



UV and Our Nation's Vision

INSIGHTS FROM CONGRESSIONAL BRIEFING



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Introduction



From sunburn to skin cancer, almost everyone is aware of the damage that ultraviolet (UV) radiation can cause to their skin – but very few understand the dangers of UV exposure to their

eyesight. In fact, while more than eight out of 10 Americans know that extended UV exposure can cause skin cancer, fewer than one out of 10 know that it can harm their eyes.¹ Additionally, 20 percent of Americans mistakenly believe that UV damage is reversible.²

Because so few people understand the detrimental effects of UV exposure, many aren't taking the best steps to protect and preserve their vision for the future. For example, less than half of Americans get a regular eye exam, which can be instrumental in detecting and preventing serious vision problems and eye disease.³ Additionally, more than four out of 10 don't wear UV-blocking eyewear, like sunglasses or photochromic lenses, during the winter months when UV rays are still a threat.⁴

Not only are awareness levels low, but risk of UV-related eye disease continues to increase.⁵ Today, more than 30 million Americans suffer from eye diseases such as cataract and macular degeneration⁶ – both of which have been linked to prolonged exposure to UV radiation. While UV-related eye disease can affect anyone and everyone, certain groups – including Hispanics, African Americans, Asian Americans, older Americans

and children – are at higher risk.⁷

Unfortunately, the groups at greatest risk often have the lowest awareness levels of the need for UV protection – making education and outreach to these groups critical.

The onset of UV-related eye disease is not only devastating to those who are diagnosed, but also can negatively impact the economy. With diagnosis comes an increase in medical bills and economic costs, specifically in terms of productivity. Those who can't see well may find it difficult to remain productive at work, or enjoy leisure activities at home.

Recognizing a widespread need for education on the harmful effects of UV exposure to the eyes, Prevent Blindness America – the nation's leading volunteer eye health and safety organization – hosted a **congressional briefing** with the support of Transitions Optical, Inc. through the Transitions Healthy Sight for Life Fund™. Held on September 29, 2010 at the U.S. Capitol Visitor Center in Washington, D.C., the event was attended by approximately 40 congressional staff members, including legislative and health aides, staff of executive agencies and congressional media.

The event included presentations from a panel of eye care and environmental experts, and urged lawmakers to make protecting the eyes from UV exposure a national health priority, specifically by increasing the number of UV and eye health messages coming from federal agencies, national leaders and upcoming healthcare policies. This white paper overviews the presentations and calls-to-action discussed during the congressional event.



The Government's Role In UV Education

During the congressional briefing, U.S. Representative Gene Green, Texas, co-chair of the Congressional Vision Caucus (CVC), shared the CVC's goal of increasing awareness of the risks for and impact of eye disease and vision loss in the United States. Formed in 2003, the CVC is a bipartisan coalition of Congressional Members dedicated to strengthening and stimulating a national dialogue and policy on vision-related problems and disabilities.

The CVC has three priority areas of focus:

1. Research
2. Prevention/public health
3. Improving access to treatment and rehabilitation

Considering the link between extended UV exposure and the onset of various eye diseases, sun protection should be incorporated into eye health messages.

During the congressional briefing, Representative Green reinforced the important role that policymakers can play in emphasizing the need for sun protection and the negative consequences of UV-related eye disease. Now at a critical juncture in terms of improving our nation's overall health and shaping our health care system, Representative Green urged policymakers and educators to think of ways to collaborate and proactively work to include UV eye protection as a part of future health care policies.



Overview Of Presentations

UV's Role In Eye Disease

Virtually everyone receives at least some UV exposure on a daily basis, but the potential dangers of long-term exposure to eyesight are rarely thought about – to a point where many Americans take little action to protect their eyes, even when planning to be out in the sun for an extended period of time.

The reality is, UV overexposure is dangerous, cannot be reversed and can lead to a number of serious, sight-stealing diseases down the road – making ongoing protection from UV rays a must for all Americans.

Ultraviolet 101

To better understand the effects of UV radiation on the eyes, it is helpful to recognize what UV is and where it comes from.

Most people understand that, in order to see, some level of visible light is needed. Visible light represents just a small portion of the light spectrum. On either side of the visible light spectrum are long-wavelength radiations (infrared) and short-wavelength radiations (UV). While infrared rays are relatively harmless, UV rays can pose serious risks to a person's overall health and eye health.

Most UV radiation comes from the sun, representing approximately 10 percent of the sun's total energy. Other sources of UV include **occupational** factors such as welding arcs, and artificial factors such as tanning beds.

Sunlight consists of two types of harmful rays: **UVA rays and UVB rays**. UVA rays, which can pass through window glass, penetrate deep into the skin – leading to signs of premature aging such as wrinkling or age spots. UVA rays can also cause

suppression of the immune system, interfering with the body's ability to protect itself from the development and spreading of skin cancer. UVB rays are the sun's burning rays and are the primary cause of sunburn. Excessive exposure to both forms of UV rays can lead to the development of skin cancer.

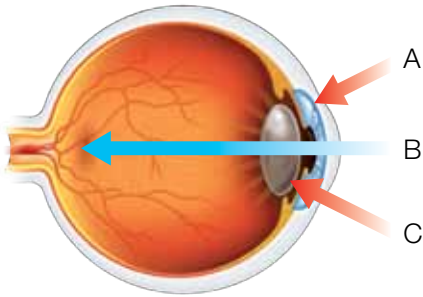
Contrary to popular belief, the majority of lifetime exposure to UV rays does not occur before the age of 18 – just 23 percent of it does.⁸ Cumulative UV exposure increases gradually with age, making UV protection important for both children and adults alike.

UV And The Eyes

On a molecular level, UV can be highly toxic – breaking up healthy cells in the human body and causing the formation of new ones that can be harmful to the immune system. Through a chemical reaction, UV rays can also cause free radicals in the body, which can destroy healthy cell tissues in the body and in the eye.

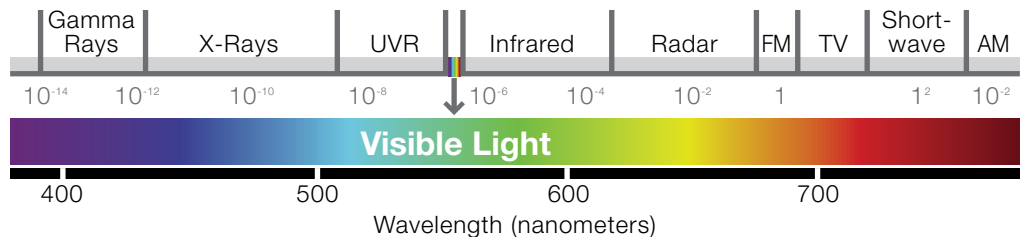
Although only small amounts of UVA and UVB light reach the inner eye – around one percent – the ocular tissues are extremely susceptible to their damaging effects, making these amounts clinically significant. Intense, short-term exposure can lead to sunburn of the eye, or **photokeratitis**. This occurs when UVB rays are absorbed by the cornea – destroying the outer cells and leading to pain, blurred vision or even temporary blindness.

UVA rays are mostly absorbed by the crystalline lens, and can penetrate much deeper into the eye – causing damage to the retina. Over time, exposure to UV rays can lead to significant and lasting damage to the eye and vision.



A: UVB (280-315nm)
B: Visible (380-780nm)
C: UVA (315-380nm)

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Cataract – or the clouding of the eye’s lens – is more common with age, but can occasionally occur in infants and



young children. A cataract generally forms very slowly and can cause blurred or hazy vision, lower color recognition, increased sensitivity to glare from lights and difficulty seeing at night. Cataract affects one in every six Americans over the age of 40 – and more than half of those over the age of 80.⁹ Of the 20 million people who suffer from cataract, an estimated 20 percent are caused by extended UV exposure.¹⁰

Macular degeneration – which destroys sharp, central vision – is the leading cause of blindness in America.¹¹ Often called age-related macular degeneration, or AMD, the disease can



also cause sensitivity to light and reflections from glare and difficulty distinguishing colors. Studies suggest that extended exposure to both UV and visible light are risk factors for developing AMD, and can actually make symptoms worse for those who are already diagnosed.¹² While surgery and medications can help delay progression, there is no known cure – making preventative measures, such as wearing UV blocking lenses, critical for those who have or who are at risk for AMD.

Diabetic retinopathy is the most common eye disease associated with diabetes – a condition that affects nearly 24 million adults and children in the United States.¹³ Diabetic retinopathy is caused by changes in the blood vessels of the retina. In some cases, blurred vision occurs when blood vessels in the eye swell and leak fluid. In others, abnormal new blood vessels grow on the surface of the retina, causing further damage. Common symptoms may include blurred vision, spots or floaters, difficulty seeing at night, light sensitivity and poor color vision. Diabetic retinopathy may also increase the susceptibility of the eyes to UV damage.



Many people experience the visual symptoms of diabetes before they even know they have the disease – and because diabetes can be detected through an eye exam, the eye doctor is often the first to make a diagnosis.

Long-term exposure to UV rays can also lead to abnormal tissue growth on the eye. **Pterygium**, for example, is a thin, wedge-shaped tissue growth with blood vessels that grows over the white part on the surface of the eye – usually affecting farmers, fisherman and people living near the equator.

In addition to being cosmetically unappealing, a pterygium can be irritating to the eye, and can even alter the curve of the eyeball, causing astigmatism. If the pterygium starts to grow over the cornea, it can blur or obstruct vision and may need to be surgically removed. Because pterygia is caused by extended UV exposure and windy conditions, it is completely preventable.



An estimated 20 percent of cataracts are caused by UV exposure.



The Economic Impact Of UV-Related Eye Disease

UV-related eye disease can contribute to significant costs for those who are diagnosed – and their employers. Preventing, or delaying, the onset of these diseases by wearing UV-blocking eyewear, such as sunglasses or photochromic lenses, can help to save on costs, boost productivity and enhance overall quality of life.

- **Cataracts** are typically treated with surgery, which costs approximately \$3,300 per eye. Annually, cataract equates to \$6.8 billion in direct medical costs.¹⁴
- **Macular degeneration** puts a burden on the economy at approximately \$305 in direct medical costs per patient annually, or \$565 million total.¹⁵

Impact Of Medications

Many people diagnosed with an eye disease – and many Americans in general – take at least one prescription or over-the-counter medication. While these medications can help to treat symptoms, they may also contribute to adverse, ocular side effects – ranging from blurred vision to light sensitivity and increased vulnerability to UV damage. Many of these effects can be alleviated through prescription of the proper eyewear that blocks UV and reduces glare.

While today's medication warning labels often mention avoiding prolonged exposure to the sun, they don't always explain why, or mention an increased risk of sunburn. Future legislation or regulation should adopt warning labels to mention protection for both the skin and eyes.

Protecting The Ozone Layer = Protecting Our Eyesight

The Earth's ozone layer plays a very important role in UV protection – naturally absorbing between 97 and 99 percent of the sun's harmful UV rays.¹⁶ When the ozone layer is depleted by free radical catalysts – including chlorofluorocarbons (CFCs), halons, methyl bromide and hydrochlorofluorocarbons (HCFCs) – more UV light makes its way to Earth's surface. This added UV exposure poses risks to everyone, including sunburn, skin cancer and eye disease. In order to protect *our nation's vision*, the ozone layer must also be protected.

The *Montreal Protocol on Substances That Deplete the Ozone Layer* is an international treaty designed to protect the ozone layer by phasing out the production and import of substances responsible for ozone depletion. The treaty entered into force on January 1, 1989 and now has universal participation among United Nations member countries. Domestically, in 1990, Congress amended the Clean Air Act, adding a section specifically designed to implement the Montreal Protocol and facilitate transition to alternatives for ozone-depleting substances with better overall environmental profiles. The U.S. Environmental Protection Agency (EPA)'s Stratospheric Protection Division (SPD) is committed to protecting the ozone layer and reducing future depletion.

While much damage has been done to the ozone layer over the course of several lifetimes, the good news is that it is slowly recovering. As a result of positive efforts to date, the ozone layer is projected to recover by the year 2060 – thus preventing millions of U.S. skin cancer deaths and cases of eye disease. Clearly, much education is needed on the importance of sun protection.

Avoided Cataract Cases

In August 2010, the EPA released its *Report on Cataract Incidence in the United States Using the Atmospheric and Health Effects Framework Model (AHEF)*¹⁷, which reinforced the positive impact that ozone layer protection policies have on reducing cases of cataract.

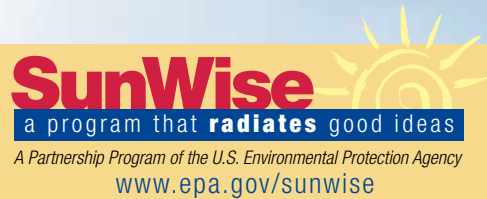
The EPA uses the AHEF model to estimate the health benefits of strengthening current ozone layer protection policies. For example, the EPA compared results under the 1997 Amendment to the Montreal Protocol with the 1987 Montreal Protocol as originally agreed. As a result of strengthening the Montreal Protocol through the 1997 amendments, the EPA estimates that more than 22 million cases of cataract will be avoided for Americans born between the years 1985 and 2100. With further protection of the ozone layer, additional cases of cataract can be avoided.

While the EPA believes the international and domestic policies will ultimately be successful in reducing ozone depletion to pre-1980 levels and subsequent increased cases of cataract, consumers must be educated on ways they can reduce UV exposure and protect their eyes while the ozone layer remains compromised and risk is elevated. Current EPA programs include SunWise – an environmental and health education program designed to teach children and their caregivers about sun safety through the use of classroom-, school- and community-based components. In collaboration with Prevent Blindness America, the program recently released an updated fact sheet on preventing eye damage, and will continue to work with Prevent Blindness America to amplify the eye protection message. According to the EPA, for every federal dollar invested in SunWise, two to four dollars are saved in public health costs – reinforcing the positive impact of consumer education.¹⁸





Making A Difference In Educating Children About Sun Safety



The Environmental Protection Agency's **SunWise** program is the largest national health and environmental education program. With a goal of **preventing skin cancer and eye damage by changing the sun protection practices of children and their caregivers**, SunWise has worked with more than 25,000 schools throughout the United States – reaching more than 3 million children.

The SunWise program provides schools with in-classroom education materials, fun activities and giveaways, and also prompts schools to invite guest speakers to school assemblies to enhance sun safety efforts. All schools are encouraged to become “SunWise” by enhancing sources of shade – such as canopies or trees – around the school and in playgrounds, and implementing policies for students – such as wearing hats, sunscreen and sunglasses – to promote sun protection. SunWise materials are available in both English and Spanish.

As a result of the program's efforts, the EPA reports that SunWise students show an 11 percent decrease in sunburns.¹⁹ More SunWise kids wear sunscreen and sunglasses when outdoors, and more understand that sun tans are not healthy.

The Impact Of Vision Wear

Today's advanced vision wear can do more than just correct vision. The right lenses can enhance overall quality of vision, while protecting it for the future. Options such as photochromic lenses – which adapt from clear to dark in proportion to the intensity of UV light – and anti-reflective coatings can reduce reflections from glare, making it easier to see while reducing eyestrain and fatigue. Most photochromic and sun lenses also offer built-in protection from harmful UVA and UVB rays, promoting long-term eye health. Impact-resistant materials, such as polycarbonate and Trivex® material, can also help to reduce preventable eye trauma.

Despite the immediate benefits possible, vision wear is constantly underestimated in its importance – and few people understand what higher-performing eyewear options can do for them.

Sun Protection

Considering the potential damage that UV exposure can cause to eyesight, everyone should be wearing lenses that block 100 percent of UVA and UVB rays. Lenses that provide sun protection can be divided into three categories – fixed-tint sunglasses, adaptive lenses and polarized lenses.

Fixed-tint sunglasses can be a single, solid color, or a gradient – meaning the lenses are a darker shade at the top and a lighter shade at the bottom. Certain colors may be chosen to help enhance objects for specific activities. For example, amber-colored lenses help improve contrast while driving – while gray tints offer the most benefits for general conditions, reducing brightness with the least amount of color distortion.

Quality fixed-tint sunglasses are designed to absorb UVA and UVB rays – however, not all sunglasses block 100 percent of UV rays, and therefore may not be effective in preventing sun damage to the eyes. Another drawback

with fixed-tint sunglasses is that because they don't adapt in changing light conditions, they may seem too light or too dark in certain situations.

Adaptive lenses – or photochromic lenses – provide sun protection while “adapting” to their surroundings to help wearers see their best in all lighting conditions. With this technology, special molecules react to incoming light and change their shape to block more or less light. This allows the lens to appear virtually clear indoors and at night, and sunglasses dark outdoors in the brightest light conditions. Depending on the technology, lenses can be activated using UV or visible light. The most common adaptive lenses are Transitions® lenses, which block 100 percent of UVA and UVB rays while reducing glare. Because not all everyday photochromic lenses darken behind the windshield of a car – since the windshield will typically block most UV rays – a second pair of fixed-tint or photochromic sun lenses may be recommended for driving.

Polarized lenses are helpful in blocking polarized light. This type of light is created by the sun or an artificial light source. When it bounces off of horizontal surfaces – like water, snow or a highway – it can cause intense glare that makes it difficult or impossible to

see. Polarized lenses can be beneficial for certain situations, including driving, skiing and fishing. Fishermen, for example, often use polarized lenses to help them see beneath the water and better locate fish. While most polarized lenses have built-in UV-blocking features, it is important to check labeling to determine if they offer full protection.

Regardless of the type of sun protection chosen, quality of the lens is important. Lenses should come from reputable sources, and be labeled as blocking 100 percent of UVA and UVB rays.

Quality Matters

Did you know that wearing an inadequate pair of sunglasses can be worse than wearing no sun protection at all?

Consider this: if a pair of sunglasses offers no UV protection, the wearer is actually increasing his or her exposure to UV rays. The inadequate sunglasses will block some of the light, causing the iris of the eye to open and allow more light in. This also lets in more UV light, increasing the amount of UV reaching the retina.

Always check to make sure you're buying sunglasses that offer maximum UV protection.

Despite the immediate benefits possible, vision wear is constantly underestimated in its importance



Focus On Glare

One of the simplest – but most important – things that eyewear can do is reduce glare. More than eight out of 10 people agree that glare and bright light outdoors affects their eyesight²⁰ – making glare protection an important consideration for almost everyone.

Eye focusing problems equate to \$2,000 in lost productivity per year, per employee.

Glare from reflections – both indoors and out – can contribute to eyestrain and difficulty seeing. Glare is not only annoying, but can also have immediate economic implications. For example, eye focusing problems alone can cause an employee to lose up to 15 minutes of productivity

per day, which equates to \$2,000 per person, per year.²¹ Additionally, one in four people who report having headaches cite glare or light as a main cause.²² More than 5 percent of the U.S. workforce reports headaches severe enough to hurt their productivity on the job – equating to 3.5 lost hours per week per employee.²³

Choosing lenses with an anti-reflective/no-glare coating – especially when combined with photochromic lenses, which adapt their level in changing light conditions – can help to reduce glare and improve quality of vision.

The Impact On Employers

With rising health care costs and stretched health care dollars, there is a huge focus on ways to lower costs and boost productivity – both of which are possible through proper vision care and vision wear offered by a premium vision benefit.

Despite the potential savings in medical costs and increased productivity, many employees aren't taking advantage of their vision benefit – even when it's paid for by the employer. One in four employees does not enroll in his or her company's vision benefit – and three out of 10 who do enroll don't use their vision benefits to get a regular eye exam.²⁴

At the same time, many employers themselves are unaware of the benefits of vision care and vision wear for their workforce. Many perceive it predominantly as a means to a lens prescription and discounts on eyeglasses and contact lenses.

They also have low awareness of the link between employees' eye- and overall-health, and have limited understanding of the role of vision wear and its impact on productivity.

Consider that while most employers correctly associate photochromic lenses with UV and glare protection, seven out of 10 incorrectly believe that anti-reflective coatings offer UV protection as well. And four out of 10 employers never discuss the importance of eye health or their vision benefit with their workforce – which could be why half of employees don't even know what lens options are included in their vision plan.²⁵

This reinforces a need for general public education targeting both consumers (employees) and their influencers (employers). Education should focus on the importance of scheduling regular eye exams for early detection of UV-related issues, and proper vision wear to provide protection. Including some of the economic benefits to taking these simple steps can also help drive home the importance of taking action.

Calculating The Cost Of Vision Loss

Employers can use the **Healthy Sight Calculator**, found at HealthySightWorkingForYou.org/calculator, to sum up the savings possible for their workforce by offering a premium vision benefit. By inputting size and demographic information, employers can use the calculator to determine the likely prevalence of systemic disease, eye disease (including UV-related disease) and vision problems among their workforce. The calculator then provides potential savings in health costs and productivity through use of the proper vision care and vision wear.



Spotlight On Hispanics

Just 3.7 percent of Hispanics know that the sun can damage their eyes.

In fact, in a 2008 survey, just 15 percent of Hispanics reported having a vision checkup within the past year.²⁶ Educating the Hispanic population about their risks and encouraging preventative steps such as getting regular eye exams and wearing UV-blocking lenses is critical.

Higher Risks For Eye Disease

Hispanics are at higher risk for several eye diseases – many of which are caused or worsened by extended exposure to UV rays.

One in five Hispanic adults suffers from **cataract** – a leading cause of visual impairment among this group. Cataract is three times more common among Hispanics than in Caucasians and African-Americans. In addition to age, UV exposure is a major risk factor.²⁷

Age-related macular degeneration is another disease affecting many Hispanics, with early onset more common among this group. Risk factors for developing AMD include family history, smoking and cumulative exposure to UV rays.²⁸

Pterygia, which is most commonly caused by exposure to wind or UV rays, is also most common among Hispanic populations, especially those with a Caribbean ancestry.

Finally, **open-angle glaucoma** is the most common cause of blindness among Hispanic populations. Family history, along with having a thin cornea or high eye pressure, are risk factors. While UV exposure is not known to contribute to the onset of glaucoma, medications taken to treat glaucoma can increase susceptibility to UV and glare.²⁹

While many demographic groups are at higher risk for UV-related eye disease, Hispanics – who make up the largest and fastest-growing demographic group in the United States – are often hit the hardest. Many Hispanics do not take all the right steps to protect their eyes for the future – like getting regular eye exams. In

Higher Risks For Systemic Disease

Hispanics are also at risk for certain overall health issues that can impact their vision.

Diabetes affects one in 10 Hispanics living in the United States, which is twice the rate of the general population. Half of Hispanics with diabetes also have diabetic retinopathy, which can increase vulnerability to glare and heightened damage from UV radiation.³⁰ Diabetic retinopathy leads to significant visual impairment in at least 10 percent of Hispanics over 15 years.³¹

Hypertension, or high blood pressure, affects nearly 30 percent of Hispanics and can cause damage to the eyes over time. Medications used to treat hypertension can lead to increased sensitivity to UV and glare.³²

Low awareness levels

Despite their higher risks, Hispanics are the least likely to have been educated about the dangers of UV rays to the eyes. Just 3.7 percent of Hispanics know that the sun can damage their eyes. Additionally, Hispanics are the most likely not to protect their eyes from the sun, with only one in seven wearing sunglasses when outdoors.³³

Barriers To Providing Care

In addition to low **awareness** of the need for preventative care, other potential obstacles to Hispanics receiving the best possible vision care include **apprehension**, or unfamiliarity with the healthcare system, and lack of **access** to health insurance, transportation or in-language information.

Language is perhaps one of the biggest obstacles to providing care or education. Consider that 85 percent of Hispanics use at least some Spanish at home, work or school.³⁴ While many Hispanics speak English, levels of fluency may vary. Some English-speaking Hispanics may also prefer speaking or receiving communications in Spanish – or may want in-language or bilingual materials for other family members.

These factors should be taken into consideration in the development of UV-related education and outreach materials targeting the Hispanic community.



Focus On Other Groups At Risk³⁵



African Americans

African Americans comprise the second largest and third fastest-growing ethnic group in the United States – making them an important focus for consumer eye health education. African Americans are at higher risk for many eye health issues – yet are often the least likely to seek out preventative care. In fact, a Journey to Wellness survey revealed that while more than four out of five African Americans agreed they should get their eyes checked yearly, less than half scheduled an eye exam within the past year.

Additionally, a study supported by Transitions Optical revealed that only 7 percent of African Americans recognize damage to the eyes as a potential side effect of UV exposure. This reinforces a great need to educate African Americans on the importance of UV protection – especially considering their higher risk for certain UV-related eye diseases.

- African Americans are 1.5 times more at risk for cataract than the general population, and five times more likely to develop blindness from the disease.
- Prevalence of diabetes, which can lead to diabetic retinopathy, is 70 percent higher in African Americans vs. non-Hispanic whites. Having diabetic retinopathy can increase vulnerability to glare and heightened damage from UV exposure.

Asian Americans

Asian Americans represent the third-largest minority population and second fastest-growing group in the United States. Despite having higher risks for several eye- and overall-health issues, 33 percent do not believe they need to schedule a regular eye exam unless they are having vision problems. Additionally, Asian Americans are the least likely demographic group to believe that vision correction will improve their everyday activities.

Asian Americans are also at risk for several UV-related eye diseases, and could benefit from targeted education efforts.

- Asian Americans are at higher risk for age-related cataract than Caucasians.
- Diabetes is the fifth-leading cause of death among Asian Americans between the ages of 45 and 64. Because Asian Americans are less likely to be obese than the general population, general health practitioners are often late in diagnosing the disease.

Because more than three out of four Asian Americans speak a language other than English at home, making available bilingual or in-language sun education materials is an important consideration for this group.

Spotlight On Kids

Children are an important focus for eye health education – particularly with regard to UV protection.

First, a child's eye is still developing. The crystalline lenses of young children under the age of 10 have not yet matured, and are therefore more vulnerable to UV damage. Additionally, UV damage is cumulative and cannot be reversed over time. Research has shown that increased exposure to UV rays in childhood can lead to higher risk of cataract and other problems in adult years. Studies also reinforce that kids spend more time outdoors than adults – getting three times the annual sun exposure.³⁶

For these reasons, UV protection needs to start early in life – and should be continued into adulthood.

Enhancing Kids' Vision

In addition to protecting kids' long-term eye health, there is also a need to provide them with more comfortable vision so they can enjoy daily activities and perform their best in school.

Bright sunlight can be distracting or dangerous – and when children are exposed to glare, it can lead to eyestrain and fatigue. Photochromic lenses are often recommended for children because they automatically reduce reflections from glare, while protecting the eyes from UV rays. Many photochromic lenses are also available in impact-resistant materials to help prevent trauma.

Spotlight On Diabetes

The rate of childhood diabetes is on the rise. In fact, experts are predicting that children born in the year 2000 have a one in three chance of developing diabetes due to the rise in childhood obesity.³⁷

Diabetes currently represents the leading cause of blindness among young adults in the United States, and complications from diabetic retinopathy may be especially rapid and severe in children developing diabetes at an early age.³⁸ Because diabetes has been linked to increased vulnerability to UV damage, children with diabetes should always wear UV-blocking eyewear.

Barriers To Educating Kids

While the message of encouraging UV protection for kids is simple, there are many barriers to reaching kids about the importance of taking this step. One challenge is low awareness of the importance of eye health and sun protection among target influencers – including parents, childcare providers, teachers, coaches and general medical practitioners.

Parents have a generally low awareness of the need to protect their kids' eyes from the sun – and are more likely to choose sun or photochromic lenses for themselves than for their children. While three out of four parents say they wear sunglasses to protect their eyes from UV rays when outside, just a little

over half said they do the same for their children.³⁹ Since it's unlikely that parents would purposely put their kids at risk, these findings reinforce a need to educate parents about the importance of sun protection for their children.

Since children spend so much time at school, it is also important to reach teachers and other key education influencers about the need for UV protection for children. Some schools, for example, have rules against children wearing sunglasses.

This can be due to dress codes, or concerns over being able to see a child's eyes. School administrators are likely unaware that they are risking the health of their students with these policies, so education targeting this audience could be beneficial.

The Time Is Right

With healthcare at the forefront of Americans' thoughts, there is no better time to help reform how people think about UV protection for themselves and for their kids. First Lady Michelle Obama's "Let's Move" campaign encourages healthy choices for children by providing parents and caregivers with the tools they need to positively influence kids' habits. Tying UV protection, while outside being active, to this call-to-action has the potential to give this message even more impact.

Vision in childhood can have a dramatic impact on healthy sight throughout life – and is deserving of recognition similar to that of other important health issues.

Kids born
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Conclusion

There is an urgent need for intervention to protect *our nation's vision* by educating on the dangers of UV rays and encouraging preventative steps, such as wearing UV-blocking sun or photochromic lenses and seeking regular eye exams for early detection and treatment of UV-related and other eye diseases. The toll on the health and lives of Americans is too great – and the economic impact of something so preventable deserves immediate attention.

During the congressional briefing, Prevent Blindness America encouraged policymakers to collaborate to make UV eye protection a priority in research, in future health coverage policy and in awareness programs.

Specific calls-to-action for lawmakers included:

- **Inclusion** of UV eye protection messages in current and future government-funded education programs on UV or related topics, such as eye- and overall-health or sun protection.
- **Research** on the impact of UV on the eye as a topic of consideration for future government-funded efforts.

- **Heightened awareness** of the role of vision wear in enhancing eye health and safety, as well as overall quality of life and productivity.

As an initial step, Prevent Blindness America has already formed a partnership with the EPA's SunWise program, which educates children and their caregivers about ways they can protect themselves from overexposure to the sun. Through the partnership, UV protection and eye health messages and activities are being further incorporated into the program's overall resources provided to schools and community organizations.

Prevent Blindness America has also created a website – www.SunAndVision.org – which includes information and resources that professionals can use to educate consumers about the importance of protecting their eyes from UV rays. The site will continue to be updated with new information and resources. Additionally, policymakers are encouraged to contact sunandvision@preventblindness.org with ideas on how UV protection can fit with their individual legislative and education priorities.

There is an urgent need for intervention to protect our nation's vision



References

- ¹ Survey conducted on behalf of Transitions Optical, Inc. from March 9-13, 2006 via ICR in Media, Pa.
- ² Survey conducted on behalf of Transitions Optical, Inc. from March 9-13, 2006 via ICR in Media, Pa.
- ³ Survey conducted on behalf of Lighthouse International in September 2010 via Harris Interactive.
- ⁴ 2009 American Eye-Q Survey, conducted on behalf of the American Optometric Association.
- ⁵ *Report on Cataract Incidence in the United States Using the Atmospheric and Health Effects Framework Model*. Environmental Protection Agency. <http://www.epa.gov/ozone/science/effects/AHEFCataractReport.pdf>. Accessed December 22, 2010.
- ⁶ Vision Problems in the U.S. Study conducted by Prevent Blindness America and National Eye Institute among Americans aged 40 and older, 2008.
- ⁷ *Cultural and Linguistic Considerations for Vision Care*. Transitions Optical, Inc. 2009.
- ⁸ Godar DE, Urbach F, Gasparro FP, van der Leun JC. UV Doses of Young Adults. *Photochemistry and Photobiology*, 2003, 77(4): 453-457.
- ⁹ Vision Problems in the U.S., 2008.
- ¹⁰ World Health Organization. Global Solar UV Index, August 2002.
- ¹¹ Vision Problems in the U.S., 2008.
- ¹² American Macular Degeneration Foundation.
- ¹³ American Diabetes Association.
- ¹⁴ Vision Problems in the U.S., 2008.
- ¹⁵ The Economic Burden of Major Adult Visual Disorders in the United States, 2006.
- ¹⁶ National Aeronautics and Space Administration. <http://www.nas.nasa.gov/About/Education/Ozone/ozonelayer.html>. Accessed on December 22, 2010.
- ¹⁷ *Report on Cataract Incidence in the United States Using the Atmospheric and Health Effects Framework Model*. Environmental Protection Agency. <http://www.epa.gov/ozone/science/effects/AHEFCataractReport.pdf>. Accessed December 22, 2010.
- ¹⁸ Kyle JW, Hammit JK, Lim HW, Geller AC, Hall-Jordan LH, Maibach EW, DeFabo EC, Wagner MC. Economic evaluation of the US Environmental Protection Agency's SunWise program: sun protection education for young children. *Pediatrics*. 2008; 121(5):e1074-84.
- ¹⁹ Geller, A. et al. 2003. Evaluation of the SunWise School Program. *The Journal of School Nursing*. 19(2), 93-99.
- ²⁰ Survey conducted on behalf of Transitions Optical, Inc. among 2,207 U.S. adults via Harris Interactive, December 2008.
- ²¹ KAZI Personal Control Lighting Study. *How Personal Control Lighting Can Reduce Eyestrain, Improve Productivity and Save Energy*.
- ²² Survey conducted on behalf of Transitions Optical, Inc. via Harris Interactive, January 2010.
- ²³ Stewart, Walter, et al. *Lost Productive Time and Cost Due to Common Pain Conditions in the U.S. Workforce*. *JAMA*. 2003;290;2443-2454.
- ²⁴ Survey conducted on behalf of Transitions Optical, Inc. via Harris Interactive, January 2010.
- ²⁵ Survey conducted on behalf of Transitions Optical, Inc. via Harris Interactive, January 2010.
- ²⁶ Survey conducted on behalf of Transitions Optical, Inc. via Garcia Research Associates, December 2010.
- ²⁷ Archives of Ophthalmology. <http://archophth.ama-assn.org/cgi/content/full/122/4/487/TABLEEEB30088T5>. Accessed December 21, 2010.
- ²⁸ Archives of Ophthalmology. <http://archophth.ama-assn.org/cgi/content/full/122/4/487/TABLEEEB30088T5>. Accessed December 21, 2010.
- ²⁹ Rodriguez, J. et al, "Causes of Blindness and Visual Impairment in a Population-based Sample of U.S. Hispanics," *Ophthalmology*, April 2002, Vol. 109, No. 4: pp. 737-743.
- ³⁰ U.S. Centers for Disease Control.
- ³¹ Pan American Health Organization. Prevention of Blindness and Eye Care. http://new.paho.org/hq/index2.php?option=com_content&do_pdf=1&id=244. Accessed on February 2, 2011.
- ³² National Eye Institute. <http://www.ncbi.nlm.nih.gov/pubmed/7875754>. Accessed on December 21, 2010.
- ³³ Survey conducted on behalf of Transitions Optical, Inc. from March 9-13, 2006 via ICR in Media, Pa.
- ³⁴ Migration Information Source.
- ³⁵ *Cultural and Linguistic Considerations for Vision Care*. Transitions Optical, Inc., 2009.
- ³⁶ Truham AP. Sun Protection in childhood. *Clin Pediatr*. 1991;30:676-681.
- ³⁷ U.S. Centers for Disease Control.
- ³⁸ U.S. Centers for Disease Control.
- ³⁹ Survey of employees conducted on behalf of Transitions Optical, Inc. via Synovate, October 2010.



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