

WHO INFORMATION SERIES ON SCHOOL HEALTH DOCUMENT SEVEN

Sun Protection: An Essential Element of Health-Promoting Schools

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*This document is dedicated
to the memory of*

Herbert Loeb Friedman

*who contributed
significantly to the health
and development of
adolescents*

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Sun Protection: An Essential Element of a Health-Promoting School was written for WHO by Stephanie Harper, The Cancer Council of Victoria, Australia in collaboration with Eva Rehfuess, Intersun, the Global UV Project, and Jack Jones, WHO Global School Health Initiative. It was edited by Jennifer Davis-Kay, Education Development Center Inc. (EDC), WHO Collaborating Centre to Promote Health through Schools and Communities, United States.

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Anat Aizik
Israel Cancer Association
Givatayim, Israel

Cecilia Boldeman
Karolinska Hospital
Stockholm, Sweden

Pierre Césarini
Association Sécurité Solaire
Paris, France

Angus Fergusson
Meteorological Service of Canada
Ontario, Canada

Robin Fuchs-Young
Anderson Cancer Centre, University of Texas
Smithville, United States

Beat Gerber
Swiss Federal Office of Public Health
Bern, Switzerland

Sandra Gordon
Eastern Health and Social Services Board
Belfast, Northern Ireland

Sharon Henry
Eastern Health and Social Services Board
Belfast, Northern Ireland

Drusilla Hufford
U.S. Environmental Protection Agency
Washington, United States

Gianni Mariutti
Istituto Superiore di Sanita
Rome, Italy

Jill Meara
National Radiological Protection Board
Chilton, United Kingdom

Irena Miseviciene
Kaunas University of Medicine
Kaunas, Lithuania

Ulrik Ringborg
Karolinska Hospital
Stockholm, Sweden

Mike Repacholi
World Health Organization
Geneva, Switzerland

Colin Roy
Australian Radiation Protection and Nuclear
Safety Agency
Melbourne, Australia

Miguel Angel Santinelli-Ramos
Institute of Security and Social Services for the State
Workers
Mexico City, Mexico

Mona Saraiya
Centers for Disease Control
Atlanta, United States

Craig Sinclair
The Cancer Council of Victoria
Carlton Victoria, Australia

Terry Slevin
Cancer Foundation of Western Australia
West Perth, Australia

Skaidra Valiukeviciene
Kaunas University of Medicine
Kaunas, Lithuania

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Foreword

Investments in schools are intended to yield benefits to communities, nations and individuals. Such benefits include improved social and economic development, increased productivity and enhanced quality of life. In many parts of the world, such investments are not achieving their full potential, despite increased enrolments and hard work by committed teachers and administrators. This document describes how the results of educational investments can be enhanced, by increasing the capacity of schools to promote health as they do learning.

For better or worse, health influences education. If children are healthy, they can take full advantage of every opportunity to learn. But, children who cannot attend school because of poor health or unhealthy conditions cannot seize the opportunities that schools provide. Similarly, schools cannot achieve their full potential if children who attend school are not capable of learning well. Poor health and unhealthy conditions jeopardize the value of school attendance. But education can also help promote healthy attitudes and behaviour, through carefully designed school health programmes. In this respect, health is not only a condition required for teaching and learning, but also an outcome of quality education. School health must therefore be a key element in efforts to achieve Education for All (EFA), and health must be high on the agenda of the education sector at all levels.

Overexposure to ultraviolet (UV) radiation from the sun is of considerable public health concern, and plays an important role in the development of skin cancer and cataracts, and suppresses the immune system. Children are particularly at risk as (i) sun exposure during childhood appears to set the stage for the development of skin cancer, (ii) a majority of a person's lifetime exposure occurs before age 18, and (iii) because children have more time to develop diseases with long latency, more years of life to be lost and more suffering to be endured as a result of impaired health. Prevention efforts in schools to change children's knowledge, attitudes and behaviour regarding sun protection can significantly decrease adverse health effects and health care costs.

This document is part of the WHO Information Series on School Health prepared for WHO's Global School Health Initiative. The Initiative is a concerted effort by international organizations to help schools improve the health of students, staff, parents and community members. Although definitions will vary, depending on need and circumstances, a Health-Promoting School can be characterized as a school constantly strengthening its capacity as a healthy setting for living, learning and working.

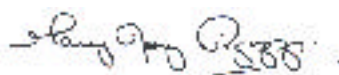
The extent to which each nation's schools become Health-Promoting Schools will play a significant role in determining whether the next generation is educated and healthy. Education and health support and enhance each other. Neither is possible alone.



Dr Pekka Matti Jaako Puska
Department of Noncommunicable Disease
Prevention and Health Promotion
WHO



Dr Richard Helmer
Department for the Protection of the Human
Environment
WHO



Ms Mary Joy Pigozzi
Division for the Promotion of
Quality Education
UNESCO

Health-Promoting School

A Health-Promoting School:

- Fosters health and learning with all the measures at its disposal
- Engages health and education officials, teachers, students, parents and community leaders in efforts to promote health
- Strives to provide a healthy environment, school health education, and school health services along with school/community projects and outreach, health promotion programmes for staff, nutrition and food safety programmes, opportunities for physical education and recreation, and programmes for counseling, social support and mental health promotion
- Implements policies, practices and other measures that respect an individual's self-esteem, provide multiple opportunities for success, and acknowledge good efforts and intentions as well as personal achievements
- Strives to improve the health of school personnel, families and community members as well as students; and works with community leaders to help them understand how the community contributes to health and education

FRESH Initiative

At the World Education Forum in Dakar, Senegal, April 2000, WHO, UNICEF, UNESCO and the World Bank launched an initiative to work together to Focus Resources on Effective School Health (FRESH Initiative). In doing so, they are helping schools provide a living and learning environment that is friendly and welcoming to children, healthy for children, effective with children, and protective of children.

Education and health agencies are encouraged to use this document in support of the FRESH Initiative by implementing school health policies, improvements in the school environment, skills based health education and school health services to reduce exposure of students, school personnel, families and community members to the harmful effects of the sun.

1. Introduction

This document is part of the World Health Organization (WHO) Information Series on School Health and is intended to help schools use health promotion strategies to reduce the incidence of harmful effects from exposure to ultraviolet (UV) radiation. The document, based on the Ottawa Charter for Health Promotion (Annex 1), will help people create conditions conducive to health and well-being and to reductions in prevailing health concerns.

While the concepts and strategies in this document apply to all countries, some of the examples might be more relevant to specific countries. Variations in skin type, climate, and environmental and cultural factors influence risk of health damage due to UV exposure, and programmes may need to be adapted to take such variations into account.

1.1 Why did WHO prepare this document?

WHO prepared this document to help people care for themselves and others, to make informed, healthy decisions and have control over their lives, and to ensure that society creates conditions that allow all of its members to attain and maintain good health.

This document provides information that will help individuals and groups to do the following:

- Make a strong case for incorporating sun protection measures in schools
- Understand the nature of a Health-Promoting School
- Plan, implement, and evaluate sun protection measures as part of the development of a Health-Promoting School

1.2 Who should read this document?

This document can be used by:

- governmental policy makers, programme planners, and coordinators at local, district, provincial, and national levels, especially those from the ministries of health and education
- members of nongovernmental institutions and other organizations and agencies responsible for planning and implementing health interventions, especially staff and consultants of national and international health, education, and development programmes who are interested in promoting health through schools
- community leaders, local residents, health care providers, social workers, development assistants, media representatives, and members of organized groups (e.g., youth groups) interested in improving health, education, and well-being in the school and the community
- members of the school community, including teachers and their representative organizations, students, staff, parents, volunteers, and school based service workers
- students in pre service teacher training programmes and teachers participating in in service training programmes

1.3 What is ultraviolet (UV) radiation?

UV radiation is one component of the many different types of radiation emitted by the sun (sometimes described as the solar spectrum); it is also produced by artificial sources, such as tanning lamps and solariums. Unlike visible light, which can be detected by our eyes and the infrared radiation that gives the sun its heat, UV radiation can neither be seen nor felt.

The intensity of solar UV radiation is influenced by the following:

- Sun height: The higher the sun in the sky, the higher the UV level. Thus, UV levels vary with time of day and time of year, with maximum levels generally occurring when the sun is directly overhead (solar noon), which is around midday in the summer (although this depends on location and whether daylight savings time is used).
- Latitude: The closer to the equator, the higher the UV levels.
- Cloud cover: Heavy clouds can significantly reduce UV levels, whilst scattered clouds result in levels rising and falling as clouds pass in front of the sun. Even with cloud cover, UV levels can be high due to the scattering of UV radiation by particles of moisture and other materials in the atmosphere.
- Ozone: Ozone absorbs some of the UV radiation that would otherwise reach the earth's surface. Ozone levels vary throughout the year and even across the day.
- Altitude: At higher altitudes, a thinner atmosphere filters less UV radiation. Thus, with every 1,000 meters altitude, UV levels can increase by approximately 8 percent.
- Environment: UV is reflected or scattered to varying extents by different surfaces. For example, snow can reflect as much as 80 percent of UV radiation; dry beach sand, about 15 percent. UV radiation that has been scattered or reflected is sometimes referred to as indirect UV.

1.4 What are the health effects of UV exposure?

The sun is the vital source of energy for all life on this planet. It would be impossible to survive without the sun. Exposure to sunlight enables the body to produce vitamin D, which plays a crucial role in skeletal development, immune function, and blood cell formation. However, 10 to 15 minutes daily exposure of face, forearms, and hands to normal Northern European summer sun is sufficient to maintain vitamin D levels.¹ Closer to the equator, where UV levels are higher, even shorter periods of exposure suffice. Hence, for most people, vitamin D deficiency is unlikely. Possible exceptions are those who have very limited sun exposure (e.g., the housebound elderly), or those with heavily pigmented skin who live in areas where UV levels are relatively low.

The UV spectrum can be divided into three different categories: UVA, UVB, and UVC. UVC does not reach the earth's surface. Both UVA and UVB radiation are responsible for harmful effects on the skin, eyes, and immune system.

In the short term, excessive exposure to UV radiation causes sunburn—reddening (erythema), pain, and, in severe cases, blistering of the skin.

Over time, UV exposure, whether or not it is associated with sunburn, accelerates skin ageing and causes changes in body cells, which may lead to skin cancer. There are three different forms of skin cancer, each named for the type of skin cell in which they originate:

- Basal cell carcinoma: the most common and least dangerous skin cancer
- Squamous cell carcinoma: the type that may spread to other parts of the body if not treated
- Melanoma: the least common but most dangerous form of skin cancer, which, if not treated quickly, releases cancer cells that spread to other parts of the body (i.e., metastasise), possibly resulting in death

Basal and squamous cell carcinomas are often referred to collectively as common or non-melanocytic skin cancers (NMSCs).

UV radiation also causes changes at the cellular and molecular level that result in the suppression of immune function, thereby compromising the body's ability to resist disease.²

Exposure of the eyes to UV radiation over long periods contributes to the development of cataracts (i.e., cloudiness of the lens that can ultimately result in blindness) and pterygium (i.e., an overgrowth of the conjunctiva onto the cornea).³

1.5 Why increase efforts to improve sun protection?

The incidence of skin cancer has increased since the early 1970s, by as much as 4 percent per year in the United States; skin cancer represents one in every three cancers diagnosed globally⁴. This increase has been attributed to changes in behaviour, such as increased participation in outdoor activities and more frequent sunbathing. Changes in travel patterns may also contribute to increases in sun exposure⁵ and therefore skin cancer incidence. For example, it has been estimated that British residents can receive as much as 30 per cent of their annual UV exposure during their two week summer holidays.⁶ This is also likely to be true of other northern and middle European countries where holidays in areas of lower latitude are increasing in popularity. Yet experts believe that four out of five cases of skin cancer could be prevented by sensible behaviour in relation to sun exposure.⁷

High levels of the skin pigment melanin appear to reduce the risk of common skin cancers for people with darker skin; however, in the case of severe sun exposure, melanin appears to be less effective in protecting against melanoma.⁸ Moreover, when skin cancer occurs in people with darker skin, it is likely to be detected later, when the cancer is more advanced and therefore more dangerous.

Excessive exposure to UV radiation is an issue of global concern, as eye damage and immune suppression affect all skin types equally.

Some 12 to 15 million people are blind from cataracts, and, according to WHO estimates, up to 20 percent of these may be caused or enhanced by sun exposure, especially in countries located close to the equator, such as India and Pakistan.⁹

The possibilities of increased risk of infection and reduced efficacy of immunization as a result of UV exposure have serious global implications. Again, the most vulnerable population are children living in countries located close to the equator. Development and implementation of sun protection strategies should also have beneficial effects for the immune competence of those at added risk of infection as a result of UV exposure.

1.6 What are the essential elements of sun protection?

The key element of sun protection is minimizing the amount of time spent in the sun, particularly during the period when UV radiation is at its most intense, generally the four hour period around solar noon. When possible, indoor activities should be planned for this period. Outdoor activities should always be organized to make the maximum possible use of shade.

When outdoors, as much of the skin should be protected as possible with loose fitting, tightly woven clothing. Garments with at least elbow length sleeves and collars, and longer skirts or trousers are most effective. Headwear should shade the face, the back of the neck, and the ears, such as a hat with a brim of about 8–10 cm or a legionnaire style cap with flaps on the back and sides.

Sunscreen should be used for areas that cannot be adequately covered with clothing, including the face, which is only partially protected by a hat. Even in the shade, indirect UV levels can be sufficiently high to be harmful, so sunscreen should be worn at all times when outdoors. To provide protection against UVA and UVB, a broad spectrum sunscreen with a sun protection factor (SPF) of at least 15 is recommended. Even when applied correctly (see Annex 2), no sunscreen is able to block UV radiation completely, so it should never be used as the first or only method of sun protection. It also should not be used to extend the amount of time spent in the sun, or in place of clothing.¹⁰

1.7 Why are children a target group?

There is strong evidence that exposure to UV radiation during childhood and adolescence is a risk factor for developing skin cancer later in life.^{11, 12} It is also estimated that the majority of a person's lifetime UV exposure occurs during childhood.¹² Protecting young people's skin and eyes should reduce future incidence of skin cancer and eye problems. Children are also the group most susceptible to the effects of reduced immune competence because of their greater vulnerability to infections.

The development of good habits during childhood can also contribute to more appropriate sun behaviour later in life, and thus to a further overall reduction in lifetime UV exposure.

1.8 How will this document help people promote health?

This document provides a framework for promoting sun protection strategies through schools. Based on the latest scientific research and programme experiences, it is designed to help people address the range of factors that can be modified to implement sun protection strategies in a Health-Promoting School's curriculum.

This document will help individuals and schools to do the following:

- **Create healthy public policy:** This document provides information that people can use to argue for increased local, district, and national support for sun protection interventions in schools and to justify decisions to increase such support.
- **Develop supportive environments:** This document describes changes in the physical and social environments that are necessary to reduce UV exposure for students and staff. It also describes how parents, teachers, community leaders, and others concerned about UV exposure can support these changes in schools and communities.
- **Reorient health services:** This document describes how current health services can be modified and expanded to more effectively promote sun protection.
- **Develop personal skills:** This document identifies skills that young people need to develop in order to protect themselves from exposure to UV radiation. It also identifies skills that others, such as parents, teachers, and school principals, need in order to create conditions to minimize UV exposure.
- **Mobilize community action:** This document identifies joint actions that the school and community can undertake to promote health and reduce UV exposure, and identifies ways in which the school can collaborate with the community. It also provides arguments and facts that can be communicated through the mass media to call attention to the problem of skin damage due to sun exposure and the need for school based efforts to be complemented by national, community, and family actions.

1.9 How should this document be used?

Sections 2 and 3 can be used to argue for implementation of strategies to reduce UV exposure in schools. Section 4 provides advice on planning for sun protection interventions. Section 5 can be used to assist schools in integrating health promotion efforts into various elements of a Health-Promoting School. The final section assists in evaluation efforts to make health promotion and sun protection a key part of a Health-Promoting School.

For specific guidance on planning, implementing and evaluating, this document should be used in conjunction with the WHO document “Local Action: Creating Health-Promoting Schools,” which provides practical guidance, tools, and tips from Health-Promoting Schools around the world and can help tailor efforts to the needs of specific communities.

2. Convincing others that sun protection in schools is important

This section provides arguments that can be used to convince policy makers and others of the importance of sun protection during childhood and adolescence. These arguments present reasons why communities both need and will benefit from sun protection interventions and health promotion programmes. They also provide reasons to justify decisions to increase support for such efforts.

2.1 Argument: UV exposure during the school years contributes significantly to total lifetime exposure

During the first 18 years of life, when much of one’s lifetime UV exposure is received, a significant proportion of time is spent at school or participating in school based activities, such as camps or school sports. Students attend school for most of the year, and school hours generally incorporate peak UV periods.

Some school events, such as sporting carnivals, can require students, staff, and spectators to be outdoors for the entire school day. Outdoor activities and break times, particularly lunch, frequently occur at times when UV levels are at their maximum. Thus, the school environment and the manner in which a school operates can have a significant impact on children’s UV exposure at the period in their lives when they are most vulnerable to its effects.

Structural and organizational strategies that provide sun protection for students and staff while they are at school are simple to adopt and can also be used to compensate to some extent for the reluctance of adolescents to adopt personal sun protection measures. For example, providing attractive shaded areas that are likely to be used by adolescents for passive recreation during breaks can reduce the need for use of protective clothing at these times.

Implementation of such strategies also provides a practical demonstration of how such measures can be adopted beyond the school environment. For example, ensuring that sun protection strategies are an integral component of all outdoor activities, including school breaks and sports lessons, illustrates to students and parents how sun protection can be incorporated into other family and community activities.

2.2 Argument: Schools are vitally important settings through which to promote education about UV radiation and providing sun protection

It is important to target children’s attitudes and behaviour at a young age, particularly in primary school, when children tend to be most receptive to the need for sun protection—during adolescence, influences of peers and fashion are more likely to take precedence.^{13,14,15} School programmes can not only help to reduce UV exposure at school, but also to facilitate the development of habits and attitudes that can have an impact on sun exposure at other times. Because children of school age have more leisure time, much of which tends to be spent outdoors, good habits carried over from the school setting can further contribute to reductions in total UV exposure.

Role modeling of appropriate sun behaviour by staff is a vital element in educating students and parents as well as protecting staff from excessive UV exposure, but the school can also become a role model for families and other community organizations, such as sporting clubs or kindergartens. Having to plan for sun protection at school can make it easier for parents and students to plan for sun protection during activities

that occur outside the school environment. Personal sun protection equipment is simple and readily portable—a hat, a shirt, and sunscreen can be carried from one venue to another in a small bag.

Curriculum programmes focusing on or incorporating sun protection education can be used to develop communication and life skills. These are ideally part of a comprehensive approach that aims to develop positive attitudes toward preventive measures and to promote responsible decision making, all of which are essential for general health and well-being. Because reducing UV exposure is a more specific objective than, for example, “healthy eating”, and personal sun protection strategies are quite easy to implement, sun protection education can be used as a starting point prior to tackling some of the broader, more complex issues (such as nutrition).

2.3 Argument: Sensible sun exposure behaviour contributes to decreasing the risks of some of today’s leading health problems

UV exposure causes sunburn, accelerates skin ageing, and is the major risk factor for the development of skin cancer. It also contributes to eye damage and suppresses immune function. Hence, reducing exposure to UV radiation is an issue of global concern.

It has been estimated that more than 2 million non-melanoma skin cancers and 200,000 malignant melanomas occur globally each year—one in every three cancers diagnosed is skin cancer. Given levels of ozone depletion and current trends, it is predicted that this will increase by as much as 300,000 non-melanoma skin cancers and 4,500 melanomas each year.⁹ However, appropriate sun exposure behaviour could prevent as many as four out of five cases of skin cancer.⁵ High levels of skin cancer in Australia, Europe, and the United States have resulted in campaigns designed specifically to reduce UV exposure. In Australia, where skin cancer is the most common form of cancer, there is evidence that public health campaigns conducted over the past 20 years to reduce sun exposure may be having a beneficial effect on skin cancer rates.¹⁶

It has also been estimated that up to 20 percent of the 12 to 15 million cases of blindness due to cataracts can be at least partially attributed to UV exposure, particularly in countries located near the equator.⁹ Consequently, 3 million people’s sight may be saved each year through the use of appropriate eye protection. Moreover, a 10 percent decrease in total ozone levels is predicted to result in between 1.6 and 1.75 million additional cases of cataracts per year worldwide.⁹

The growing evidence that UV exposure can also result in reduced effectiveness of the immune system has serious implications for the efficacy of immunization programmes and the spread of infection, particularly for many Asian, African, and South American countries. Strategies to reduce UV exposure at critical times may be essential to ensure that immunization programmes are not compromised.

2.4 Argument: Preventive health habits developed at a young age are likely to continue into adulthood

Sun protection strategies are relatively easy to adopt and incorporate into a daily routine, to the extent that they become habits. If these behaviours are regularly reinforced and role modeled, they are more likely to continue into adulthood, particularly as children’s capacity to understand the reasons for such habits increases.

Knowing how to prevent a recurrence of sunburn can provide children with a sense of control over their own health and well-being. Most children are capable of putting on hats as they go outside and, with guidance and practice, can learn to correctly apply sunscreen. These simple strategies can quickly become part of the daily routine. Another helpful factor is that, unlike other preventive measures, where the effects may not become evident for several years, the symptoms of sunburn are more immediate, thus enabling children to relate the behaviour (lack of sun protection) to the outcome (sunburn).

2.5 Argument: School children are especially susceptible to fashion trends suggesting that a suntan is healthy

The influence of peer pressure and fashion becomes more powerful during adolescence, and good habits tend to be replaced by sun seeking behaviours. This is often based on the belief that a tan is healthy and attractive; it is also at least partially due to the fact that, with the possible exception of sunglasses, sun protective clothing is seldom considered fashionable by young people.

Even when adolescents are aware of the long term implications, they tend to be reluctant to protect themselves, just as they are more likely to indulge in other forms of risk taking behaviour, such as tobacco use or unprotected sex. It is important to address these issues through programmes that develop life skills, promote healthy decision making, and give young people the self-esteem to address these pressures. Such programmes may also help to change the group norms that are a factor in the rejection of personal sun protection. Surveys of Australian secondary school students suggest that the proportion seeking a dark tan had decreased, and those seeking a light tan increased between 1990 and 1996.¹⁷ This suggests that awareness of the need for sun protection can positively influence attitudes and behaviour, even in this age group. Although the majority of young people still indicate that they do seek a tan, it is a step in the right direction.

2.6 Argument: Reducing sun exposure enables healthy adulthood and ageing

In the short term, excessive exposure to UV radiation causes sunburn. The symptoms, although painful, seldom last more than a few days, except in severe cases. However, childhood UV exposure is a major factor in the development of skin cancer later in life. Children must therefore be a key target group for prevention programmes.

Non-melanoma skin cancers tend to develop around age 40, and melanoma can affect people in their late teens and early 20s. In Australia, melanoma is the most common cancer in the 15–44 years age group.¹⁸ Since those who have been diagnosed with skin cancer are considered to be at greater risk of developing it again, the disease can potentially affect a person's health for a significant proportion of his or her lifetime.

Sun exposure also causes other skin damage, including wrinkling, pigmentation changes, and other non-malignant lesions. These can become apparent from a relatively early age (depending on extent and age of exposure). Reducing childhood exposure should reduce the incidence of such problems during adulthood and, if good habits are maintained for much of the lifetime, should improve the health of older individuals.

Similarly, use of eye protection is likely to delay the onset of cataracts and to reduce the incidence of blindness from cataracts. This has obvious implications for the health and well-being of adults, not the least of which is the preservation of their independence, something that is extremely important to older people.

2.7 Argument: Investing in sun protection interventions decreases costs in the health system and strengthens the economy

In Australia, skin cancer is the most costly of all cancers to the Australian health system. The direct costs of treatment have been estimated at US\$5.70 per head per annum, while the cost of current prevention campaigns has been calculated at US\$0.08 per head per annum. Assuming that a 20 year prevention campaign costing US\$0.17 per head per annum reduced UV radiation exposure by 20 percent, and that melanoma rates began to fall after a 5 year lag, and that non-melanocytic skin cancers and solar keratoses fell after a 15 year lag, the predicted annual savings would be US\$0.17 per person.¹⁹ In other words, every dollar spent would save a dollar in health care costs.

India has a particularly high incidence of cataracts, a significant percentage of which are likely to be related to UV exposure, and in 1994 was granted US\$118 million by the World Bank to reduce its backlog in cataract surgery.²⁰ Considerable savings are therefore possible if the development of cataracts can be prevented or delayed.

2.8 Argument: With ongoing ozone depletion, UV levels on earth are likely to rise and people will experience more harmful UV exposure

It has been predicted that depletion of the ozone layer, due to the release of substances such as chlorofluorocarbons (CFCs), will result in an increase in the amounts of UV radiation reaching the earth's surface.²¹ There are also seasonal holes in the ozone layer over the Antarctic and the Arctic, which contribute to higher UV levels at particular times of the year.²² While there is considerable uncertainty about the implications for human health, an increase in UV related problems such as skin and eye damage is a potential consequence, particularly in the Northern Hemisphere, where the "hole" is more likely to extend over heavily populated areas.

The Montreal Protocol, an agreement limiting the use of chemicals that destroy the ozone, should result in a reduction in the rate at which this damage occurs, provided that there is full compliance. However, even if compliance is complete, it is expected that the ozone layer will not recover until at least the middle of the 21st century.²³ During 2000, the ozone hole over the Antarctic extended over such populated areas as Chile, where residents were warned that they could get sunburned in less than seven minutes due to increased UV levels. Furthermore, it is now believed that ozone damage may be exacerbated by the greenhouse effect, despite reductions in levels of ozone depleting chemicals in the atmosphere.^{21, 24}

Given the uncertainties relating to the possible health consequences of ozone depletion, it is clear that taking action to reduce UV exposure is essential. The only way to protect people against the possible risks associated with ozone damage is to encourage them to protect themselves.²³ In view of the sensitivity of children's skin, it is even more critical that action is taken to reduce childhood exposure to UV.

3. Convincing others that sun protection in schools will really work

This section provides arguments that can be used to convince policy makers and others of the effectiveness of sun protection interventions in schools and to justify decisions to support such efforts.

3.1 Argument: We can improve health and well-being through sun protection in schools

There is evidence that school based interventions are effective in improving levels of sun protection for children in younger grade levels.^{25,26,27} In Australia, this has resulted in the development of the National SunSmart Schools Programme, which seeks to provide a consistent, high standard approach to sun protection across all primary schools.

The key elements of effective sun protection interventions in schools are considered to be the following:

- **Development of a comprehensive sun protection policy that clearly documents strategies:** Involving parents and students in the policy development process is important to secure their support and improve their understanding of the strategies.
- **A range of strategies relating to behaviour, the school environment, and curriculum programmes, appropriate to the local climate and the school community:** Essential elements relate to clothing (of both students and staff), particularly hats and sunglasses; scheduling of outdoor activities; shade provision and use; sunscreen; and curriculum programmes.
- **A regular review process:** The review should both evaluate the effectiveness of policy implementation, and suggest changes in response to perceived areas of weakness or to the recommendations of relevant health authorities.

Effective school sun protection involves a holistic approach that employs strategies that address behaviour, the curriculum, and the environment. The Health-Promoting Schools model provides an ideal framework within which to implement a comprehensive approach to sun protection.

3.2 Argument: Schools can provide interventions to improve sun protection in ways that are highly cost effective

Interventions to improve sun protection are relatively simple to implement and, in most cases, inexpensive. Changes to school uniforms or dress codes can be phased in over a period of time and incorporate clothing (including sunglasses) that can be worn outside the school environment.

Sunscreen can be purchased in bulk by schools to reduce the cost to students, but, as awareness and understanding increases, this may be an item that parents are willing to purchase for their children anyway, for use not just at school but also at other times.

While shade development is often costly, it can be incorporated in a broader environmental programme. For example, tree planting can be promoted not just as a means of improving shade, but also of enhancing air and soil quality. Shade, whether provided by trees or structures, also has other obvious benefits in improving the overall school environment.

Shade development can also be a process that fosters more active parental participation through, for example, fundraising activities. Active involvement of children in the process can provide them with practical experience in setting and working toward shared goals, and perhaps even become the foundation for participation in similar activities at the community level. Such participation can enhance students' sense of ownership of the outcome and help to develop their confidence and communication skills.

Changes to scheduling of outdoor activities can be achieved relatively cheaply or at no cost. For example, extending the morning break and having it at a time when UV levels are lower, and shortening the lunch break, which usually occurs at the peak UV time, is cost neutral. There can even be benefits; for example, beginning sporting carnivals in the late afternoon may increase parental participation.

Simple, low cost activities can be used to educate children and their families about UV radiation and sun protection (see Annex 3). In fact, children can gradually take on the task of educating other members of their family and the wider community. This can give them pride in their knowledge, as well as a sense of control over their own health and that of others close to them.

Apart from reducing sun exposure of students while they are at school, these interventions serve to educate staff and parents and can readily be applied to situations beyond the school environment. For example, hats and shirts with collars can be incorporated into uniforms for community sporting clubs, and a tree planting programme could be introduced for a local sports ground.

3.3 Argument: Sun protection education for girls has a positive impact on the health of families

Improving the health and education of girls is likely to improve that of their children, because girls or women generally have most of the responsibility for supervision, education, and care of other members of their households.²⁸ Teaching girls why and how to minimize UV exposure not only reduces their own risk of harmful effects on the skin, eye, and immune system, but also provides them with simple strategies to protect other members of their families and, in particular, their own children. Almost equally important is the enhancement of their own self-esteem and confidence as a result of their greater ability to control factors affecting their health and that of others.

3.4 Argument: Sun protection interventions in schools benefit the entire community

Schools are often the hub of their communities—a venue for local events and a meeting point for parents. Elements of sun protection, such as hat wearing and shade development are highly visible, and, as such, implementation of these strategies can demonstrate good practice to the broader community. The school can act as a model for other community organizations and groups; activities in the area of sun protection may be an entry point for schools to adopt a more pro active role in the community with respect to other health issues.

As teachers are often active members of their communities—for example, as users of child care or preschools, or as members of sporting clubs—they are able to take their knowledge and experiences and apply them in the broader community setting.

Schools are also one means of introducing new health information and partnerships between the school and local organizations, groups, and businesses, which can benefit all members of the community. For example, a local business may offer discounts on sunscreen and hats in return for promotion through school newsletters and bulletins; community health workers may conduct sun protection education programmes in schools.

4. Planning the interventions

As a health issue with a very specific risk factor, sun protection is ideal as an entry point to becoming a Health-Promoting School. If this has already been achieved, sun protection interventions are readily incorporated within the Health-Promoting School Framework.

The first step in developing interventions to minimize UV exposure is to decide that this is a health and educational priority. It is then necessary to plan the interventions by determining which strategies will have the most significant impact on health and education, and how these strategies can be integrated with other health promotion activities to best effect.

This section describes the key steps in planning effective sun protection interventions as an essential element of a Health-Promoting School.

4.1 School and community involvement in planning

Health-Promoting Schools involve members of the school and community in planning programmes that respond to their needs and can be maintained with available resources and commitments.

Establishing a school health team and a community advisory committee are important steps in the planning process.

4.1.1 School health team

The school health team is responsible for the coordination and monitoring of health promotion policies and activities. It is essential that parents, students, and staff, including management, are involved in the planning process from the outset. If such a team does not exist, the introduction of sun protection interventions can be the stimulus for its formation and provide a model on which other health interventions may be based.

Student involvement is essential in order to develop strategies that are relevant to student needs and concerns and will enlist their support. Effective sun protection relies to a significant extent on student cooperation, which is most likely to be achieved if students actively participate in the decision making process and feel a sense of ownership. Parental input is also critical to ensure that strategies are feasible; i.e., parents must be willing and able to support the purchase of hats, sunglasses, and sunscreen and possibly to assist in shade development. As school staff are primarily responsible for implementation, their input is essential in order to ensure that strategies are practical within the context of the school environment, organization, and available resources.

The school health team should include a balance of young people and adults with an interest in and commitment to the well-being of the school community, for example, students, teachers, administrators, and parents. This team must be given the time, resources, and authority to enable it to lead and oversee health promotion activities in the school. A sun protection working group that is a sub committee of this team would have responsibility for the planning and implementation of sun protection interventions.

4.1.2 Community advisory committee

It is also important to work with groups or individuals outside the school who have an interest in health promotion and may influence student knowledge, attitudes, and behaviour in relation to UV exposure and sun protection. If such a committee does not already exist, development of a sun protection intervention can be an opportunity to establish one.

Potential partners might include local government representatives, businesses, community youth agencies, nongovernmental organizations, health service providers, and sporting groups. The committee should include people with a range of skills, interests, and resources who can assist the school health team in the implementation of sun protection interventions. The team should also represent the community's geographical, economic, social, ethnic, and religious composition.

To facilitate the efforts of the school health team, there are a number of things the community advisory committee can do:

- Help determine local needs and resources
- Disseminate information about UV exposure and the need for sun protection
- Build support across the community
- Encourage community involvement
- Help obtain resources and funding for sun protection interventions
- Reinforce learning experiences provided in the school

The community advisory committee and the school health team should work together in planning health promotion efforts and in coordinating the various components of a Health-Promoting School, such as health education, health services, and community and family involvement, in order to maximize health outcomes.

4.2 Situation analysis

Policy and decision makers and other interested groups should consider conducting a situation analysis, which involves the collection and analysis of relevant national, district, and local data. This data can be used to justify resource allocation and to plan, implement, and evaluate health promotion interventions. The school health team and the community advisory committee can begin planning sun protection interventions by conducting such an analysis at the local level.

4.2.1 Purpose of conducting a situation analysis

Carrying out a situation analysis will help people better understand the needs, resources, and conditions relevant to planning interventions. A well conducted situation analysis has the following benefits:

- It provides a strong basis for the support of policy and decision makers, particularly in relation to allocation of resources.
- Accurate and up-to-date data and information can provide a basis for discussion, justification, and setting priorities for action.
- Data obtained through the situation analysis are essential for planning and evaluating the interventions. Data can help ensure that programmes focus on actual health needs and the experience, motivation, and strengths of the target population so that interventions increase the physical, social, and mental well-being of students, staff, families, and community members. Data also provide a baseline with which trends in sun protection knowledge, attitudes, and behaviour can be compared.

4.2.2 Information needed

A range of qualitative and quantitative data is required for planning health promotion and sun protection interventions and to establish a baseline for evaluation. Qualitative data includes descriptions of feelings and beliefs, while quantitative data is numerical information.

The following information can help to determine local needs and priorities in relation to sun protection:

- Levels of UV radiation, skin cancer incidence, and mortality at the national, regional, and local levels, and, if available, data relating to frequency of sunburn and use of sun protection strategies.
- Knowledge, attitudes, beliefs, values, behaviours, and conditions relating to sun protection and skin cancer. For example, people may believe that dark or olive skin protects them from the harmful effects of UV exposure and that there is therefore no need to adopt sun protection strategies; they may not understand the relationship between sun exposure and skin cancer; or they may adhere to traditional forms of dress that make it difficult to wear appropriate hats. Because values, beliefs, and attitudes have a major effect on health behaviours, this kind of information is essential in order to develop effective health promotion strategies. Interventions that do not take into account the potential barriers and make the best possible use of factors likely to facilitate implementation will be wasteful of resources and unlikely to achieve the desired health outcomes.
- Resources, including personnel and financial resources and services, that are available in the school and the community.
- Existing programmes. These should be evaluated to determine whether and how they may facilitate health promotion in relation to sun protection. For example, activities relating to peer pressure and tanning behaviour could be incorporated into existing programmes that focus on self-esteem and decision making for adolescents; education about the causes and nature of skin cancer could be integrated into science programmes on the nature of cells and cell division.

4.2.3 Data sources

The table below shows some basic questions for a situation analysis and some sources of and methods for collecting information.

Basic Questions	Sources of and Methods for Data Collection
What data are available in relation to the burden of skin cancer and UV related eye damage in the community?	Local, regional, and national health authority data
How prevalent is skin cancer and eye damage at national, regional, and local levels?	Morbidity and mortality rates from government and health authorities
Do children get sunburned?	Observation, research data, focus groups, survey/questionnaire
Do children experience UV related eye damage?	(Same as above)
Do parents and children have basic knowledge about the risks associated with UV exposure and how they can protect themselves?	Observation, questionnaire/survey, focus groups
What important behaviours and practices in school children and their families influence their UV exposure and sun protection?	(Same as above)
Do parents and children have basic knowledge about how they can protect themselves from the sun?	(Same as above)
What common attitudes, beliefs, and customs of teachers, parents, and children affect their exposure to UV radiation and their sun protection behaviour?	(Same as above)
What kind of human and physical resources and capacities exist at the school and community levels to provide sun protection interventions?	Observation, interviews with community leaders, review of available data
Are sun protection interventions being implemented in the community?	(Same as above)
Are education, health, or other relevant interventions being implemented in the school, into which sun protection interventions (such as healthy decision making) could be integrated?	Interviews with classroom teachers and school and community leaders, review of available data

This table does not necessarily include all information to be sought, nor every source and method. The collaboration between the school and community that is essential in this process may reveal additional questions and alternative or extra sources and methods.

4.3 Commitment and policies

To be effective, sun protection interventions require commitment and action from a wide range of individuals and groups. It is also important to obtain the support of relevant government departments, health and education authorities, community and business leaders, educators, parents, students, and the community.

4.3.1 Political commitment

Sun protection interventions in schools are greatly facilitated by support at various levels of government and from the ministries of health and education. Political commitment and support may take a variety of forms:

- Public endorsement by government representatives of the need for health promotion and sun protection interventions in schools

- Collaboration with health authorities in the development of guidelines or recommendations for schools in relation to sun protection interventions such as clothing guidelines and incorporation of shade in new school buildings
- Assistance with the planning, conduct, and evaluation of interventions, possibly through the appointment, by their office, of an influential representative of the relevant level of government
- Financial support for school health promotion and sun protection intervention
- Provision or subsidization of training and materials to assist schools in developing and implementing health promotion and sun protection interventions

4.3.2 Community commitment

Efforts to achieve effective sun protection interventions in the context of a Health-Promoting School also rely on community understanding and support. It is essential that parents and community members participate in the design, content, delivery, and evaluation of interventions. This should occur from the outset to ensure that families and the community have the opportunity to raise any concerns and to participate in the planning process. Such involvement is also important to create a sense of community ownership and to enable resources, facilities, and expertise to be shared effectively. It can be achieved through community group meetings, formal presentations, individual meetings with relevant groups and individuals use of school publications, and even local media.

Community commitment is enhanced by the following:

- Public acknowledgement of the importance of sun protection by community leaders, local government representatives, health and education authorities, and other relevant organizations
- Establishment of a designated committee for coordinating community sun protection interventions
- Provision of local resources for health and sun protection interventions in schools
- Coordination of interventions with other programmes in the community, e.g., shade development for community facilities
- Efforts to attract community and media attention, e.g., through printed material or through special school events like sporting carnivals

4.3.3 Supportive school policies

School policies provide the framework for the implementation of sun protection interventions (see Annex 4 for an example of a policy). Policies should be simple statements of the rationale, objectives, and guidelines for implementation relating to the school environment, behaviour, and curriculum. They may also incorporate statements about the policy evaluation process. They should take into account specific factors that may influence implementation, such as local climatic conditions, and times of day and/or year at which UV levels are sufficiently high to constitute a risk.

Policy development requires input from teachers and administrators, parents and students, and all other relevant members of the school community. It should take into consideration other relevant health concerns and health promotion activities, as well as the needs, priorities, and cultural practices of groups represented in the school community. Collaboration between the school and the community and with relevant health and government authorities is strongly recommended.

The following rules or guidelines could be included in a sun protection policy:

- Teachers, parents, students and all other relevant school personnel will be represented in the planning, development and review process.
- The community advisory committee will meet periodically to maintain coordination between the school and community.
- Teachers will receive ongoing training in relation to appropriate sun protection strategies.
- The school is committed to ensuring that sufficient shade is available within its grounds.
- The school encourages the use of shade as a means of reducing UV exposure during outdoor activities.

- Outdoor activities will be minimized during periods when UV radiation is at its most intense.
- Students, teachers, other staff, and parents will wear sun protective clothing whilst involved in outdoor activities organized by/for the school.
- The need for sun protection for participants and spectators will be reflected in the planning for all outdoor events conducted by or at the school, e.g., by choosing venues that have adequate shade.
- Sun protection education will be included sequentially as part of a comprehensive school health programme.
- The school will encourage the use of maximum protection sunscreen as a method of sun protection, to be used properly and in conjunction with other methods, especially for areas of skin that cannot adequately be protected by clothing and hats, including the face.
- Parents will be educated about the need for a combination of sun protection methods for themselves and their families during outdoor activities.

4.4 Goals and objectives of sun protection interventions in schools

Goals and objectives are essential to guide and clarify what the sun protection interventions are intended to achieve and how the interventions are to be evaluated. Goals and objectives should be developed by the school health team in collaboration with the community advisory committee, on the basis of the situation analysis.

4.4.1 Goals

The goals should describe in broad terms what the programme will achieve. The goals of sun protection interventions in a Health-Promoting School should include, but not be limited to, these three:

- To provide a school environment that reduces the UV exposure of students, and other members of the school, the students' families, and the community
- To develop knowledge of and attitudes toward sun protection that will result in adoption of sun protection behaviours by students and other members of the school, the students' families, and the community
- To develop the skills, behaviours, and confidence that will be the basis of lifelong sun protection habits

The goals are then broken down into specific outcome and process objectives so that everyone clearly understands what needs to be done, when, and why. Objectives are the steps for reaching an overall goal; they describe outcomes in measurable terms that will help determine how successfully the goal is being reached.

4.4.2 Outcome objectives

Outcome objectives might include the following:

- By(date)....., knowledge and attitudes relevant to students' and parents sun protection behaviour (e.g., knowledge of safe sun protective behaviours; attitudes toward wearing hats and using sunscreen) will have increased bypercent over baseline.
- By(date)....., the percentage of students/teachers/parents that consistently demonstrate a particular sun protective behaviour will have increased bypercent over baseline.
- By(date)....., the percentage of students (getting sunburned during school activities/coming to school sunburned) will have reduced bypercent from baseline.
- By(date)....., the amount of shade in the school grounds will have increased bypercent over baseline.

4.4.3 Process objectives

Process objectives describe what will be changed or implemented to achieve the outcome objectives.

Examples of process objectives are as follows:

- By(date)....., the number of Health-Promoting Schools in the district/nation that have implemented sun protection interventions will have increased from (number) to (number).
- By(date)....., at least (number) of the following interventions will have been implemented to make the school environment more health enhancing:
 - More trees have been planted in the school grounds.
 - As many outdoor sports and physical education lessons are conducted outside the peak UV periods as is possible.
 - Outdoor sports and physical education lessons are conducted in shaded areas whenever possible.
 - Other outdoor activities (such as assemblies) are conducted outside peak UV periods or in shade.
 - Minimizing UV exposure for all participants is a priority in the planning for all outdoor events, e.g., camps, excursions, sporting events.
 - Sun protective clothing items have been included in the school dress code or uniform.
- By(date)....., at least (number) of the following interventions will be implemented to enhance sun protection related school health education:
 - Sun protection education programmes will be incorporated into the curriculum at all levels.
 - Teachers and other school staff will have participated in at least (number) sun protection training programmes.
 - All parents will have received regular information (via newsletters/bulletins) that raise their awareness of the need to protect themselves and their families from the sun, and how to do so.
 - All parents will have had the opportunity to attend at least one information session on why and how they should protect themselves and their families from the sun.
- By(date)....., the following sun protective behaviours will be encouraged/required:
 - Students will wear sun protective headwear (e.g., broad brimmed or legionnaire style hats) whenever they are involved in outdoor activities, including breaks.
 - Students will wear sun protective clothing items whenever they are involved in outdoor activities, e.g., shirts with collars and longer sleeves, longer style shorts/skirts.
 - Maximum protection, broad spectrum sunscreen will be available by use for staff and students.
 - Application of sunscreen before school and at appropriate times during the day (e.g., prior to the lunch break) will be actively encouraged.
 - Students will be encouraged to use available areas of shade for outdoor activities and during passive recreation periods, e.g., lunch breaks.
 - Staff and parents will be requested to act as role models by wearing appropriate clothing and sunscreen and seeking shade whenever they are involved in outdoor activities.
- By.....(date)....., at leastpercent of students/parents/teachers will have participated (number) in of the following interventions to reduce UV exposure:
 - Providing sun protection education in a relevant subject area
 - Receiving sun protection education in a relevant subject area
 - Organizing or contributing to a sun protection related school/community project
 - Creating an environment that reduces UV radiation exposure for students/teachers/parents

5. Integrating sun protection within various components of Health-Promoting Schools

A Health-Promoting School strives to use the school's full organizational capacity to improve the health of students, school personnel, families, and community members. Such a school offers many opportunities to promote sun protection as an essential element for the attainment of health. Sun protection interventions can serve as an entry point for the development or enhancement of policies, planning groups, and various components, which serve as a framework for a Health-Promoting School. These components include, but are not limited to:

- skills based health education
- a healthy school environment
- school safety
- school health services
- physical exercise, recreation, and sports
- community and family involvement and outreach
- counseling and social support health
- promotion for school staff

The effectiveness of the interventions integrated into each of the above components is influenced by the extent to which they are supported by a variety of people, policies and trained staff. Their effectiveness is also influenced by the extent to which interventions in each of these components combine with other health promotion efforts to complement and reinforce one another.

Not all schools will have the resources to integrate sun protection interventions into all of the components at one time. Therefore, each school has to establish its own priorities, in collaboration with all parties concerned, and decide the extent to which the components should be addressed. A Health-Promoting School enables students, parents, teachers, and community members to work together to make such decisions. **It is more important to start with small changes that are possible than to wait until resources become available to address all components simultaneously.**

5.1 Skills based school health education

School health education should help individuals avoid health risks and create an environment that is conducive to health for all. Thus, behaviours and conditions that are to be influenced must be clearly defined. Common behaviours that should be addressed to prevent or reduce the risk of UV related health problems include the following:

- Unprotected exposure during breaks
- Unprotected exposure when travelling to and from school
- Unprotected exposure during organized outdoor activities
- Outdoor activities conducted during peak UV periods
- Inappropriate use of sunscreens

Close collaboration between education and health officials, the School Health Team, the Community Advisory Committee, and other school and community members is necessary to identify the particular behaviours and conditions relevant to health in each community.

In a Health-Promoting School, sun protection education is designed to help students acquire the knowledge, attitudes, beliefs, and skills they need to make informed decisions, practice healthy behaviours and create conditions conducive to health (see Table 5.1).

In a Health-Promoting School, skills based health education about sun protection addresses the nature of UV radiation and its beneficial and harmful effects on health and well-being. It also provides strategies to minimize of UV exposure in the context of a healthy lifestyle, which necessarily includes outdoor activities. It should provide opportunities for students to acquire the knowledge they need to make informed decisions

about their exposure to UV radiation from the sun and other sources. It should also enable them to critically evaluate and question images that present a suntan as a sign of good health and attractiveness.

Skills based health education should occur sequentially from primary through secondary levels, addressing the physical, mental, emotional, and social dimensions of health. It can be taught as a specific subject, as part of several subjects, or ideally a combination of both. Sun protection education should be part of the school health curriculum and should be integrated into a range of subject areas. The most obvious of these is science, where, for example, the nature of UV radiation can be explored; students can investigate the structure and function of the skin, the eye, and the immune system, and the effects of UV radiation on each. However, it can also be part of a number of other subject areas (see Annex 5 for examples). Sun protection education should also be incorporated into the school's extracurricular activities, particularly outdoor events, and integrated into other school health components, such as physical activity and staff health.

Appropriate scheduling of sun protection education, taking into consideration factors such as latitude, climate, lifestyle and cultural factors, enhances its relevance for students. Children's understanding of sun protection messages is enhanced and reinforced by experience of warm, sunny weather and the practice of taking care in the sun. Often, spring will be the best time of year to incorporate sun protection education, however it may also be relevant prior to the skiing season or a holiday period.

Table 5.1 Knowledge, Attitudes and Skills for Primary and Secondary Schools.

<p>Early Primary School (Ages 6–9)</p> <p>KNOWLEDGE: <i>Students will learn that:</i></p> <ul style="list-style-type: none"> • the sun has beneficial and harmful effects for living things • sun exposure causes sunburn and skin and eye damage • staying indoors or in the shade at certain times of the day/year can help prevent skin and eye damage • appropriate hats and clothing, sunscreen and sunglasses, can help protect one against damage caused by the sun <p>ATTITUDES: <i>Students will demonstrate:</i></p> <ul style="list-style-type: none"> • a personal commitment to using sun protection strategies <p>SKILLS: <i>Students will be able to:</i></p> <ul style="list-style-type: none"> • communicate knowledge about the risks associated with sun exposure and personal attitudes for minimizing sun exposure • choose appropriate methods of sun protection for particular situations • apply sunscreen correctly (see Annex 2) • identify strategies used by the school to minimize sun exposure • encourage others to minimize their sun exposure
<p>Late Primary School (Ages 10–12)</p> <p>KNOWLEDGE: <i>Students will learn that:</i></p> <ul style="list-style-type: none"> • the sun has beneficial and harmful effects for living things • the sun produces UV radiation, which causes sunburn and skin and eye damage • UV radiation is at its maximum at certain times of the day and year • UV levels are independent of temperature • minimizing outdoor activities at peak UV times is one way to avoid UV related health problems • staying in the shade is a way of reducing UV related health problems • wearing protective clothing, sunscreen, and sunglasses helps to minimize UV related health problems • a suntan and other skin changes, such as freckles, are signs that the sun has damaged the skin • young people can resist the pressure to get a suntan • young people can make sensible decisions about using sun protection • sunscreen does not completely block UV <p>ATTITUDES: <i>Students will demonstrate</i></p> <ul style="list-style-type: none"> • a personal commitment to using sun protection strategies • support for others who choose to use sun protection strategies • responsibility for personal health <p>SKILLS: <i>Students will be able to:</i></p> <ul style="list-style-type: none"> • communicate knowledge about the risks associated with sun exposure and personal attitudes for minimizing sun exposure • identify times/situations when sun protection is most necessary • choose appropriate methods of sun protection for particular situations • apply sunscreen correctly (see Annex 2) • identify signs of UV related damage • identify strategies used by the school to minimize sun exposure • encourage others to minimize sun exposure • state the benefits of minimizing UV exposure • support others who choose to minimize UV exposure

Secondary School (Ages 13–16)
<p>KNOWLEDGE: <i>Students will learn that:</i></p> <ul style="list-style-type: none"> • UV radiation is a form of radiation produced by the sun that can neither be seen nor felt (i.e., compared with visible light and infrared radiation) • exposure to UV radiation has short and long term consequences for health in relation to the skin, eyes, and immune system • levels of UV radiation are not related to temperature but are influenced by such factors as the position of the sun in the sky, geographical location, and altitude • changes in the skin, such as tanning and freckles, are signs of damage due to UV, regardless of whether the source of UV is the sun or an artificial source, such as a tanning lamp or sunbed • it is not necessary to have a suntan to be attractive • the media and peers often influence young people to behave in ways that are not conducive to health, such as encouraging them to get a sun tan, and that these influences can be subtle
<p>ATTITUDES: <i>Students will demonstrate:</i></p> <ul style="list-style-type: none"> • a personal commitment to using sun protection strategies • support for others who choose to use sun protection strategies • responsibility for personal health • confidence in their personal ability to use sun protection strategies
<p>SKILLS: <i>Students will be able to:</i></p> <ul style="list-style-type: none"> • explain the nature of UV radiation and the basic mechanisms by which it causes UV related health problems (i.e., changes in chemicals/cells in the skin; changes in the lens and cornea of the eye) • describe and implement appropriate sun protection strategies (including correct application of sunscreen—see Annex 2) for a range of personal and group situations • make and implement responsible personal decisions about the use of sun protection strategies in a range of situations • identify and counter inappropriate arguments for not using sun protection • support others who choose to minimize UV exposure • plan and implement school and community action to reduce UV exposure

Sun protection education should be combined with efforts addressing other health issues, as appropriate. For example, a primary school programme on safety could include such topics as road safety, hygiene, and safe behaviour in the sun. A secondary school programme on healthy decision making could incorporate critical discussion of images of good health and attractiveness relating to body shape, tanning, and tobacco use. A variety of issues can be addressed simultaneously, with specific issues explored in greater depth to make a particular point.

Alternatively, by coordinating or linking the presentation of related topics in different classes, the issues can be linked, and learning experiences can reinforce and complement one another. Linking of sun protection issues with other relevant topics can also be enhanced by co-teaching, sharing teaching resources, referring students to related lessons, and involving students from different classes in different activities.

Curriculum resources for sun protection education may be available through governmental and nongovernmental agencies and organizations, universities, or teacher's unions. Supplementary materials relevant to the local situation can also be generated by teachers and students themselves or adapted from resources obtained from other countries. The INTERSUN Web site (<http://www.who.int/uv>) provides links to national organizations responsible for school campaigns and a list of educational resources on UV radiation and sun protection.

5.1.1 Designing and/or selecting education methods and materials for health education

Use of a variety of educational methods, including lectures, discussions, debates, role plays, and audiovisual aids, is essential for effective health education. Methods should be selected and lessons prepared in such a way as to increase knowledge, build positive attitudes and values, dispel myths, increase skills, and provide support for a healthy lifestyle. Choice of methods should be made on the basis of lesson objectives; for example, a lecture may enhance knowledge but is less effective in influencing beliefs and building skills. Discussions, debates, and practical activities or demonstrations may be effective in exposing and dispelling local myths. A range of possible teaching strategies is included in Annex 6, but this list is not intended to be exhaustive.

In selecting essential knowledge for students in relation to UV radiation and sun protection, information that will enable students to make and act on sensible decisions regarding sun protection, rather than technical information in relation to the nature of UV radiation or sun protection methods, should be emphasized. For example, students being able to apply sunscreen effectively is more important than their ability to explain how the SPF for sunscreen is determined.

Objectives and activities should have a practical focus and be relevant to the students' own experiences. There should be opportunities to develop skills and knowledge that can be applied at school, at home, and in the community. For example, students can actively participate in the design of school uniforms or the development of a sun safe school dress code, and they can develop a plan to reduce UV exposure for participants in a favourite leisure activity.

5.1.2 Training teachers and other school personnel to implement health education

Training is an essential prerequisite for school personnel involved in the development, implementation, and delivery of school health education programmes. Ideally, training should be ongoing and incorporate time for personnel to receive accurate information, discuss issues, share ideas and resources, and evaluate programmes. Opportunities should be available for teachers to develop their own skills in the kinds of teaching strategies necessary to influence attitudes and beliefs and develop skills, rather than simply focusing on knowledge. Teachers need to be both competent and confident in using such strategies as discussions, debates, role plays, practical activities, and community education projects. Such strategies are sometimes avoided by teachers because they can be more time consuming and difficult to manage than conventional methods; they must also be well planned and executed if they are to achieve their objectives. Therefore, it is important that teachers are given the opportunity to develop and practice these necessary skills.

In a Health-Promoting School, health education may be integrated across several curriculum areas, and thus teachers in all curriculum areas should be encouraged to incorporate health issues into their programmes. Furthermore, all personnel have a responsibility to act as role models for students by demonstrating appropriate sun protection behaviours; in doing so, they will be seen by students as supportive of sun protection interventions and therefore understand the rationale underlying the strategies the school implements.

Finally, school personnel should understand why sun protection is necessary and how to protect themselves for their own health and well-being. Their duties often require them to participate in activities that increase their exposure to UV radiation, and it is important that they understand both the risks and how to minimize them. Additional components relating to, for example, the importance of early detection of skin cancer should also be incorporated, as appropriate.

In Northern latitude countries, the potential for excessive sun exposure poses a health risk for only a relatively short period of each year. As a consequence, health risks of UV radiation exposure are often not perceived as important or relevant in the school context. With an already packed curriculum many teachers may decide to concentrate their limited time and resources on key curricular activities. However, they are usually happy to promote the message if ready made lesson plans are provided as a sustainable resource and

these are linked to key curricular areas. The following simple guidelines may help to motivate teachers to be committed to integrating sun protection in their teaching:

- 1. Clearly link opportunities for teaching sun protection to key curricular themes.**
- 2. Stick to approximately five simple key messages.**
- 3. Provide background information and ready-to-use resources to teachers.**
- 4. Organize short seminars for teachers and staff.**
- 5. Hold competitions to encourage participation by students and teachers.**
- 6. Identify a champion to take the message forward.**
- 7. Foster parent involvement.**
- 8. Recognize each school's efforts through an award system.**

5.1.3 Youth participation

Participation and empowerment are key principles of a Health-Promoting School. Students should be involved in planning school health programmes, carrying out the activities, and evaluating them in a structured way.

There are several ways in which students can be actively engaged and empowered:

- Involving them in policy development: Ensuring that students participate in the decision making process—for example, through student councils or representative bodies—is essential to gain their support.
- Involving them in the development and evaluation of implementation strategies: Strategies developed by students are more likely to receive student support. For example, students can redesign components of the school uniform to increase the level of sun protection provided, or design and build a new shade structure for the school grounds—thus achieving a sense of ownership in the outcomes. Students may offer creative solutions or strategies that are more likely to be accepted by other students because they understand what is relevant and important to young people. Students should also be involved in the evaluation process, for example, by developing and carrying out surveys of the effectiveness of sun protection strategies
- Having students act as peer role models and educators: Peers can act as positive role models, simply by being seen using sun protection during outdoor activities, particularly whole school events. Young people seldom see sun protection measures, such as hat wearing, as fashionable. Thus, the potential influence of role models, both in developing positive attitudes and counteracting negative ones simply through their behaviour, is important. Students can also act as role models through more specific educational activities, for example, by developing and implementing education programmes for other students. However, peer educators must be properly trained to ensure that they have not just the knowledge but also the skills necessary to support other students.
- Participating in community education and other community projects: Important community links can be developed through student participation in programmes involving the wider community. This might include, for example, conducting information sessions for families, organizing a tree planting programme for a local recreational facility, or helping to develop a sun protection policy for a sports club.

5.2 Healthy school environment

For sustainable improvements in levels of sun protection, the Health-Promoting School must create an environment that supports interventions through changes, not just to the physical environment, but also through policies and practices.

5.2.1 Supportive policies and practices

School policies are brief documents that clearly state what a school will do and how it will do it. Policies guide the planning, implementation, and evaluation of efforts to improve health and reduce UV exposure.. Section 4.3.3 outlines requirements for an effective sun protection policy and the rules or guidelines that could be included in such a policy. A sample sun protection policy is provided in Annex 4.

5.2.2 Physical environment

The physical environment is made up of the school buildings, classrooms, and school grounds, including areas used for passive and active recreation. The condition of the physical environment can have a significant impact on the UV exposure levels of members of the school community. Signs or prompts can help to encourage sun safety.

Three key aspects of the physical environment should be addressed:

- **Shade:** It is essential that students and staff have access to adequate shaded areas. In particular, shade must be available at peak UV periods, that is, during the middle of the day, for outdoor activities and also, if appropriate, for breaks. This is especially important if students are expected to eat lunch outside—it should be possible for all students to eat their lunch in the shade, or alternatives should be offered, for example, allowing students to eat in classrooms before going outside. Shaded areas should also be sufficiently attractive so that students will be willing to use them, for example, by providing seating and keeping the area clean. Where possible, shade should be incorporated into building design, for example, by using verandas and covered walkways. Tree planting is a cheaper, more long term solution than shade structures, and is a means of significantly improving the atmosphere of the school; however, temporary measures may be needed until new trees are able to provide adequate protection.
- **Clothing:** Clothing that provides effective sun protection should be available to students, staff, and parents and its use encouraged or required. Recommended items include broad brimmed or legionnaire hats; shirts with collars and longer sleeves; longer style shorts, skirts, or trousers; and wrap around sunglasses with UV protective lenses. Clothing used for sporting activities is particularly important, as students are often outdoors for extended periods during such activities.
- **Scheduling of outdoor activities:** Where possible, outdoor activities should be scheduled to avoid peak UV periods and to make the best possible use of shaded areas or indoor facilities. This also includes events that involve students spending extended periods of time outdoors, such as sporting carnivals. Beginning such events later in the day or conducting them over successive mornings can help to avoid excessive UV exposure. Midday breaks can be shortened and morning or late afternoon breaks extended to minimize the amount of time spent outdoors during peak UV periods.

5.2.3 Psychosocial environment

The psychosocial environment relates to the social and mental conditions that affect education and health. The ambience of a Health-Promoting School is one that respects the individual and fosters confidence in healthy lifestyles.

The following aspects of a healthy psychosocial environment should be integrated into a Health-Promoting School:

- **Teacher role models:** Teachers play an important role as adult role models and mentors. Teachers can encourage students to protect themselves from the sun by wearing protective clothing and sunscreen and seeking shade. This applies particularly to physical education/sports teachers who are often key role models for popular students and student leaders. If student leaders are positively influenced, they can in turn influence others.
- **Peer reinforcement:** Students can provide positive reinforcement to their peers by showing that sun seeking behaviour is not a requirement for peer acceptance. Schools therefore need to provide

time and opportunities to enable students to socialize in environments where UV exposure is avoided or minimized.

5.3 School health services

School health services help foster health and well-being as well as prevent, reduce, monitor, and treat important health problems or conditions. In Health-Promoting Schools, health services are provided to students, school personnel, families, and community members, and are coordinated with other sun protection services and activities in the school and community.

Models for providing school health services vary tremendously, not only from developed to developing countries, but also among and within nations themselves, and not all schools can provide access to school health services. Where they exist, school health services may consist of, for example, one teacher designated to be responsible for first aid, a trained school nurse, or a school health team.

One role of a school health service may be the provision of sunscreen, which should be available for all school activities. In deciding how to make sunscreen available, schools should consider five things:

- **Access:** Schools can request that sunscreen be applied prior to students coming to school, and make provisions for reapplication during the day. Schools may also request parents to supply sunscreen; however, a school supply should always be available.
- **Choice of sunscreen:** Sunscreen should have an SPF of at least 15, protect against both UVA and UVB, and preferably be water resistant.
- **Skin reactions:** Due to variations in skin type and the chemical composition of sunscreens, some students will experience skin reactions to certain brands. If schools provide sunscreen, parents should be informed of the type/brand so they can supply their own if necessary.
- **Management:** Sunscreen can deteriorate and must be used before its expiry date. Even if the expiry date has not been exceeded, sunscreen may still be ineffective if not stored correctly.
- **Correct use:** Staff, students, and parents should understand the limitations of sunscreen as a sun protection method (see Annex 2). Most students will require supervision to ensure that sunscreen has been applied correctly. Schools could allow for this by, for example, building time for application into their programmes.

A further role for school health services is in the treatment of sunburn and, if necessary, referral to other agencies. Health services providers are also in an ideal position to compile sunburn related data, which can be used to assess whether current programmes are effective and to better target interventions. For example, if cases of sunburn are related to particular school or community activities, such as sports days, strategies can be modified accordingly. Where particular individuals or groups are affected more frequently, appropriate action can be taken to respond to their specific needs.

Health service providers know the health effects of excessive UV exposure and often have firsthand experience in dealing with the consequences. Their expertise can be valuable in communicating the need for sun protection and appropriate strategies on an individual basis, in a classroom setting, and to the wider school community.

5.4 Community and family involvement and outreach

A Health-Promoting School addresses health promotion and sun protection by engaging students, school personnel, families, and community members in collaborative and integrated efforts to improve health in the school and through school/community projects and outreach. Community members and parents should believe that their school is open and receptive to their ideas and participation.

Family and community members can be involved in Health-Promoting Schools in various ways:

- **Taking part in planning and decision making:** For instance, by participating in the school health team or community advisory committee.

- **Participating in activities and services offered through schools:** For instance, attending projects to gain specific knowledge and skills relating to sun protection, such as exhibitions, performances, or health fairs.
- **Providing support or resources:** For instance, supplying material or financial donations, identifying or acting as guest speakers, or providing specialist services related to sun protection. Community health workers can assess current sun protection practices, and local suppliers can offer sun protective items, including clothing, sunscreen, and sunglasses.
- **Advocating for health:** For instance, knowledge and skills acquired in a school/community project can be used by community and family members to take communal actions that will result in sustainable sun protection interventions.

The family and community also provide a setting for students to understand, practice, and share what they learn about health and sun protection in the classroom. For example, a homework activity could involve comparisons of adults' (and even, if available, a baby's) skin with the students' to identify signs of UV exposure. Older students could also be asked to explain the signs of sun damage to older family members. This enables students to take pride in their knowledge and ability to help others.

Healthy practices in relation to UV exposure are more likely to take place if there is consistent information and support from the family and community. If this is to occur, parents and community need to be well informed, which can be achieved if schools are willing to act as leaders through role modeling and community education programmes.

Outreach also provides opportunities to facilitate healthy decision making and enhance health outcomes for those who are not reached by schools directly, particularly in areas where a high proportion of young people do not attend school.

5.4.1 Collaboration with parents and families

It is essential that parents understand the objectives of sun protection interventions and the underlying rationale, and that they have the knowledge and skills to allow them to reinforce the appropriate health messages at home. This increases the likelihood that parental attitudes and behaviours will be consistent with those of the school, and that parents will provide the things their children need to protect themselves, such as clothing, sunscreen, and sunglasses.

Tapping in to the concern that parents feel for their children's health is also one means of persuading them to be more proactive about their own health and that of other family members. While improving parents' sun protection behaviour may be one way of promoting sun protection for their children, the reverse may also be true: The messages children take home can encourage parents to adopt more sun protective behaviours themselves.

Although this is not an objective of school based interventions, given that, with the exception of sunburn, most of the effects of UV exposure are long term, greater parental awareness of the risks of UV exposure may also facilitate community interventions focusing on secondary prevention. If parents are aware of the signs of UV damage, they may be more likely to seek further information and early treatment, which will generally improve health outcomes.

5.4.2 Collaboration with the community

Sun protection interventions can be a means of involving the broader community in school based activities. Health services can deliver health education programmes that provide knowledge about the consequences of UV exposure and how to reduce the risk of damage, or provide advice about content and presentation. Resources can be developed jointly and shared between the school and the community.

Community members who have themselves experienced health problems relating to UV exposure are often willing to provide firsthand accounts to others. The value of this type of participation is enhanced if those providing the information are respected by students, for example, successful sports people. In return, these people often appreciate the opportunity to “give something back” by encouraging young people to take preventive measures.

Cooperation with local businesses can guarantee the availability and promotion of sun protection items. Any promotion of sun protection strategies within the community will serve to further spread and reinforce the message beyond those with direct links to the school.

In turn, the school can demonstrate leadership by incorporating sun protection interventions into all of its activities and thus acting as a role model for the community. Sports days and school fairs are all ideal opportunities for the school to showcase its sun protection strategies. An example of how sun protection strategies could be incorporated into such an event is given below.

Example A: A “SunSmart” School Sports Day

Planning for the event involves a committee comprised of students (including competitors), parents, teachers, administrators, and community members.

Prior to the event, parents are informed of the measures to be taken and the reasons for them through school newsletters. They are asked to ensure that their children wear sun protective clothing, including hats, and sunscreen on the day. If they plan to attend, they are requested to act as role models for students by dressing appropriately and seeking shade.

The local pharmacy or supermarket donates sunscreen for use on the day in return for promotion over the public address system during the event and in the school newsletter in the weeks prior and following.

The event begins in the late afternoon, avoiding the peak UV period and providing an opportunity for parents who may work during the day to attend. It is conducted at a venue that has natural shade for spectators; in addition, temporary shade in the form of umbrellas and tents is made available for officials and in the marshalling areas.

During the event, regular public address announcements remind those present to cover up and seek shade. Student leaders circulate, distributing sunscreen and encouraging spectators to protect themselves. Monitors are appointed to collect sun protective items from the marshalling area to where competitors finish their events; sunscreen is also available for reapplication. Points or spot prizes (possibly donated by local businesses in return for promotion) are awarded to groups (such as houses or classes) who show sensible sun behaviour or encourage others to do so. Recipients are recognized with other winners at the conclusion of the event. Surveys are distributed, asking parents and other spectators for feedback regarding the measures that have been implemented.

After the event, student leaders survey students and school staff about the effectiveness of the measures and how they could be improved. The number of students reporting sunburn after attending the event is recorded and compared with that for the previous year. This feedback, combined with the feedback from parents, is used to guide planning for future events.

5.4.3 Involving the media

The media, including television, radio, signboards, posters, calendars, newspapers, magazines, and leaflets, can be used to raise awareness and to encourage more sensible sun exposure. This can occur on any scale, from local to national, and is an effective means of communicating simple messages that can be further developed through more comprehensive education programmes.

Securing the cooperation of media that appeal particularly to young people can help to ensure that messages consistent with sensible sun behaviour are promoted. For example, information on the ageing effects of sun exposure can be included in articles on skin care in magazines targeting young girls.

Recruitment of successful sports people or celebrities with whom students can identify through the media is one way to influence young people's behaviour. If such people are seen to behave sensibly in relation to sun exposure and protection, there is a greater likelihood that young people will do the same. While schools themselves seldom have the resources to secure the services of such people, developing partnerships with other agencies that do—for example, government and nongovernmental organizations, business, and national sporting bodies can—is one way of gaining access to them.

Critical discussion of the images provided through mass media is another useful way of developing students' analytical skills both in relation to health messages and in a broader context. Techniques used in the media are often subtle and pervasive; for example, use of darkly tanned models in skimpy clothing may be used to promote a range of goods intended for young people, reinforcing the view that the behaviour and appearance thus portrayed is necessary for acceptance. It is not always possible to present images to counteract those presented in the media, but it is important that students understand how they are being influenced.

5.5 Physical exercise, recreation, and sports

Involvement in outdoor activities, including sports and recreation, forms an important part of a healthy lifestyle but may also increase one's risk of excessive sun exposure. However, active participation in outdoor activities need not be compromised, and, in fact, enjoyment can be enhanced through the implementation of sun protection interventions. Sensible behaviour is relatively simple to incorporate; it can also minimize risks and eliminate negative consequences, such as sunburn, that are often associated with being outdoors. Developing appropriate sun protection attitudes and habits that can be extended from the school environment to other settings is the best means of enhancing one's good health.

One way of integrating sun protection and physical exercise is through activities or games that combine the two. Examples of this are provided below.

Tunnel Hat: This is Tunnel Ball but instead using a broad brimmed or legionnaires hat. The hat is passed through children's legs, the person at the end of the line puts it on and runs to the front of the line, and so on.

Umbrella Relay: Children carry umbrellas to other team members. The relay could be between one shaded area and another. (Hats could be substituted for umbrellas.)

Dress-up Relay: Teams form two lines, facing one another. The children at the head of the line dress in a long sleeved shirt, a hat, and sunglasses. They then undress and the next child takes over. The team that finishes first wins.

Sunscreen Skittles: Children try to bowl over bottles of sunscreen arranged as skittles.

Hat Quoits: Children throw hats onto a quoits stick to score points.

Shady Lady: Play some music while children skip (hop or whatever) around. Anyone not in the shade when the music stops is out.

Shadow Chasey: Play in an area with some shade cover. The person who is "it" must tag others by standing on their shadows. The shade is a "safe zone," but the time children can stay there should be limited.

Such activities can incorporate discussions and other techniques to reinforce educational messages. For example, a game of Shadow Chasey could follow a discussion of how shadows are formed, how they change with the position of the sun, and the implications of this for sun protection. Playing at different times of the day would provide a practical illustration of these points.

Sun protection strategies can also be incorporated in all sports and recreational activities conducted by the school, for example:

- Developing sun protective sports uniforms or dress codes
- Attempting to conduct sports activities and lessons outside the peak UV periods
- Using shaded areas for activities where possible
- Making sun protective items a requirement for camps, excursions, etc.
- Developing sun protection policies for inter school sporting associations
- Organizing a SunSmart school sports day with community involvement (see Example A)

Involving students in the development of these strategies improves their understanding, creates a sense of ownership, and enhances their ability to plan beyond the school environment. For example, students could be provided with an itinerary for an excursion and asked to develop the list of required equipment. Students can also be involved in the design of sun protective clothing items.

5.6 Health promotion for school staff

Health promotion and training in relation to UV exposure and sun protection for school staff is essential for a number of reasons:

- Staff need to understand that health promotion and education is not just the responsibility of some staff members, like, health teachers, but part of the role of all staff.
- If they are to effectively communicate sensible sun related behaviour to students, staff must have the requisite knowledge and skills.
- Complete staff support is essential for the effective implementation of interventions.
- Staff should be able to assess their own sun related behaviour and to protect their own health.
- Staff are obviously well placed to identify measures that can be incorporated into their practices to improve levels of sun protection for themselves and their students.

Health promotion for staff should be ongoing to ensure that all staff, including those new to the school, are kept up to date. Promotions should incorporate a critical evaluation of current policies and practices to ensure that those not conducive to health are identified and modified.

Staff who are themselves well informed and supportive of the need to address the sun protection issue can also make appropriate recommendations to national teachers' associations or other education fora, in relation to both policy development and curriculum. In the longer term, sun protection education may be incorporated into national curricula and inter school collaborations such as, for example ensuring that sun protection strategies are incorporated into inter school sports competitions.

6. Evaluation

Evaluation is a powerful tool that can be used to inform and strengthen school health programmes. The major objectives of most evaluations are to determine whether the programme is being implemented as planned and producing the intended outcomes, and the extent to which this is or is not happening.

Properly conducted evaluation helps policy makers and planners do the following:

- Keep participants informed about outcomes
- Provide feedback and make improvements or adjustments, as necessary
- Obtain information that can be shared in order to help others
- More fully value the efforts of schools and their communities

All groups affected by the programme should have the opportunity to offer input. The information collected should provide the basis for decisions about the programme and its components.

6.1 Ongoing evaluation

Provision for evaluation should be made at the outset of a programme, and it should be an ongoing process. Once needs have been assessed and objectives developed, an evaluation and monitoring plan should be formulated to track progress in relation to those objectives. Evaluation is essential during the implementation phase to check that it is proceeding as planned. After a predetermined interval, the outcomes and impact of the interventions should be assessed, and decisions then made regarding the need for further improvements. The cycle is then repeated to see what further change is required.

6.2 Types of evaluation

Two types of evaluation are most relevant for school health programmes: process and outcome evaluation.

6.2.1 Process evaluation

Process evaluation assesses what interventions have been implemented, to whom, and when. It provides information about progress toward objectives and the need for interim adjustments. Methods that can be used for process evaluation include record keeping by schools and interviews with teachers, school administrators, and others.

Process evaluation answers questions such as these:

- To what extent are the interventions being implemented in the way that they are intended?
- To what extent are the interventions reaching the individuals who may need them (for example, students, parents, teachers, and community members)?

6.2.2 Outcome evaluation

Outcome evaluation measures whether and to what extent the programme's objectives have been achieved. Both qualitative and quantitative data collected during the situation analysis can constitute baseline data, with relevant post intervention data used to assess whether changes have occurred in the indicators chosen for investigation. Hence, for example, data may be sought in relation to whether there have been changes in the frequency of children getting sunburned during both school based activities and out of school hours, children's knowledge of sun protection methods, the frequency of use of various sun protection strategies, or the attitudes of parents and children toward sun protection.

Outcome evaluation answers questions such as these:

- Are the interventions achieving what was expected, as expressed in the objectives?
- To what extent did students adopt healthy behaviours or create healthy conditions?
- To what extent did the programme achieve increases in students' knowledge, attitudes, and skills in relation to the harmful effects of UV radiation and how to prevent them?
- What specific interventions worked best? Which did not work?
- How did students feel about the interventions?

6.3 What and how to evaluate

The following table provides an overview of the various programme components that can be evaluated with examples of quantitative and qualitative questions for process and outcome evaluation. This table is not intended to be inclusive as programmes and objectives will vary. Evaluation should be based on the objectives established in the planning phase and conducted in collaboration with the planning teams and other programme participants.

Components	Examples of Possible Evaluation Questions
Policy	<ul style="list-style-type: none"> • Does the school have a comprehensive sun protection policy? • Is the policy implemented and enforced as written? • Are resources and responsible people designated to support sun protection interventions • What do administrators, teachers, students, and teachers think of the policy?
Goals and objectives	<ul style="list-style-type: none"> • Are goals and objectives well defined, and do they establish the criteria against which to assess intervention activities and outcomes? • Are the objectives stated in terms of health status, behaviours, or conditions to be influenced?
Target groups	<ul style="list-style-type: none"> • Are teachers, students, school health personnel, parents, and community representatives involved in the planning of the interventions directed toward them? • What proportion of school children, parents, or other relevant groups has been reached by sun protection interventions? • Has the frequency of sunburn in the target groups during school based activities decreased? • Has the frequency of sunburn in the target groups during out of school hours decreased?
Skill based health education and teacher training	<ul style="list-style-type: none"> • What do students, teachers, and parents think of the curriculum? • Are sun protection curriculum programmes implemented as planned? • Does sun protection education foster knowledge, beliefs, attitudes, and skills needed to adopt healthy sun related behaviour or create conditions conducive to it? • Is in service training provided for educators responsible for implementing sun protection education • Do teachers feel comfortable implementing various parts of the curriculum?
Healthy school environment	<ul style="list-style-type: none"> • Is the amount of shade in the school grounds adequate, or has it improved? • Is shade available in areas that students are likely to use? • Are students/staff/parents actively encouraged/required to wear sun protective clothing? • Do students/staff/parents wear sun protective clothing? • Are outdoor activities scheduled to occur outside peak UV periods whenever possible? • Is sun protection a priority in the planning of school outdoor events? • Is there adequate support for healthy decision making in relation to sun protection?
Community and family involvement and outreach	<ul style="list-style-type: none"> • To what extent are community members involved in sun protection interventions? • Do families and the community see the school as a source of reliable and useful information in relation to sun protection? • Have parents changed their sun protection practices as a result of school programmes?

	<ul style="list-style-type: none"> • What do parents and community members think about the sun protection interventions that have been implemented?
Health promotion for school staff	<ul style="list-style-type: none"> • Are health promotion activities relating to sun protection available for school staff? • Do school staff understand the rationale for sun protection interventions? • Do the health promotion activities for school staff help them to adopt healthy behaviours or create conditions that foster healthy sun related behaviour?

6.4 Reporting progress and achievements

It is essential that the outcomes of the evaluation process are communicated to programme participants. The criteria used should be consistent to ensure continuity and comparability. The information should be readily understood by those to whom it is directed, who should be able to use it effectively to form the basis for further planning and to make changes where necessary.

Appropriate reporting of outcomes should recognize and acknowledge achievements and be a means of assisting others in implementing sun protection interventions.

ANNEX 1: Ottawa Charter for Health Promotion (1986)

Health promotion is the process of enabling people to increase control over, and to improve, their health. To reach a state of complete physical, mental and social well-being, an individual or group must be able to identify and to realize aspirations, to satisfy needs, and to change or cope with the environment. Health is, therefore, seen as a resource for everyday life, not the objective of living. Health is a positive concept emphasizing social and personal resources, as well as physical capacities. Therefore, health promotion is not just the responsibility of the health sector, but goes beyond healthy lifestyles to well-being.

PREREQUISITES FOR HEALTH

The fundamental conditions and resources for health are:

- peace
- a stable ecosystem
- shelter
- sustainable resources
- education
- social justice
- food
- equity
- income

Improvement in health requires a secure foundation in these basic prerequisites.

ADVOCATE

Good health is a major resource for social, economic and personal development and an important dimension of quality of life. Political, economic, social, cultural, environmental, behavioural and biological factors can all favour health or be harmful to it. Health promotion action aims at making these conditions favourable through advocacy for health.

ENABLE

Health promotion focuses on achieving equity in health. Health promotion action aims at reducing differences in current health status and ensuring equal opportunities and resources to enable all people to achieve their fullest health potential. This includes a secure foundation in a supportive environment, access to information, life skills and opportunities for making healthy choices. People cannot achieve their fullest health potential unless they are able to take control of those things which determine their health. This must apply equally to women and men.

MEDIATE

The prerequisites and prospects for health cannot be ensured by the health sector alone. More importantly, health promotion demands coordinated action by all concerned: by governments, by health and other social and economic sectors, by nongovernmental and voluntary organizations, by local authorities, by industry and by the media. People in all walks of life are involved as individuals, families and communities. Professional and social groups and health personnel have a major responsibility to mediate between differing interests in society for the pursuit of health.

Health promotion strategies and programmes should be adapted to the local needs and possibilities of individual countries and regions to take into account differing social, cultural and economic systems.

HEALTH PROMOTION ACTION MEANS:

BUILD HEALTHY PUBLIC POLICY

Health promotion goes beyond health care. It puts health on the agenda of policy makers in all sectors and at all levels, directing them to be aware of the health consequences of their decisions and to accept their responsibilities for health.

Health promotion policy combines diverse but complementary approaches, including legislation, fiscal measures, taxation and organizational change. It is coordinated action that leads to health, income and social policies that foster greater equity. Joint action contributes to ensuring safer and healthier goods and services, healthier public services, and cleaner, more enjoyable environments.

Health promotion policy requires the identification of obstacles to the adoption of healthy public policies in non-health sectors, and ways of removing them. The aim must be to make the healthier choice the easier choice for policy makers as well.

CREATE SUPPORTIVE ENVIRONMENTS

Our societies are complex and interrelated. Health cannot be separated from other goals. The inextricable links between people and their environment constitutes the basis for a socio-ecological approach to health. The overall guiding principle for the world, nations, regions and communities alike is the need to encourage reciprocal maintenance—to take care of each other, our communities and our natural environment. The conservation of natural resources throughout the world should be emphasized as a global responsibility.

Changing patterns of life, work and leisure have a significant impact on health. Work and leisure should be a source of health for people. The way society organizes work should help create a healthy society. Health promotion generates living and working conditions that are safe, stimulating, satisfying and enjoyable.

Systematic assessment of the health impact of a rapidly changing environment—particularly in areas of technology, work, energy production and urbanization—is essential and must be followed by action to ensure positive benefit to the health of the public. The protection of the natural and built environments and the conservation of natural resources must be addressed in any health promotion strategy.

STRENGTHEN COMMUNITY ACTION

Health promotion works through concrete and effective community action in setting priorities, making decisions, planning strategies and implementing them to achieve better health. At the heart of this process is the empowerment of communities—their ownership and control of their own endeavours and destinies.

Community development draws on existing human and material resources in the community to enhance self help and social support, and to develop flexible systems for strengthening public participation in and direction of health matters. This requires full and continuous access to information, learning opportunities for health, as well as funding support.

DEVELOP PERSONAL SKILLS

Health promotion supports personal and social development through providing information, education for health, and enhancing life skills. By so doing, it increases the options available to people to exercise more control over their own health and over their environments, and to make choices conducive to health.

Enabling people to learn, throughout life, to prepare themselves for all of its stages and to cope with chronic illness and injuries is essential. This has to be facilitated in school, home, work and community settings. Action is required through educational, professional, commercial and voluntary bodies, and within the institutions themselves.

REORIENT HEALTH SERVICES

The responsibility for health promotion in health services is shared among individuals, community groups, health professionals, health service institutions and governments. They must work together towards a health care system which contributes to the pursuit of health.

The role of the health sector must move increasingly in a health promotion direction, beyond its responsibility for providing clinical and curative services. Health services need to embrace an expanded mandate which is sensitive and respects cultural needs. This mandate should support the needs of individuals and communities for a healthier life, and open channels between the health sector and broader social, political, economic and physical environmental components.

Reorienting health services also requires stronger attention to health research as well as changes in professional education and training. This must lead to a change of attitude and organization of health services which refocuses on the total needs of the individual as a whole person.

MOVING INTO THE FUTURE

Health is created and lived by people within the settings of their everyday life: where they learn, work, play and love. Health is created by caring for oneself and others, by being able to take decisions and have control over one's life circumstances, and by ensuring that the society one lives in creates conditions that allow the attainment of health by all its members.

Caring, holism and ecology are essential issues in developing strategies for health promotion. Therefore, those involved should take as a guiding principle that, in each phase of planning, implementation and evaluation of health promotion activities, women and men should become equal partners.

COMMITMENT TO HEALTH PROMOTION

The participants in this Conference pledge:

- to move into the arena of healthy public policy, and to advocate a clear political commitment to health and equity in all sectors;
- to counteract the pressures towards harmful products, resource depletion, unhealthy living conditions and environments, and bad nutrition; and to focus attention on public health issues such as pollution, occupational hazards, housing and settlements;
- to respond to the health gap within and between societies, and to tackle the inequities in health produced by the rules and practices of these societies;
- to acknowledge people as the main health resource; to support and enable them to keep themselves, their families and their friends healthy through financial and other means; and to accept the community as the essential voice in matters of its health, living conditions and well-being;
- to reorient health services and their resources towards the promotion of health, and to share power with other sectors, other disciplines and, most importantly, with people themselves;
- to recognize health and its maintenance as a major social investment and challenge, and to address the overall ecological issue of our ways of living.

The Conference urges all concerned to join them in their commitment to a strong public health alliance.

CALL FOR INTERNATIONAL ACTION

The Conference calls on the World Health Organization and other international organizations to advocate the promotion of health in all appropriate forums and to support countries in setting up strategies and programmes for health promotion.

The Conference is firmly convinced that if people in all walks of life, nongovernmental and voluntary organizations, governments, the World Health Organization and all other bodies concerned join forces in introducing strategies for health promotion, in line with the moral and social values that form the basis of this CHARTER, Health For All by the year 2000 will become a reality.

CHARTER ADOPTED AT AN INTERNATIONAL CONFERENCE ON HEALTH PROMOTION

The move towards a new public health
November 17–21, 1986, Ottawa, Ontario, Canada

ANNEX 2: Appropriate Use of Sunscreen

Sunscreens contain chemicals that absorb and scatter UV rays, thereby filtering out most of the UV from the sun. The SPF on a sunscreen label provides an indication of the relative abilities of different sunscreens to filter out UVB rays.

Because no sunscreen can prevent all the UV radiation from reaching the skin, sunscreen should never be the first or only method of sun protection used. As much of the skin as possible should be covered with clothing, with sunscreen used on areas that cannot be protected with clothing. As a hat can only partially protect the face, neck, and ears, sunscreen should be applied to these areas.

UV radiation is reflected off surrounding surfaces, such as concrete, sand, or walls, and scattered by particles in the atmosphere into shaded areas; this is known as indirect UV. Indirect UV can reach people even when they are in the shade; therefore, sunscreen should be at all times when outdoors.

The SPF should not be used to calculate how long a person can stay out in the sun without getting sunburned. Sunscreens should not be used to extend the amount of time spent in the sun or as a substitute for clothing.

An SPF of at least 15 is recommended. The sunscreen should also be broad spectrum to provide protection against both UVA and UVB. Water resistant sunscreens are recommended, particularly for water based activities.

To be effective—that is, to achieve the level of protection indicated by the SPF value—sunscreen must be applied correctly:

- Apply sunscreen at least 20 minutes before going outside.
- Apply it liberally to clean, dry skin and do not rub in, i.e., leave a film on the skin; this will dry quite quickly.
- Reapply ever two hours, or more frequently if the sunscreen is likely to have been washed, sweated, or wiped off.

Check the expiry dates on sunscreen containers regularly. If a sunscreen shows any signs of deterioration—for example, separation of the components—do not use it, even if the expiry date has not been exceeded.

ANNEX 3: Simple Activities to Educate Children and Their Families About Sun Protection

Following are some ideas for simple activities that could be used to teach children—and through the children, their families—about sun protection. This list is not intended to be exhaustive, but rather used as a starting point.

- Assign a group of students or a class to make a sun protection display in a prominent area of your school that is likely to be seen by parents and other visitors. The display could contain examples of sun protective clothing, sunscreen containers, etc. Students could prepare posters explaining the various aspects of the display.
- Conduct a SunSmart fashion parade at your school. This could be incorporated into the programme for a general information session for parents. Students could model sun protective items, including sunglasses, and prepare a commentary that explains the sun protective qualities of each.
- Give students simple homework tasks in which parents and other family members can be involved. Examples: designing and making a sun protective hat from paper or other scrap materials from home, developing a simple poster on a specific sun protection topic, designing a label for a bottle of sunscreen, or making up a poem, rhyme, or song about how not to get sunburned.
- Conduct a tree planting day/activity. In the information promoting the event, explain why you are planting trees and invite parents to attend. Make sun protection a priority, e.g., run it as a twilight event, or ask that parents and students dress in sun protective clothing and ensure that staff do the same.
- Ask students to compare their skin with that of older family members, e.g., parents, grandparents, aunts/uncles, and older brothers and sisters, and to note the differences. They could also make comparisons with younger family members (especially babies, if possible). Discuss the outcomes in class.
- Ask students to develop a set of sun safety rules or tips for their homes. In class, discuss the key elements, which students then adapt for their own home and the types of activities that family members are involved in. Students could develop a poster that could be displayed in a prominent place in their home, e.g., next to a door that is used to leave the house.

ANNEX 4: Example of a School Sun Protection Policy

A policy like the one below could be adapted for implementation in a primary school.

Sample Sun Protection Policy

Our SunSmart policy has been developed to ensure that all students and staff attending this school are protected from skin damage caused by the harmful ultraviolet rays of the sun. It is to be implemented throughout the year but with particular emphasis from September to April. As part of general SunSmart strategies, our school will do the following:

Behaviour

- Require children to wear broad brimmed or legionnaire hats whenever they are outside (e.g., during recess, lunch, sports, and excursions).
- Work with the parent community to provide SPF 15+ broad spectrum, water resistant sunscreen for staff and student use.
- Encourage the daily application of sunscreen before school and prior to the lunch break.
- Encourage children to use available areas of shade for outdoor activities.
- Encourage children to wear sunglasses whenever practical for outdoor activities.
- Request staff and parents to act as role models by practicing SunSmart behaviours.

Curriculum

- Incorporate programmes on skin cancer prevention into the curriculum at all grade levels.
- Regularly reinforce SunSmart behaviour in a positive way through newsletters, parent meetings, and student and teacher activities.
- Ensure that the SunSmart policy is reflected in the planning of all outdoor events (e.g., camps, excursions, sporting events).

Environment

- Provide sun protective clothing items and sunglasses as part of our school uniform.
- Schedule outdoor activities before 11:00 a.m. and after 3:00 p.m. whenever possible.
- Organize outdoor activities to be held in areas with plenty of shade whenever possible.
- Schedule outdoor assemblies early in the day or in an area where all students can be in shade.
- Work toward increasing the number of shelters and trees so as to provide adequate shade in the school grounds.

Evaluation

<Name of Position/Committee> will review the effectiveness of this policy each year.

They will:

1. Review the SunSmart behaviour of students, staff, parents, and visitors and make recommendations for improvement.
2. Assess shade provision and usage and make recommendations for increases in shade provision.
3. Update and promote curriculum material relevant to SunSmart activities.

ANNEX 5: Examples of Ways in Which Sun Protection Can Be Integrated into Curriculum Areas Other than Health

Sun protection education should be integrated into areas of the curriculum other than health. These examples are intended as starting points only, and can be further developed according to the school's curriculum, the ages and capabilities of the students, and the teachers' objectives.

Science

- Conduct experiments to investigate changes in objects left in the sun.
- Describe the characteristics and structure of skin.
- Classify animal skins according to their characteristics.
- Investigate the structure and function of the eye and the impact of UV related damage on vision.
- Describe how different length shadows are formed by an object in the same position at different times of the day.
- Construct a model to show how the position/movement of the earth relative to the sun affects the intensity of UV radiation.
- Draw or describe the possible consequences of damage to the ozone layer.
- Describe the chemical reactions involved in the production and breakdown of ozone in the atmosphere.
- Identify types of UV radiation and their characteristics, e.g., wavelengths
- Investigate the impact of latitude on the intensity of UV radiation.
- Develop a flow chart or other representation of the cell cycle (i.e., cell division, specialization, and death) and how this can be disrupted by agents like UV radiation.
- Investigate the normal action of the immune system, how it may be altered by exposure to UV, and the implications for the body's ability to resist disease.

Mathematics

- On clock faces, show a range of times when it is most safe and least safe to be outdoors, with the times written under the clocks.
- Take regular temperature and UV readings and represent these on a graph.
- Tally answers to questions about attitudes regarding health and sun protection and graph the results.
- Develop a survey about sun protection behaviour at school and graph the results.
- Assess the amount of shade available in the school (i.e., develop a measuring system).

Language

- Write a story or poem about getting sunburned.
- Make a speech about ways to prevent sunburn, e.g., to another class.
- Prepare information about sun protection (e.g., on a poster) for an audience that speaks another language.

The Arts/Humanities

- Make up and perform songs about sun protection.
- Develop a poster or mural on an aspect of sun protection.
- Compare the sun behaviour, habits, and customs of people living at different latitudes.
- Consider occupations and leisure activities that expose people to the sun and how these might be varied to improve safety.

Technology Studies/Design/Crafts

- Design a container for sunscreen, including the label.
- Design and construct a sun protective garment for a specific purpose, e.g., a school or sports uniform.

- Develop a plan and construct a model of a new shade structure for the school grounds.
- Construct a model of the school grounds showing how trees and structures, could be used to improve shade provision.
- Construct a shade structure for a specific purpose.

Environmental Studies

- Explain the importance of trees in modifying the environment in relation to UV radiation.
- Undertake tree planting programmes to improve shade provision within the school grounds or community.
- Design a building (such as a school building or a house) that is energy efficient and incorporates shade.
- Conduct a debate about the need for further action in relation to ozone depletion.
- Role play the deliberations of a committee whose objective is to decide the need for action on the use of chemicals contributing to ozone depletion.
- Conduct a debate about the need to prevent further clearing of trees or to plant more trees on the school grounds or in the community.

ANNEX 6: Teaching Strategies for Sun Protection Education

Communication Methods to Convey Knowledge

- Lectures
- Storytelling
- Panel discussions
- Programmed instruction
- Audiovisually-aided instruction
- Guest speakers
- Demonstrations
- Peer teaching
- Non-directive teaching
- Individual instruction on independent student research projects

Methods to Influence Attitudes and Skills

- Open discussions
- Inquiry and experimentation
- Field trips to community resources
- Behaviour modification
- Concept formation
- Construction of models
- Competitions
- Role plays
- Debates
- Design of sun protective items, e.g., clothing, shade structures
- Games
- Simulations
- Modeling of behaviours
- Problem solving tasks

Organizational Methods to Bring About Community-wide Changes

- Organizing school or community groups for specific purposes (e.g., to change the school uniform or dress code, to raise funds for shade development)
- Committee work (e.g., participation in the development of the school sun protection policy)

REFERENCES

1. McKie, R. M. (2000). Effects of ultraviolet radiation on human health. *Radiation Protection Dosimetry*, 91: 15–18.
2. Duthie, M. S., Kimber, I. and Norval, M. (1999). The effects of ultraviolet radiation on the human immune system. *British Journal of Dermatology*, 140: 995–1009.
3. McCarty, C. and Taylor, H. R. (1999). Light and risk for age related eye diseases. In A. Taylor (Ed.), *Nutritional and Environmental Influences on Vision* (Chapter 8). Boca Raton, FL: CRC Press Inc.; 135–150.
4. American Cancer Society. *Cancer Facts and Figures 2000*. New York.
5. Diffey, B (2000) Personal protection: the way forward. *Radiation protection dosimetry*, 91: 293-296
6. Diffey (1996) Population exposure to solar UVA radiation. *European Journal of Dermatology*, 6: 221-222
7. Stern, R. S., Weinstein, M. C., and Baker, S. G. (1986). *Archives Dermatology*, 122: 514–515.
8. Vermeer, M., Schmeider, G. J., Yoshikawa, T., van den Berg, J., Metzman, M. S., Taylor, J. R., and Streilein, J. W. (1991). Effects of ultraviolet B light on cutaneous immune responses of humans with deeply pigmented skin. *Journal of Investigative Dermatology*, 97: 729–734.
9. World Health Organization. (1994). *Environmental Health Criteria 160: Ultraviolet Radiation*. Geneva: World Health Organization.
10. International Agency for Research on Cancer. (2001). Recommendations for public health action. *IARC Handbooks of Cancer Prevention: Sunscreens*. Lyon: World Health Organization.
11. Khlal, M., Vail, A., Parkin, M., and Green, A. (1992). Mortality from melanoma in migrants to Australia: Variation by age at arrival and duration of stay. *American Journal of Epidemiology*, 135: 1103–1113.
12. Marks, R., Jolley, D., Leclerc, S., and Foley, P. (1990). The role of childhood exposure to sunlight in the development of solar keratoses and non-melanocytic skin cancer. *Medical Journal of Australia*, 152: 62–66.
13. Dixon, H., Borland, R., and Hill, D. (1999). Sun protection in primary school children: the influence of age, gender and colouring. *Preventive Medicine*, 28: 119–130.
14. Broadstock, M., Borland, R., and Hill, D. (1996). Knowledge, attitudes and reported behaviours relevant to sun protection and sun tanning in adolescents. *Psychological Health*, 11: 527–539.
15. Marks, R. and Hill, D. (1988). Behavioural change in adolescence: A major challenge for skin cancer control in Australia. *Medical Journal of Australia*, 149: 514–515.
16. Staples, M., Marks, R., and Giles, G. (1998). Trends in the incidence of non-melanocytic skin cancer (NMSC) treated in Australia 1985–1995: Are primary prevention programs starting to have an effect? *International Journal of Cancer*, 78: 144–148.
17. Australian Secondary Schools Drug and Alcohol Surveys (SSASS: 1990, 1993. ASSAD: 1996). Unpublished data.
18. Australian Institute of Health & Welfare and Australasian Association of Cancer Registries. (1998). Cancer in Australia 1995: Incidence and mortality data for 1995 and selected data for 1996. AIHW Cat. No. CAN5. Canberra, Australia..
19. Carter, R., Marks, R., and Hill, D. Could a national skin cancer primary prevention campaign in Australia be worthwhile? An economic perspective. *Health Promotion International*
20. World Bank Cataract Blindness Control Project in India. (1994). Report No. 12246-IN. India: South Asia Country Department II.
21. Armstrong, B. (1996). An overview. In Proceedings of the Conference on The Health Consequences of Ozone Depletion. *Cancer Forum*, 20: 152–157.
22. Fraser, P. (1996). Chemistry of stratospheric ozone and ozone depletion. In Proceedings of Conference on the Health Consequences of Ozone Depletion. *Cancer Forum*, 20: 162–168,
23. Shevlin, J. (1996). Successes and ongoing challenges—the international policy response to ozone depletion and its implications for human health. In Proceedings of the Conference on the Health Consequences of Ozone Depletion. *Cancer Forum*, 20: 152–157.

24. Allart, M., Valks, P., van der A. R., Kelder, H., and van Velthoven, P. (2000). Ozone minihole observed over Europe, influence of low stratospheric temperature on observations. *Geophysical Research Letters*, 24: 4089–4092.
25. Dobbinson, S., Peipers, A., Reading, D., and Sinclair, C. (1998). A national approach to skin cancer prevention: The National SunSmart Schools Program. *Medical Journal of Australia*, 169: 513–514.
26. Girgis, A., Sanson-Fisher, R., Tripodi, D., and Golding, T. (1993). Evaluation of interventions to improve solar protection in primary schools. *Health Education Quarterly*, 20: 275–287.
27. Segan, C. (1994). Evaluation of SunSmart policies, practices and resource usage in Victorian primary schools: Telephone interviews with school principals. SunSmart Evaluation Studies No. 3. Melbourne: Anti-Cancer Council of Victoria.
28. World Health Organization (1996). *WHO Promoting Health Through Schools: The World Health Organization's Global School Health Initiative*. Geneva: WHO.
29. WHO (1998). WHO Information Series on School Health: *Healthy Nutrition: An Essential Element of a Health-Promoting School*. Geneva: WHO.
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