Today‘s Webinar: UVB4Blue

Thank you for joining us, we will begin our Webinar shortly…

Help us to provide the best Webinar experience for everyone and to conserve your internet bandwidth:

- **Turn off your video feed**
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****Please note this webinar session is being recorded**

ZEISS Web Series Speakers

Webinar presenters:

Brent McCardle, LDO

Mary Herd, MBA, ABOC

Sara Cecchini, MBA

Robert T. Spirito, MBA, ABOM, NCLEC

Steven Haifawi, MBA, ABOC

Cindi Davis, ABOC, CPOT

Maureen Hanna

ZEISS upcoming webinars

Upcoming Webinars

Today, Tuesday and Wednesday:

UVB4Blue: Prioritizing Light Protection's Role in Eye Health

Health concerns related to blue light exposure are increasing within the eye care community among consumers but with 4 out of 5 lenses not providing sunglass level UV protection, should we be focusing on giving everyone proper UV protection since there is no debate about the issues associated with UV?

Approved for 1 hour of ABO Credit

Thursday and Friday:

Beyond the Traditional Subjective Refraction

How wavefront optimization can help the majority of your patients improve their visual quality and comfort.

Approved for 1 hour of ABO Credit or 1 hour of NCLE Credit

Next Week:

Position of Wear: Measuring Success with Digital Tools

Every optician has their favorite PD ruler but in today's digital world consumers expect more. In this webinar we will explore how today's digital tools incorporate technological advancements that provide ultra-precise measurements that not only instill a higher sense of confidence but set your dispensary apart from the competition.

Eye strain and working from home

While telecommuting is not a new concept, the Novel Corona virus pandemic is creating tens of millions of new telecommuters as they adhere to social distancing guidelines. For many, the elimination of the daily commute is extending their workday which means more screen time as they work, meet, and socialize remotely. This webinar will look at the impact on our eyes this change creates and the solutions ECPs can provide to help.

Approved for 1 hour of ABO Credit or 1 hour of NCLE Credit

https://zeiss.com/webinars

ZEISS Virtual Expo

In the spirit of bringing us closer, sharing product innovations, and supporting Eye Care Professionals, we've created a brand new digital concept: **ZEISS Virtual Expo**.

Whether in PJs or jeans, using a laptop or smartphone, you can now take a 3D tour of the ZEISS booth and interact with exclusive bite-sized content.

ZEISS Virtual Expo is a 24/7 experience, and is available now at:

www.ZeissVirtualExpo.com

Continuing Education

Is this course accredited?

- Yes, you can receive either 1 hour of ABO or NCLE

How do I get my credit?

- We currently plan to mail your physical certificate in May
  - This depends on a few factors including the ABO/NCLE being back in the office with enough time to send us the certificates, but we will send as soon as possible
- We will mail the certificate you requested (ABO or NCLE) to the address you provided during registration
  - If we have any issues we will reach out to you
- If you have any questions or concerns you can email me directly at: Brent.McCardle@zeiss.com

Today‘s Presenter

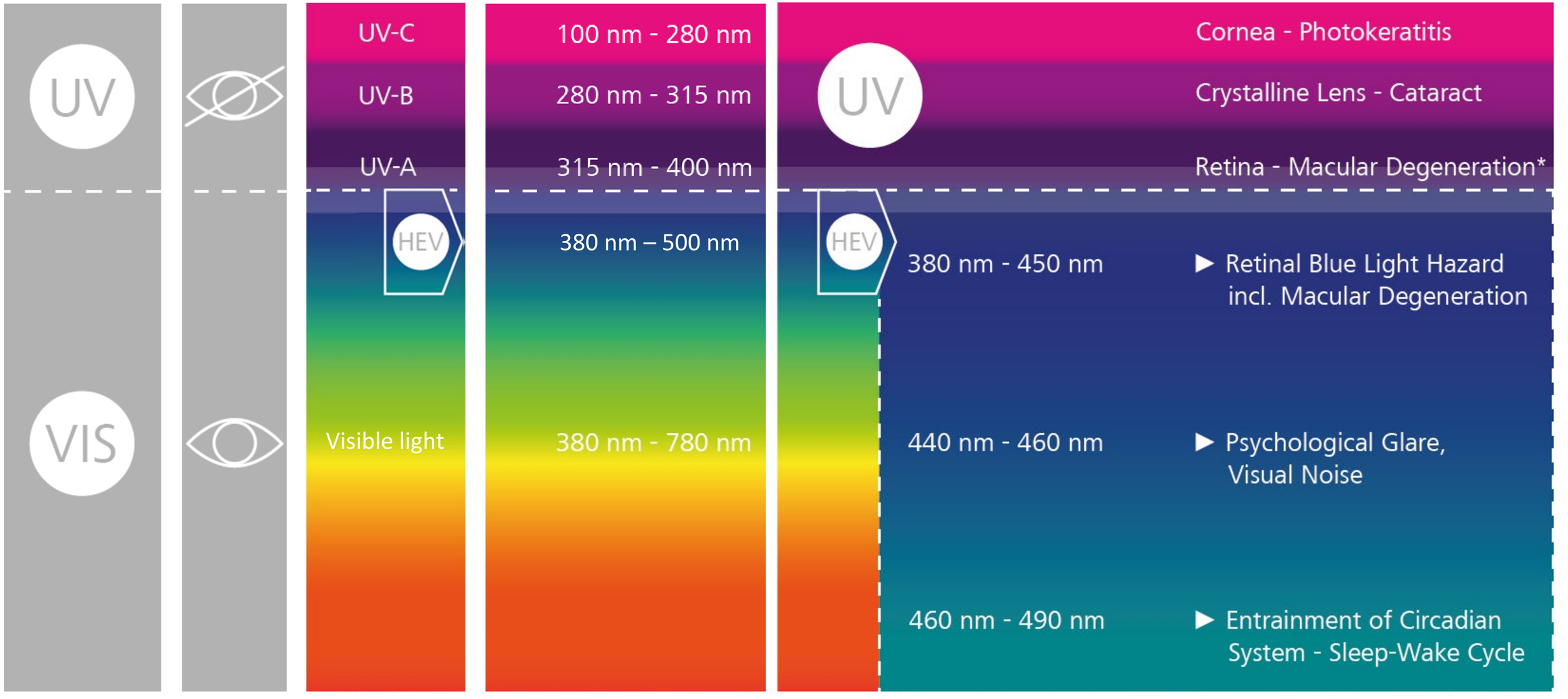
Brent McCardle, LDO
Technical Education Specialist

Brent.McCardle@zeiss.com

UVB4BLUE

Full eye protection that's right 4U

Brent McCardle
Technical Education Specialist
brent.mccardle@zeiss.com



*Depends on the Age

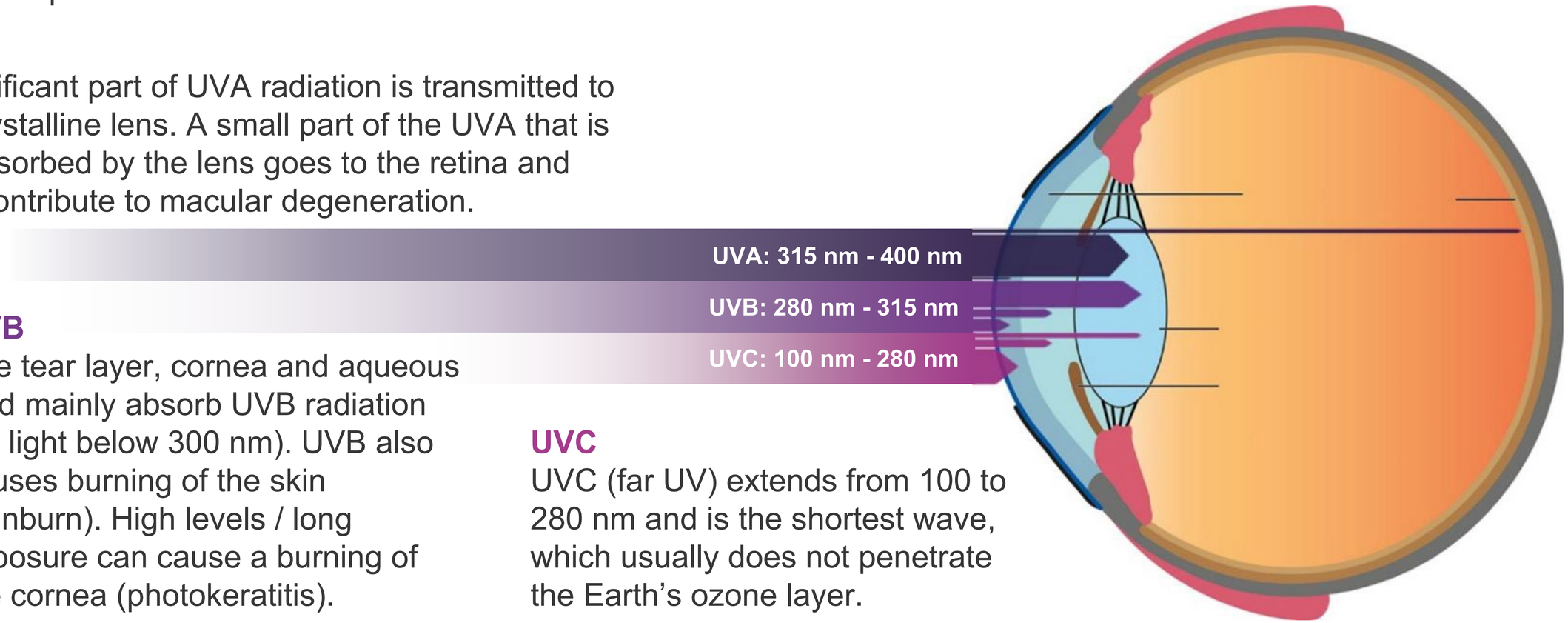
It’s time to offer full UV protection

How does UV radiation affect the human eye?

Prolonged exposure to UV or high intensities of UV radiation (for example, in sunbeds) damages the tissues of eyes and can cause a ‘burning’ of the eye surface, called ‘snow blindness’ or photokeratitis.

UVA

A significant part of UVA radiation is transmitted to the crystalline lens. A small part of the UVA that is not absorbed by the lens goes to the retina and may contribute to macular degeneration.



UVB

The tear layer, cornea and aqueous fluid mainly absorb UVB radiation (all light below 300 nm). UVB also causes burning of the skin (sunburn). High levels / long exposure can cause a burning of the cornea (photokeratitis).

UVC

UVC (far UV) extends from 100 to 280 nm and is the shortest wave, which usually does not penetrate the Earth’s ozone layer.

Issues Associated With UVR

Sunburn

Damages skin cells

Wrinkles

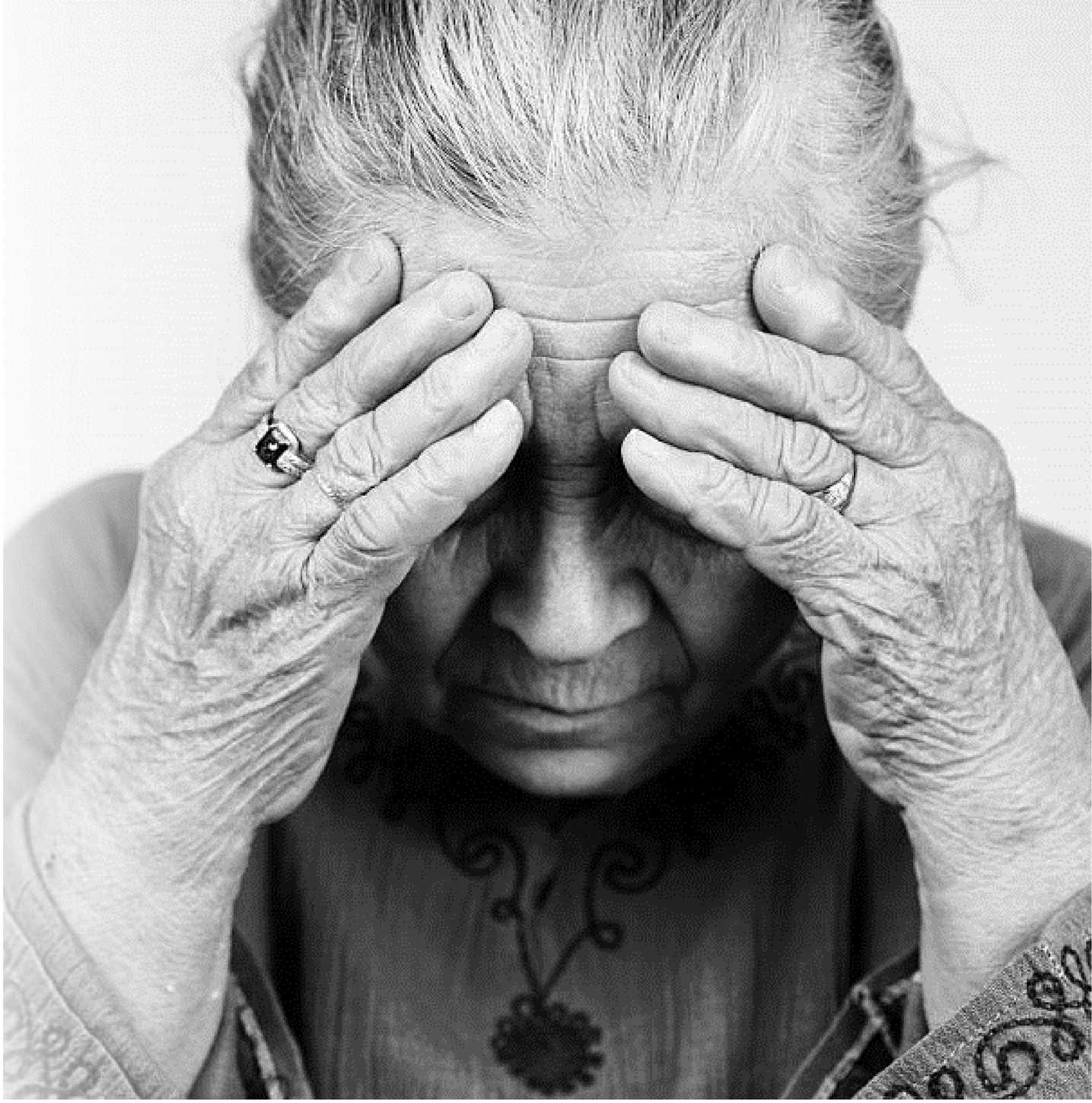
Accelerates skin aging

Skin Cancer

Often starts around eye and eye lids

Eye Damage/Diseases

Conjunctiva, Iris, Lens, and Retina



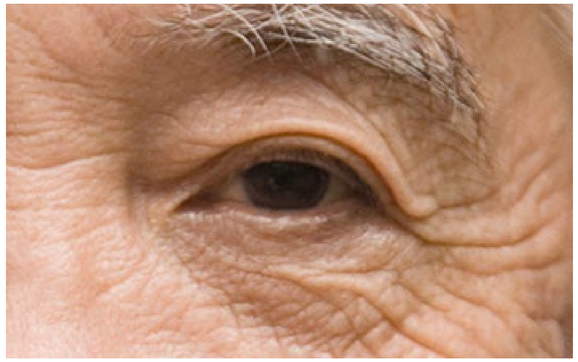
It’s time to offer full UV protection

Eye health is too important to take risks

Constant exposure to UV rays is not just harmful to the skin, but also to the eyes. Over time, it can cause various forms of eye diseases and accelerated aging of the tissue surrounding the eyes.

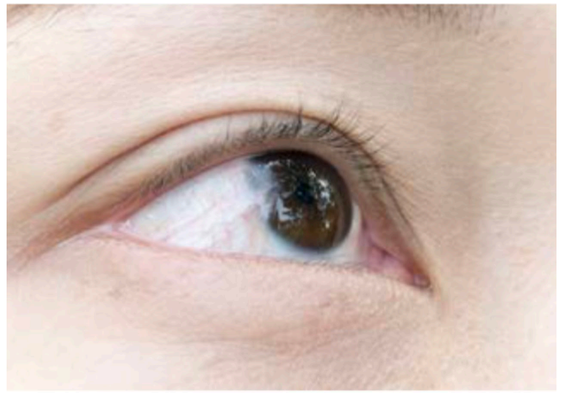
Photokeratitis

Sunburn of the cornea due to excessive exposure.



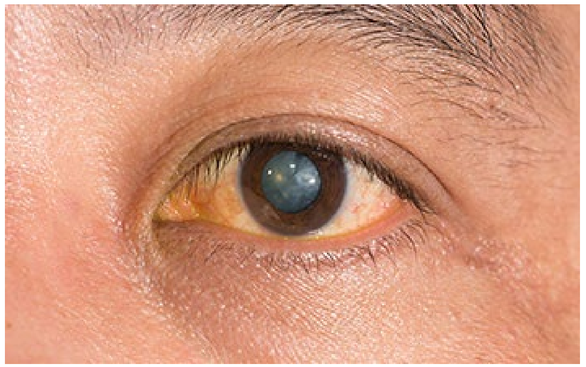
Photoaging and DNA change of skin

Photoaging of eyelids makes skin thicker and leads to prominent wrinkles.



Pinguecula

Thickened deposed of fat, protein, and calcium.



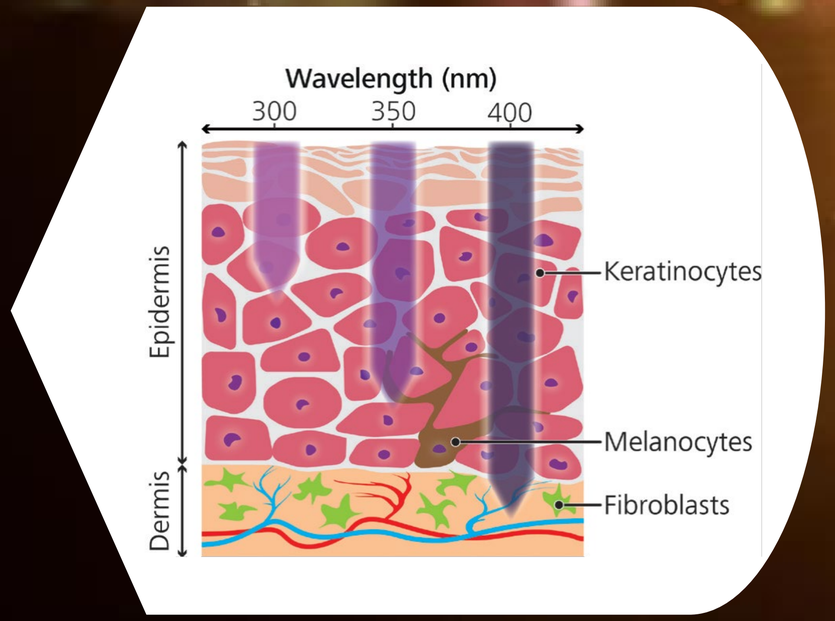
Cataract

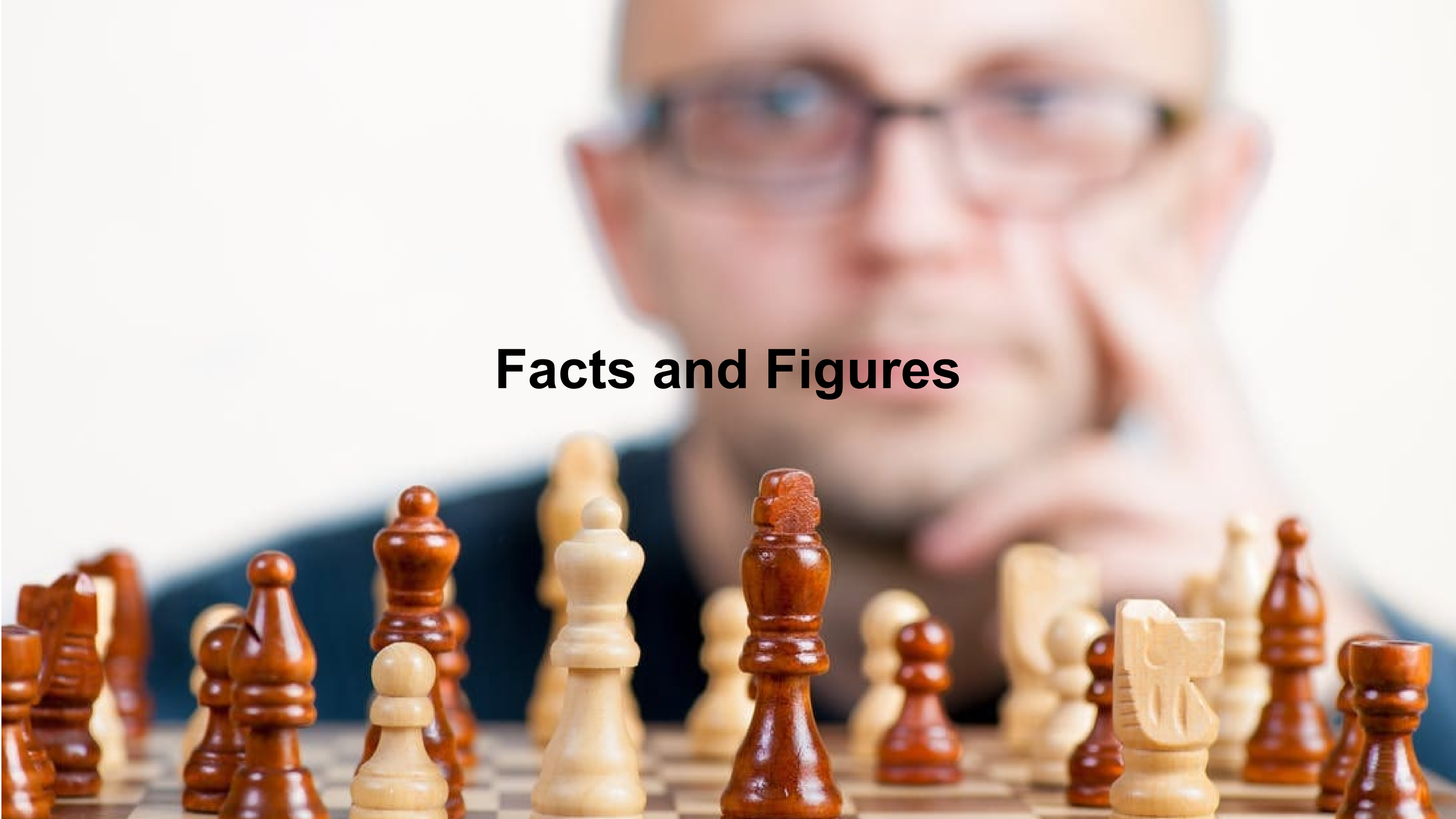
Clouding of the eye’s crystalline lens, often as a result of excessive UV exposure.

Other Hazards

Keratitis, Pterygium, Melanoma, Carcinoma

Long wavelength UVR penetrates deep into the skin, damaging eyelids and causing photoaging.





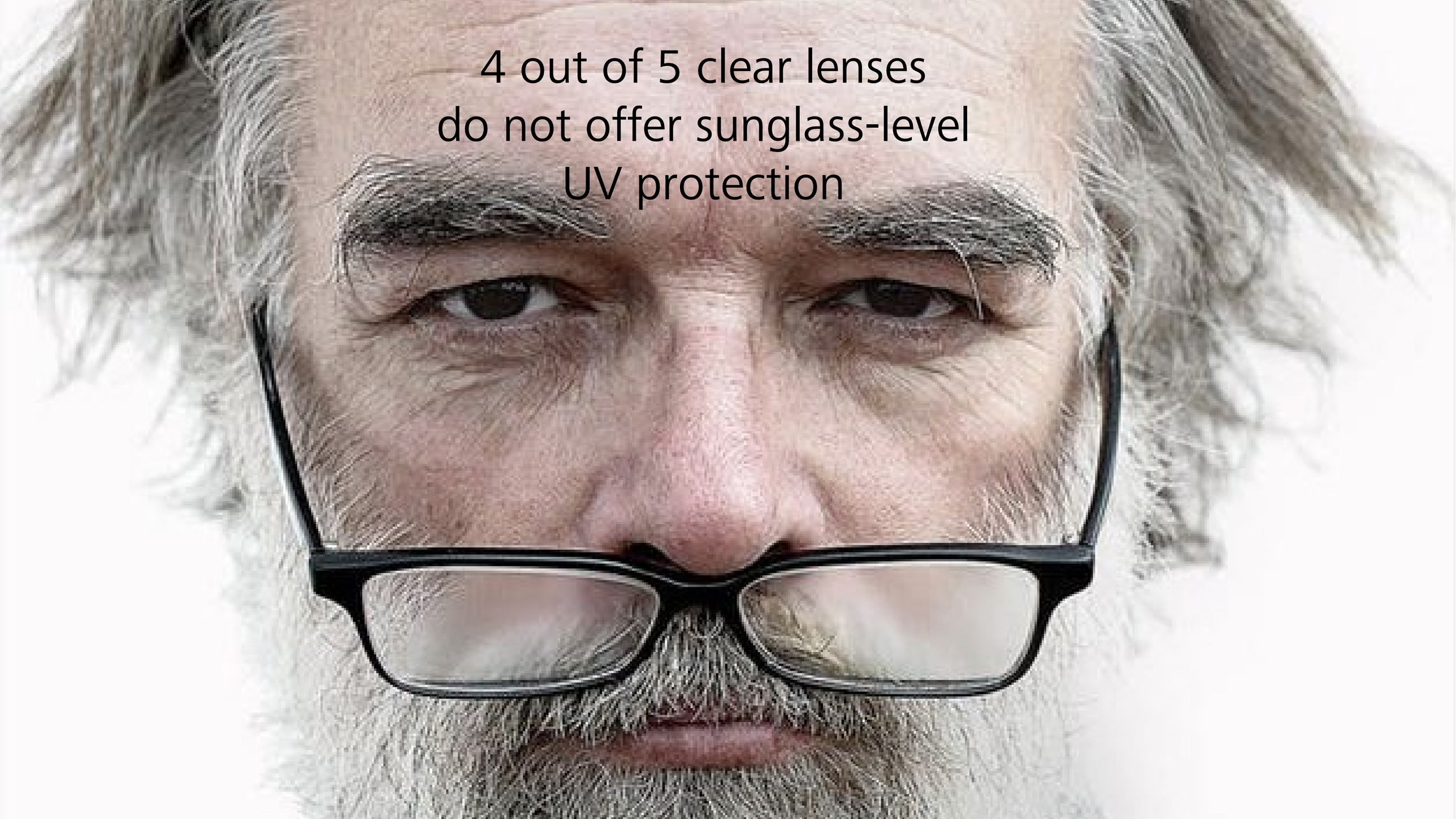
Facts and Figures

Skin protection is already known.

But what about protection for the eyes?

Only 21.2% wear sunglasses when being outdoors in the sun.*

*Source: The Vision Council. “Eye Care & Protection", 2017.


4 out of 5 clear lenses
do not offer sunglass-level
UV protection

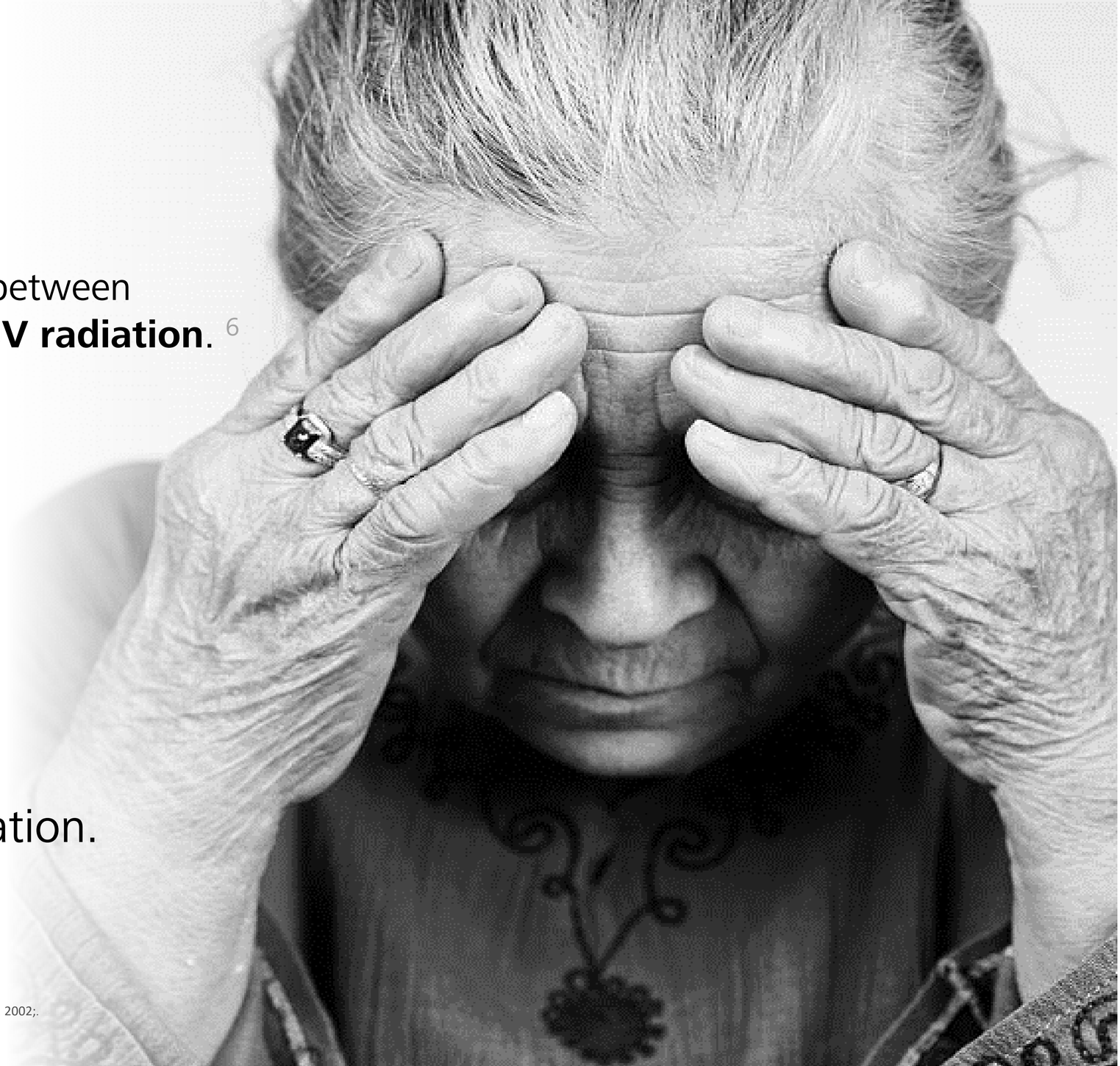
UV and Cataracts

Various studies have found a **correlation** between cataract formation and the **exposure to UV radiation**. [6]

The WHO states roughly

20 % of all Cataracts

are caused or enhanced by UV radiation.



6 McCarty CA, Taylor HR. A review of the epidemiologic evidence. Linking ultraviolet radiation and cataracts. Dev Ophthalmol. 2002;.

48%

of **world blindness**
is caused by **cataracts.***

*Source: World Health Organization. “Causes of blindness and visual impairment." WHO, 2017.

UV and Skin cancer

The eyelid region is susceptible for UV damage and to develop skin cancers.

Between 5 - 10 % of all skin cancers occur on the eyelids specifically. [8,9]

But the eye lid area is **often not protected** against UV radiation.

Did you know?

Liverpool University confirmed in a report (7/2017):
Many people when putting sunscreen on their face forget to creme eye suroundings.

https://news.liverpool.ac.uk/2017/07/06/misapplication-sunscreen-leaving-people-vulnerable-skin-cancer/

8 Cook BE Jr, Bartley GB. Treatment options and future prospects for the management of eyelid malignancies: an evidence-based update. *Ophthalmology*2001 Nov; 108(11):2088-98.

9 Abraham J, Jabaley M, Hoopes JE. Basal cell carcinoma of the medial canthal region. *Am J Surg* 1973; Oct; 126(4):492-5.

UV radiation is always around.

UV light is always around. Even on cloudy days.

Ground reflectance of UV radiation can increase the **intensity** significantly and provides the eye with an “extra dose”

UV Reflectance of some surfaces: [16]

Fresh snow	**88%**
Sea foam (surf)	**25–30%**
White house paint	**22%**
Dry sand (beach)	**15-18%**
Concrete pavement	**8-12%**
Grass	**2-4%**

16. Sliney DH. Physical factors in cataractogenesis: ambient ultraviolet radiation and temperature. Invest Ophthalmol Vis Sci. 1986 May;27(5):781-90.

UV radiation is always around.

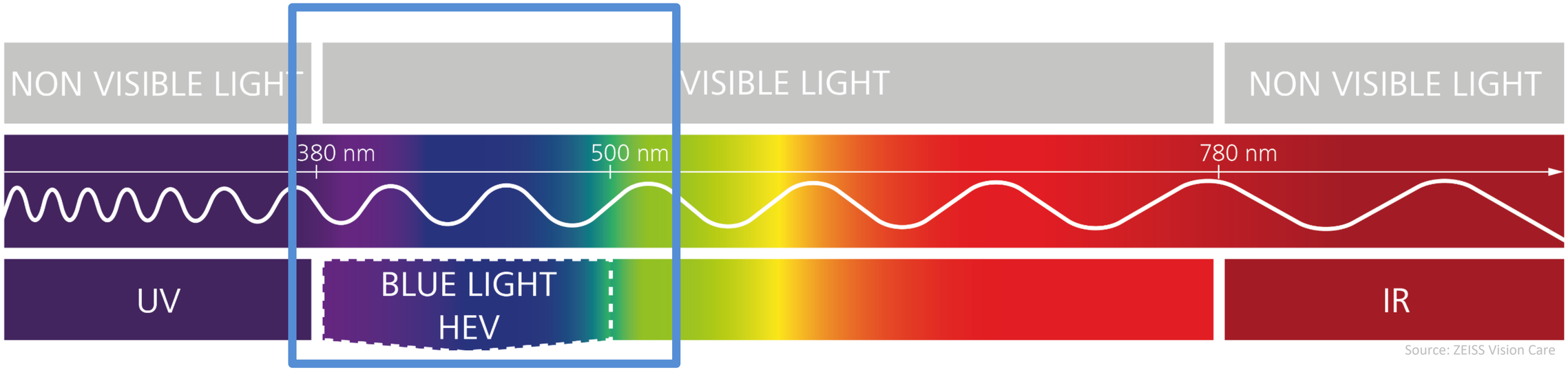
Some people are more exposed to it.

- People working outdoors are exposed to **10-20%** more UV light than an average indoor worker. [17]
- Up to **50%** of the total UV we're exposed to by age 60 occurs before we reach the age of 20. [18]

17 International Agency for Research On Cancer. IARC monographs on the evaluation of carcinogenic risks to humans. Solar and ultraviolet radiation. IARC Monogr Eval Carcinog Risks Hum. 1992;55:1-316.
18. Green AC, Wallingford SC, McBride, P. Childhood exposure to ultraviolet radiation and harmful skin effects: Epidemiological evidence. Prog Biophys Mol Biol. 2011 Dec: 107(3): 349-355.

According to Vision Watch, only 7.6% of parents report that their children always wear sunglasses outdoors.

High Energy Visible (HEV) Light



What is HEV / Blue light

- HEV **H**igh **E**nergy **V**isible Light is typically defined as light between 380 – 500 nm.
- As light's wavelength decreases, the energy of the light increases.
- Blue light / HEV Light is higher in energy than the other wavelengths in the visible spectrum.

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Light - Eye - Vision

Vision & Color

The human eye is sensitive to light from 380 to 780 nm.

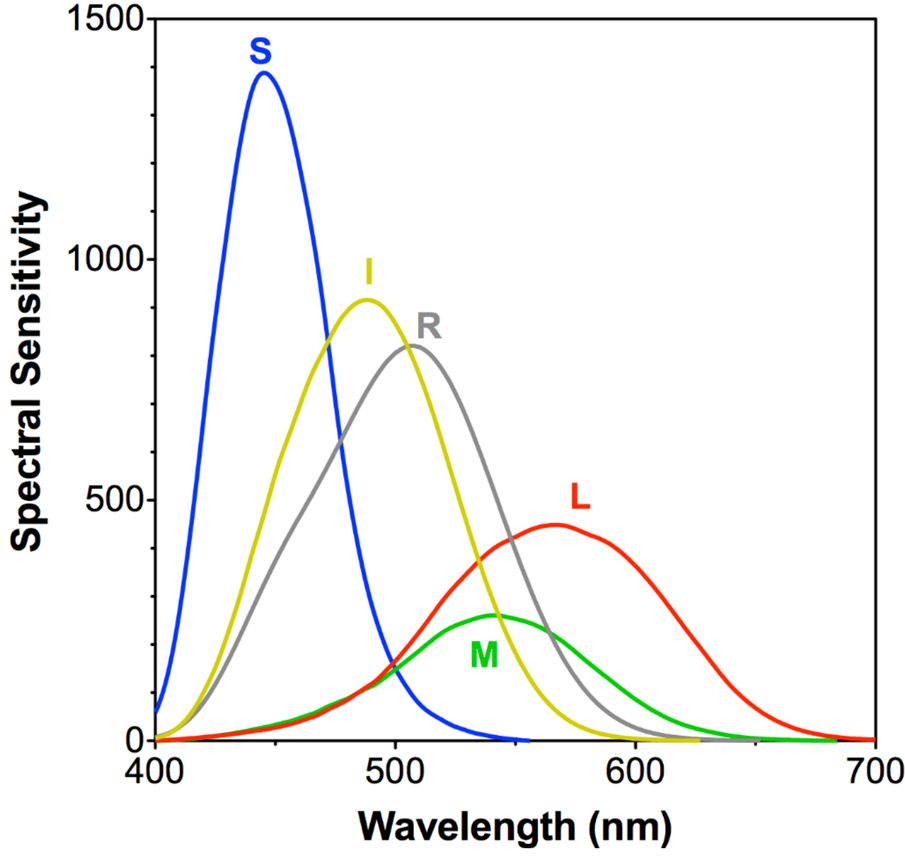
The retina consists of **3 classes of photoreceptors**:

Rods and **Cones(Color)**

- Cones (S, M and L) are sensitive to bright light, giving us scotopic and photopic vision to form a representation of the visual world
- Rods (R) are sensitive to dim light

Intrinsically Photosensitive Retinal Ganglion Cells (ipRGCs)

- Provide a stable representation of ambient light intensity.
- Exhibit a peak spectral sensitivity between 460 - 484 nm.
- Contribute to conscious sight and to non-image-forming functions

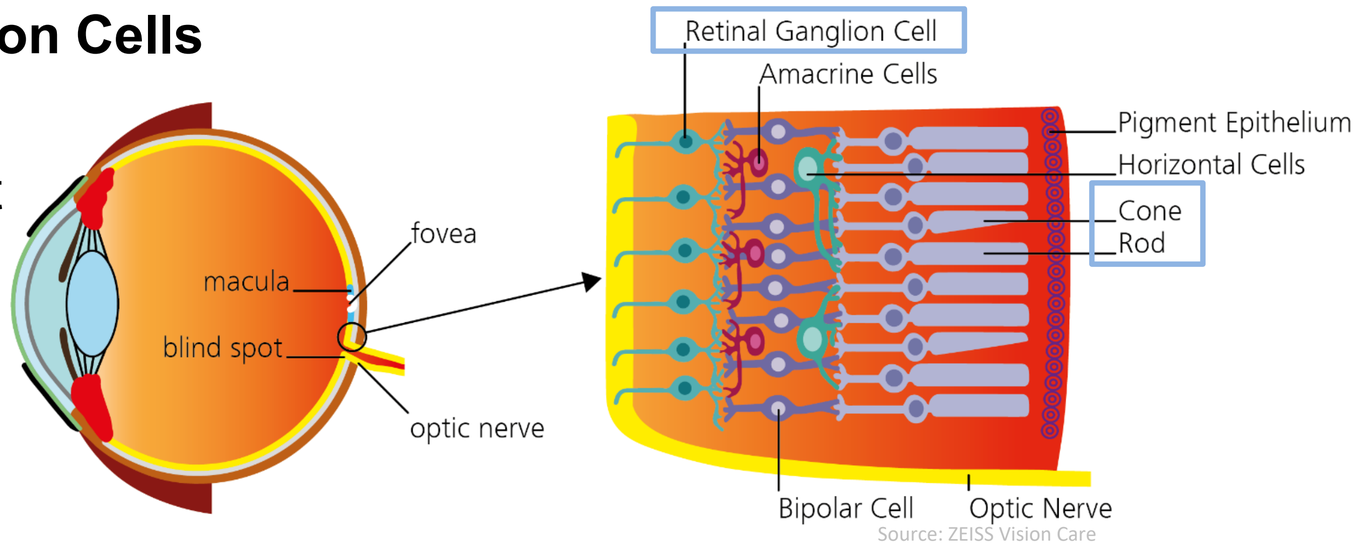


Relative spectral sensitivities of the five photoreceptors in human retina, including S-, M-, L-cones, rods, and ipRGCs

Light - Eye - Vision

Intrinsically Photosensitive Retinal Ganglion Cells (ipRGCs)

- Control pupil size and regulates the amount of light getting to the retina.
- Provide a control for our biological clock, known as the “circadian rhythm”.
- Influence the secretion of the hormone melatonin into the bloodstream.
- Contribute to higher levels of alertness and may contribute significantly to more effective visual learning.
- Inadequate exposure of the ipRGCs to blue light may aggravate many common problems on health and well-being , including sleep disorders, depression, and impaired cognitive function.



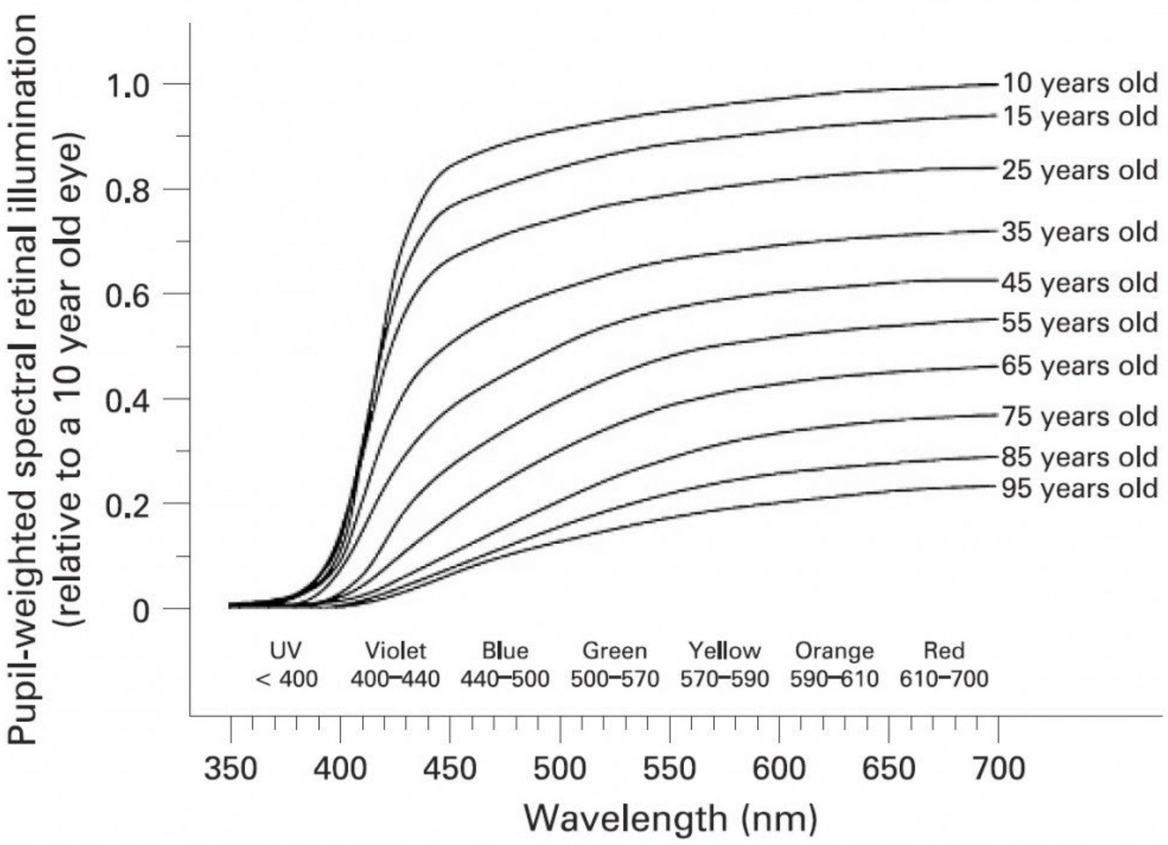
Some figures:
A typical human retina contains about
- 120 million rod cells
- 6 million cone cells
- very few photosensitive ganglion cells (only approx. 1% of the 1.5m ganglion cells)

Light - Eye - Vision

Light Transmission through the Eye

- The absorbance and the light transmission by the crystalline lens depends on the age.
- Therefore also the spectral retinal illumination varies with age.
- The strongest age-related reduction of illumination occurs in the violet and blue part of the visible spectrum.

Human eye lens spectral transmittance by age.

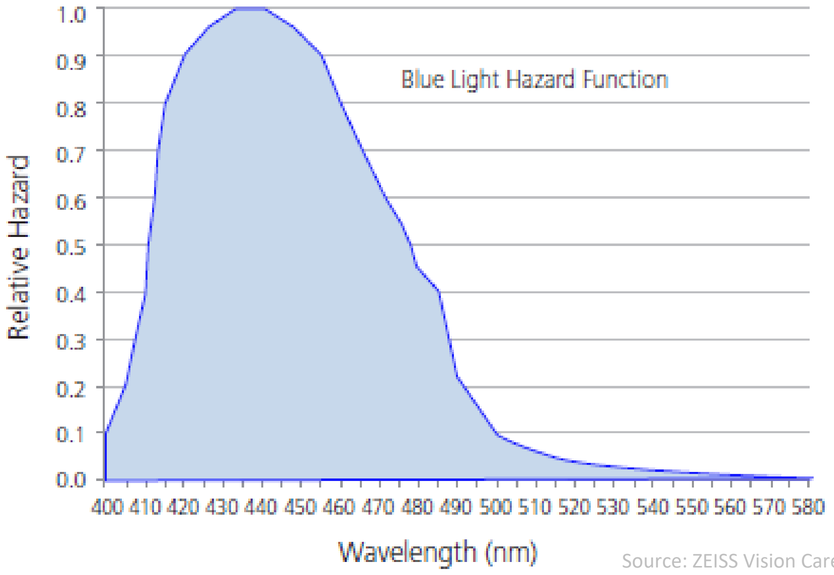


Turner et al. 2008

Blue Light Challenges: BLH

The Blue Light Hazard BLH

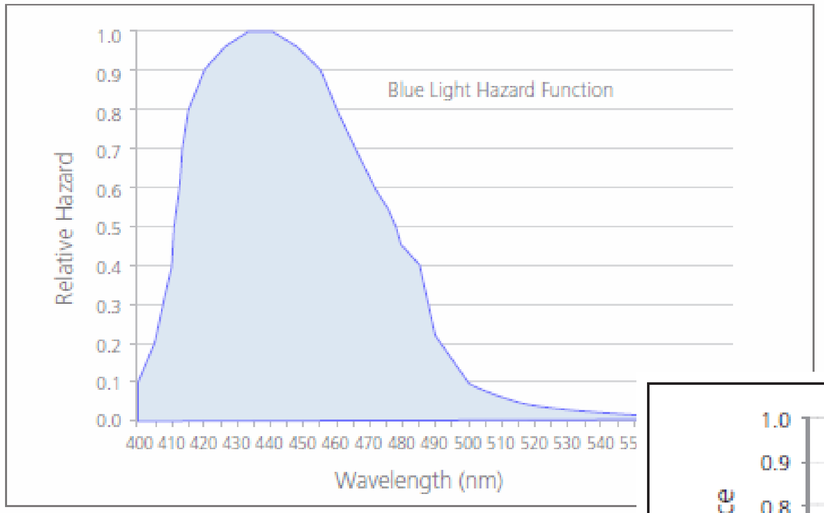
- Blue Light Hazard is the potential for a photochemical induced retinal injury resulting from electromagnetic radiation exposure.
- The Blue Light Hazard function spreads roughly from 390 to 510 nm.
- The peak at 450nm has highest potential to cause damage to the retina.
- Blue Light Hazard may be a contributor to the development of age-related macular degeneration (AMD).
- Depending on light source the Blue Light Hazard spectrum is modified and looks different.



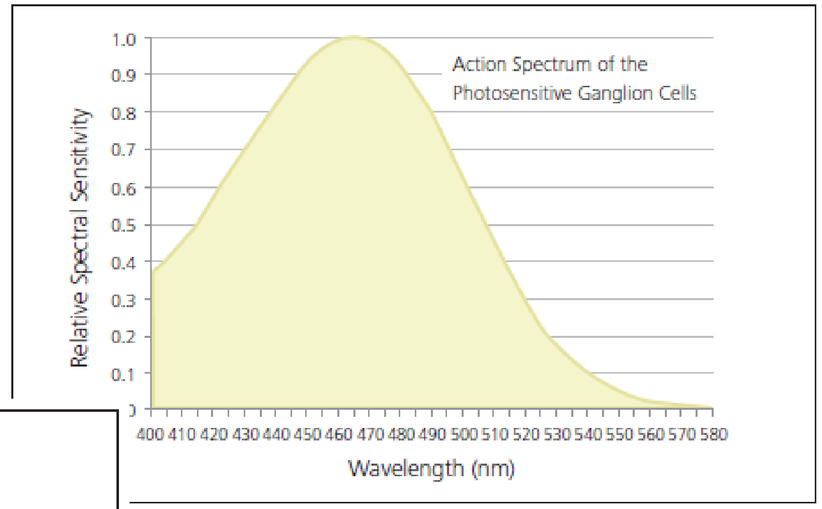
Source: ZEISS Vision Care

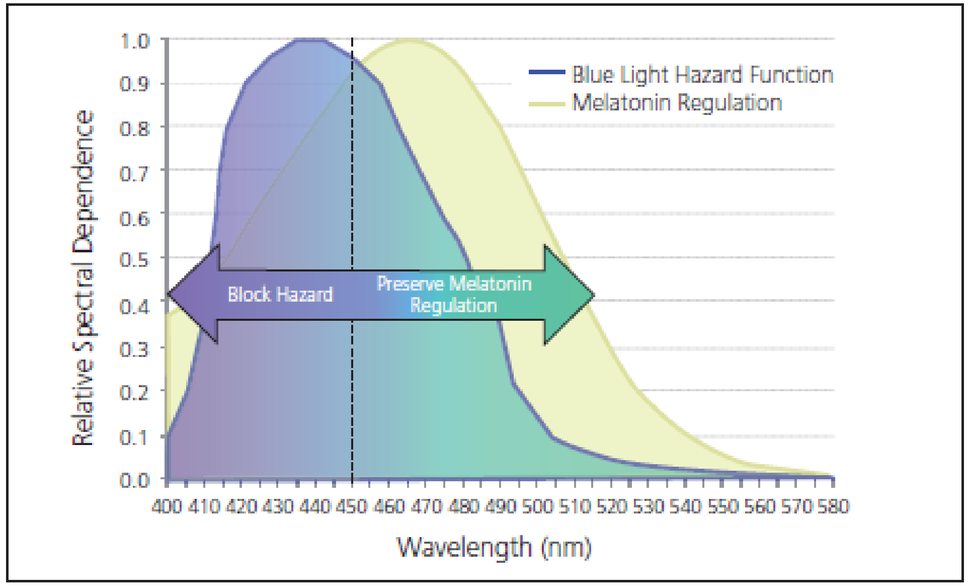
Managing Blue Light Duality

Action spectrum of BLH Blue Light Hazard



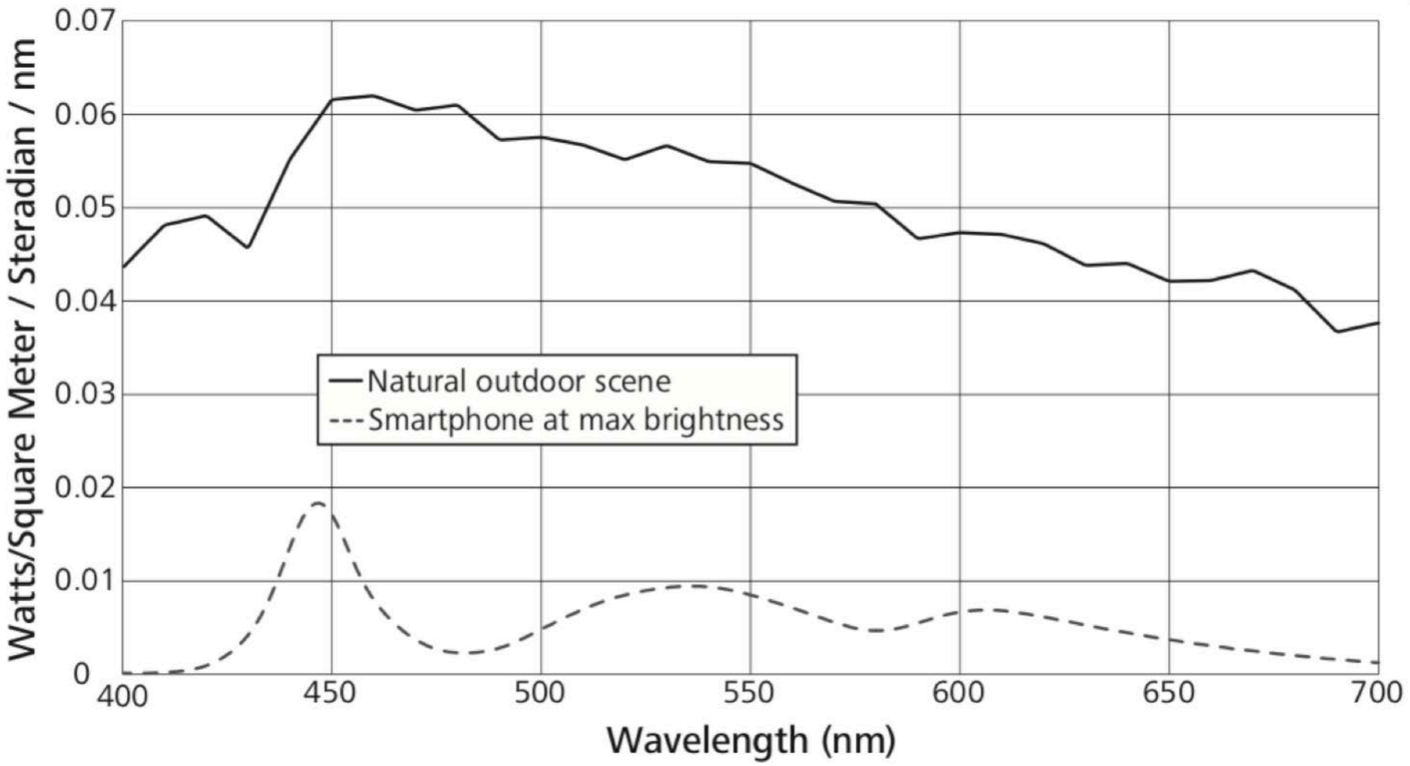
Action spectrum of ipRGC





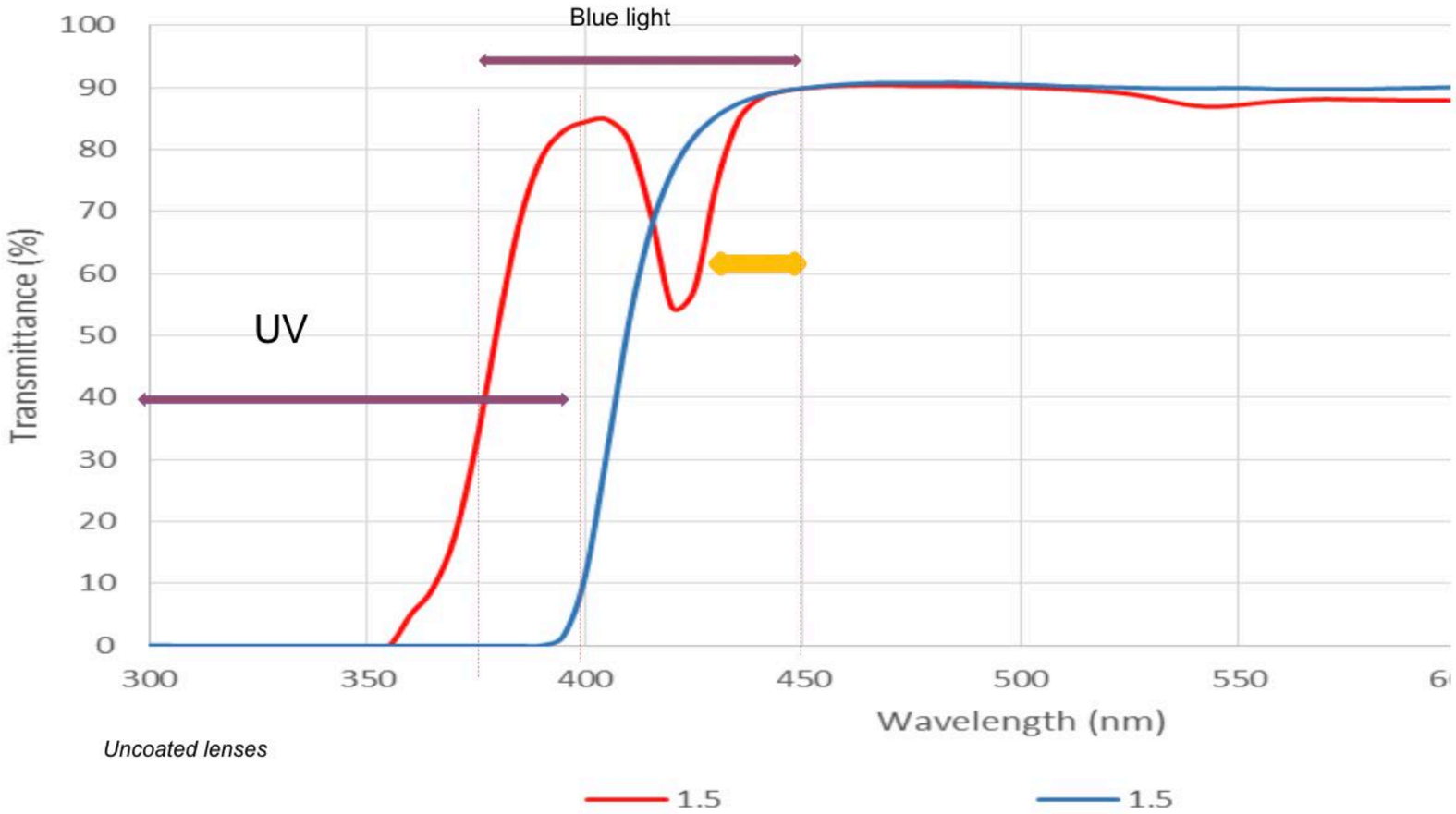
Blue Light and Digital Devices

- Blue light outdoors is 30 times stronger than devices



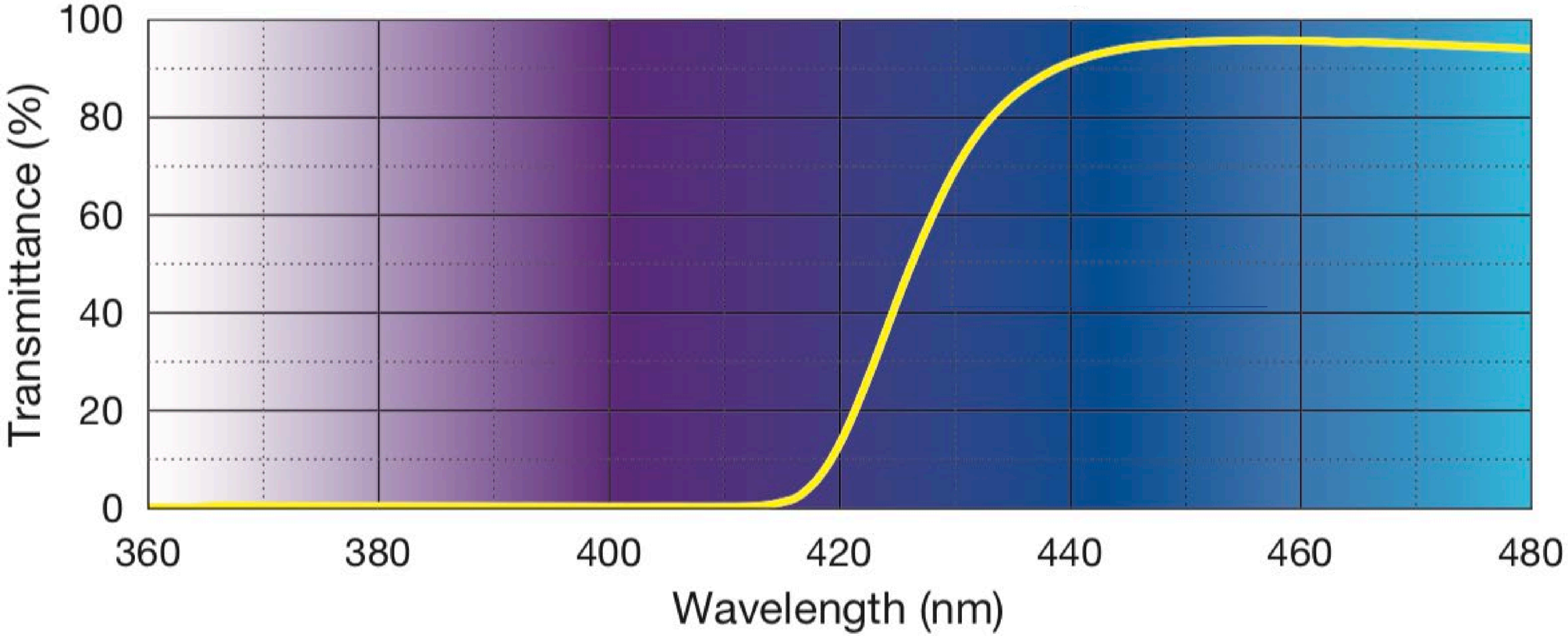
Current solutions

- Current solution do not attenuate the BLH

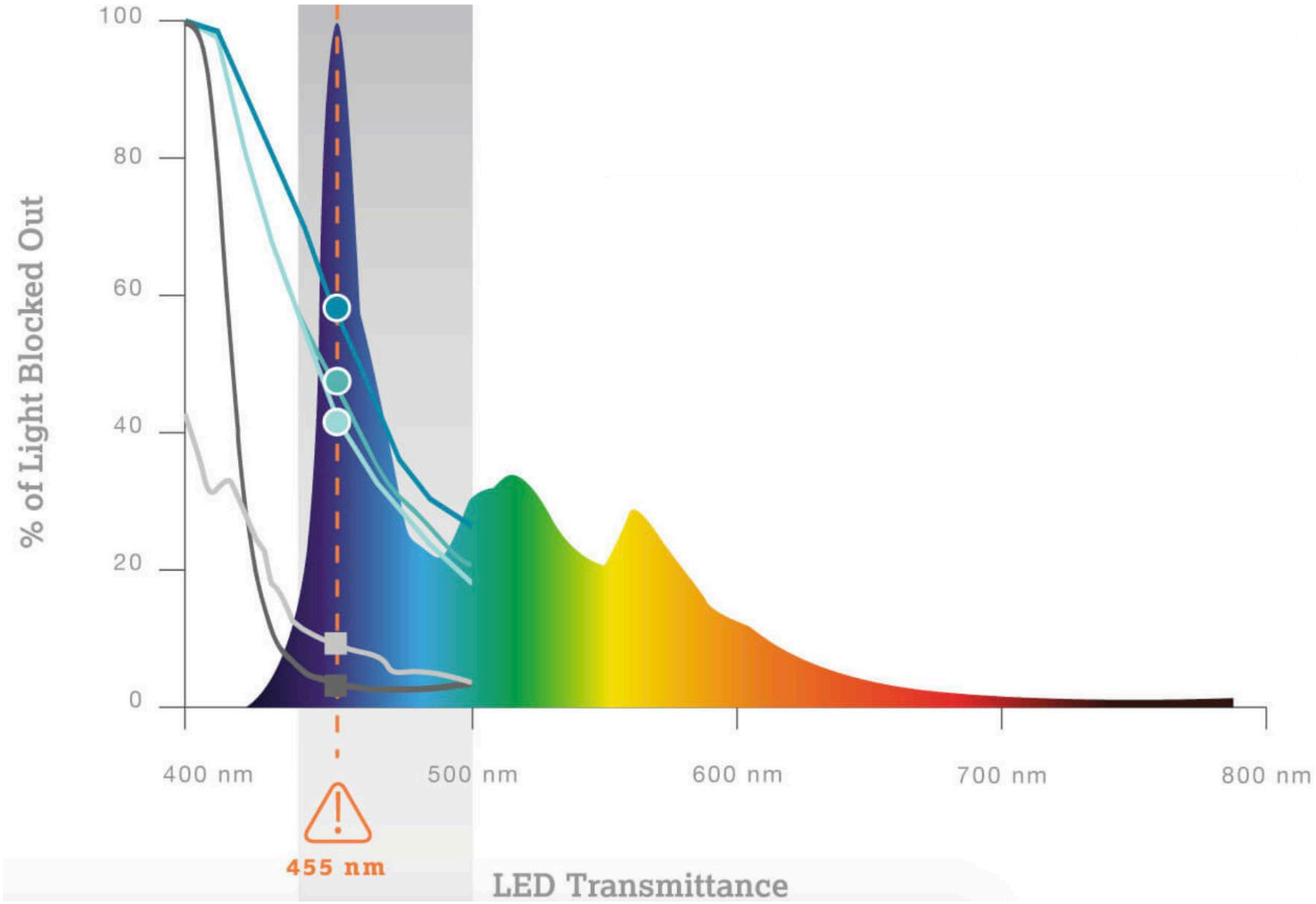


Uncoated lenses

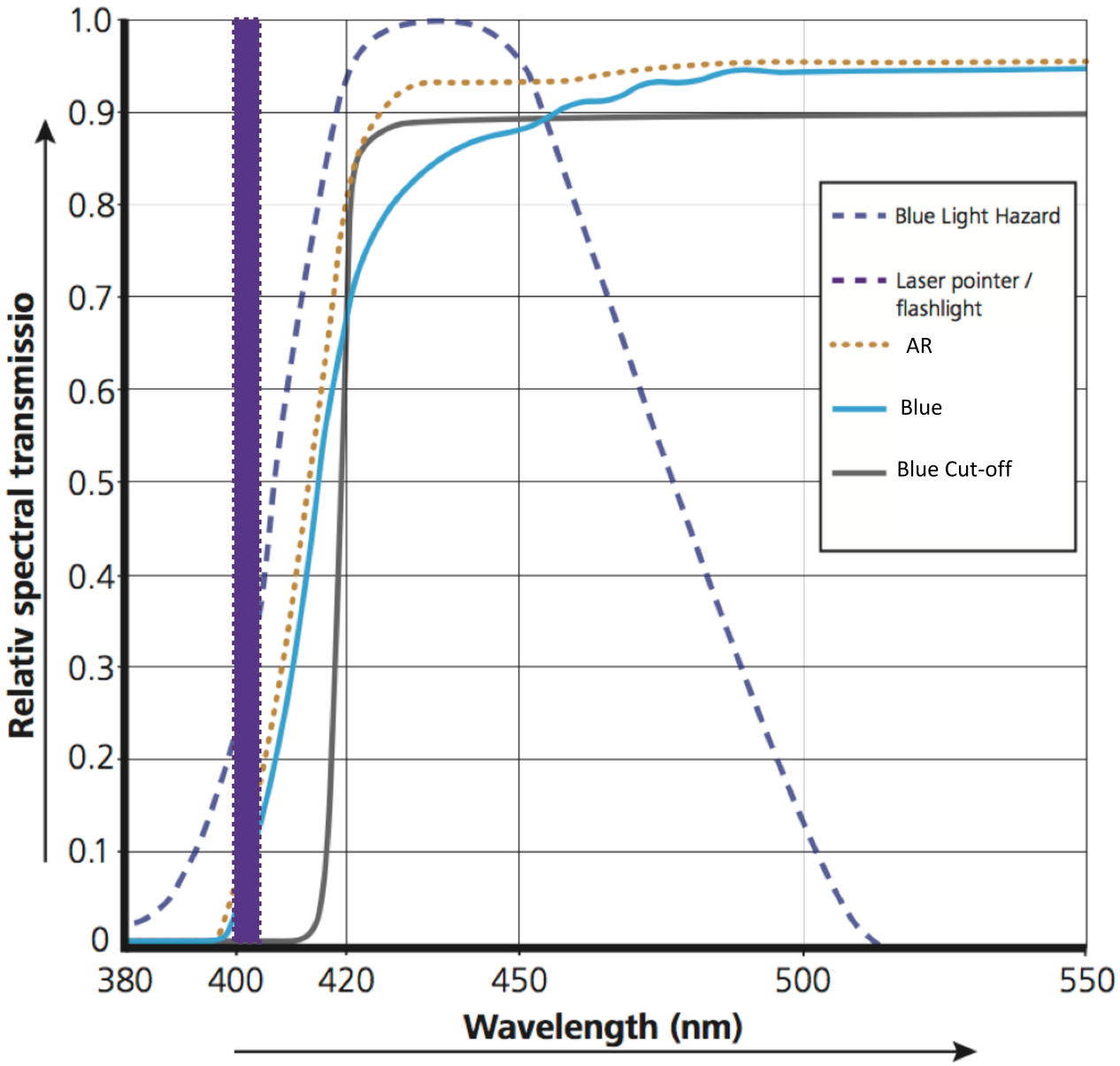
Current solutions



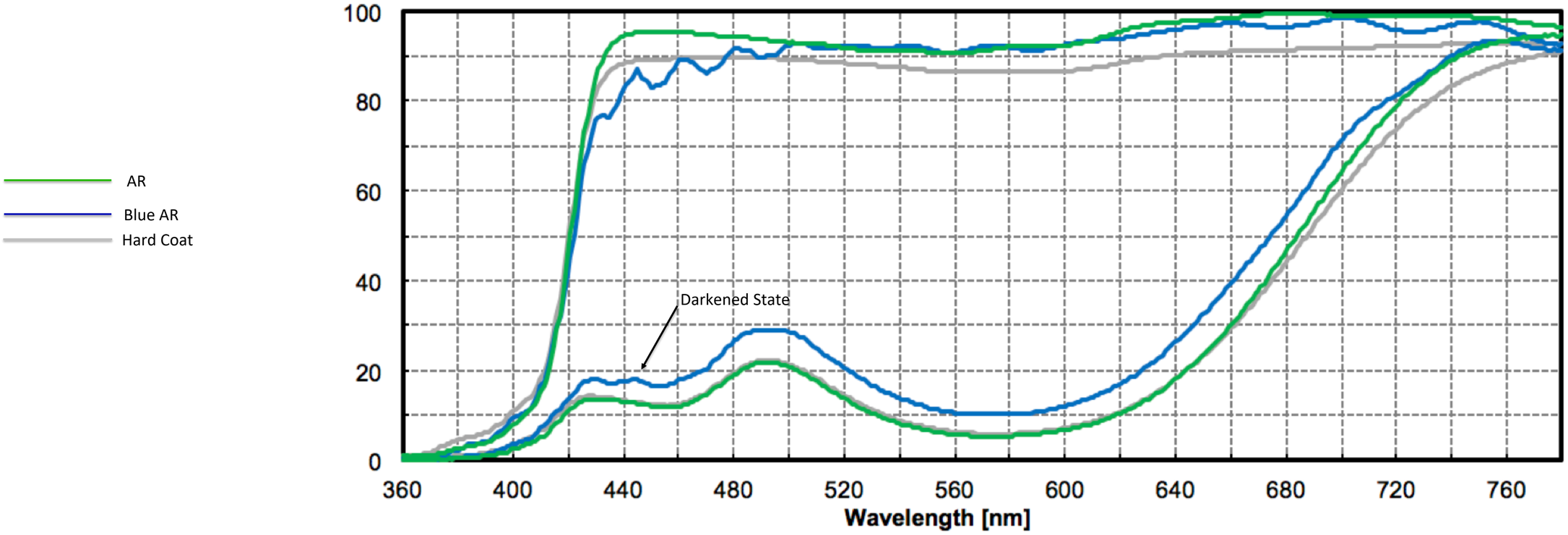
Current solutions



Blue Comparisons



Blue Misconceptions



Blue light – No credible eye health threat in everyday life conditions

- Some studies report long term exposure to blue Blue light in sunlight causes macular degeneration*, but others have contradicted them**
- National Eye institute currently lists only age, race, family history, genetics and smoking as risk factors for maculopathy
- Research relies on self reporting
- A smartphone‘s luminance would have to be more than 100,000 units to be deemed unsafe by standards organizations. This is brighter than being outdoors at noon- time on a mountain with full sunshine blazing on freshly fallen snow

* 1. Taylor HR, West S, Muñoz B, Rosenthal FS, Bressler SB, Bressler NM. The long-term effects of visible light on the eye. Arch Ophthal- mol. 1992;110(1):99-104.

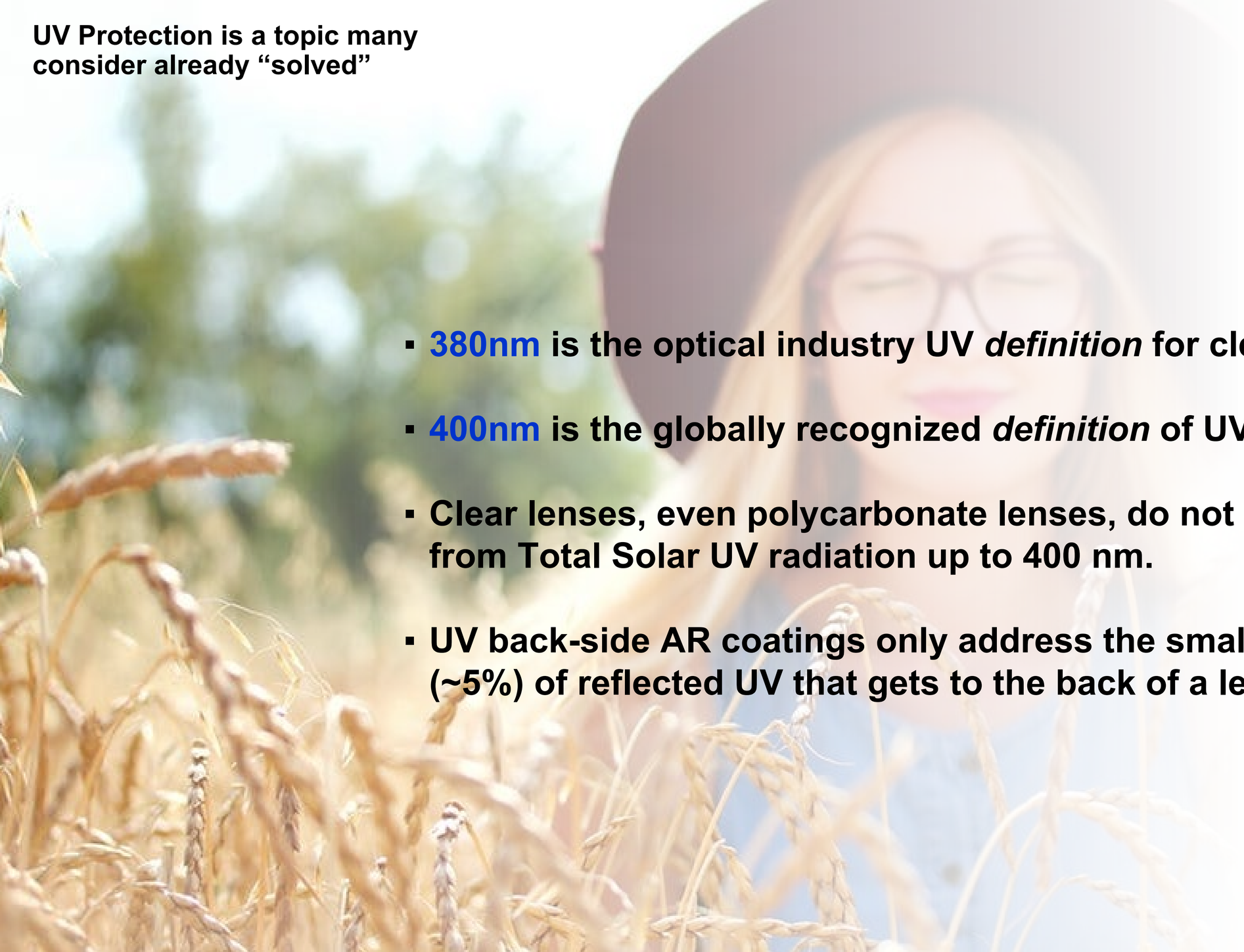
2. Tomany SC, Cruickshanks KJ, Klein R, Klein BE, Knudtson MD. Sunlight and the 10-year incidence of age-related maculopathy: the Beaver Dam Eye Study. Arch Ophthalmol. 2004;122(5):750-7.

** 3. McCarty CA, Mukesh BN, Fu CL, Mitchell P, Wang JJ, Taylor HR. „Risk factors for age-related maculopathy: the Visual Impairment Project. Arch Ophthalmol 2001“; 119: 1455–1462.

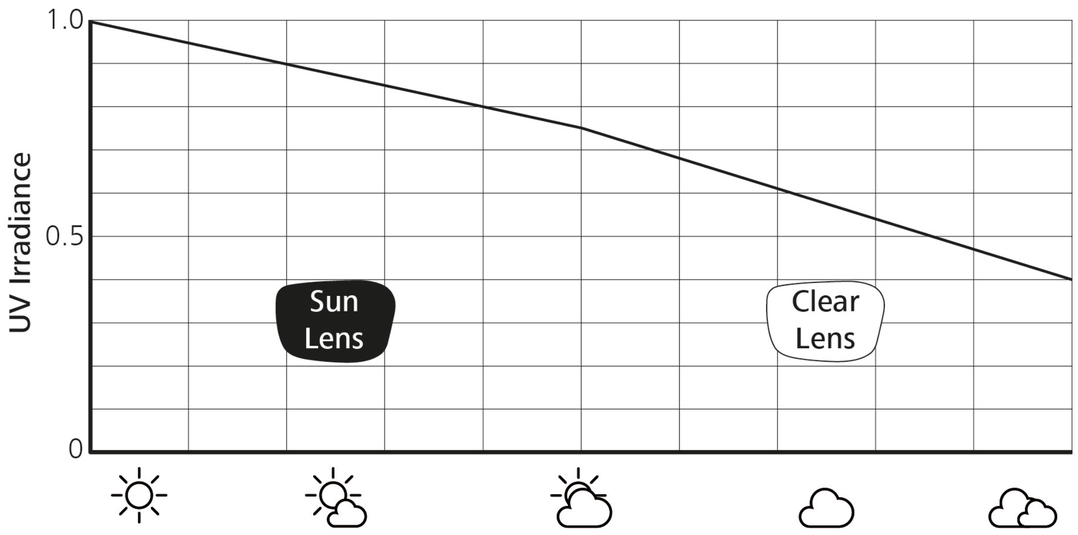
4. C Delcourt, I Carrie`re, A Ponton-Sanchez, S Fourrey, A Lacroux, L Papoz. „Light Exposure and the Risk of Age-Related Macular Degeneration,The Pathologies Oculaires Lie‘es a` l’Age (POLA) Study.“ Arch Ophthalmol. 2001;119:1463-1468

The UV Problem

UV Protection is a topic many consider already “solved”



- 380nm is the optical industry UV *definition* for clear lenses
- 400nm is the globally recognized *definition* of UV
- Clear lenses, even polycarbonate lenses, do not protect eyes from Total Solar UV radiation up to 400 nm.
- UV back-side AR coatings only address the small amount (~5%) of reflected UV that gets to the back of a lens



UV IRRADIANCE

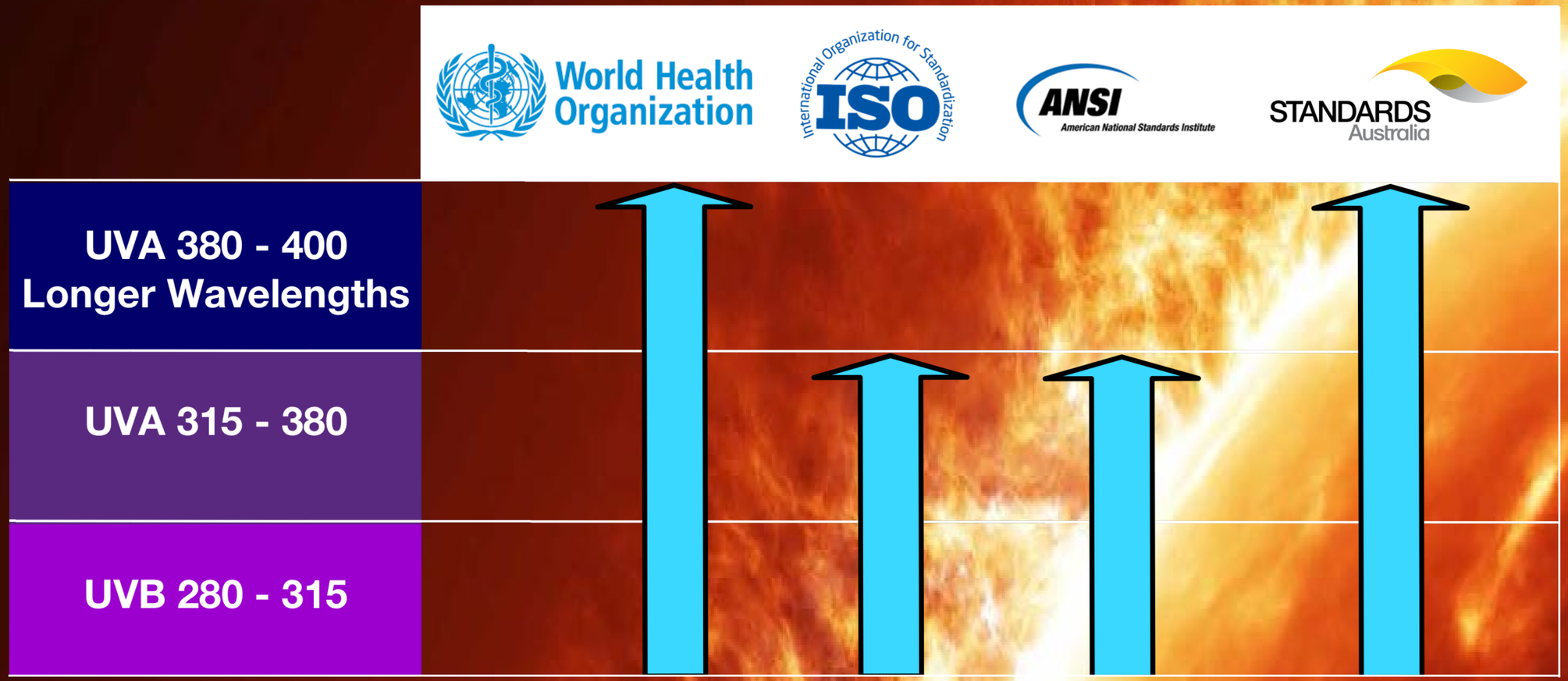
…on Cloudy days, in shadows, and full sun.

Studies discuss mean UV exposure under clouds from 70-75%*.

SO WHAT CAN WE DO KNOWING THIS?

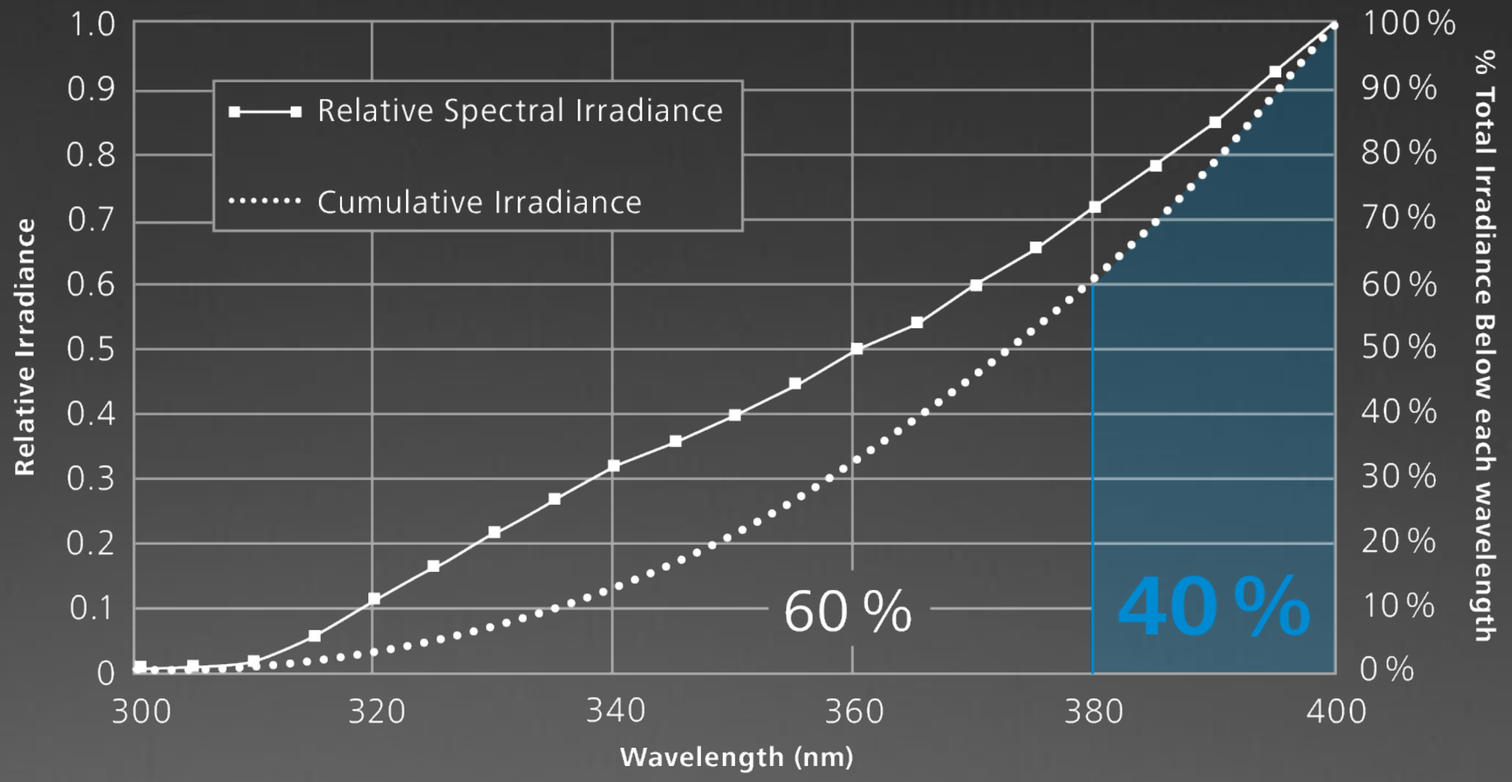
*Calbo, J., & González, J. A. (2005). Empirical studies of cloud effects on UV radiation: A review. Reviews of Geophysics, 43(2).

Current market standards for UV in lenses don't always consider the full UV spectrum up to 400nm



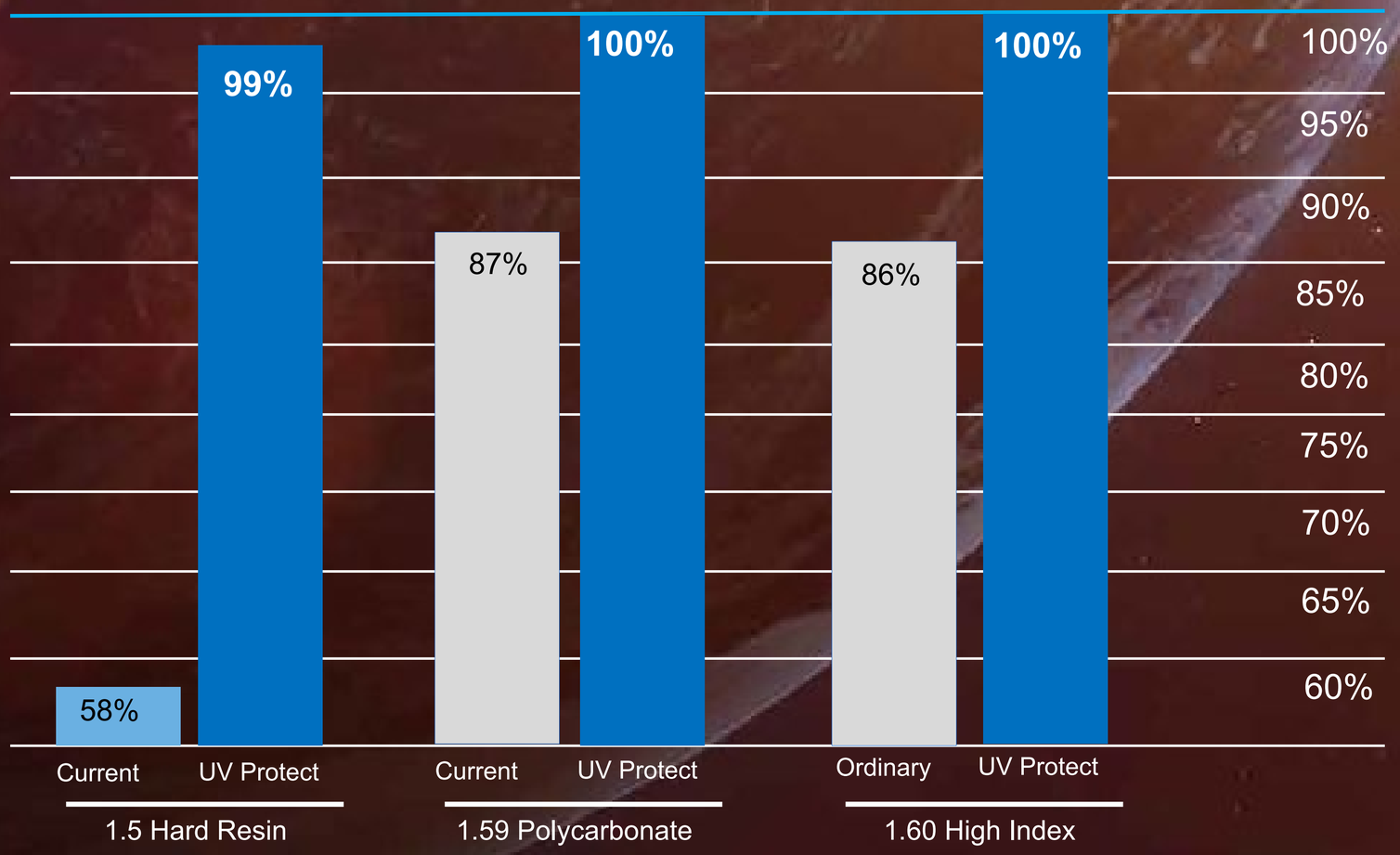
The Gap

40% of solar UVR that reaches the Earth’s surface is in wavelengths that some lens standards ignore



Solar UVR spectrum normalised to its maximum value at a wavelength of 400 nm[4]

The new standard in patient care and UV protection

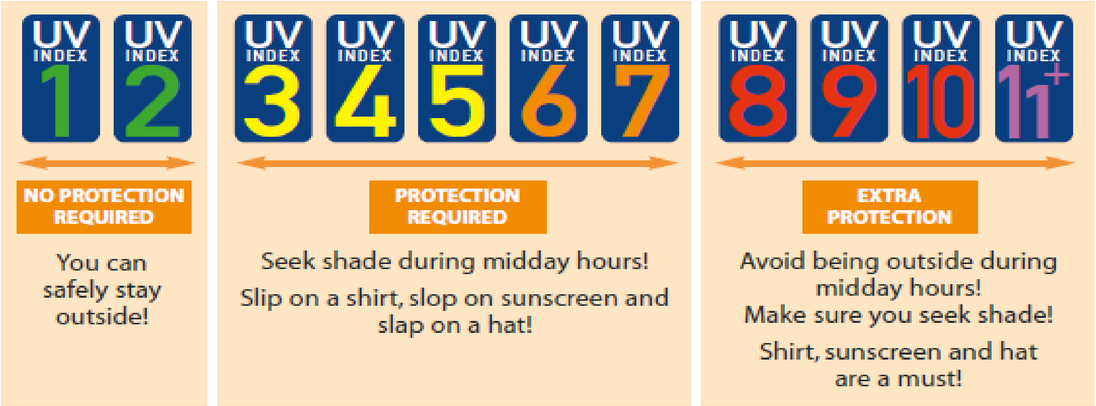


Total Solar UV radiation Protection*

*calculated from transmittance data from 280-400nm range using Solar spectralirradiance Es (λ), ISO 8980-3:2013

The UV Index.

A good indicator when protection is recommended.



UV Index 3 and above.

You might be surprised how high the UV Index is in your home town during the day.

Even in Central Europe & US; on a sunny day in summer, the UV Index easily can exceed 7 on its peak.

!

The WHO basic sun protection messages

- Limit exposure during midday hours.
- Seek shade.
- Wear protective clothing.
- Wear a broad-brimmed hat to protect the eyes, face and neck.
- **Protect the eyes with wrap-around design sunglasses or sunglasses with side panels.**
- Use and reapply broad-spectrum sunscreen of sun protection factor (SPF)15+ liberally
- Avoid tanning beds.
- Protect babies and young children.

"…Billions are spent worldwide to treat these diseases, many of which could have been prevented or delayed. The Global Solar UV Index should be an important element of an integrated and long-term public health approach to sun protection…"

(web page of the WHO)

http://www.who.int/uv/intersunprogramme/activities/uv_index/en/

PRODUCT SOLUTIONS

…on sunny days.

What are the available solutions on the market against UV Radiation?

- Sunglasses
  - Cannot be worn all day
- ZEISS UVProtect in any material
  - Sunglass level UV protection in a clear lens
- Photochromics
- Trivex, 1.67, 1.74

PRODUCT SOLUTIONS

…on Cloudy days and in the shade.

What are the available solutions on the market against UV Radiation?

- ZEISS UVProtect in any material
  - Sunglass level UV protection in a clear lens
- Photochromics
- Trivex, 1.67, 1.74

Seeing is Believing

Clear lens transmits UV
Dark lens is UVProtect
Absorbs all UV - none transmits to the eye

ZEISS CE Credits

PRO TO PRO
CONTINUING EDUCATION

PRODUCT SPOTLIGHT – ZEISS SMARTLIFE LENS TECHNOLOGY

SMARTLIFE: THE EVOLUTION OF LENS DESIGN FOR DYNAMIC CONNECTIVITY

A Complete Premium Lens Portfolio for a Connected, On-the-Move Lifestyle—No Matter the Age

By Deborah Kotob, ABOM

[1 CE CREDIT]

PRO TO PRO
CONTINUING EDUCATION

THE PANE OF INDOOR UV REVEALED

By Deborah Kotob, ABOM

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TECHNOLOGY AND PERFORMANCE MEET FASHION

ZEISS PhotoFusion and DuraVision Flash Mirrors

By Linda Conlin, ABOC, NCLEC

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MAKING THE INVISIBLE VISIBLE–

Demonstrating UV Protection to Patients

PRODUCT SPOTLIGHT: New screening technology instantly reveals effects of UV rays on eyes and skin

Deborah Kotob, ABOM

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Product Spotlight – ZEISS Vision Care – UVProtect

UV BEFORE BLUE LIGHT:

Prioritizing Light Protection for the Eyes

By Deborah Kotob, ABOM

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Closing the UV Protection Gap

Ophthalmic Lens Standards vs. Biological Protection Requirements

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By Deborah Kotob, ABOM

https://www.2020mag.com/ce/

ZEISS Virtual Expo

ZEISS Virtual Expo is a 24/7 experience, and is available now at:

www.ZeissVirtualExpo.com

ZEISS upcoming webinars

Upcoming Webinars

Today, Tuesday and Wednesday:

UVB4Blue: Prioritizing Light Protection's Role in Eye Health

Health concerns related to blue light exposure are increasing within the eye care community among consumers but with 4 out of 5 lenses not providing sunglass level UV protection, should we be focusing on giving everyone proper UV protection since there is no debate about the issues associated with UV?

Approved for 1 hour of ABO Credit

Thursday and Friday:

Beyond the Traditional Subjective Refraction

How wavefront optimization can help the majority of your patients improve their visual quality and comfort.

Approved for 1 hour of ABO Credit or 1 hour of NCLE Credit

Next Week:

Position of Wear: Measuring Success with Digital Tools

Every optician has their favorite PD ruler but in today's digital world consumers expect more. In this webinar we will explore how today's digital tools incorporate technological advancements that provide ultra-precise measurements that not only instill a higher sense of confidence but set your dispensary apart from the competition.

Eye strain and working from home

While telecommuting is not a new concept, the Novel Corona virus pandemic is creating tens of millions of new telecommuters as they adhere to social distancing guidelines. For many, the elimination of the daily commute is extending their workday which means more screen time as they work, meet, and socialize remotely. This webinar will look at the impact on our eyes this change creates and the solutions ECPs can provide to help.

Approved for 1 hour of ABO Credit or 1 hour of NCLE Credit

https://zeiss.com/webinars

Continuing Education

Is this course accredited?

- Yes, you can receive either 1 hour of ABO or NCLE

How do I get my credit?

- We currently plan to mail your physical certificate in May
  - This depends on a few factors including the ABO/NCLE being back in the office with enough time to send us the certificates, but we will send as soon as possible
- We will mail the certificate you requested (ABO or NCLE) to the address you provided during registration
  - If we have any issues we will reach out to you
- If you have any questions or concerns you can email me directly at: Brent.McCardle@zeiss.com

Thank You