Educating the Public About the Hazards of Ultraviolet Radiation

U.S. Army Center for Health Promotion and Preventive Medicine

Technical Guide 270
September 2001

ACKNOWLEDGEMENTS

The U.S. Army Center for Health Promotion and Preventive Medicine (USACHPPM) hosted an international working group that met in Baltimore, Maryland (USA), in August 1996 and comprised the following members who participated in the development of this technical guide:

Mph. Cecilia Boldemann, Karolinska Hospital, Stockholm, Sweden
Mr. William Bonta, National Conference of Radiation Control, Program Director, USA
Prof. E. W. Breitbart, Dermatologische Praevention, Hamburg, Germany
Ms. Dominique Bressoud, Swiss Federal Office of Public Health, Bern, Switzerland
Dr. Jean-Pierre Cesarini, Sécurité Solaire, Paris, France
Dr. Mark Davis, Major, USACHPPM, Aberdeen Proving Ground, Maryland, USA
Dr. Yvon Deslauriers, Health Canada, Ottawa, Ontario, Canada
Ms. Drusilla J. Hufford, U.S. Environmental Protection Agency (USEPA), Washington DC, USA
Dr. Michinori Kabuto, National Institute for Environmental Studies, Ibaraki, Japan
Prof. Yoon Shin Kim, Hanyang University, Seoul, Korea
Ms. Janice Langford, USACHPPM, Aberdeen Proving Ground, Maryland, USA
Dr. Martin Lehnert, Bochum, Germany
Mr. Ruediger Matthes, Bundesamt für Strahlenschutz, Oberschleissheim, Germany
Dr. Michael H. Repacholi, World Health Organization (WHO), Geneva, Switzerland
Dr. Colin Roy, Australian Radiation Laboratory, Yallambie, Victoria, Australia
Dr. David Sliney, USACHPPM, Aberdeen Proving Ground, Maryland, USA
Mr. Stephen Wengraitis, USACHPPM, Aberdeen Proving Ground, Maryland, USA

Editors:
Velma L. Buchanan, USACHPPM
Drusilla Hufford, USEPA
Eva Rehfuess, WHO
David H. Sliney, USACHPPM
Stephen Wengraitis, USACHPPM

PREFACE

This technical guide is intended to provide guidance on effectively educating the public about the health hazards of excessive exposure to ultraviolet radiation (UVR). This publication also describes how the ultraviolet radiation index (or "UV Index") can be used to raise awareness about the variation in UVR levels, their damaging effects, and the amount of protection needed to avoid sun damage.

An international group of experts working under the auspices of the World Health Organization (WHO) INTERSUN Program contributed to this technical guide. INTERSUN, the Global UV Project, was established in 1992 to coordinate and evaluate international research, and to develop practical ways of monitoring change in UV-induced health effects over time in relation to environmental and behavioral change. The INTERSUN Program is also working to generate an appropriate public health response through recommendations and information dissemination, including the educational use of the UV Index. The latest information can be obtained at the Program's website (http://www.who.int/uv/).

TABLE OF CONTENTS

INTRODUCTION

For most people, the sun is the primary source of UVR exposure. Skin cancer, photo ageing of the skin, and cataracts are just a few of the potential health hazards associated with overexposure to UVR. The primary purpose of educating the public about UVR exposure is to reduce the incidence of sunburn, particularly among children and adolescents. Decreasing overall cumulative UVR exposure is also important. Teachers and educators in the local school systems are in a unique position to convey information about the health hazards of excessive exposure to the sun. Furthermore, the media (radio and television news and weather reporters, newspaper and magazine publishers, etc.) can use an educational tool known as the "UV Index" as a daily reminder for people to practice sun-safe behaviors. General campaigning by public health personnel at shopping centers, beaches, and other gathering places is another way to disseminate information about the adverse effects of increased UVR exposure and appropriate measures to mitigate the effects.

When establishing a program designed to educate the public about UVR exposure and the UV Index, it will be necessary to survey the population to determine the baseline level of knowledge, attitudes and behavior. Good recordkeeping and additional surveys can assess the effectiveness of the program or campaign. Such evaluation is an essential element of any intervention program, and is necessary to demonstrate changes in knowledge, attitudes and behavior and to improve the delivery of the message. Creating a supportive environment, both ideological and financial, is another important factor in ensuring the success of any educational campaign.

ESTABLISHING AN EDUCATIONAL PROGRAM ON UVR HAZARDS AND PROTECTION

Surveying the population

Use questionnaires to conduct an initial survey to determine how much is already known. Decide who should participate in the survey (target audience) and how many people should be included, as well as what data is needed (what questions should be asked). If possible, involve epidemiologists in designing the survey. Baseline data should reflect the characteristics of the country or region where the program will be implemented, such as (1) the culture, (2) the climate, (3) the educational system, (4) the social structure, (5) the methods used to communicate information, etc. Work and social habits vary among countries as do sunburn incidence and prevalence and the level of knowledge regarding the UV Index and UVR protection.

Using the UV Index as an educational tool

In an international effort to raise public awareness about the damaging effects of UVR, the World Health Organization (WHO), the World Meteorological Organization (WMO), and the International Commission on Non-Ionizing Radiation Protection (ICNIRP) developed an educational tool known as the Global Solar UV Index. The UV Index is now used in many countries to inform the public about the level of hazardous solar UVR exposure. Typically, the UV Index is reported daily and predicts the maximum UVR level expected on the following day. The UV Index uses a simple scale. The values range from zero upward, and the higher the index value, the greater the likelihood of skin- and eye-damaging exposure to UVR and the less time it takes for damage to occur.

For public education, the levels of the UV Index should be "translated" into levels of severity that are easy to understand, using language that creates a link to everyday situations. Protective measures should be recommended as well. This will enable people to plan what protective measures are necessary based on how intense the UVR exposure is expected to be. There remain differences of opinion among experts as to the specific protective measures that must be adopted as the UV Index values increase. The WHO INTERSUN Program is continuing to work in resolving these differences, and the latest information can be obtained from the WHO website (http://www.who.int/uv/).

Delivering the message

The results of the initial survey should be used to determine the messages that need to be emphasized in the campaign. Three major avenues exist for disseminating information about the UV Index and the health effects of excessive exposure to UVR: *schools*, the *mass media*, and *general campaigns* designed to reach a broad spectrum of the population. While the techniques used to improve knowledge, attitude and behavior may be the same (e.g., pilot studies in schools and among the general population), the level of difficulty of the material presented will depend on the audience. For example, a discussion of ozone layer depletion designed for environmental protection specialists will need to be adapted to meet the educational level of children.

Schools. Through local departments of education, teachers can play an active role in advising their pupils about the health hazards of excessive exposure to the sun. Initiatives in Australia and the United States have shown that educators can effectively convey the message about UVR and public health. Commitment on the part of educators is vital to good communication and to reducing the health hazards associated with UVR exposure.

- *Introducing the program to current teachers.* The initial survey can be conducted to gauge students' reactions to information about UVR and identify the subject matter that creates the strongest reaction in students. Personally discuss the UVR educational program with the teachers, and explore ways to naturally integrate the message into the teachers' lesson plans so it is relevant (e.g., relate UVR protective measures and discussion of the UV Index to school subjects or summer/winter vacation).

- *Introducing the program to new teachers*. Encourage the integration of UVR education into college curricula, particularly colleges of teaching and medical schools. Teachers and medical practitioners must be knowledgeable about the UV Index and UVR protective measures if they are to assume a teaching role, and curricula should be designed accordingly. Graduates of teaching colleges and medical schools can help to design educational programs for the school system, as well as for public health service agencies. It is important that students in these colleges and schools help to develop the programs that will operate in their settings.

Mass media. Local television and newspapers can be used to inform the public about UVR protection and the UV Index. How the information is delivered to the public is very important. Use unrelated events as a "hook," or try hiding the message about UVR protection in other messages. For example, one motion picture included outdoor scenes in which an authority figure consistently reminded a visitor to wear sunscreen. Another motion picture depicted characters who ignored warnings about solar UVR reflections from sea foam at the beach, and they suffered severe sunburns as a consequence.

•*Message design.* Messages in the mass media should be kept simple, with only one or two core messages delivered at a time. Media campaigns in France have shown the value of simple, clear messages and logos symbolizing the campaign. For national-level campaigns, involve well-known and respected organizations. For local campaigns, small community newspapers might be the best way to advertise the message. Consider using spokespersons who are well-known and easily identified, as well as champions of human interest issues, although this approach may not work in all cultures. Avoid the use of the word "don't" since it has a negative connotation and could diminish the effectiveness of the message. Collaborate with the medical community (general practitioners, pediatricians, dermatologists, ophthalmologists, etc.) to assure scientific credibility of the message. Update the campaign periodically, refining messages based on new surveys, new research, etc.

•*Message hierarchy.* Use the initial survey to determine what aspects of UVR protection need to be emphasized. The following is a suggested hierarchy of the messages to be included in mass media campaigns on UVR protection and the UV Index. The order of this hierarchy may differ from country to country.

- Limit exposure during midday hours (10 am to 4 pm).
- Seek shade if it is necessary to be outside during midday hours.
- Wear protective clothing if outside (for example, white clothing with a tight weave or multiple layers of light weave).
- Wear a broad-brimmed hat to protect the eyes, face and neck.
- Protect the eyes with wraparound-design sunglasses or sunglasses with side panels.
- Avoid tanning beds.
- Keep babies under 12 months out of the sun, as well as persons with immune disease or those who use sun-sensitizing drugs.
- Use sunscreen with sun protection factor (SPF) 15+ liberally, and reapply often on areas of the body that are not protected by clothing.

General campaigns and their audiences. General campaigns can help to educate the public about UVR protection and the UV Index. Provide a stage for the message in as many relevant settings as possible. There are many ways to reach people, and certain categories of people in the general population need to be targeted.

•*Tourist industry.* Members of the tourist industry need to be aware of their responsibility in protecting public health. Encourage hotels to post the UV Index and "sell" safe holidays to their customers. Airlines can report the UV Index at the destination to passengers and show short videos about UVR exposure and protection in airport waiting areas. Tourists need to be educated about the hazards from UVR ground reflections in snow environments. Ground reflections can cause severe stress to the eye regardless of eye color, and stress can lead to the formation of cataracts. Hazy days may be more damaging than cloudless days.

•*Occupationally exposed persons.* The hazards of UVR exposure to occupationally exposed people, like fishermen, sailors, street workers, and farm workers, can create problems for employers in terms of liability. Because of liability claims, workers in the Australian Outback now must be provided with hats and sunglasses. Public service postings on billboards and at bus stops can be used to reach street workers, much like the anti-tobacco smoking messages so widely disseminated in the United States. Fishermen and farm workers may be more difficult to reach, requiring mass mailings to the workers or adoption of a general policy that requires employers to educate their outdoor workers. Subsequent surveys can then be performed to ensure that the workers received education in UVR exposure and the UV Index.

•*Recreationally exposed persons.* Recreational boaters, school children, day care providers, spectators at sporting events, etc., are among those who are "recreationally exposed" to the sun. Public officials, such as city planners and mayors, can help to reduce the risk for this population group by devising new rules for swimming pools and arranging for tree plantings and the building of awnings and other shading structures to increase shade. The UV Index can be displayed at leader boards at sporting events and during flybys at beaches where permitted.

Public officials can arrange for educational events at beaches, with free sunscreen giveaways and information brochures distributed at golf tournaments and car club meets. Physicians specializing in sports medicine can distribute literature pertaining to sun exposure to patients.

•*Children (outside of school) and new parents.* Pediatricians can be instrumental in disseminating information to new parents. Health care center waiting rooms can feature short

videos, and doctors can mail pictures of skin lesions to patients and their families. A routine mailing of such pictures showed some public benefit in Switzerland.

Funding

Financial resources are necessary to establish any educational program and make it work. Costs can be considerable. This is especially true for population surveys, which usually involve time-consuming recordkeeping and evaluation processes.

Most government and international agencies are interested in protecting public health and catalyzing positive behavior change, but are unlikely to have adequate funding for large-scale efforts. Successful programs will rely heavily on partnerships among government agencies, private sector participants, and media partners. Efforts in France between government and the private sector have been successful. In Germany, insurance companies support educational efforts pertaining to UVR protection and the UV Index.

Volunteer work can also help defray costs considerably. Medical schools and teaching colleges; university and medical center departments of community and family medicine; and institutions engaged in health promotion and behavioral, psychological, sociological and epidemiological research are all good sources for locating volunteers. Some of these institutions are publicly funded with the purpose of monitoring behavioral changes in society.

CREATING A SUPPORTIVE ENVIRONMENT FOR UVR EDUCATION

Building networks and alliances

To create a supportive environment for the integration of UVR protection into the culture of a country, it is necessary to establish working relationships with strategic authorities, institutions, and organizations as well as other cooperative partners such as cancer associations. Personal communication with people in the organizations is always best. Try to assess the level of receptivity for UVR education within the organization and the feasibility, in terms of time and staff, of permanent involvement and commitment to the program. Determine if the organization is already involved in projects related to UVR exposure, and convince the organization that a new project will reinforce the work already in progress.

Seeking help from personnel in the media

Establish a relationship with television and radio reporters, meteorologists, journalists, magazine editors, etc. Instead of mass mailings, solicit their help through personal contact. Remember that they are busy people. Simplify their jobs by writing the message for them or providing them with illustrative pictures or draft articles that they can modify. Encourage increased reporting of the UV Index as it relates to leisure time and vacations (e.g., routine reporting on weekends and on a seasonal basis). Target ski reporters and beach reporters, as well as publishers of parents' and women's magazines and sports magazines.

Finding other allies

Besides those in the media, there are other people and organizations who can help to get the message delivered and who are willing to be "champions" of the cause. Following are some suggestions on how to gain their support:

- Talk to environmental protection specialists, and make them aware of their responsibility as advocates of UVR education programs. Without their support, the program goals will be impeded.

- Provide cosmeticians with information to share with customers, and try to involve cosmetics and personal care products companies in changing the image of "what is beautiful." Discourage the use of tanning beds.

- Talk with the telephone companies, and lobby to have the UV Index reported on telephone weather lines.

EVALUATING THE SUCCESS OF THE UVR EDUCATIONAL PROGRAM

Resurveying throughout the program and good recordkeeping practices are crucial in determining if the UVR educational program has been effective. Evaluation should occur approximately one year after the start of the program, and, ideally, follow-up surveys should be performed on a yearly basis. Examples of strong follow-up surveys include efforts by the Centre for Behavioural Research in Cancer, the Anti-Cancer Council of Victoria, Australia (Dr. David Hill), and the Boston University Oncology Center (Dr. Howard Koh and Allan Geller).

Some experts recommend a minimum of three surveys to establish whether the effects of the intervention are permanent. For example, have there been changes in people's behavior in terms of wearing hats, using umbrellas, etc.? Has there been an increase in the sale of sunscreens, particularly those with a high SPF? Are there still misunderstandings and myths surrounding UVR exposure? If no changes occur, strategies must be revised, renewed, reinforced, or reoriented.

APPENDIX A: REFERENCES

Buller D.B., Borland R., Skin cancer prevention for children: A critical review *Health Education and Behavior* 26(3):317-343, 1999.

Cesarini P., Cesarini J.-P., UV Index and communicating UV information to the public *Measurements of Optical Radiation Hazards* (edited by: Matthes R., Sliney D., DiDomenico S., Murray P., Phillips R., Wengraitis S.) 437-442, Commission International de l'Eclairage (CIE)/ICNIRP, Vienna, 1998.

Diffey B., Personal protection: The way forward *Radiation Protection Dosimetry* 91(1-3):293-296, 2000.

Fergusson A., Environment Canada's children's UV index sun awareness programme *Radiation Protection Dosimetry* 91(1-3):317-343, 2000.

Glanz K., Lew R.A., Song V., Cook V.A., Factors associated with skin cancer prevention in a multiethnic population *Health Education and Behavior* 26(3):344-359, 1999.

Graffunder C.M., Wyatt S.W., Bewerse B., Hall I., Reilley B., Lee-Pethel R., Skin cancer prevention: The problem, responses, and lessons learned *Health Education and Behavior* 26(3):308-316, 1999.

Hill D., Dixon H., Promoting sun protection in children: Rationale and challenges *Health Education and Behavior* 26(3):409-417, 1999.

Hoegh, H.J., Davis B.D., Manthe A.F., Sun avoidance practices among Non-Hispanic white Californians *Health Education and Behavior* 26(3):360-368, 1999.

Holloway L., Shadow method for sun protection *Lancet* 335:484, 1990.

Hooker G., Rapporteur's report: Personal exposures, public perception and dissemination *Radiation Protection Dosimetry* 91(1-3):287-292, 2000.

Hughes B.R., Altman D.G., Newton J.A., Melanoma and skin cancer: Evaluation of a health education programme for secondary schools *British Journal of Dermatology* 128:412-417, 1993.

Lowe J.B., Balanda K.P., Stanton W.R., Gillespie A., Evaluation of a three-year school-based intervention to increase adolescent sun protection *Health Education and Behavior* 26(3):396-408, 1999.

Melia J., Pendry L., Eiser J.R., Harland C., Moss S., Evaluation of primary prevention of skin cancer: A UK perspective *Radiation Protection Dosimetry* 91(1-3):317-343, 2000.

Miller D.R., Geller A.C., Wood M.C., Lew R.A., Koh H.K., The Falmouth safe skin project: Evaluation of a community program to promote sun protection in youth *Health Education and Behavior* 26(3):369-384, 1999.

New C., Driscoll C.M.H., Kitchen K., Miners B., The global solar UV index used in the United Kingdom *Radiation Protection Dosimetry* 91(1-3):313-316, 2000.

Parrott R., Duggan A., Cremo J., Eckles A., Jones K., Steiner C., Communicating about youth's sun exposure risk to soccer coaches and parents: A pilot study in Georgia *Health Education and Behavior* 26(3):385-395, 1999.

Repacholi M., Global solar UV index *Radiation Protection Dosimetry* 91(1-3):307-312, 2000.

Sinclair C., Dobbinson S., Montague M., Can a skin cancer control programme make a difference? A profile of the SunSmart programme *Radiation Protection Dosimetry* 91(1-3):301-302, 2000.

Slevin T., Clarkson J., English D., Skin cancer control in Western Australia: Is it working and what have we learned? *Radiation Protection Dosimetry* 91(1-3):303-306, 2000.

Solórzano L., Hernandez G., Jaramillo D., Colombia : 40 million people exposed to extreme ultraviolet radiation during the whole year *Radiation Protection Dosimetry* 91(1-3):325-328, 2000.

Wester U., Paulsson L.-E., The influence of a UV index on the attitudes of a Swedish population towards sun exposure *Radiation Protection Dosimetry* 91(1-3):323-324, 2000.

APPENDIX B: EXAMPLES OF INFORMATIVE BROCHURES AND INFORMATION DISSEMINATION TECHNIQUES

This appendix provides examples of some of the techniques, illustrations, and wording used in international campaigns to combat skin cancer. Remember, however, that messages and campaigns pertaining to the health effects of UVR must accurately reflect the most current research on the subject.

Example 1 provides sample brochure information on the Global Solar UV Index, UVR environmental exposure aspects, health effects, protection methods, and links to UV Index websites around the world (current as of December 2000). However, there remain differences of opinion among experts as to the exact SPF guidance and specific protective measures that must be adopted as the UV Index values increase. The WHO INTERSUN Program is continuing to work in resolving these differences, and the latest information can be obtained from the WHO website (http://www.who.int/uv/). In addition, the following websites may have further, more current materials for use in educational pamphlets:

Educational Materials and Source Country	Website
SunSmart Campaign, Victoria, Australia	http://www.sunsmart.com.au/
SunSmart Campaign, Western Australia	http://www.cancerwa.asn.au
Environment Canada, Canada	http://www.msc-smc.ec.gc.ca/uvindex/
Sécurité Solaire, France	http://www.club-internet.fr/securite-solaire/
Sun Know How Program, United Kingdom	http://www.doh.gov.uk/sunknowhow/
SunWise School Program, United States	http://www.epa.gov/sunwise/idex.html

Example 2 is a reproduction of a page from the U.S. Environmental Protection Agency's (USAEPA) "Be Sun Wise" Program. It graphically explains the increase in sun exposure risk and the precautions needed based on increasing values of the UV Index. **Similar illustrations have been used in other programs, but the same descriptors and categories of exposure are not always used. Efforts have been underway to standardize the terminology, wherever feasible.**

Example 3 is from Sécurité Solaire, France, and shows how pictures of friendly cartoon characters can explain scientific concepts to even the youngest audiences.

Example 1: Information Pertaining to UVR Exposure, Health Effects, and Protection (Sample Brochure)

Healthy people are active people who often spend a lot of time outdoors. To fully enjoy an outdoor lifestyle, it is important to know that the sun's UVR can have unwanted health effects.

UVR and the UV Index

The sun's rays include visible light, heat and UVR, and the sun is by far the strongest source of UVR in our environment.

The major factors that affect the level of UVR are:

- Solar elevation or "height" of the sun in the sky.
- Cloud cover.
- Ozone.
- Altitude.
- Shade effects and ground reflection.

Solar elevation or "height" of the sun in the sky. UVR is most intense when the sun's elevation is at its highest in the sky (i.e., closer to directly overhead). The height of the sun varies with the following factors:

- Time of day. The two hours before and after solar noon are the most dangerous time periods. This is generally around midday.
- Time of year. The sun's height varies with the season, and UVR levels are highest during the summer months.
- Latitude. During any given month, the sun is higher in the sky at locations closer to the equator.

Cloud cover. UVR intensities are highest under cloudless skies, and cloud cover generally lowers a person's exposure. Cloud thickness and extent determine how much UVR levels are reduced. UVR levels can actually increase on days that are mostly overcast if the sunlight penetrates and reflects off the cloud layer.

Ozone. Ozone is a gas present in the earth's upper atmosphere. It is extremely important as it shields the earth from the sun's harmful UVR. As the ozone layer gets thinner, the protective filter activity of the atmosphere is progressively lost, and more UVR reaches the earth's surface. Consequently, people and the environment are exposed to higher levels of UVR.

Altitude. UVR increases with altitude above sea level, being highest in the mountains and lowest at sea level.

Shade effects and ground reflection. Judicious use of shade can substantially reduce UVR exposure. However, many surfaces including sand, sea foam, concrete and dry grass reflect UVR and add to one's overall exposure. Fresh snow is an especially good reflector; hence people in snow-covered areas need to protect their skin from sunburn even in winter. "Snow blindness" is caused by the high UVR exposures that are typical of snow-covered mountain regions, and people must protect their eyes with goggles.

Health Effects of UVR Exposure

UVR affects the skin, eyes, and immune system. The immediate risk from prolonged exposure to UVR is sunburn, but the most serious long-term health risk is skin cancer. An individual's sensitivity to UVR varies considerably. Fair-skinned people with minimal ability to tan have a much higher risk of sunburn and skin cancer than dark-skinned people. However, darker skin provides no protection against damage to the eyes or immune system.

Sunburn. In its mildest form, sunburn consists of a reddening of the skin. A strong sunburn may cause the skin to blister and peel, which is not only painful but also leaves the very white and fresh skin underneath unprotected and even more prone to UVR damage.

Melanoma skin cancer. Malignant melanoma is the rarest but most dangerous type of skin cancer. It is one of the most common cancers among 20- to 35-year-olds. In many countries melanoma cases have doubled in the past two decades, and the rise in cases is expected to continue. The chances of survival are good if the cancer is recognized and treated early. If untreated, the tumor can develop rapidly, and cancer cells can spread to other parts of the body.

Other skin cancers. In contrast to malignant melanoma, the non-melanoma skin cancers, basal and squamous cell carcinoma, are rarely fatal. They grow slowly and rarely spread to other parts of the body (metastasize). Nevertheless, they should be treated at an early stage.

Skin ageing. Sun exposure causes premature skin ageing. The skin gradually loses its elasticity, leaving wrinkles, sags and bags. UVR exposure can also be responsible for the dark patches or liver spots often seen in elderly people.

Eye damage. Exposure to UVR over long periods can cause inflammation of the eye. An extreme form of this is snow blindness that sometimes is experienced by skiers and climbers at high altitudes. UVR exposure also accelerates the development of cataracts that can lead to blindness if untreated.

Suppression of the immune system. The immune system is the body's defense mechanism against disease and cancer. Environmental UVR levels are sufficient to suppress the immune system, and may reduce the body's resistance to infections. For example, sunlight exposure can precede the onset of recurrent eruptions of cold sores.

The Global Solar UV Index

The Global Solar UV Index is a measure of the maximum level of sunburning UVR on a given day. It is reported on a scale from 0 to about 15 – the higher the index value, the greater the likelihood of skin- and eye-damaging exposure to UVR, and the less time it takes for damage to occur. The UV Index can provide important information to help you prevent UVR damage.

Index Values	Exposure Category
1 to 2	Low
3 to 5	Moderate
6 to 7	High
8 to 10	Very High
11+	Extreme

Note: The various exposure categories and the protection messages associated with them will vary from country to country. The WHO INTERSUN Program is continuing to work in resolving these differences, and the latest information can be obtained from the WHO website (http://www.who.int/uv/).

Protective Measures to Follow Based on the UV Index

Protective measures allow you to enjoy outdoor activities safely. By taking a few simple precautions, you can greatly reduce your risk of sun-related illnesses. The following table recommends protective measures for the various levels of the UV Index. The table is based on the assumption that the reader has sensitive skin typical of fair-skinned Caucasians.

1 to 2	You can safely enjoy being outside!
3 to 7	Seek shade during midday hours! Slip on a shirt, slop on sunscreen and slap on a hat!
≥ 8	Try to avoid being outside during midday hours! Seek shade, slip on a shirt, slop on sunscreen and slap on a hat!

More Messages: A Checklist of Action Steps for Sun Protection

Limit time in the midday sun. The sun's UV rays are strongest between 10 a.m. and 4 p.m. To the extent possible, limit exposure to the sun during these hours.

Pay attention to the UV Index. This important resource helps you plan your outdoor activities in ways that prevent overexposure to the sun's rays. While you should always take precautions against overexposure, take special care to adopt sun safety practices when the UV Index predicts exposure levels of very high or extreme.

Use shade wisely. Seek shade when UV rays are the most intense, but keep in mind that shade structures such as trees, umbrellas or canopies do not offer complete sun protection. Remember the shadow rule: "Watch your shadow – No shadow, seek shade!"

Wear protective clothing. A hat with a wide brim offers good sun protection for your eyes, ears, face, and the back of your neck. Sunglasses that provide 99 to 100 percent UV-A and UV-B protection will greatly reduce eye damage from sun exposure. Tightly woven, loose-fitting clothes will provide additional protection from the sun.

Use sunscreen. Apply a sunscreen with SPF 15+ liberally and reapply every 2 hours, or before working, swimming, playing or exercising outdoors.

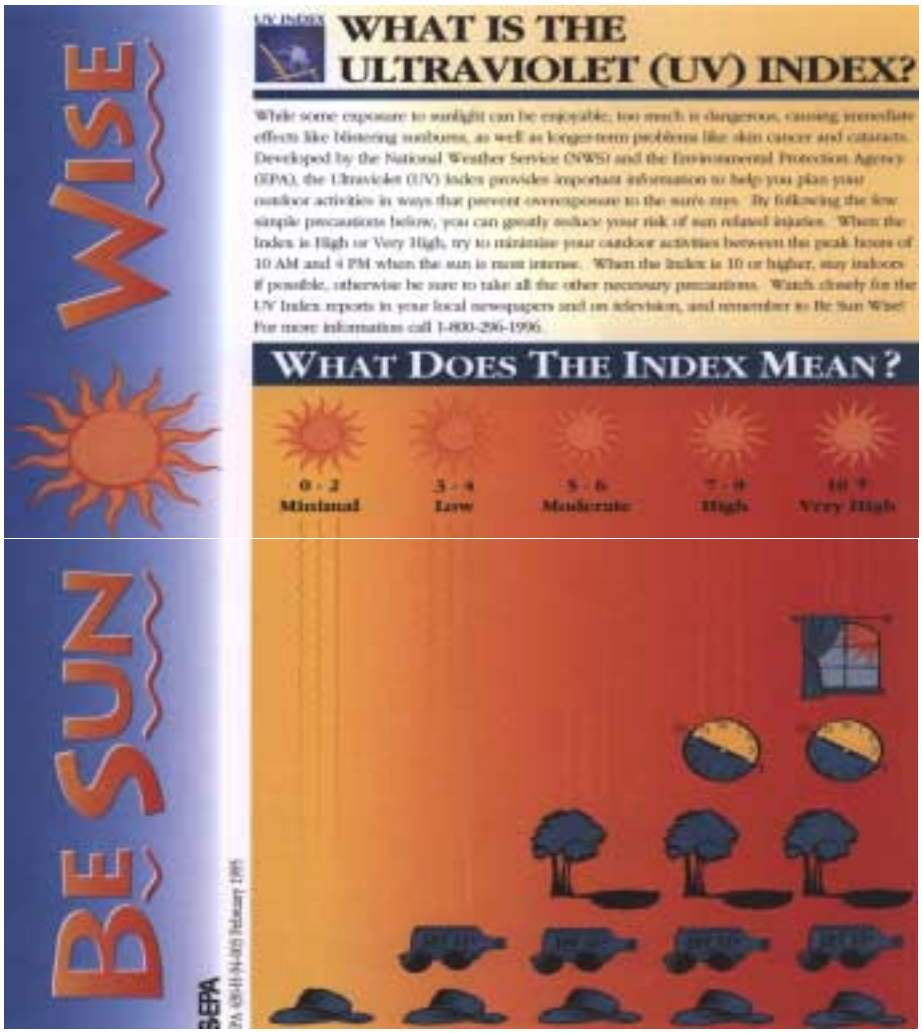
Avoid sunlamps and tanning parlors. Sun beds damage the skin and unprotected eyes, and are best avoided entirely.

Remember to protect children. Children are at a higher risk of suffering damage from exposure to UVR than adults and therefore require special protection. Children are usually not aware of the harmful effects of UVR; parents are responsible for protecting their children from damage due to UVR exposure. The following guidance is offered for parents and those charged with the care of children:

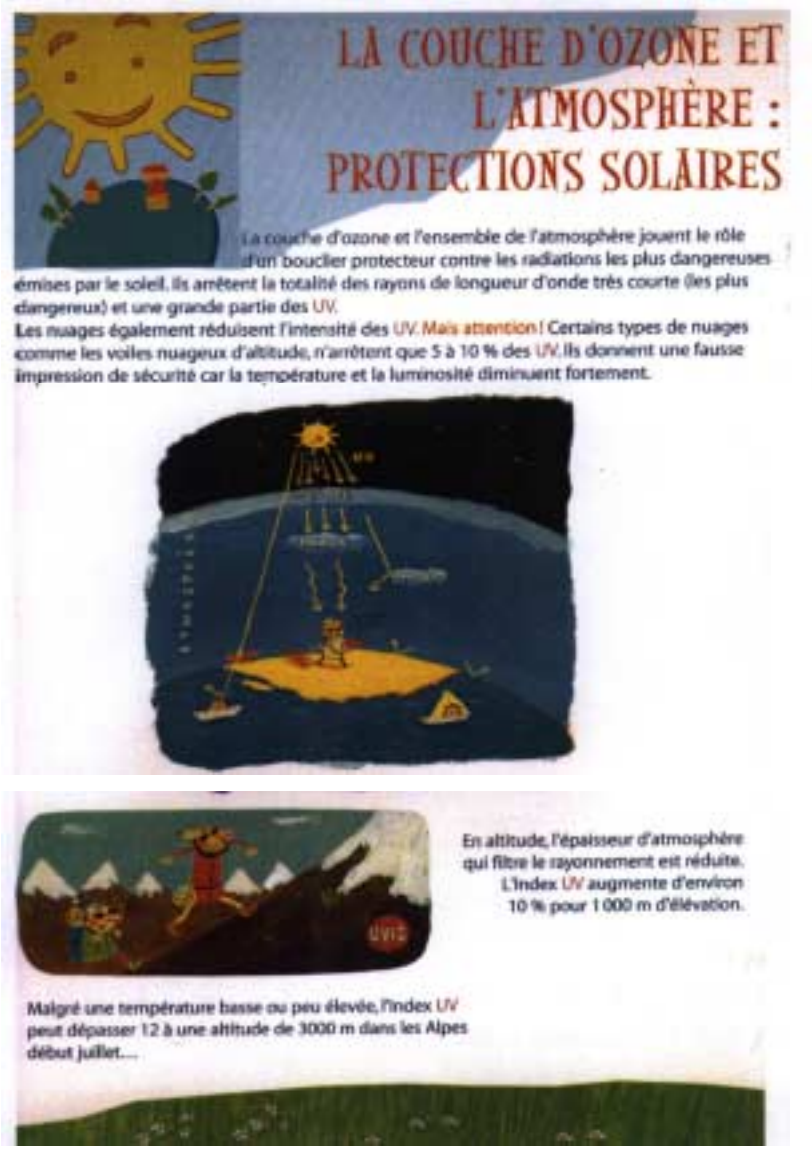
- Always keep babies younger than 12 months in the shade.
- Never let infants or young children sleep in the sun.
- Encourage children to play in the shade.
- Make sure children wear protective clothing, including a hat and sunglasses, when they go outdoors.
- Get children used to wearing sunscreen.
- Apply sunscreen lotion generously to children.
- Pay particular attention to the most exposed body parts — the face, neck, shoulders, back, knees and tops of feet.
- Never allow children or teenagers to use sunlamps.

Source: USEPA, SunWise School Program.

Example 2: Informative Leaflet Using Graphical Techniques to Describe the UV Index, the Increase in Sun Exposure Risk, and the Necessary Protective Measures



Example 3: Informative Leaflet From Sécurité Solaire, France, Showing How Pictures With Friendly Cartoon Characters Can Explain Scientific Concepts to Young Audiences



APPENDIX C: UV INDEX WEBSITES FOR VARIOUS COUNTRIES

World	Institut für Medizinische Physik und Biostatistik Veterinärmedizinische Universität Wien http://i115srv.vu-wien.ac.at/uv/uv_online_alt.htm#uvimaps
Australia	Bureau of Meteorology http://www.bom.gov.au/info/about_uvb.shtml
Argentina	Centro Regional de Dados Satelitales http://www.conae.gov.ar/iuv/iuv.html Servicio Meteorologic Nacional http://www.meteofa.mil.ar/
Canada	Atmospheric Environment Service http://www.msc-smc.ec.gc.ca/uvindex/
Finland	Ilmatieteen Laitos http://www.ozone.fmi.fi/
France	Sécurité Solaire http://www.securite-solaire.org/
Germany	Bundesamt für Strahlenschutz http://www.bfs.de/uvi/index.htm
Israel	Israel Weather Forecast http://www.weather.co.il/radio.asp
Italy	Stazione Metereologica del La.M.M.A. http://www.lamma.rete.toscana.it/previ/ita/stazlam.htm
Japan	Shiseido UV Ray Information http://www.shiseido.co.jp/e/e9708uvi/html/index.htm
Luxembourg	Meteorological Station of the Lyceé Classique de Diekirch http://www.restena.lu/meteo_lcd/
Mexico	Mexico City Air Quality Report http://sima.com.mx/sima/df/_zseeng.html
Norway	NOAA/ EPA Ultraviolet Index http://www.cpc.ncep.noaa.gov/products/stratosphere/uv_index/index.html
Sweden	Swedish Meteorological and Hydrological Institute http://www.smhi.se (main page of Institute)
United Kingdom	The Meteorological Office http://www.met-office.gov.uk/sec3/gsuvi.html
United States	The Weather Channel http://www.weather.com/health/uvindex.html

Local Reproduction Authorized
And Encouraged