

National Cancer Prevention Policy

2007–09



Preventable risk factors

Ultraviolet radiation

U l t r a v i o l e t r a d i a t i o n

Melanoma incidence now exceeds lung cancer incidence. Skin cancer is, in financial terms, the most costly burden to the health system.

Introduction

The principal cancer related to excess ultraviolet (UV) radiation is skin cancer. Australia has the highest rates of skin cancer in the world. Skin cancer includes cutaneous melanoma and non-melanoma skin cancers (NMSC), namely basal cell carcinoma (BCC) and squamous cell carcinoma (SCC).

From as early as the 1950s and '60s, concern over high skin cancer rates led to limited community education campaigns programs in Victoria and Queensland. These aimed to raise public awareness about skin cancer and to increase health professionals' early detection of skin cancer.

Since the 1980s, more extensive public health programs aimed at preventing excessive exposure to UV radiation have been implemented across Australia by cancer organisations and government health services. The 'Slip! Slop! Slap!' and SunSmart slogans, developed in 1980 and 1987 by The Cancer Council Victoria, have been the themes of many campaigns and are well recognised by Australians in relation to sun protection. The focus of these skin cancer prevention programs has been on reducing the potential harm of skin cancer by decreasing exposure to UV radiation and increasing early detection and effective treatment.

Despite the challenges of evaluating programs aimed at changing sun protection behaviour, evidence of the effectiveness and cost-efficiency of programs in Australia and overseas is accumulating. Research is increasingly linking public health programs that encourage behaviour change to reductions in incidence and mortality.

In addition to this, in Australia, there is evidence that primary prevention programs aimed at reducing sunlight exposure may be affecting skin cancer rates (Staples et al. 2006) and that changes in adult behaviour have resulted in some reduction in skin cancer incidence (Slevin, Clarkson & English 2000).

The link between ultraviolet radiation and cancer

The major causative factor in the development of melanoma and NMSC is UV radiation exposure (Sun Protection Programs Working Party 1996; Armstrong 2004). Childhood sun exposure is clearly important. In addition, adult exposure appears to contribute. The exact exposure needed to develop various skin cancers is not entirely clear. It is likely that both cumulative and episodic exposures are important, particularly if they cause sunburn.

Based on a review of recalled sun exposure by period of life in studies of melanoma, the relative risk of melanoma with a history of childhood sunburn is 1.8, while for sunburn in adulthood it is 1.5 (Whiteman, Whiteman & Green 2001).

In adult life, recreational (intermittent) sun exposure appears to be the strongest determinant of melanoma risk followed by total lifetime sun exposure and occupational exposure. Fair skin, which tends to burn easily and tan poorly, is also an important risk factor for skin cancer (Sun Protection Programs Working Party 1996; English et al. 1997; Armstrong 2004).

In relation to NMSC, there is evidence that childhood and recreational (that is intermittent and non-occupational) sun exposure is important in determining the risk of basal cell carcinoma, while cumulative sun exposure, latitude and occupational exposure are associated with squamous cell carcinoma (Sun Protection Programs Working Party 1996). The burden of disease depends on geographical location. Both BCC and SCC rates are around three times higher in latitudes closer to the equator (Staples, Marks & Giles 1998; NCCI 2003), where UV radiation is higher.

Impact of ozone depletion

Changes in the stratospheric ozone may also play a role in the incidence of skin cancer. The ozone layer acts as a barrier to UV radiation. Its depletion over the 20th century has resulted in higher incident radiation levels reaching the earth's surface generally. The break-up of the Antarctic ozone layer has caused profound but localised ozone depletion over southern land masses (Armstrong 1996).

International measures to protect the ozone layer are showing signs of impact; despite this, climate change is expected to affect future ozone levels, slowing recovery of the ozone layer (Severi & English 2004). Due to the large variations in UV radiation levels during the day, it is difficult to accurately assess what impact ozone depletion has had on overall skin cancer incidence rates.

Solariums

Artificial UV radiation sources are also hazardous and for this reason solarium use should be avoided. Recent epidemiological studies have raised the possibility of an association between solarium use and melanoma (Young 2004; Gallagher, Spinelli & Lee 2005), however, epidemiological results generally lack consistency. Limited data from long-term follow-up of patients with severe psoriasis raise the possibility of an increase in SCC and BCC rates associated with solarium use (Autier 2004). There is no current evidence that supports the view that exposure to UV radiation through solariums is 'safe' or that tanning in this way protects against skin cancer.

Sunscreens

There has been some debate about the role of sunscreens in skin cancer prevention, and the potential association of sunscreen use with melanoma risk. A review (Gallagher, Lee & Bajdik 2004) found mounting evidence that sunscreen can prevent SCC, but no evidence that it can prevent BCC. It has been suggested that people may use sunscreen in order to stay longer in the sun and thus may increase their risk of cutaneous melanoma (IARC 2000). However, Gallagher et al. caution that retrospective case-control studies of melanoma and sunscreen use should be interpreted with great care, because of subject recall problems and confounding effects (2004).

Vitamin D

There is good evidence that vitamin D is obtained through sun exposure. There is also increasing evidence that vitamin D may protect against certain types of cancers (Garland et al. 1985; Garland et al. 1989; Giovannucci et al. 2006; Boniol, Armstrong & Dore 2006)

and can be beneficial in reducing the risk of osteoporosis. Therefore a balance is required between avoiding an increase in the risk of skin cancer and achieving enough UV radiation exposure to maintain adequate vitamin D levels.

For people with fair skin, it has been estimated that adequate vitamin D levels (>50 nmol/l) can be achieved in summer by exposing the face, arms and hands or an equivalent surface area for as little as 10 to 15 minutes, either side of the peak UV periods, on most days of the week (Samanek et al. 2006). In winter, in the southern states of Australia, where UV radiation levels are less intense, vitamin D levels may be maintained by approximately two to three hours of sunlight exposure accumulated over a week to the face, arms and hands or equivalent surface area. In northern states, the amount of sunlight exposure required to maintain adequate vitamin D levels is significantly less than this. Most people would achieve sufficient levels of sunlight exposure with normal outdoor activities without needing to deliberately seek additional sun exposure (TCCA 2006).

However, some people are at risk of vitamin D deficiency, for example, women with dark skin who wear veils (particularly in pregnancy) and elderly or disabled people in institutional care or who are housebound. These people may require dietary supplements (Marks et al. 1995; Nowson & Margerison 2002). In most situations, sun protection to prevent skin cancer is required during times when the UV Index is moderate or above (>3). At these levels, it is unlikely to put people at risk of vitamin D deficiency.

The impact

Skin cancer accounts for 81% of all new cases of cancer diagnosed in Australia each year (AIHW & AACR 2004).

Melanoma and NMSC account for almost 47% of the cancers managed by general practitioners (AIHW & AACR 2004).

Melanoma

Excluding NMSC, in 2005 melanoma was estimated to be the third most common cancer diagnosed in Australian women (after breast cancer and colorectal cancer, and the third most common in Australian men (after prostate and colorectal cancer). Overall melanoma incidence now exceeds that of lung cancer (AIHW & AACR 2004).

In Australia in 2005, 10,014 people were diagnosed with melanoma (5705 men and 4309 women) (AIHW, AACR, NCSG & McDerimid 2005).

In Australia in 2005, there were 1273 deaths from melanoma (862 men and 411 women) (ABS 2007).

Trends in incidence and mortality

Melanoma is rare in populations of non-European origin (Severi & English 2004).

In Australia the lifetime risk (to age 75 years) of developing melanoma is 1 in 24 for men and 1 in 33 for women. In 2005 the mean age of first diagnosis for melanoma was 61 years for men and 57 for women. Between 1991 and 2005 the incidence rate for melanoma increased on average 1.5% per year among men and 0.9% per year among women (AIHW, AACR, NCSG & McDerimid 2005).

Among younger age groups (< 25), the rate of new cases of melanoma (incidence) is stable (AIHW & AACR 2004). This is most probably due to a change in sun protection

behaviours as a result of public education programs, although it may in part be related to a change in the racial mix in the Australian population.

Mortality from melanoma rose steadily from 1931 to 1985 with annual rates of increase of 6% in men and 3% in women (Giles & Thursfield 2001).

Since 1990 the rate of death from melanoma in Australia has been relatively stable but remains twice as high for men compared to women. Mortality rates for men increased 0.7% per year between 1991 and 2005 and mortality rates for women decreased by 0.4% per year between 1991 and 2005 (AIHW, AACR, NCSG & McDerimid 2005; ABS 2007).

Non-melanoma skin cancer (NMSC)

NMSC is the most common cancer in Australia (AIHW & AACR 2004).

Cases of NMSC are not reported routinely to cancer registries but data obtained from population surveys suggests that 374,000 Australians (equivalent to 1.8% of the population) are treated for NMSC each year (AIHW & AACR 2004; Staples et al. 2006).

It has been estimated that in 2002 in Australia, 256,000 people were diagnosed with BCC and 118,000 people were diagnosed with SCC (NCCI 2003).

In Australia in 2002, there were 407 deaths from NMSC (270 men and 137 females) (ABS 2004).

Trends in incidence and mortality

In 2002 the cumulative risks of developing at least one NMSC to age 70 years were 70% for men and 58% for women. Incidence rates of NMSC have increased from 1985 to 2002. The increase has been greatest for people 60 years and older while rates for people under 60 have stabilised (Staples et al. 2006).

The rate of treatment (and therefore diagnosis) of new cases of SCC rose by 133% between 1985 and 2002 and was similar across the sexes. The rate of treatment (and therefore diagnosis) of new cases of BCC rose by 35% between 1985 and 2002 and was greater in men (42%) than in women (26%). NMSC rates for both SCC and BCC were higher in more northerly parts of Australia (NCCI 2003).

Mortality from NMSC decreased overall between 1950 and 1994 but an increase in deaths among men was noted from the mid-1980s to the mid-1990s, a phenomenon thought to be related to the HIV/AIDS epidemic (Giles & Thursfield 2001). Mortality rates (2002) are now 1.6 per 100,000 for men and 0.5 per 100,000 for women (ABS 2004).

NMSC is Australia's most expensive cancer. More than \$264 million (9% of the total costs of cancer) was spent on diagnosis and treatment in 2000–01 (Staples et al. 2006).

The challenge

Growth in the solarium industry

One of our great challenges is to counter the growing influence of solariums as agencies that promote the desirability of a tan and potentially expose users to dangerous UV radiation. The number of solariums and their commercial profile have increased significantly over the last few years and competition in the industry has led to substantial publicity and marketing campaigns being waged by solarium operators. Solariums

have been assertively marketed to the young as a health and beauty aid. The number of establishments in one city alone (Melbourne) increased by more than 650% over five years to the end of 2001 (Fox 2001). We need to continue to educate the public on the dangers of solariums and dispel the many solarium myths.

Advocating for solarium regulation

Regulation of the solarium industry also remains a challenge. In the face of a degree of apparent reluctance by all state and territory governments, and also the Australian Government, to regulate the solarium industry, there needs to be persistent efforts to maintain and increase industry standards.

A study of 30 solarium centres in Melbourne during the 2003–04 summer demonstrated poor compliance by many operators with numerous aspects of the voluntary Australian Standard: 90% provided access to fair skinned customers and 52% of people aged 16 years were able to buy solarium services without the parental consent the code requires (Dobbinson, Wakefield & Sambell 2006).

Increases in the desirability of a tan

Despite improving attitudes towards sun protection, there is worrying evidence that attitudes to tanning and sun protection behaviours are again changing. There are indications of a recent increase in the desirability of a tan. This is thought to have been influenced by the growth in the number and profile of commercial solariums and fashions that have emphasised skimpy clothing with maximum skin exposure. The absence of a substantial paid mass media campaign around skin cancer may also have played a role. Given the association between sun protection advertising and people's attitudes and behaviours, there needs to be more investment in mass media campaigns to reverse these trends before they affect skin cancer incidence and mortality.

Explaining the risks and benefits of UV radiation exposure

New debates continue to emerge in relation to the health risks and benefits of UV radiation exposure in terms of vitamin D. Some of these debates have the potential to confuse Australians and contaminate the sun protection message. The SunSmart UV Alert is a useful tool that can help explain when people need to protect themselves from UV radiation and when protection is not essential. However, this initiative requires monitoring and further marketing to ensure that the public understands and responds appropriately.

Upskilling GPs in the assessment, diagnosis and treatment of skin cancer

We need to ensure that the knowledge and skills of GPs keeps pace with scientific developments in the detection and treatment of skin cancer. It is critical that GPs know how to respond when people ask for a skin cancer check in response to SunSmart messages that tell them to seek GP advice about any suspicious spot or lesion.

Changing adolescents' sun exposure patterns

Adolescents generally adopt sun protection behaviours less frequently than adults and it is more challenging to achieve attitude and behaviour changes among teenagers (Arthey & Clarke 1995; Mermelstein & Riesenbergs 1992; Dobbinson & Hill 2004). Adolescents spend more time in the sun than any other group. While they have been shown to have a high level of knowledge on the dangers of sun exposure, they engage in relatively few sun protection behaviours. We need effective interventions that address adolescents' growing perception of sun-tanning as desirable.

Screening for melanoma

There is insufficient Australian research to support a population melanoma screening program (refer to the chapter on melanoma for more information).

Absence of a long-term coordinated national skin cancer control program

For the first time the Australian Government has committed funds to a national approach, with \$5.5 million being allocated to a social marketing approach delivered over the summer of 2006–07. However, despite achievements of over 20 years, Australia still lacks a long-term national skin cancer program. Cooperation continues to grow between the state cancer councils, but there is also considerable inconsistency in the funding available across states and territories to implement population-based skin cancer control campaigns.

Effective interventions

After more than 20 years of work, Australia is recognised as having the most extensive, comprehensive and longest-lasting skin cancer prevention programs in the world. Many have been based on and modified by extensive research and evaluation (Montague, Borland & Sinclair 2001).

Skin cancer prevention programs delivered throughout Australia by the state and territory cancer councils have been formed through needs analysis and formative research that has guided the development of effective and appropriately targeted strategies.

The Cancer Council Australia has a strong commitment to research that facilitates the development of evidence-based practice. Several state and territory cancer councils fund epidemiological and behavioural research that provides valuable expertise towards the development and evaluation of skin cancer prevention and early detection programs.

In 2003, The Cancer Council Australia and its members initiated the inaugural national sun survey to determine attitudes, knowledge and behaviours of the community with a specific focus on sun protection behaviours and sunburn incidence of Australian children, adolescents and adults (TCCA, unpublished data). The results of this survey provide valuable evidence to guide the development of skin cancer prevention strategies.

The health belief model (Egger, Spark & Donovan 2005) guides strategies that might influence people's perceived risk, and ability to reduce this risk, within supportive environments, to motivate behavioural and attitudinal change. Once skin cancer prevention programs are implemented, evaluation determines the effectiveness of strategies and possible areas for improvement.

Site-specific interventions targeting settings such as childcare centres, pre-schools, primary and secondary schools, outdoor recreation settings, workplaces and health care settings have been shown to help reduce exposure to UV radiation (Glanz, Saraiya & Briss 2004). Of all settings, school programs have been shown to be most effective for improving knowledge and attitudes and in some cases improving short-term behaviours.

For skin cancer prevention programs to be most effective, they should adopt a multi-strategic approach that enables a variety of priority groups to be targeted. Glanz, Saraiya and Briss (2004) recommend that programs use individual-directed strategies, environmental, policy and structural interventions, media campaigns and community-wide multi-component interventions.

Buller and Borland (1999) concluded that comprehensive, community-wide programs can increase sun protection behaviours and reduce UV radiation exposure. These programs are more effective than smaller-scale interventions since they are delivered through multiple channels, creating repeated exposure to consistent sun protection messages. Overall, though more expensive, community-wide interventions may prove to be the most efficient and cost-effective way to achieve behaviour change.

In addition, skin cancer prevention programs should embrace the recommendations of the Ottawa Charter (WHO 1986) in relation to public policy development, advocacy strategies, developing personal skills, reorientating health services and strengthening community action.

The policy context

Skin cancer prevention can be aided by regulating the solarium industry, effective shade design by local government, and advocacy and policy for sun protection behaviours in the workplace. Strategies that increase GPs' skills in early detection of skin cancer and encourage people to seek early diagnosis and treatment should also be supported.

Where possible, The Cancer Council Australia and its members seek to build strong partnerships with key stakeholders to support sound skin cancer prevention strategies. This collaborative approach allows the Cancer Council to access valuable advice and feedback from leading medical, policy and industry representatives, as well as consumers.

Aims

We encourage Australians to protect themselves throughout life against UV radiation, avoid unnecessary sun exposure and avoid exposure to other sources of UV radiation. Our aims are to:

- change the attitudes, knowledge and skills of individuals, particularly young people, about skin cancer and sun protection
- develop strategies for the early detection and effective diagnosis of skin cancer
- achieve healthy settings, organisations, products, policies and practices that promote sun protection
- strengthen the community's capacity for coordinated action on skin cancer prevention
- inform the design, implementation and evaluation of skin cancer prevention strategies.

What needs to be achieved	How The Cancer Council Australia and its members (the state and territory cancer councils) will do this
Positive changes in the attitudes of Australians towards sun protection with a particular emphasis on young people	Encourage the Australian Department of Health and Ageing to develop and implement a well-evaluated, long-term and comprehensive national social marketing campaign for children and young people aged 17 to 25 years

What needs to be achieved	How The Cancer Council Australia and its members (the state and territory cancer councils) will do this
An increase in knowledge of the UV Index and application of the UV Index to sun protection behaviours	<p>Ensure adequate public information dissemination of the UV Index through the media and other settings to reach population sub-groups involved in activities and situations identified at high risk for UV radiation exposure</p> <p>Provide training and information to news agencies to support the widespread use of the UV Index</p>
An increased capacity to monitor behavioural trends	<p>Every three years implement a national survey of sun protection along the lines of the Victorian Sun Survey, involving telephone interviews about sun-related experiences over the previous weekend, and details of temperature, cloud cover and UV radiation levels</p> <p>Implement the Primary Schools and Early Childhood Survey nationally every three years</p>
An increased capacity to monitor epidemiological trends	Conduct a survey of incidence of non-melanoma skin cancer every five years: the next survey is due in 2007
An increased capacity to know what works in relation to program delivery	<p>Undertake specific research and evaluation studies to:</p> <ul style="list-style-type: none"> • evaluate skin cancer control strategies • increase the likelihood of long-term Australian Government investment in skin cancer prevention • gather more evidence relating to the economic evaluation of skin cancer prevention • lead national and international understanding of what works in relation to skin cancer prevention
Protection of young people in caring and educational settings	<p>Provide support for the implementation of sun protection policies and practices by all childcare and pre-school centres across Australia in conjunction with local, state and territory and Commonwealth governments</p> <p>Ensure state and territory governments adopt sun protection policies and practices in all Australian primary schools: in most states and territories this will involve continued development and extension of the National SunSmart Schools Program in all primary schools</p> <p>Determine effective strategies and support their implementation to improve sun protection practices of students in secondary schools across Australia</p>
An increase in the amount of natural or constructed shade in public places	Encourage the adoption of shade provision and construction policies and building design standards by relevant areas of local, state and territory and Commonwealth governments
Improved sun protection practices among outdoor workers	<p>Encourage the inclusion of sun protection policies and practices in all relevant industrial agreements</p> <p>Ensure the incorporation of specific provisions for sun protection practices into existing and future state and territory and Commonwealth occupational health and safety legislation</p>
An increase in the early identification of harmful skin lesions among older people, especially men over 50 years	Coordinate public relations activity and promotional material to educate people over 50 years about the importance of early detection

What needs to be achieved	How The Cancer Council Australia and its members (the state and territory cancer councils) will do this
The safer operation and promotion of solariums	Encourage state and territory governments to implement and monitor legislation to control solarium operation and promotion Monitor compliance by the solarium industry to the guidelines issued by the Australian Competition and Consumer Commission (ACCC) and the AS/NZS 2635:2002 standard for solaria, and draw any non-compliance with the <i>Trade Practices Act</i> to the ACCC's attention
Increased knowledge of skin cancer prevention strategies among key professional groups	Encourage tertiary institutions to include information on sun exposure and sun protection in relevant education of childcare workers and teachers, medical practitioners, nurses and health professionals
Effective coordinated policy development and implementation	Develop and maintain evidence-based policy positions about the relationship between ultraviolet radiation and cancer to complement the Australian policy context Ensure effective and coordinated policy development and implementation to ensure existing policies reflect the best available evidence
Increased knowledge and skills of medical practitioners in the early detection and treatment of melanoma	Encourage professional associations to increase GP skills in diagnosis of early skin cancer in order to avoid missed lesions and reduce unnecessary lesion removal through accredited training programs Encourage state and Commonwealth governments to increase access for all Australians to diagnostic and treatment services, particularly Australians in rural and remote areas

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Ultraviolet radiation

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