



# Skin cancer prevention

## A blue chip investment in Victoria

SunSmart  
Cancer Council Victoria  
2008



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## Executive summary

Every year, 1,600 Australians die from skin cancer.<sup>1</sup> The cost to the health system is enormous – over \$294 million annually.<sup>2</sup> **Ironically skin cancer is one of the most preventable cancers in Australia.**

The SunSmart program aims to minimise the human cost of skin cancer in Victoria. The program, jointly funded by Cancer Council Victoria (Cancer Council) and the Victorian Health Promotion Foundation (VicHealth), leads the world in skin cancer prevention, with the Cancer Council appointed the World Health Organization Collaborative Centre for Ultraviolet Radiation in 2004.

Supporting SunSmart at the Cancer Council is the Centre for Behavioural Research in Cancer (CBRC), the Cancer Epidemiology Centre (CEC) and Cancer Information and Support Service. A key factor to SunSmart's success is ensuring work is underpinned by solid research and evaluation and is responsive to community needs.

SunSmart has extensive collaborative links with government, commercial and community agencies, an impressive range of resources and a focus on building structural and environmental approaches to sun protection.

Over the next 20 years, SunSmart is predicted to prevent 1,900 premature deaths and reduce the number of cases of melanoma by 20,000 and non-melanoma skin cancer by 49,000. The program is extremely cost effective with a \$2.32 net saving for every dollar spent.<sup>3,4</sup> SunSmart is not only about skin protection – it's an investment in prevention that brings considerable human and economic benefits to Victoria.

While the SunSmart program has made many gains, looking at trend data over its history suggests that some gains may be in danger of being lost unless investment is increased.

This report gives a summary picture of the severity of skin cancer incidence and mortality in Australia and Victoria. It highlights the successes of the long commitment to skin cancer prevention in Victoria and gives a summary of the SunSmart program between 2003 and 2007.

Twenty years of commitment and partnerships with allies and government has seen significant changes in social norms and the population's health including:

- decreased rates of melanoma and non-melanoma skin cancer in young people
- positioning Victoria as a national leader in solarium legislation across Australia
- increased use of hats and sunscreens, reductions in sunburn and decreased desire for a tan.

Extensive behavioural and epidemiological research provides the foundation for the SunSmart program. Based on this knowledge, the most effective interventions required to improve and sustain behaviour and broader environmental change include:

- **Investment in public education campaigns**, especially television advertising. This is essential to ensure gains that are made in skin cancer control are not eroded over time. Renewed behaviour change efforts are required to address the trends, for example, of people 'forgetting to protect' and 'poor application of sunscreen'.
- **Targeting adolescents and young adults**, given their low compliance with sun protective measures and higher sunburn incidence on summer weekends.
- Focusing on settings and activities where people mostly get burnt including **sport, water/beach related activities, active and passive recreation**.
- **Improving environmental protection strategies**, such as ensuring shade audits, options for built and natural **shade** and promoting the **SunSmart UV Alert**.
- Ensuring a tailored response with sections of the population that are more likely to be at risk of **vitamin D** deficiency.
- Providing ongoing core activity such as working with **schools, early childhood services** and **workplaces** to ensure a **health inequalities lens** in activity design, delivery and evaluation.

Resources, research and innovative strategies are required to address these challenges.

## Why skin cancer prevention?

Australia has the highest skin cancer incidence and mortality rates in the world. Over 1,600 Australians die from skin cancer each year, with at least two in three Australians being diagnosed with skin cancer before 70 years of age.<sup>1</sup> In 2002, **skin cancers accounted for over 80% of all cancers diagnosed in Australia.**<sup>2</sup> Cancer incidence in regional areas is significantly higher than in major cities; 60% of these excess cancer cases in regional Australia are due to melanoma.<sup>5</sup>

Non-melanoma skin cancer (NMSC) is the most common skin cancer in Australia.<sup>6</sup> Cases of NMSC are not routinely reported to cancer registries, but data obtained from population surveys suggest that more than 370,000 Australians, equivalent to almost 2% of the population, are treated for an NMSC each year.<sup>7</sup> In 2005, there were 405 deaths from NMSC in Australia (276 male and 129 female); 82 of these were Victorians.<sup>1</sup>

**In 2005, in Victoria, there were 2,347 new cases of melanoma and 245 people died from melanoma.**<sup>6</sup> Excluding NMSC, melanoma is now the third most common cancer diagnosed in Victorian women and the fourth most common in men.<sup>8</sup>

The cost to the health system in Australia of treating skin cancer is approximately \$300 million per year, a total consisting of over \$264 million per year for non-melanoma and over \$30 million for melanoma skin cancer.<sup>2</sup> Australian general practitioners have almost one million patient encounters annually for skin cancer.<sup>9</sup>

**Skin cancer is the most expensive burden on our health system of all cancers.**<sup>2</sup>

## Aim and objectives

In 1980, the Slip! Slop! Slap! campaign was launched as a limited public education program funded by public donations. In 1986, the Cancer Council was restructured and centres for behavioural research and epidemiological research were established. This facilitated a strong data, research and evaluation basis for the subsequent skin cancer campaign. The first of a series of household telephone surveys was run in the summer of 1987–88, and continues to provide important baseline data against which targets can be set and progress assessed.

In 1988, with the support of VicHealth, a new broad-based, multi-faceted skin cancer control program, the SunSmart program, was introduced. Since then VicHealth has contributed more than \$13 million and the Cancer Council \$8.6 million to the program. The aim of SunSmart is to lead, coordinate, implement and evaluate action to minimise the human cost of skin cancer in Victoria.

Today, with the continuing support of VicHealth, the key sun protection messages have expanded to ensure a focus on individual and environmental strategies including slip on sun-protective clothing, slop on SPF30+ sunscreen, slap on a hat, seek shade and slide on some sunglasses (Figure 1).

SunSmart has also taken a leadership role in promoting a balance between the benefits and harms of UV exposure and the links with vitamin D.

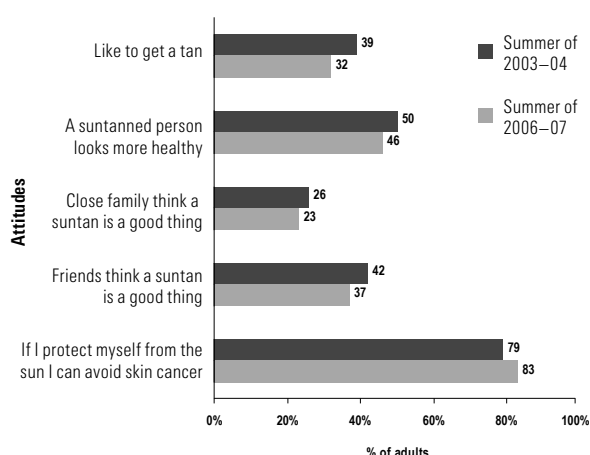


Protect yourself in five ways from skin cancer

FIGURE 1: SLIP! SLOP! SLAP! SEEK! SLIDE!

## Skin cancer prevention: does it make a difference?

The Sun Protection Survey is the main study used to assess the Victorian population's response to the SunSmart program. Between 1987 and 2002, 11,589 people were surveyed throughout summer about their outdoor activities and sun-protective behaviours over the previous weekend.<sup>10</sup> In the summers of 2003–04 and 2006–07 the survey was expanded to become the National Sun Protection Survey (conducted by CBRC). These studies, accompanied with ongoing investment in program evaluation and research in Victoria and nationally, allow for the monitoring of changes in population knowledge, attitudes, behaviours and skin cancer rates, and economic measurement of the effectiveness of skin cancer prevention interventions. At a population level significant changes and trends have been measured.

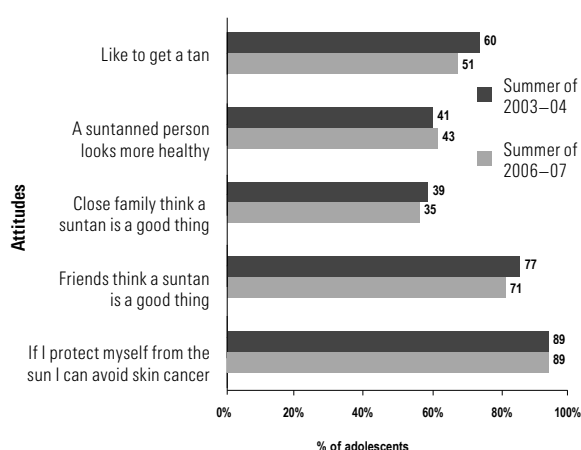


GRAPH 1: AUSTRALIAN ADULTS' ATTITUDES TO SUNTANS AND SUN PROTECTION (PERCENTAGE OF ADULTS WHO AGREED WITH EACH STATEMENT)<sup>10</sup>

## Knowledge, attitudes and beliefs

Since the 1987–88 summer, there have been large attitudinal changes towards suntanning.<sup>10</sup> Sixty-four per cent of Victorian adults now say that they do not like to get a suntan.<sup>10</sup> There have also been more recent changes in Australian adults' knowledge, attitudes and beliefs relating to sun protection. In 2006–07, 46% believed a suntanned person looks more healthy (50% in 2003–04), and only 12% believed a suntanned person is healthier. There were also reductions in the percentage of Australian adults reporting that their close family think a suntan is a good thing (23% in the summer of 2006–07 compared with 26% in the summer of 2003–04) and that their friends think a suntan is a good thing (37% in the summer of 2006–07 compared with 42% in the summer of 2003–04). Adults were more likely to believe that if they protect themselves from the sun they could avoid skin cancer (83% in the summer of 2006–07 compared with 79% in the summer of 2003–04) (Graph 1).<sup>10</sup>

The percentage of Australian adolescents reporting that they like to get a suntan has dropped from 60% in the summer of 2003–04 to 51% in the summer of 2006–07. Importantly, there was also a reduction in adolescents reporting that their friends thought a suntan was a good thing (77% in the summer of 2003–04 to 71% in the summer of 2006–07). There was however a slight increase in adolescents reporting that a suntanned person looked more healthy (Graph 2).<sup>10</sup>



GRAPH 2: AUSTRALIAN ADOLESCENTS' ATTITUDES TO SUNTANS AND SUN PROTECTION (PERCENTAGE OF ADOLESCENTS WHO AGREED WITH EACH STATEMENT)<sup>10</sup>

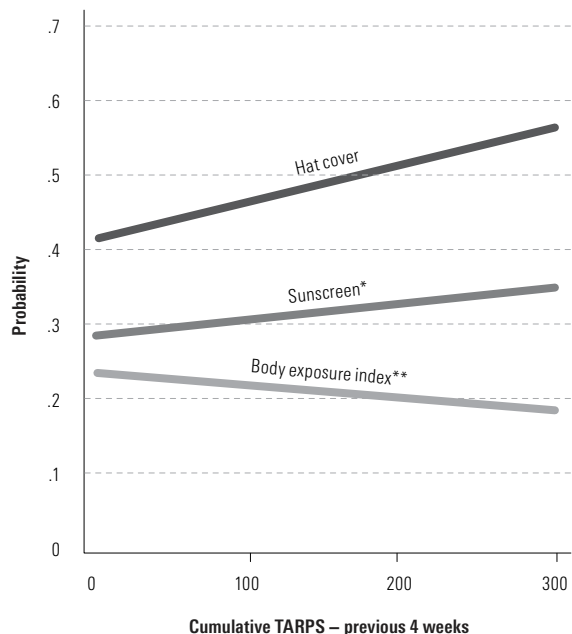
## Sun protection behaviours have substantially improved

There have been significant increases in the use of hats and sunscreens, and reductions in overall proportions of unprotected skin.<sup>12,13</sup> In the summer of 1987–88, 21% of Victorian adults reported wearing a hat when outdoors on weekends during peak ultraviolet (UV) radiation periods;<sup>12</sup> by the summer of 2006–07, this figure was 46%.<sup>13</sup>

Observational studies suggest similar trends in attitudes to suntans and sun protection. CBRC’s serial cross-sectional observational field surveys of teenagers and adults at leisure on summer weekends between 11 am and 3 pm found that, after adjusting for covariates, there were significant improvements in the extent of body cover over the decade.<sup>11</sup>

In 2006–07, the Australian Government funded the first national mass media campaign on skin cancer awareness. Data from the summer 2006–07 survey was therefore able to be compared with pre-campaign survey data from summer 2003–04. The campaign reached a large cross section of the population with 64% of adolescents and 58% of adults able to recall the television advertisement. Importantly, the awareness was highest in adults with sensitive skin and among younger adults. Survey results showed that the advertisement made viewers think about what it would be like to get skin cancer and encouraged them to protect their skin.<sup>10</sup>

Victorian specific data further supports the importance of television advertising. Sun protection behaviour directly correlates with SunSmart television advertising. For example, for each increase of 100 Target Audience Rating Points (TARPs) in exposure to SunSmart advertising, the odds of preferring to get no tan at all increased by 20%. This is consistent with overall trends in sun-protective behaviours. Modelling the effects of increased TARPs on behaviour showed that hat use and sunscreen use increased with increasing exposure to advertising, while the mean proportion of the body exposed to the sun decreased (Graph 3).<sup>12</sup>



GRAPH 3: EFFECT OF TARPS ON SUN PROTECTION BEHAVIOUR<sup>12</sup>

\* Weak evidence for inadequate model fit (p\_0.029 from Hosmer–Lemeshow test).

\*\* Fitted values from multiple linear regression.

Source: Dobbins SJ, Wakefield MA, Jansen KM, Herd NL, Spittal MJ, Lipscomb JE, Hill DJ. Weekend sun protection and sunburn in Australia trends (1987–2002) and association with SunSmart television advertising. *Am J Prev Med.* 2008;34(2):94–101. Accessible from [http://linkinghub.elsevier.com/retrieve/pii/S0749-3797\(07\)00643-5](http://linkinghub.elsevier.com/retrieve/pii/S0749-3797(07)00643-5)

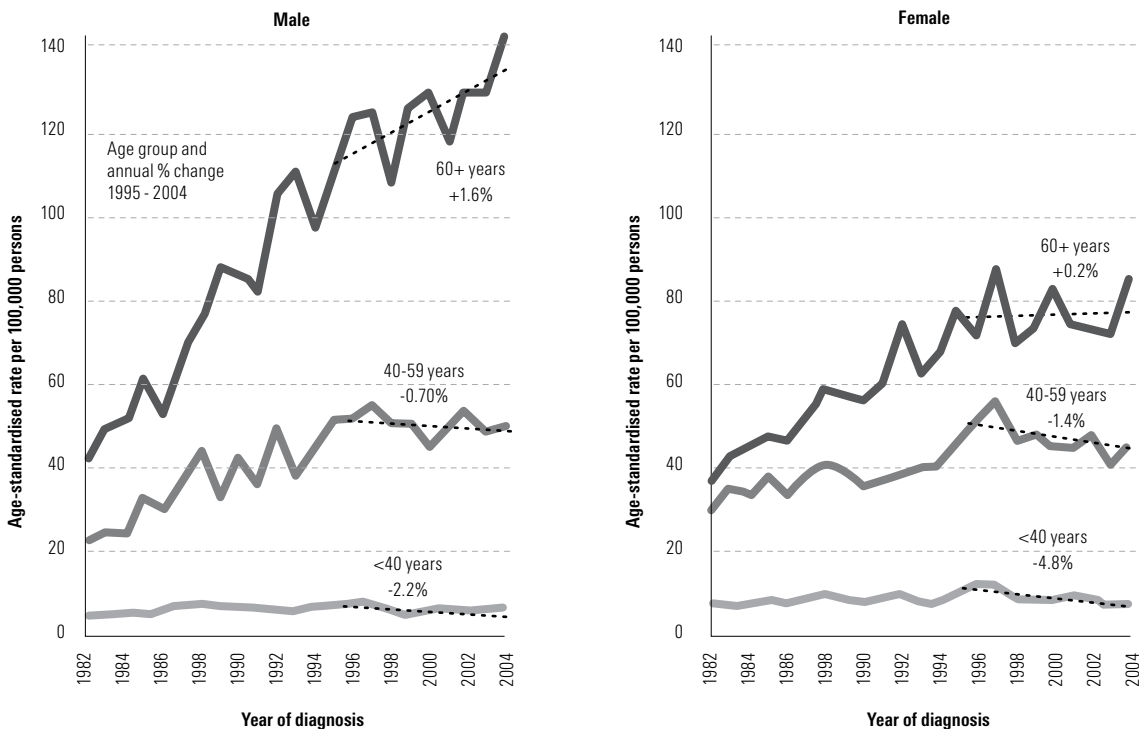
Sunburn incidence is commonly used as a proxy indicator of effective melanoma prevention. There has been a **significant reduction in sunburn incidence** in Victoria since the inception of SunSmart, with **9% of adults burnt on an average summer weekend in 2001–02 compared to 14% in the summer of 1987–88**.<sup>12</sup>

In the most recent national data from the 2006–07 summer, the vast majority of Australian adolescents and adults were outdoors for more than 15 minutes during peak UV times with the mean time spent outdoors at 111 minutes for adolescents and 116 minutes for adults. This level of sun exposure would result in sunburn for the majority of respondents' skin types without adequate protection of the skin. **Respondents commonly reported the reason they got sunburnt was due to 'forgetting to protect' and/or poor application of sunscreen.** The parts of the body that most commonly got burnt were multiple sites on the upper body; arms or hands (43%) on adults and shoulders/head (42/41%) on adolescents.<sup>13</sup>

The study also identified activities and settings where people get sunburnt including at the beach/water/pool (17% for adults and 39% for adolescents), participating in active recreation/sport (20% for adults and 37% for adolescents) and passive recreation (20% in adults).<sup>13</sup>

## Melanoma incidence: things are changing

The ultimate indicator of success of a skin cancer prevention program is the reduction in the incidence of morbidity and mortality due to skin cancer. While melanoma incidence in Victoria continues to rise, the rates of increase have slowed. There is now a slower increase among those aged over 60, and falling incidence rates in those under 60. These **falling rates in younger people are consistent with a positive effect of the SunSmart program on behaviour change** (Graph 4). Rates in older Victorians reflect less positive sun protection behaviours in their early lives, before SunSmart commenced. Mortality rates from melanoma have declined steadily for women since the late 1980s, and appear to have stabilised for men.<sup>14,15</sup>



GRAPH 4: MELANOMA INCIDENCE TRENDS BY AGE GROUP AND SEX, 1982–2004.<sup>6</sup>

## Cost effectiveness: SunSmart is value for money

SunSmart was rated the second most cost effective and health saving intervention (the first being community heart health programs) in a recent economic analysis completed by the Victorian Department of Treasury and Finance (Table 1).

Risk factor	Intervention	Ranking before production gains*	Ranking after production gains*
CVD risk factors	Community Heart Health Program	1	1
<b>Sunlight exposure</b>	<b>SunSmart program</b>	2	2
Smoking	Call back counselling	2	3
Alcohol use	Brief GP intervention	4	8
Depression	Maintenance CBT for five years – public psychologist	5	5
Depression	Maintenance CBT for five years – private psychiatrist	6	6
Smoking	Bupropion	7	7
CVD risk factors	Beta blockers targeted at 15% risk group	8	11
Smoking	Nicotine replacement therapy	9	9
CVD risk factors	Dietary counselling targeted at 10% risk group	10	12
Alcohol use	Random breath testing	11	4
Cervical cancer	Screening (current practice)	12	10
Physical inactivity	Active GP script	13	14
Depression	Maintenance SSRIs for 5 years	14	13
CVD risk factors	Dietary counselling targeted at 5% risk group	15	15
CVD risk factors	ACE inhibitors targeted at 10% risk group	16	17
CVD risk factors	Beta blockers targeted at 5% risk group	17	16
CVD risk factors	ACE inhibitors targeted at 5% risk group	18	18
CVD risk factors	Combination targeted at 15% risk group	19	19
Physical inactivity	Exercise physiologist	20	20
Depression	Opportunistic screening + CBT	21	21

TABLE 1: COMPARATIVE RANKING OF INTERVENTIONS ON COST EFFECTIVENESS BEFORE AND AFTER PRODUCTION GAINS.<sup>3</sup>

\*Production gains refer to absence from paid work due to premature death or retirement and/or short-term absences from paid work due to ill health.

SunSmart is predicted to prevent 1,900 premature deaths and reduce the number of melanoma cases by 20,000 and non-melanoma skin cancer cases by 49,000, over the next 20 years.<sup>3</sup> The program is extremely cost effective with a \$2.32 net saving for every dollar spent.<sup>4</sup>

## Program achievements 2003–07

During 2003–07, SunSmart has positioned itself to be an integrated program focused on affecting individual sun protection behaviours and environmental and legislative change. The program is underpinned by strong research and evaluation, which is responsive to an ever-changing environment.

Partnerships with government at all levels, VicHealth, corporations and industry, health, medical and scientific sectors, employer and employee organisations, other state and territory cancer councils and other sections of the Cancer Council, remain crucial to the optimal functioning of the SunSmart program in Victoria.

Some examples from the benefits of these partnerships include:

- The formation of advisory groups to guide strategic directions including the local government shade reference group, workplace program advisory group, secondary schools program advisory group and the general practitioner melanoma working group.
- \$100,000 per annum for the Cancer Council through a partnership with Worldmark for UV Shield, a national car window tinting company (on behalf of all state and territory cancer councils). These funds are re-invested into SunSmart programs across Australia.
- \$18,000 for the production of workplace-related resources and joint delivery of the state-wide free skin cancer check initiative with WorkSafe Victoria.

The advertisement *Tattoo* was launched in 2003 and was adopted across Australia and internationally (Figure 2). This campaign aimed to question the increasing tendency for young people to seek a tan. *Tattoo* was the first mass media strategy targeting young people with a message about the dangers of tanning. It depicts a contemporary image of a young woman who has a tattoo that animates and moves across her body, leaving in its wake a melanoma, resulting in a surgical scar. Data from the summer 2004–05 survey showed that 74% of people recalled the advertisement and its key messages. Due to limited funds the only other paid television advertising that the SunSmart program in Victoria has conducted in recent years is the Clare Oliver *No tan is worth dying for* advertisements (included paid and unpaid television advertising) as discussed below.

The 2003–07 advocacy and capacity building highlights are summarised in the subsequent pages.

## Victoria leads the way in solarium legislation

In the decade up to 2006, there was a 500% increase in the number of solariums in Melbourne.<sup>16</sup> Sun beds were assertively marketed to young people as a health and beauty aid. Compliance research, led by the Cancer Council, demonstrated a generally poor operator compliance with the voluntary Australian Standard with 90% providing access to fair skinned customers and 52% allowing 16 year olds to purchase solarium services without the parental consent that the code requires.<sup>17</sup>

SunSmart worked closely with the Victorian Department of Human Services (DHS) to implement the *Solariums: Fashion to die for* campaign (Figure 3). SunSmart also played an active media advocacy role commenting on solariums following the much-publicised death of a young melanoma patient, Clare Oliver, in 2007 (Figure 3).

In August 2007, The Hon Daniel Andrews MP, Minister for Health, announced the regulation of the solarium industry, under the Radiation Act 2005, to commence in 2008. The *No tan is worth dying for* campaign followed, developed in partnership with the Clare Oliver Foundation and VicHealth. The partnership with DHS led the way to a wave of legislation across other states in Australia. Standards Australia also brought forward the review of the Australian standard for solariums to build stronger requirements to protect consumers' health.

Data released from the Victorian State Government in July 2008 now shows a staggering 29% decrease in the number of sites with a tanning unit, while the number of licensed tanning units has also dropped by 19%.<sup>18</sup>

A strong media presence is key to keeping SunSmart in the public arena and influencing social norms about sunburn, tanning and skin cancer. The program has maximised its media presence by achieving an impressive amount of unpaid media exposure and limited paid advertising.



## Ensuring a balance: Vitamin D

SunSmart has taken a leadership role in promoting a balance between the benefits and harms of UV exposure. Sun protection is recommended only when the UV index is three or above. (unless at high altitude or near water).

In 2007, SunSmart, the Australia and New Zealand Bone and Mineral Society, Osteoporosis Australia, the Australasian College of Dermatologists and state and territory cancer councils finalised the joint position statement (and public communication strategy) on vitamin D.<sup>19</sup> The position statement is available at [www.cancer.org.au/positionVitD](http://www.cancer.org.au/positionVitD)

Work is now focused on further research, tailoring sun protection messages for populations at risk of deficiency and working with schools and early childhood centres in neighbourhood renewal sites (Figure 4). More work is needed to promote a balance between the benefits and harms of UV exposure particularly tailored strategies for at risk populations, including naturally dark skinned, people who cover their skin for religious or cultural reasons, the elderly and people who are housebound or in institutional care, and babies and infants of vitamin D deficient mothers.

The SunSmart UV Alert was launched in 2005–06 with the Bureau of Meteorology (BOM), Australian Radiation Protection and Nuclear Safety Agency, state and territory cancer councils and led by SunSmart Victoria (Figure 5). When the forecast UV index reaches three and above, the SunSmart UV Alert is issued and reported in all daily newspapers across Australia, as well as on the BOM website and via Telstra Pocketnews SMS weather forecasts. The SunSmart UV Alert raises awareness of the risk of exposure to UV radiation, and encourages people to protect themselves. People can use the SunSmart UV Alert as a tool to monitor when safe sun exposure is possible for vitamin D production. The SunSmart UV Alert is accessible at [www.bom.gov.au/weather/uv](http://www.bom.gov.au/weather/uv)

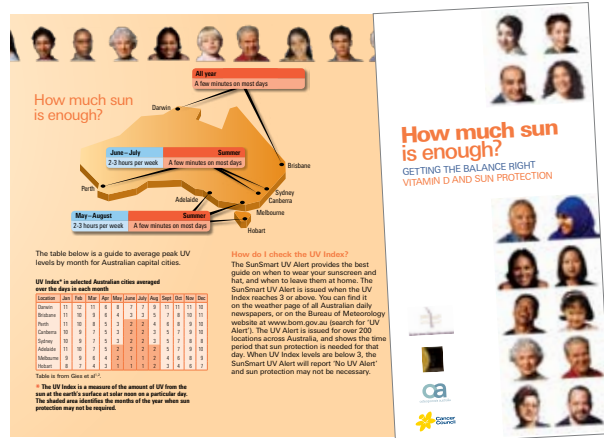


FIGURE 4: HOW MUCH SUN IS ENOUGH? PUBLIC BROCHURE

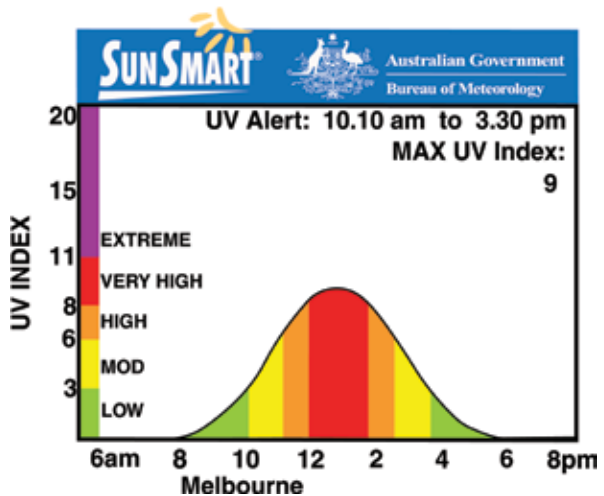


FIGURE 5: THE SUNSMART UV ALERT

## Schools and early childhood

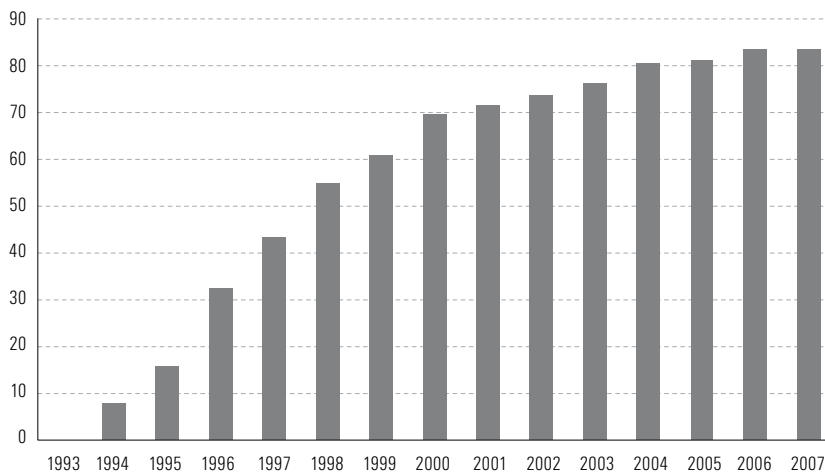
In 1993, 12 Victorian primary schools agreed to participate in a SunSmart Schools pilot program. By 2007, that number had increased to 1392 or 84% of Victorian primary schools (Graph 4). This is the highest participation rate of any state or territory in Australia. Special education schools have also steadily increased their SunSmart membership with 54% now participating in the program.

The SunSmart Early Childhood program began with a participation rate of 6% in 1996. This has grown to 67% or 1803 early childhood services across Victoria. In partnership with Playgroup Victoria, sun protection information has been shared with approximately 40,000 families. Working with local government continues to be a very effective partnership to increase and maintain participation rates for all early childhood services and council managed services in their area. Out of the 62 Victorian councils that have council-managed early childhood services, 23 have 100% of their services SunSmart.

Results from a national primary school sun protection survey indicated that Victorian schools are working well to provide a supportive environment for their students and staff including 94% having a written sun protection policy; 99% enforcing hat wearing in terms one and four (the peak UV radiation months in Victoria), with 75–100% of students wearing a hat during their lunch break; 91% of schools requiring teachers to wear hats.<sup>20</sup> The SunSmart Schools program supports each member school with policy advice and curriculum resources to encourage best practice (Figure 6).

In 2004, a new secondary school curriculum resource based on the *Tattoo* campaign was developed in consultation with teachers, students and peak bodies. The resource includes a teacher's manual and a 20-minute documentary on the making of the advertisement with commentary by a leading media studies academic. By December 2005, 150 copies of the resource were purchased by Victorian secondary schools and a further 150 copies were sold interstate.

Focus testing with staff, students and school principals, informed the development and implementation of a new secondary schools sun protection program in 2007. Between October and December 2007, 42 schools registered with the Secondary School Sun Protection program.



GRAPH 4: VICTORIAN SUNSMART SCHOOLS PROGRAM MEMBERSHIP 1993–2007

These participation rates are the highest across Australia, representing unprecedented engagement with schools and early childhood services when compared to other public health issues.

Advocacy is an important tool for broader policy change. Action has included:

- Working with the Department of Education and Early Childhood Development (DEECD) to ensure sun protection advice and guidance is included in their guidelines and reference materials. Information has also been submitted to the DEECD's new Building Quality Standards Handbook and online Occupational Health and Safety (OH&S) guidelines risk register with UV radiation listed as a hazard.
- Submission prepared and presented to the parliamentary inquiry into dress codes and school uniforms in Victorian schools, arguing that school uniforms and dress code policies should include sun protective clothing and hats. The committee has now released a statement requiring government schools to address sun protection in its guidelines for school dress codes and requires all government schools to include a sun protective hat as an option in their school dress code or school uniform policy. This information will also be passed on to appropriate authorities for non-government schools.
- Submission to DEECD's Blueprint for Early Childhood Development and School Reform. Future emphasis and action is required to work with all schools and DEECD to ensure shade is considered when planning for new school developments and refurbishments.

## Workplaces

The SunSmart program works with WorkSafe to promote workplace sun safety and OH&S legislation. The education program conducted 577 sessions between 2003 and 2007, generating revenue for future activity. The program significantly improved workers' knowledge about sun exposure as a workplace hazard and how to protect themselves from the sun.<sup>21</sup>

In 2006–07, a series of new national workplace resources were developed, in partnership with WorkSafe Victoria, and coordinated by the Cancer Council (Figure 7). The new resources and an online training program were launched in November 2007. This now ensures the provision of nationally consistent messages for organisations employing outdoor workers.

Strong networks have been built with a range of state, regional and industry based groups. This has resulted in a range of collaborative projects including:

- The UV protection blitz campaign was developed and launched in close partnership with WorkSafe Victoria; the Construction, Forestry, Mining and Energy Union; and the Victorian Trades Hall Council. This involved WorkSafe inspectors visiting construction sites to raise awareness of the need to protect outdoor workers from the sun's UV radiation as well as improve the ability of employers to fulfil their legal obligations. WorkSafe field officers are now leading advocates for sun protection in the industry.
- SunSmart and WorkSafe Victoria, with the Workers' Occupational Health Centre, major construction companies and trade and labour councils, also conducted a state-wide awareness-raising project that delivered 18 free skin cancer checks in metropolitan Melbourne and regional Victoria.

Over 20 professional in-service seminars were presented to organisations including the Victorian Construction Safety Alliance, the Victorian Health and Safety Professional Forum, the Australian Industry Group, Holmesglen TAFE and the Electrical Trades Union. The seminars informed of the need for sun protection policies in Victorian workplaces. SunSmart has also worked closely with the agriculture, manufacturing and logistics program of WorkSafe and other stakeholders such as the FarmSafety Alliance and Victorian Farmers' Federation to develop a tailored skin cancer prevention and early detection campaign for farmers and rural outdoor workers.<sup>22</sup> The 2005 pilot was conducted in Gippsland. The campaign, *Protect your farm's most important asset. You* was launched in November 2006 at the Shepparton saleyards (Figure 8). The campaign was recalled by 64% of people surveyed and rated as highly relevant to farmers and outdoor workers. Farmers who recalled the campaign were more likely to report using sunscreen and wearing wide-brimmed hats than those who were not aware of the campaign.

## Building community capacity

A range of strategies have been implemented with prioritised groups across Victoria including:

- A general practitioner melanoma early detection workshop was developed, piloted and implemented in partnership with Divisions of General Practice across Victoria. Eighteen sessions were conducted with 300 general practitioners in 2007.
- A full day training program was developed to enhance the capacity of community health professionals and workplace trainers to deliver skin cancer prevention and early detection education. In 2007, seven sessions were held in rural Victoria reaching approximately 90 participants.
- A training program was developed in 2006 for the BOM weather forecasters to raise the awareness of sun protection issues and to encourage them to report the SunSmart UV Alert during radio and television weather forecasts.
- Annually SunSmart, in partnership with the Men's Health Program and PapScreen Victoria, conducts cancer education seminars. In addition, 156 multilingual sessions (encompassing more than 18 languages) were conducted across Victoria between 2003 and 2007.
- Through the VicHealth Partnerships for Health funding grant, SunSmart supported over 50 state sporting associations with information and support on sun protection policy development. State sporting associations and clubs made 13,244 visits to the SunSmart website with the SunSmart sports policy downloaded 6538 times. Sixty-six requests were generated from website visits, regarding sponsorship, resources, sunscreen purchases and educational materials.

## Shade

There has been a strong focus on working with local government to advocate for broad structural strategies such as shade planning, and provision to support individual behaviour change strategies. In a survey conducted in 2007, 45% of Victorian adults believed adequate shade was hard to find at their local park or playground. Adequate shade was even more difficult to find at sports grounds, with non-metropolitan residents finding it harder than those in metropolitan areas.<sup>23</sup>

In 2004, the shade reference group of local government and key peak bodies was established. The group aims to increase shade expertise in Victoria and increase high quality and cost-effective shade in the community. The annual SunSmart Shade Awards for Local Government is an initiative of this group, which was established in 2005. The awards criteria have been expanded for 2008 to also include the education sector and workplaces.

This collaborative work continues to pay off:

- Shade strategies were specifically mentioned in 28% of municipal public health plans and 71% included 'implied' references to shade provision in 2005.<sup>24</sup>
- Local government-run facilities used by children are becoming increasingly shaded. By 2001, 53% of local government authorities with outdoor swimming pools had shade over all wading pools, compared to 37% in 1998 and only 20% in 1993.<sup>25</sup>

Significant advances were made in the provision of shade in school, community, local government, healthcare and sporting settings. A professional resource, Shade for Everyone, guides planning and shade development in community-based settings. The Healthy Urban Environments training program was developed in collaboration with the National Heart Foundation (Victorian Division) and the Planning Institute of Australia. SunSmart also works with Sport and Recreation Victoria to advocate for the inclusion of shade provision in the criteria for the Community Facility Funding program, which provides funding to local government authorities for the construction of community facilities.

From 2003–07 the Cancer Council Helpline received and responded to approximately 38,000 telephone enquiries related to the SunSmart program, skin cancer prevention, early detection and management. The number of page visits to the SunSmart website for each year was over half a million, with approximately 47,000 page visits per month in 2007. 152,310 resources were distributed in 2007–08 alone.



FIGURE 6: OUTSIDE 5 RESOURCE

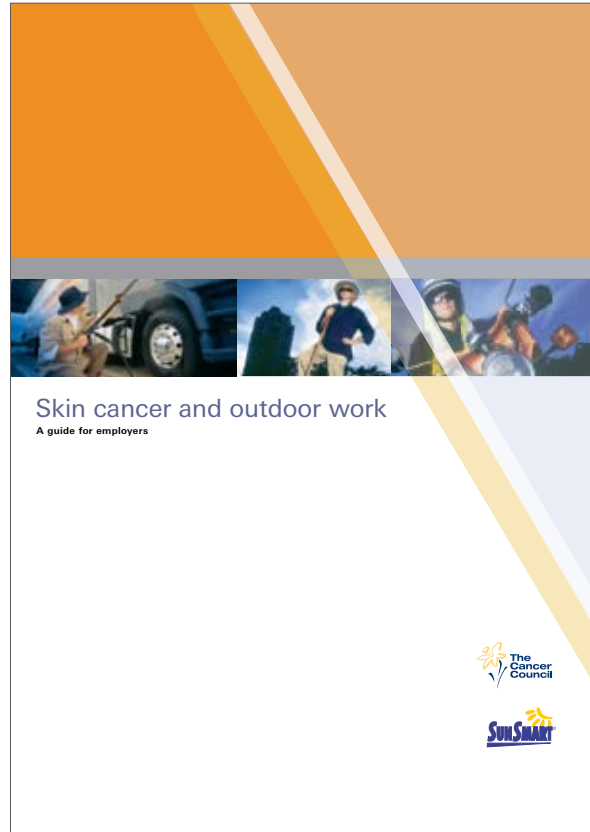


FIGURE 7: NATIONAL WORKPLACE RESOURCE



FIGURE 8: PROTECT YOUR FARM'S MOST IMPORTANT ASSET. YOU CAMPAIGN 2006

## Lead and share knowledge

The SunSmart program is acknowledged as the national and world leader in sun protection with the Cancer Council appointed the World Health Organization Collaborative Centre for Ultraviolet Radiation in 2004. Significant effort has been invested in sharing the 20 years of learnings, contributing to future strategic directions for skin protection and providing advice to fledgling programs in other countries including New Zealand, United States, Ireland, Denmark, Germany and the United Kingdom.

This activity has resulted in **significant national and international exposure for the SunSmart program and Victoria**. The Cancer Council also chairs the National Skin Cancer Committee (NSCC), comprising members from all state and territory cancer councils. Through the National Cancer Control Institute and the NSCC, SunSmart has led the drive to involve the Commonwealth government in part-funding the National Sun Survey (based on the Victorian model), and on committing \$5.5 million for a national advertising campaign which ran over the summers of 2006–07 and 2007–08.

## 2003–07 Leadership roles

### Advisory roles

- 2008 Chair, Sun Protection Messaging Forum, New Zealand Cancer Society, New Zealand
- 2007 Chair, Scientific Roundtable on UV, Vitamin D and Health, New Zealand Cancer Society, New Zealand
- 2003–07 Adviser, WHO, Strategic Plan for the Intersun Programme, Geneva
- 2006 Adviser, the Canadian and American Cancer Societies, North American position statement on Vitamin D, UV and Health, Canada
- 2005 Advisory Committee Member, USA Sun Safety in Schools Project, USA
- 2004 Consultant reviewer, Irish Cancer Society, Ireland

### Invited speaker presentations

- 2008 National Skin Cancer Strategy Forum, Health Canada's Canadian Partnership Against Cancer, Toronto, Canada
- 2007 A Cancer Council's Role in Prevention, Cancer Research UK Seminar, United Kingdom
- 2007 Health Promotion Success Against the Odds, National Hepatitis C Health Promotion Conference, Melbourne, Australia
- 2007 Shedding Light on Vitamin D: Myths and Facts about Sunlight Exposure, Deakin University, Melbourne, Australia
- 2006 Sunbeds – A Case for Legislative Reform, Canadian Cancer Society, Toronto, Canada
- 2006 Skin Cancer Prevention: A Case For Action, UICC World Cancer Congress, Washington DC, USA
- 2006 Risks and Benefits of Sun Exposure, The Australasian College of Dermatologists 39th Annual Scientific Meeting, Melbourne
- 2006 Emerging Issues in Skin Cancer Control, International Cancer Prevention Conference, St Gallen, Switzerland
- 2005 Risks and Benefits of Sun Exposure, WHO International workshop on UV Exposure Guidance, Munich, Germany
- 2005 Setting the Framework for Advocacy (Keynote), Conference on the Public Health Aspects Of Artificial Tanning Sunbeds, Canada
- 2005 Lessons Learnt in Skin Cancer Control, Cancer Care Ontario, Toronto, Canada
- 2004 The Australian Experience in Skin Cancer Control, Irish Cancer Society, Belfast, Ireland
- 2003 WHO's Intersun Programme, International Meeting of Signatories to the Montreal Protocol on Ozone Depleting Substances, Nairobi, Kenya
- 2003 National Symposium on Cancer Prevention, Health Canada, Ottawa

CBRC and CEC support the SunSmart program in ensuring actions are based on the latest evidence and evaluation. Activities include:

- Coordinating the National Sun Surveys conducted in 2003–04 and 2006–07 that were based on the Cancer Council’s long-running surveys of sun protection attitudes and behaviours.
- Analysing and publishing data on trends in sun protection attitudes and behaviours in Victoria, and the relationship with SunSmart advertising,<sup>12</sup> continuing the series of annual observational studies of summer sun protection behaviours in leisure settings – trends to 2002 were published in 2008.<sup>11</sup>
- A study of solarium compliance with the Australian Standard for Solaria for Cosmetic Purposes in partnership with DHS.<sup>17</sup>
- An audit of the national increase in the number of solariums listed in the Yellow Pages, used for awareness raising through the media, and advocacy with the state government to regulate the industry.<sup>16</sup>
- The publication of SunSmart Evaluation Studies Volume 7 (2004), covering studies undertaken between 1998 and 2001: a survey of local government policy and practices in 2001;<sup>26</sup> sun-protective environments survey at Victorian swimming pools in 2001;<sup>25</sup> sun-protective practices of triathletes survey;<sup>27</sup> an evaluation of the Cancer Council regional seminar series for Community Health Service professionals;<sup>28</sup> an evaluation of the SunSmart Workplace Education Program in 2006.<sup>21</sup>
- Pre-testing and evaluation of concepts for: the Tattoo and Clare Oliver television advertisements; the joint DHS-SunSmart brochure on solariums, which targeted people who might consider using a solarium to tan and parents of teenagers who might use a solarium; surveys of sun protection attitudes and practices among Victorian farmers and testing for the media campaign targeting Victorian farmers.<sup>22,29</sup>
- Collection of the Victorian data for the national survey of policies and practices in primary schools.<sup>20</sup>
- Analysis and reporting of a survey of sun protection policies and practices in junior cricket clubs<sup>30</sup> and policy and practice in Victorian sports clubs. This demonstrated that health promoting policy can be established in sport clubs when it is well supported by health agencies and their peak sporting bodies.<sup>31</sup>
- An evaluation of awareness, understanding and use of the SunSmart UV Alert, conducted via intercept survey at the Moomba Waterfest in 2007.<sup>32</sup>
- Quantitative and qualitative research to inform the development of the revised sun protection program for secondary schools (unpublished).

The Cancer Council places a high priority on publishing and disseminating knowledge derived from research, evaluation and practice experience in order to assist other health agencies develop public health campaigns.

Between July 2003 and December 2007, CBRC and SunSmart staff had 16 articles relating to skin cancer control published in peer reviewed journals, as well as 11 books and book chapters. Thirty-seven other articles or papers have been published. Twenty-eight oral presentations were made to national and international scientific audiences and many more to state and local forums (Appendix 1). In addition, 14 invited speaker presentations were given (p18).

## Key challenges and opportunities

SunSmart is not just about skin protection but is an investment in effective prevention, leadership, and capacity building. The key success elements are the integration of research and evaluation, partnerships and a long-term commitment to individual behaviour and broader environmental change.

It is heartening to observe downward trends in skin cancer incidence and mortality, especially in the under-40s. As mentioned earlier, in 2006–07 alongside the first nation-wide skin cancer prevention campaign, there was a significant shift in Australian adolescents' and adults' tan preferences and social norms for tans with high awareness of the campaign messages.<sup>10</sup>

The shift in adolescent tan preference was also accompanied by a reduction in intentional tanning behaviour in the 2006–07 summer.<sup>13</sup> However, there is still a lot of room for further improvement in adolescents' and adults' sun protective behaviours. The study of the sun protective behaviours of Victorians from 1987 to 2002 also analysed the effects of SunSmart advertising on behaviour. **Increased SunSmart advertising activity (frequency and reach of broadcast) was shown to correlate with an increased use of hats and sunscreen and reduced the proportion of the body exposed to the sun in the Victorian population.**<sup>13</sup>

This Victorian data suggests that the **desire for a tan fluctuates with variations in the amount spent on SunSmart television advertising.** Change management theories such as Lewin's force field model, suggest that investment is required to decrease the negative forces (so as to change social norms) such as those that promote suntans and solarium. Results suggest that further **investment in public education campaigns**, especially television advertising, is essential to ensure gains that are made in skin cancer control are not eroded over time.<sup>33</sup>

Adolescence and childhood are critical periods during which sun exposure is more likely to contribute to skin cancer in later life.<sup>34,35,36</sup> The 2006–07 results suggest that **adolescents and young adults** require an increased focus as a priority for skin cancer prevention messages because of their low compliance with sun protective measures and higher sunburn incidence on summer weekends.<sup>13</sup> Particular focus needs to be directed to new media strategies over and above traditional media strategies. Advocacy work is also required with fashion magazine editors to communicate that sunscreen alone is not sufficient and clothing is an important component of sun protection. Editors need to be encouraged to promote fashionable sun protective styles of summer clothing. Working with fashion magazines

is especially important given there has been little change in covering styles portrayed in women's magazines in Australia over almost two decades.<sup>13</sup>

The current study also identified a number of activities and settings where sunburn is common. **A high proportion of people were sunburnt during water/beach related activities and sport and passive recreation.** Programs can do more to support environmental change in these settings such as ensuring shade audits and providing portable shade and signage to encourage sun protection. Programs can also do more to provide timely reminders and broadcasts about the need for sun protection such as promoting the **SunSmart UV Alert** more widely and providing ongoing spring and summer campaign messages.<sup>13</sup>

Over the past several years, there has been an increase in media coverage of issues relating to **vitamin D**, in particular related to new evidence of links to potential prevention or treatment effects for a number of diseases including breast, prostate, and colorectal cancer, non-Hodgkin's lymphoma, diabetes and multiple sclerosis. A sub-section of the population, deliberate tanners, may be using vitamin D as justification for further increasing their sun exposure.<sup>37,38</sup> More work is needed to promote a balance between the benefits and harms of UV exposure. Tailored strategies need to be implemented with certain sections of the population that are more likely to be at risk of vitamin D deficiency.

In 2003, the Cancer Council conducted research to determine the level of compliance with the voluntary Australian Standard for solariums. With the introduction of **solarium industry regulations**, it is to be hoped that compliance will improve, however, this is not automatic as has been demonstrated in California where a similar study found that only 43% of solariums enforced regulations regarding parental consent for minors.<sup>39</sup> It will be important to repeat this research once regulations and monitoring systems are in place. A communications strategy needs to be developed to promote the new solarium industry regulations (due for release in February 2009) and monitor the public's perception of solarium safety. While regulation should reduce the risk associated with the industry, principally we expect by banning access to under 18s and fair-skinned people, the program will need to continue to communicate the risk to individual users.

While the SunSmart program has made many gains, looking at trend data over its history suggests that some gains may be in danger of being lost unless investment is increased.

Extensive behavioural and epidemiological research provides the foundation for the SunSmart program. Based on this knowledge, the most effective interventions required to improve and sustain behaviour and broader environmental change include:

- **Investment in public education campaigns**, especially television advertising. This is essential to ensure gains that are made in skin cancer control are not eroded over time. Renewed behaviour change efforts are required to address the trends, for example, of people 'forgetting to protect' and 'poor application of sunscreen'.
- **Targeting adolescents and young adults**, given their low compliance with sun protective measures and higher sunburn incidence on summer weekends.
- Focusing on settings and activities where people mostly get burnt including **sport, water/beach related activities, active and passive recreation**.
- **Improving environmental protection strategies**, such as ensuring shade audits, options for built and natural **shade** and promoting the **SunSmart UV Alert**.
- Ensuring a tailored response with sections of the population that are more likely to be at risk of **vitamin D** deficiency.
- Providing ongoing core activity such as working with **schools, early childhood services** and **workplaces** to ensure a **health inequalities lens** in activity design, delivery and evaluation.

Resources, research and innovative strategies are required to address these challenges.

# Appendix 1

## Skin cancer research publications

January 2003 to June 2008 (alphabetical by year)

### Peer-reviewed original journal publications

#### Under review

Dobbinson SJ, White Vanessa, Wakefield MA, Jamsen KM, White Victoria, Livingston PM, English DR, Simpson JA. Adolescents' use of purpose-built shade in secondary schools: a cluster randomised controlled trial. *BMJ* (submitted June 2008).

Makin J, Dobbinson S, Doyle C. Victorian farmers' skin cancer prevention knowledge and behaviours. *Journal of Occupational Health and Safety* (submitted May 2008).

#### Published

##### 2008 (including in press)

Dobbinson S, Wakefield M, Hill D, Girgis A, Aitken J, Beckmann K, Reeder AI, Herd N, Fairthorne A, Bowles K-A. Prevalence and determinants of Australian adolescents' and adults' weekend sun protection and sunburn, summer 2003–2004. *Journal of the American Academy of Dermatology* (in press, accepted June 2008).

Dixon HG, Lagerlund M, Spittal MJ, Hill DJ, Dobbinson SJ, Wakefield MA. Use of sun-protective clothing at outdoor leisure settings from 1992 to 2002: serial cross-sectional observation survey. *Cancer Epidemiology, Biomarkers & Prevention* 2008; 17(2): 428–434.

Dobbinson SJ, Wakefield MA, Jamsen KM, Herd NL, Spittal MJ, Lipscomb JE, Hill DJ. Weekend sun protection and sunburn in Australia: trends (1987–2002) and association with SunSmart television advertising. *American Journal of Preventive Medicine* 2008; 34(2): 94–101.

Sinclair CA, Makin JK. Sometimes it takes a loss of life to make a difference. *BMJ* 2008; 336(7635): 73.

##### 2007

Dixon H, Dobbinson S, Wakefield M, Jamsen K, McLeod K. Portrayal of tanning, clothing fashion and shade use in Australian women's magazines, 1987–2005. *Health Education Research* 2007, Advance Access November 13, doi: 10.1093/her/cym057.

Dixon HG, Hill DJ, Karoly DJ, Jolley DJ, Aden SM. Solar UV forecasts: a randomized trial assessing their impact on adults' sun-protection behaviour. *Health Education & Behavior* 2007; 34(3): 486–502.

Livingston PM, White V, Hayman J, Dobbinson S. Australian adolescents' sun protection behavior: who are we kidding? *Preventive Medicine* 2007; 44(6): 508–512.

##### 2006

Dobbinson SJ, Hayman JA, Livingston PM. Prevalence of health promotion policies in sports clubs in Victoria, Australia. *Health Promotion International* 2006; 21(2): 121–129.

Dobbinson S, Wakefield M, Sambell N. Access to commercial indoor tanning facilities by adults with highly sensitive skin and by under-age youth: compliance tests at solarium centres in Melbourne, Australia. *European Journal of Cancer Prevention* 2006; 15(5): 424–430.

Lagerlund M, Dixon HG, Simpson JA, Spittal M, Taylor HR, Dobbinson SJ. Observed use of sunglasses in public outdoor settings around Melbourne, Australia: 1993 to 2002. *Preventive Medicine* 2006; 42(4): 291–296.

##### 2005

English DR, Milne E, Jacoby P, Giles-Corti B, Cross D, Johnston R. The effect of a school-based sun protection intervention on the development of melanocytic nevi in children: 6-year follow-up. *Cancer Epidemiology, Biomarkers & Prevention* 2005; 14(4): 977–980.

Liu W, Hill D, Gibbs AF, Tempany M, Howe C, Borland R, Morand M, Kelly JW. What features do patients notice that help to distinguish between benign pigmented lesions and melanomas?: the ABCD(E) rule versus the seven-point checklist. *Melanoma Research* 2005; 15(6): 549–554.

Milne E, Jacoby P, Giles-Corti B, Cross D, Johnston R, English DR. The impact of the Kidskin sun-protection intervention on summer suntan and reported sun exposure: was it sustained? *Preventive Medicine* (in press).

##### 2003

Livingston PM, White VM, Hayman J, Dobbinson S. Sun exposure and sun protection behaviours among Australian adolescents: trends over time. *Preventive Medicine* 2003; 37(6): 577–584.

### Non peer-reviewed publications

(including editorials, invited commentaries, opinion pieces and letters to editor in peer-reviewed journals; and articles in non-peer reviewed publications)

##### 2008

Makin J. (Book review) Rise and Shine: sunlight, technology and health, by Simon Carter. *Australian and New Zealand Journal of Public Health* 2008; 32(2); 191–192.

##### 2007

Makin JK, Dobbinson SJ, Herd NL. (Letter to Editor) The increase in solariums in Australia, 1992–2006. *Australian and New Zealand Journal of Public Health* 2007; 31(2): 191–192.

##### 2004

Dobbinson S, Wakefield M. Study of compliance of inner Melbourne solarium centres with a new Australian Standard. *Skin Cancer Update* 2004; 10: 12–13. (Produced by: Centre for Clinical Research in Cancer, The Cancer Council Victoria.)

Hill D. [Invited commentary] Skin cancer prevention: a commentary on Saraiya et al. *American Journal of Preventive Medicine* 2004; 27(5): 482–483.

## Books and book chapters

### In press

Elwood M, Makin JK, Sinclair CA, Burton R, Prevention and screening. In: Balch C, Houghton AN, Sober AG, Soong SJ, Atkins MB, Thompson JF, eds. *Cutaneous Melanoma*. (5th edn). St Louis: Quality Medical Publishing, in press.

### Published

#### 2007

Boldemann and Sinclair. Sun Protection at School. And Rehfuss and Sinclair. The UV Index in Practice. In: Rindborg, Brandt, Brietbart, Griener (Eds) *Skin Cancer Prevention*, Informa Healthcare NY.

Borland R, Dobbinson S. Cancer: skin. In: Ayers S, Baum A, McManus C, Newman S, Wallston K, Weinman J, West R (Eds). *Cambridge Handbook of Psychology, Health & Medicine*, 2nd edition. Cambridge University Press.

Sinclair C. Vitamin D, An Emerging Issue in Skin Cancer Control. In: Senn, Kapp (Eds) *Cancer Prevention*. Springer.

#### 2004

Dobbinson S, Hill DJ. Patterns and causes of sun exposing and sun protecting behaviour. In: Hill D, Elwood JM, English DR (Eds). *Prevention of skin cancer*. Cancer Prevention – Cancer Causes, Vol 3. Dordrecht, NL: Kluwer Academic Publishers, 2004.

Hill D, Elwood JM, English DR (Eds). *Prevention of skin cancer*. Cancer Prevention – Cancer Causes, Vol 3. Dordrecht, NL: Kluwer Academic Publishers, 2004.

Sinclair C, Hilditch, A. *UV Radiation Reduction for Local Authorities*. World Health Organization. Geneva.

#### 2003

Sinclair C, Artificial Tanning Sunbeds: Risk and Guidance Note. World Health Organization. Geneva.

Sinclair C, Ultraviolet Radiation as a hazard in the Workplace. World Health Organization. Geneva.

Cross D, Harper S, Sinclair C & Slevin T. Evaluating Schools Programs to Promote Sun Protection, World Health Organization. Geneva.

## CBRC Research Paper Series (website)

### 2007

Makin J, Dobbinson S, Strong K. *Awareness, understanding and use of the SunSmart UV Alert by the Victorian public*. CBRC Research Paper Series No. 30. Melbourne, Australia: Centre for Behavioural Research in Cancer, The Cancer Council Victoria, September 2007.

### 2006

Dobbinson S, Rose M, Peckham P, Makin J. *SunSmart policies and practices in Victorian local government: 2005*. CBRC Research Paper Series No. 21. Melbourne, Australia: Centre for Behavioural Research in Cancer, The Cancer Council Victoria, October 2006.

### 2005

Dobbinson S, Doyle C, Effendi Y. *Sun protection behaviour of junior cricketers and their coaches: an observational study*. CBRC Research Paper Series No. 14. Melbourne, Australia: Centre for Behavioural Research in Cancer, The Cancer Council Victoria, June 2005.

Dobbinson S, Doyle C, Wakefield M. *Farmers' and outdoor workers' beliefs about skin cancer and protection from summer sun: a brief report*. CBRC Research Paper Series No. 18. Melbourne, Australia: Centre for Behavioural Research in Cancer, The Cancer Council Victoria, November 2005.

## Reports and other publications

### 2008

Francis K, Makin J. *UV Alert sign pilot testing*. Prepared for: Bureau of Meteorology. Melbourne: The Centre for Behavioural Research in Cancer, The Cancer Council Victoria, March 2008.

Dobbinson S, Jansen K, Francis K, Dunlop S, Wakefield M. *2006–07 National Sun Protection Survey: Report 2*. Prepared for: The Cancer Council Australia and Australian Government Department of Health and Ageing. Melbourne: Centre for Behavioural Research in Cancer, The Cancer Council Victoria, February 2008.

### 2007

Dobbinson S, Jansen K, Francis K, Dunlop S, Wakefield M. *2006–07 National Sun Protection Survey: Report 1*. Prepared for: The Cancer Council Australia and Australian Government Department of Health and Ageing. Melbourne: Centre for Behavioural Research in Cancer, The Cancer Council Victoria, December 2007.

Francis K, Makin J. *Evaluation of the farmers' skin cancer prevention and early detection campaign, 2006–07*. Prepared for SunSmart. Melbourne: Centre for Behavioural Research in Cancer, The Cancer Council Victoria, December 2007.

Makin J. *Evaluation of the Outside 5 early childhood resources*. Prepared for SunSmart. Melbourne: The Centre for Behavioural Research in Cancer, The Cancer Council Victoria, August 2007.

### 2006

Cameron M, Sambell N. *SunSmart Workplace Education Program evaluation*. Prepared for: SunSmart. Melbourne: Centre for Behavioural Research in Cancer, The Cancer Council Victoria, October 2006.

McLeod K, Dobbinson S, Wakefield M, English D, White V, Livingston P. *Qualitative follow-up to a secondary school shade intervention*. Melbourne: Centre for Behavioural Research in Cancer, The Cancer Council Victoria, July 2006.

Webster B, Hayman J. *Prevalence of sun-related behaviours among Tasmanian secondary school students in 2005 and trends over time*. Prepared for The Cancer Council Tasmania. Melbourne: Centre for Behavioural Research in Cancer, The Cancer Council Victoria, November 2006.

## 2005

- Bowles K-A, Dobbinson S, Wakefield M. *Sun protection and sunburn incidence of Australian adults: summer 2003–04*. Prepared for: The Commonwealth Cancer Strategies Group and The Cancer Council Australia. Melbourne: Centre for Behavioural Research in Cancer, The Cancer Council Victoria, February 2005.
- Dobbinson S, Arbuckle J, Hoey, L. *The sun protection environment in Australian Capital Territory primary schools: evaluating the National SunSmart Schools Program 1998 and 2001*. Melbourne: Centre for Behavioural Research in Cancer, The Cancer Council Victoria, 2005.
- Dobbinson S, Arbuckle J, Hoey, L. *The sun protection environment in Northern Territory primary schools: evaluating the National SunSmart Schools Program 1998 and 2001*. Melbourne: Centre for Behavioural Research in Cancer, The Cancer Council Victoria, 2005.
- Dobbinson S, Arbuckle J, Hoey, L. *The sun protection environment in Queensland primary schools: evaluating the National SunSmart Schools Program 1998 and 2001*. Melbourne: Centre for Behavioural Research in Cancer, The Cancer Council Victoria, 2005.
- Dobbinson S, Arbuckle J, Hoey, L. *The sun protection environment in South Australian primary schools: evaluating the National SunSmart Schools Program 1998 and 2001*. Melbourne: Centre for Behavioural Research in Cancer, The Cancer Council Victoria, 2005.
- Dobbinson S, Arbuckle J, Hoey, L. *The sun protection environment in Tasmanian primary schools: evaluating the National SunSmart Schools Program 1998 and 2001*. Melbourne: Centre for Behavioural Research in Cancer, The Cancer Council Victoria, 2005.
- Dobbinson S, Arbuckle J, Hoey, L. *The sun protection environment in Victorian primary schools: evaluating the National SunSmart Schools Program 1998 and 2001*. Melbourne: Centre for Behavioural Research in Cancer, The Cancer Council Victoria, 2005.
- Dobbinson S, Arbuckle J, Hoey, L. *The sun protection environment in Western Australian primary schools: evaluating the National SunSmart Schools Program 1998 and 2001*. Melbourne: Centre for Behavioural Research in Cancer, The Cancer Council Victoria, 2005.
- Dobbinson S, Bowles K-A, Fairthorne A, Sambell N, Wakefield M. *Sun protection and sunburn incidence of Australian adolescents: summer 2003–04*. Prepared for: The Australian Government Department of Health and Ageing and The Cancer Council Australia. Melbourne: Centre for Behavioural Research in Cancer, The Cancer Council Victoria, July 2005.
- Dobbinson S, Fairthorne A, Bowles K-A, Sambell N, Spittal M, Wakefield M. *Sun protection and sunburn incidence of Australian children: summer 2003–04*. Prepared for: The Australian Government Department of Health and Ageing and The Cancer Council Australia. Melbourne: Centre for Behavioural Research in Cancer, The Cancer Council Victoria, October 2005.

Doyle C, Hassard J. *Evaluation of a fund-raising partnership between SunSmart and Target*. Melbourne: The Cancer Council Victoria, 2005.

## 2004

- Brown A, Elliott S. *Review of sun protection policies and practices in Victorian SunSmart accredited early childhood centres*. Melbourne: Centre for Behavioural Research in Cancer, The Cancer Council of Victoria, April 2004.
- Dobbinson S. Reaction to the 1999/2000 SunSmart Campaign: results from a telephone survey of Victorians and a retail intercept survey of young people. In: *SunSmart Evaluation Studies No 7, July 1998 to June 2001*. Melbourne: The Cancer Council Victoria, 2004.
- Dobbinson S. Reaction to the 2000/01 SunSmart Campaign: results from a telephone survey of Victorians. In: *SunSmart Evaluation Studies No 7, July 1998 to June 2001*. Melbourne: The Cancer Council Victoria, 2004.
- Dobbinson S, Inglis G, Hilditch A. SunSmart policies and practices in Victorian local government, 2001. In: *SunSmart Evaluation Studies No 7, July 1998 to June 2001*. Melbourne: The Cancer Council Victoria, 2004.
- Dobbinson S, Wakefield M. *Compliance of inner Melbourne solarium centres with revised Australian industry Standard: access by teens and customers with sensitive skin type*. Prepared for: Victorian Department of Human Services. Melbourne: Centre for Behavioural Research in Cancer, The Cancer Council Victoria, October 2004.
- Gartland D, Dobbinson S. The sun protection environment at swimming pools in Victoria, 2000–2001. In: *SunSmart Evaluation Studies No 7, July 1998 to June 2001*. Melbourne: The Cancer Council Victoria, 2004.
- Pearson L, Dobbinson S. Triathletes' sun protection in Victoria, 1999. In: *SunSmart Evaluation Studies No 7, July 1998 to June 2001*. Melbourne: The Cancer Council Victoria, 2004.
- Seddon S. *Investigating the effect of magazine models' suntan-levels on young women's tanning attitudes, perceptions of tanning norms and intentions to suntan*. IV Year Honours Thesis. School of Behavioural Science, The University of Melbourne, 2004. Supervised by Associate Professor Yoshihisa Kashima, Dr Melanie Wakefield, Dr Helen Dixon
- Trotter L, Fernbach M, Dobbinson S. The utility of Cancer Council seminars for community health professionals, 1999. In: *SunSmart Evaluation Studies No 7, July 1998 to June 2001*. Melbourne: The Cancer Council Victoria, 2004.

## 2003

- Szabo E, Hayman J. *Prevalence of sun-related behaviour among 12 to 17-year-old Tasmanian secondary school students in 2002*. Melbourne: Centre for Behavioural Research in Cancer, The Cancer Council of Victoria, December 2003.

## Presentations to scientific audiences

### 2008

- Dixon H, Dobbinson S, Wakefield M, Jamsen K, McLeod, K. Portrayal of tanning, clothing fashion and shade use in Australian women's magazines, 1987–2005. *9<sup>th</sup> Annual Behavioural Research in Cancer Control Conference*; Melbourne, Australia, April 9–11, 2008.
- Dobbinson S, Wakefield M, Jamsen K, English D, White V, Simpson J, Livingston, T. If you build it they will come: Results of a shade-sail intervention trial in secondary schools. *9<sup>th</sup> Annual Behavioural Research in Cancer Control Conference*; Melbourne, Australia, April 9–11, 2008.
- Dobbinson S, Jamsen K, Francis K, Wakefield M. Monitoring changes in Australians' skin cancer prevention behaviours: findings of the 2006–07 national sun protection survey. *9<sup>th</sup> Annual Behavioural Research in Cancer Control Conference*; Melbourne, Australia, April 9–11, 2008.
- Francis K, Makin J, Jones S. 'Protect your farm's most important asset – you.' A tailored skin cancer prevention and early detection campaign for farmers. *9<sup>th</sup> Annual Behavioural Research in Cancer Control Conference*; Melbourne, Australia, April 9–11, 2008.
- Makin J, Dobbinson S, Strong, K. "Planned behaviour?": Awareness, understanding and use of the sunsmart UV alert. *9<sup>th</sup> Annual Behavioural Research in Cancer Control Conference*; Melbourne, Australia, April 9–11, 2008.
- Makin J, Dobbinson S, Wakefield M. Reported changes in summer sun protection behaviours in response to concerns about Vitamin D. *9<sup>th</sup> Annual Behavioural Research in Cancer Control Conference*; Melbourne, Australia, April 9–11, 2008.
- Scully M, Wakefield M, Dixon H. Trends in news coverage about skin cancer prevention, 1993–2006: increasingly mixed messages for the public. *9<sup>th</sup> Annual Behavioural Research in Cancer Control Conference*; Melbourne, Australia, April 9–11, 2008.

### 2007

- Dobbinson S, Jamsen K, Francis K, Dunlop S, Wakefield M. 2006 National Sun Protection Survey: preliminary results. *National Skin Cancer Awareness Campaign Reference Group meeting*; Commonwealth Department of Health and Ageing, Melbourne, September 20, 2007.
- Dobbinson S, Wakefield M, Jamsen K, Herd N, Spittal M, Lipscomb J, Hill D. Weekend sun protection and sunburn in Victoria: Trends (1987–2002) and association with SunSmart television advertising. *National Skin Cancer Awareness Campaign Reference Group meeting*; Commonwealth Department of Health and Ageing, Melbourne, September 20, 2007.
- Hill D. Public health approach to education and prevention. Invited Plenary lecture, *21st World Congress of Dermatology*; Buenos Aires, September 2007.
- Makin J. SunSmart: skin cancer prevention in Australia. Presentation to Dermatology/Photobiology Department, University of Dundee; Dundee, Scotland, August 2007.

### 2006

- Dixon H, Wakefield M, McLeod K, Jamsen K, Sambell N, Dobbinson S. Media influences on sun protection: trends in Australian portrayal of tanning and fashion, 1987–2005. *UICC World Cancer Congress*; Washington DC, USA, July 2006.
- Dobbinson S. Photoprotection debate: Public education programs can change behaviour? *Photoprotection Controversies Symposium at the Vth World Congress of the International Academy of Cosmetic Dermatology*; Melbourne, December 2006. [invited speaker in favour]
- Dobbinson S. Skin cancer prevention research in Melbourne, Australia. Informal presentation at the City100 Investigator Meeting San Diego State University, USA, July 18, 2006
- Dobbinson SJ. The first national skin cancer prevention survey: Australian adolescents' and adults' sun protection and sunburn, summer 2003–2004. *UICC World Cancer Congress*; Washington, DC, USA, July 2006.
- Dobbinson S, Rose M, Battley A, Ugalde A. Investigating sun protection and shade provision policy in Victorian local government. *8th Biennial Behavioural Research in Cancer Control Conference*; Brisbane, September 2006.
- Dobbinson S, Sambell N, Spittal M, Jamsen K, Wakefield M, Hill D. Effects of SunSmart advertising on skin cancer prevention attitudes and behaviours in Melbourne: 1987 to 2002. *8th Biennial Behavioural Research in Cancer Control Conference*; Brisbane, September 2006.
- Dobbinson S, Sambell N, Spittal M, Wakefield M, Hill D. Effects of SunSmart advertising on skin cancer prevention attitudes and behaviours in Australia: 1987 to 2002. *UICC World Cancer Congress*; Washington, DC, USA, July 2006.
- Dobbinson S, Sambell N, Spittal M, Wakefield M, Hill D. Effects of SunSmart television advertising on skin cancer prevention attitudes and sun protection behaviour in Australia, 1987–2002. *The Cancer Council Victoria Seminar Series*; Melbourne, June 2006.
- Dobbinson SJ, Sambell N, Wakefield M, Sinclair C, Hill D. The first national skin cancer prevention survey: Australian adolescents' and adults' sun protection and sunburn incidence summer 2003–04. *UICC World Cancer Congress*; Washington, DC, USA, July 2006.
- Wakefield M. Findings from the National Sun Survey 2003–04. National Skin Cancer Prevention Campaign Workshop, Australian Department of Health and Ageing; Canberra, February 2006.

### 2005

- English D. Prevention of melanoma in Australia. *6th World Congress on Melanoma*; Vancouver, BC, Canada, September 2005.

## 2004

- Dixon H, Lagerlund M, Dobbinson S, Wakefield M. An observational study of adults' sun protection behaviour: 1992 to 2002. *7<sup>th</sup> Behavioural Research in Cancer Control Conference*; Newcastle, June 2004.
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