



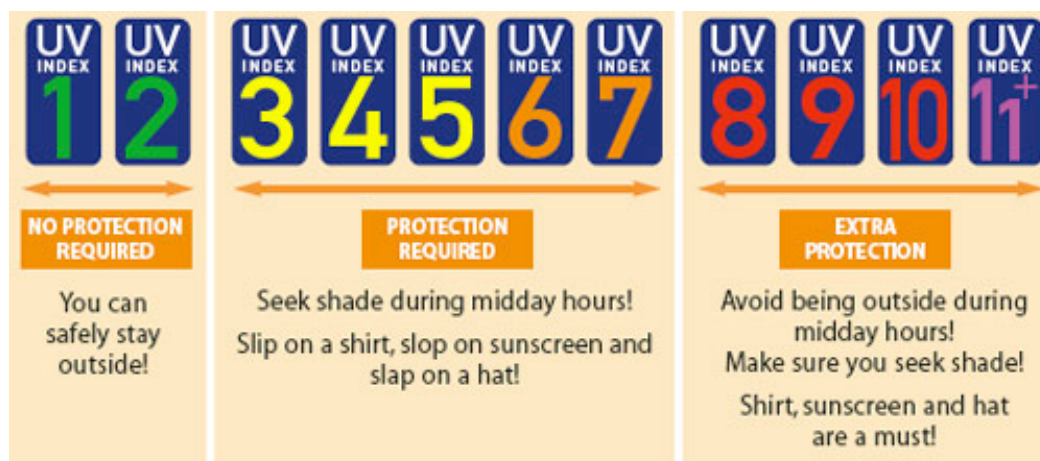
DermNet NZ

Authoritative facts about the skin from the [New Zealand Dermatological Society Incorporated](#).

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Global Solar Ultraviolet Index

The global solar ultraviolet index (UVI) describes the level of solar UVR at the Earth's surface and ranges from 1 to 11+. The higher the UVI, the greater the potential for damage to the skin and eyes and the shorter the burn time. The National Institute of Water and Atmospheric Research (NIWA) displays [predicted UVI](#) in New Zealand regions. [SunSmart New Zealand](#) provides today's UVI in your town and personal recommendations.



[Sun protective means](#) should be used whenever the UVI is over 3. These should be applied even more rigorously at very high and extreme UVI levels.

- Avoid sun around solar noon (1.30 in summer in New Zealand)
- Wear sun-protective clothing
- Put on sunglasses
- Apply [sunscreen](#) SPF 15 or 30+
- Avoid artificial sources of UVR

Levels 1 and 2: In the green band, levels one and two, the UV level is low. Low protection is needed and people can safely stay outside.

Levels 3 to 5: The yellow band, numbers three to five, indicates moderate UV levels. Protection is required when spending long periods outside.

Levels 6 and 7: Protection is essential at levels six and seven, represented by an amber band. Kiwis will be advised to follow the Cancer Society's slip, slop, slap and wrap behaviours.

Levels 8 to 10: When UV levels are in the very high red band, eight to ten, it's recommended people seek shade between 11am and 4pm, slip, slop, slap and wrap and make sure they reapply sunscreen at least every two hours.

Level 11+: Levels of 11 or higher, shown in a purple band, are regarded as extreme. Reschedule activities for the early morning and evening. Full protection is essential between 11am and 4pm.

Ultraviolet radiation

Ultraviolet radiation (UVR) is the most important preventable risk factor for skin cancer.

UVR:

- Damages skin (sunburn, premature [aging](#) and [cancer](#))
- Damages eyes (keratitis and cataracts)
- Suppresses immunity in the skin and internally
- Predisposes to [bacterial](#) and [viral](#) skin infection
- Exacerbates pre-existing [solar keratoses](#)
- Prevents innate immunity from rejecting skin tumours

Nearly 300 people die from skin cancer (mostly from [melanoma](#)) and more than 50,000 cases of melanoma and non-melanoma skin cancer are diagnosed in New Zealand each year. The cost to the health system is believed to be more than \$33 million annually.

UV radiation levels are affected by:

- The angle of the sun: the higher the sun in the sky, the higher the UVR level. This means UVR levels vary with the time of the day and the time of year.
- Latitude: the closer to equatorial regions, the higher the UVR levels.
- Cloud cover: UVR levels are highest on a clear day, but even with cloud cover, UVR can be high. And with scattered cloud it can be even higher because of reflection.
- Altitude: the thinner atmosphere at higher altitudes means less UVR is absorbed. UV increases by four percent for each 300m increase in altitude.
- Ozone: ozone absorbs some UVR that would otherwise reach the Earth's surface. Ozone levels vary over the year and even across the day.
- Reflection: UVR is reflected by different surfaces e.g. fresh snow can reflect as much as 80 percent of UVR, sand about 15 percent and sea foam about 25 percent.

Further information

The global solar UVI has been developed by the World Health Organisation (WHO) in partnership with the World Meteorological Organisation (WMO), the United Nations Environment Program (UNEP), the International Agency for Cancer Research (IARC), the International Commission on Non-Ionizing Radiation Protection (ICNIRP) and collaborating centres including the Cancer Society of New Zealand, the Health Sponsorship Council's SunSmart brand and the National Institute of Water and Atmospheric Research (NIWA).

One UVI Unit is equivalent to 25mW/m² UVR reaching the Earth's surface. The UVI forecasts usually report at least the daily maximum UVR levels averaged over a 30-minute time period, assuming there is no cloud cover and other modifying factors.

The Global Solar UVI is formulated using the International Commission on Illumination (CIE) reference action spectrum for UV-induced erythema on the human skin. The UVI is defined by the formula:

$$I_{UV} = k_{cr} \cdot \int_{250nm}^{400nm} E_{\lambda} \cdot s_{cr}(\lambda) d\lambda$$

Refer to [Intersun](#) for an explanation!

Related information

References:

- [Global Solar UV Index, A practical Guide](#) (WHO 2002)
- [Cancer Society of NZ](#)

On DermNet NZ:

- [Sun protection](#)
- [Skin cancer](#)

Other websites:

- [Intersun](#)
- [Sunsmart in New Zealand](#)
- [UVI information](#) NIWA

Books about skin diseases:

See the [DermNet NZ bookstore](#)

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DermNet does not provide an on-line consultation service.
If you have any concerns with your skin or its treatment, see a [dermatologist](#) for advice.

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