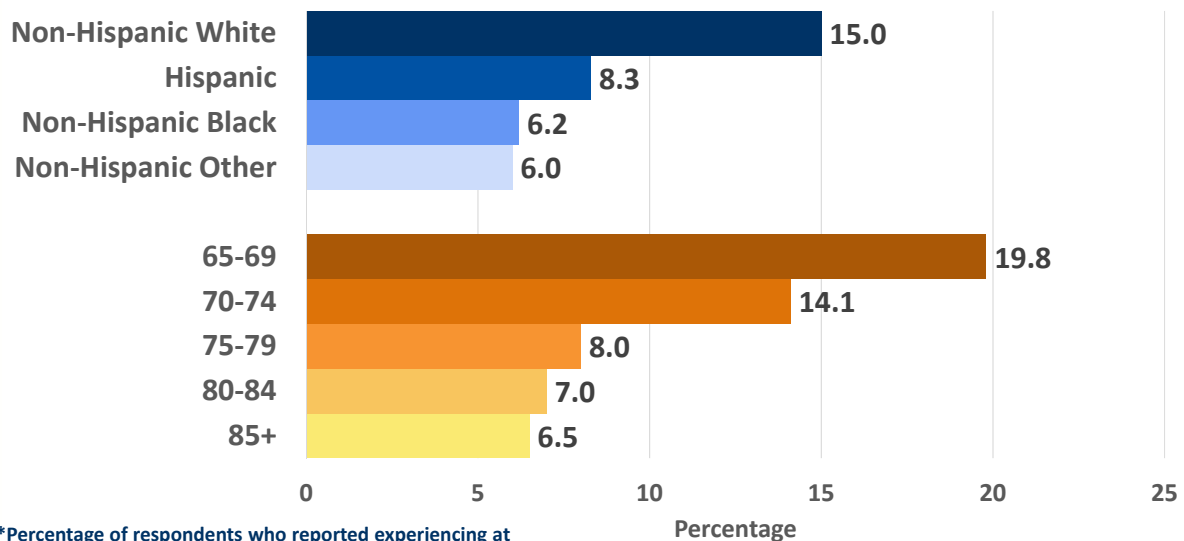
### Number of Sun Protection Behaviors\* U.S. Adults Aged 65+ (N=7,765)



### Sun Protection Categories\* U.S. Adults Aged 65+ (N=7,765)



### Prevalence of Sunburn\* Among U.S. Adults Aged 65+ (N=7,765)



## Relationship Between Sun Protection and Sunburn

- No association between sunburn and
  - Sun avoidance
  - Protective clothing
  - Total number of sun protection behaviors
- Positive association between sunburn and sunscreen use
  - aPR=1.27 (1.05, 1.52)
  - No association when limited to those with sun-sensitive skin (N=3,659)

aPR = adjusted prevalence ratio for sunburn



## Demographic Groups Most Likely to Report Sunburn



Males  
Non-Hispanic Whites  
Ages 65-69 & 70-74



*However, sunburn was prevalent among older men and women of all age groups, races, and ethnicities.*





## Discussion

- Why did we observe a lack of a protective effect for sun protection behaviors?
- Why was sunscreen use associated with an increased likelihood of sunburn?
- What more could we be doing to promote sun-safety among older adults?



## Targeted Efforts Could Focus On...



- Those most likely to sunburn
  - Men
  - Ages 65-74 years
  - Those with sun-sensitive skin
  - Those taking medications or using topical products that increase sun-sensitivity
- Those who engage in frequent outdoor activities
  - Outdoor occupational work
  - Outdoor recreational activities

## Individual-Directed Interventions

- What approaches to **message framing** would resonate most with older adults?
- How do we **empower older adults** to take action to protect the future health of their skin?
- Is **clinical counseling** on skin cancer prevention an effective strategy for older adults?

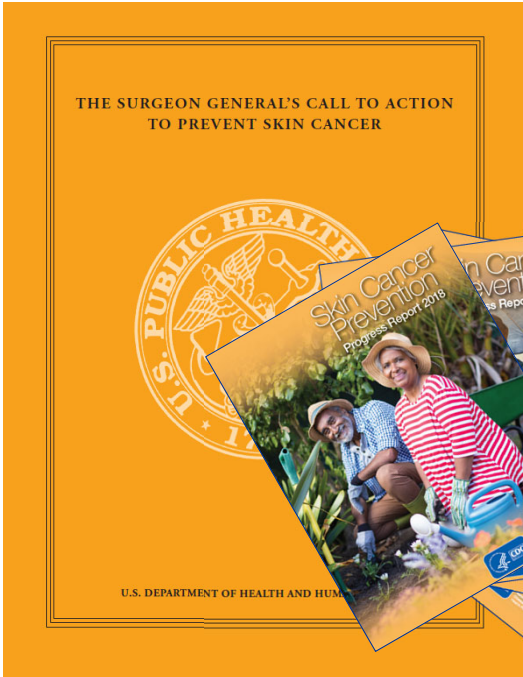


## Community Level Interventions

- Strategic placement of shade in outdoor community settings
- Removal of financial barriers to use of sun protection (e.g., costs of sunscreen and protective clothing)
- Easily accessible sun protection options
- Engagement with many community sectors




## Making Progress Together!



THE SURGEON GENERAL'S CALL TO ACTION  
TO PREVENT SKIN CANCER

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

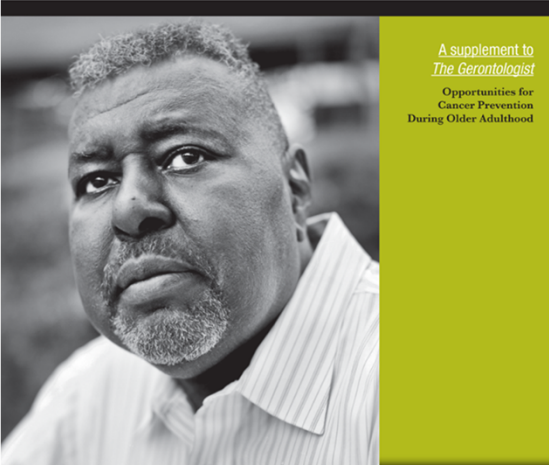


**2019**  
**SKIN CANCER PREVENTION**  
PROGRESS REPORT

U.S. Department of Health and Human Services  
Centers for Disease Control and Prevention

[https://www.cdc.gov/cancer/skin/what\\_cdc\\_is\\_doing/progress\\_report.htm](https://www.cdc.gov/cancer/skin/what_cdc_is_doing/progress_report.htm)

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CANCER IS **NOT** AN INEVITABLE ASPECT OF GROWING OLD

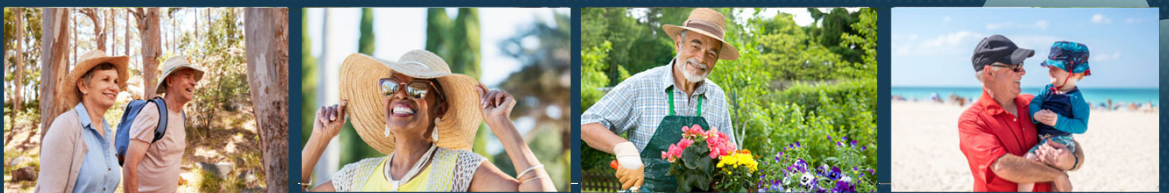


WE CAN DO MORE TO  
**REDUCE CANCER RISK**  
AND PRESERVE HEALTH AS  
PEOPLE AGE

[https://academic.oup.com/gerontologist/issue/59/Supplement\\_1](https://academic.oup.com/gerontologist/issue/59/Supplement_1)

# THANK YOU!

DHOLMAN@CDC.GOV



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The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.



## Questions?

- We will not be using the “raise hand” feature today
- Please use the “questions” feature accessible on the right side of your screen
- If we do not get to all of the questions today, we will email responses after the webinar



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## Thank You

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