Centre for Behavioural Research in Cancer
Cancer Control Research Institute
The Cancer Council Victoria

CBRC
RESEARCH PAPER SERIES
No. 30
September 2007

Awareness, understanding and use of the SunSmart UV Alert by the Victorian public

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ABSTRACT

Exposure to ultraviolet (UV) radiation has been identified as the cause of around 99% of non-melanocytic skin cancers and 95% of melanoma in Australia. The SunSmart UV Alert provides information on forecast variations in UV index levels during the day, in particular giving the times when the UV index is forecast to reach 3 or above, when skin damage can occur. This study examined awareness, understanding and use of the SunSmart UV Alert by the Victorian public, through an intercept survey conducted with 419 adults. Awareness of the Alert was high, particularly given the limited media sources from which it can currently be accessed. Nearly half of all respondents recalled having seen the Alert, and among the 61 respondents who had got weather information from a newspaper on the day of the survey, 43% had seen the SunSmart UV Alert that day. Basic understanding of the SunSmart UV Alert graphic was good, with most respondents recognising that the Alert represents variations in UV levels throughout the day. However, only very few respondents noted the actual Alert times. Among the 69 respondents who reported having seen the UV Alert on the day of the survey or in the newspaper during summer, 65% reported that seeing it helped remind them that they might need to use sun protection when they went outdoors. However, no conclusions could be drawn regarding the effectiveness of the Alert in prompting sun protection on the day of the survey due to low numbers of respondents having seen the Alert for the day. Based on these findings, it is recommended that wider dissemination of the Alert through television and radio should continue to be sought. Further research is required to pre-test options for modifying the graphic to improve understanding and links to sun protection behaviours, and to further explore the potential effectiveness of education campaigns centring on the SunSmart UV Alert.

Acknowledgments:

This study was designed by Jennifer Makin, Dr. Suzanne Dobbinson and Kylie Strong. Jennifer Makin analysed the data and wrote this report, with contributions from Dr Suzanne Dobbinson and Kylie Strong. Prof. Melanie Wakefield advised on study design and gave editorial feedback on a draft of this report. Charity Jenkins and Belinda Cerritelli provided feedback on the questionnaire; Belinda also assisted with preparation for fieldwork and Charity also coordinated data processing. Bryn Skilbeck at the City of Melbourne gave permission for the study to be conducted during Moomba Waterfest. UV Alert graphics for the survey dates were made available by Richard Dare at the Bureau of Meteorology. Rod Neale allowed researchers to operate out of the Cancer Council Victoria marquee and assisted in transporting survey materials. Kate Francis supervised data collection by Angela Hain, Shannon Handley, Vicki Koutoukidis, Lyn Magliano, Jessica Nixon, and Skye Turner-Walker. Kate also verified the figures reported in the tables and text. Margaret Byron formatted this report.

Suggested citation:

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.

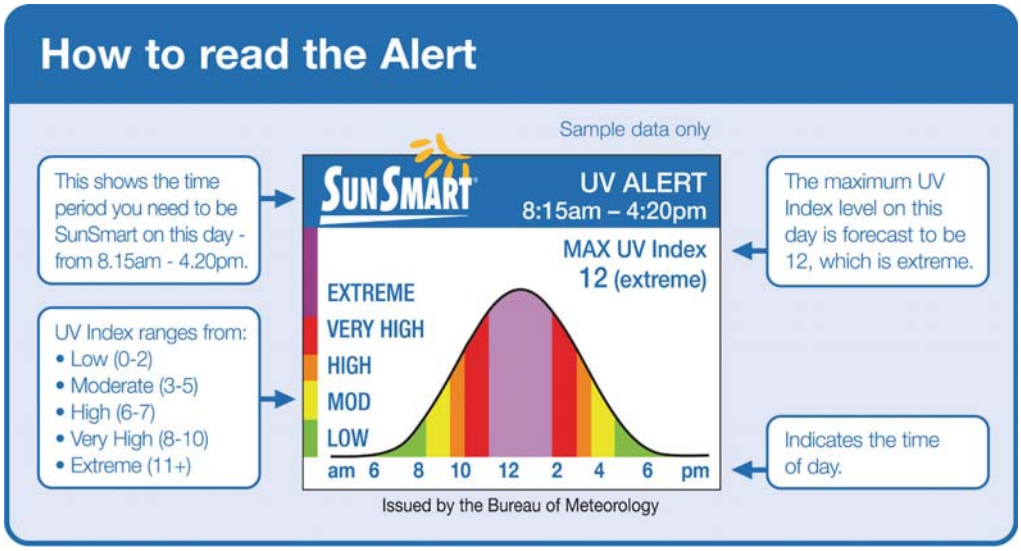
INTRODUCTION

Exposure to ultraviolet (UV) radiation has been identified as the cause of around 99% of non-melanoma skin cancers and 95% of melanoma in Australia.[1,2] Australia has higher levels of UV radiation compared to Europe and North America,[3] and has the highest levels of skin cancer in the world.[4] The UV index is an internationally standardised scale, which indicates the degree of risk associated with different levels of UV radiation. The World Health Organization (WHO) recommends the use of sun protection when the UV index reaches 3 or above, in order to prevent skin damage and particularly sunburn.[5] Since the Australian Bureau of Meteorology (BoM) adopted the UV index in 1996, maximum UV index forecasts have been included in television, radio and newspaper weather information, although not on a routine basis. However, despite nearly 10 years of exposure, recent research in Western Australia indicated that while awareness of the UV index is high, understanding and use are relatively low.[6,7]

In 2002, the WHO, together with the World Meteorological Organization, the United Nations Environment Programme and the International Commission on Non-Ionizing Radiation Protection, provided several recommendations regarding the most effective ways of presenting UV index information.[5] These included categorising different levels using colours and category names, and adding behavioural cues. In response to this, 30 alternative ways of presenting UV index information were explored through focus testing in Perth, including location maps, contour maps, time graphs and pictographs.[8] The preferred format was a bell curve using the standard WHO colours and category labels to represent the forecast UV index throughout the day.[a] Previous focus testing of alternative versions of the bell curve had also concluded that a similar presentation was the most effective in communicating the times of day when the UV index peaks.[9]

Based on the bell curve concept, in 2005, the National Skin Cancer Committee (NSCC) of The Cancer Council Australia, the Bureau of Meteorology (BoM) and the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) launched the SunSmart UV Alert. The UV Alert consists of a bell curve with the standard colours and category labels indicating forecast UV index levels throughout the day, together with a statement of the time period during which the UV index is forecast to reach 3 or above (see Figure 1). It was hoped that the UV Alert would increase the salience of the UV index and prompt more Australians to take sun protection measures appropriate to daily UV conditions.

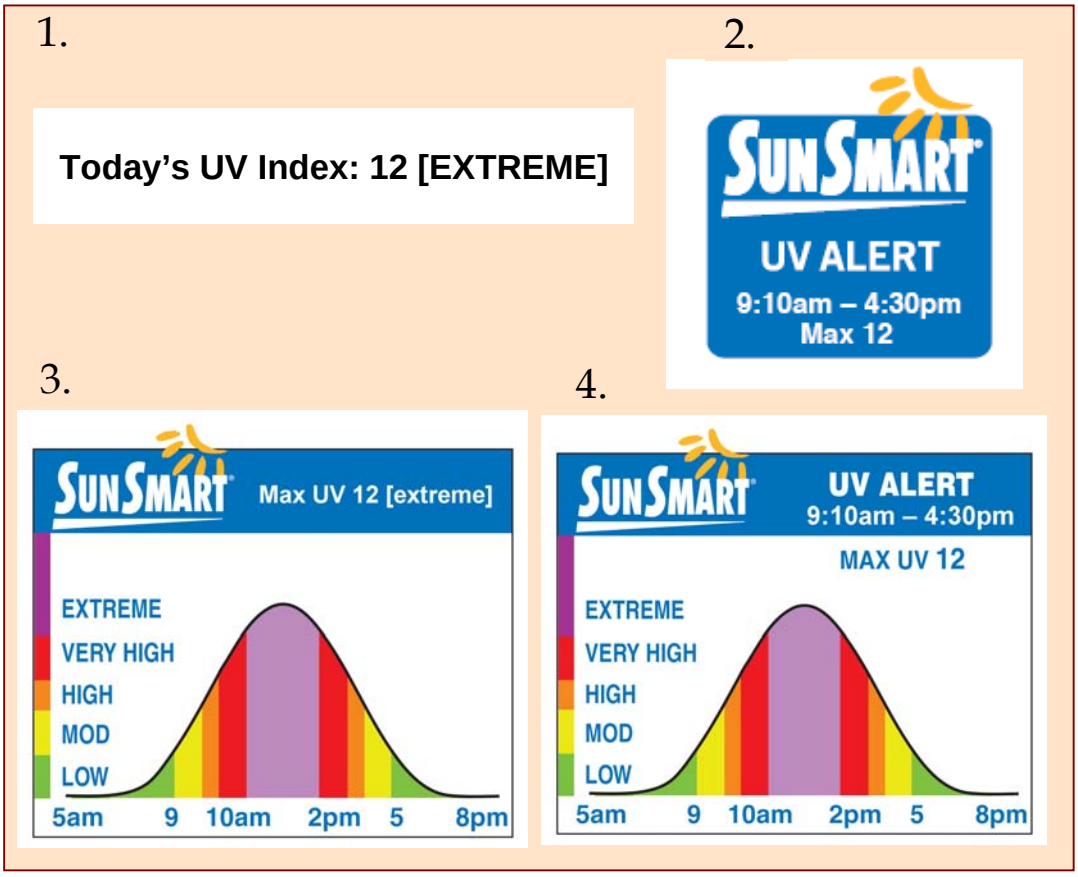
Figure 1: SunSmart UV Alert: bell curve and descriptors



[a] The BoM introduced a similar bell curve in 2000, but used non-standard colours and category labels.

The SunSmart UV Alert was pre-tested prior to its 'hard launch' in December 2005, together with three alternative presentations of UV information: 1) the traditional text-based method of reporting the maximum UV index for the day; 2) a text-only version of the Alert (stating only the times when the UV index is forecast to be 3 or above); and 3) a bell curve with the statement 'Max UV 12 [extreme]' replacing the UV Alert text (see Figure 2).[10] The UV Alert was rated as significantly more interesting than any other concept, and was also perceived as the least boring, confusing, suspicious or annoying. The two bell curve presentations of the information were rated as more believable than either of the text-based versions. The pre-testing report also concluded that of the four alternative presentations, the UV Alert was the most associated with sun protection.

Figure 2: The four pre-tested UV index concepts



The SunSmart UV Alert has been included on daily weather forecast pages of an increasing number of newspapers throughout Australia since 1 October 2005. The UV Alert is also displayed on the BoM website each day, and is provided to Telstra Pocketnews subscribers with their weather information service. Currently, the SunSmart UV Alert is not included in televised weather forecasts and only rarely on radio.

The SunSmart programs at state and territory cancer councils have been using the SunSmart UV Alert as a health promotion tool since its launch in 2005. Skin cancer control resources and education interventions have been developed to promote the UV Alert in several settings, in particular in schools and workplaces. However, as yet there has not been a comprehensive population-based promotion of the UV Alert.

This study was designed to determine levels of awareness, understanding and use of the SunSmart UV Alert among the general public in Victoria by interviewing a random sample of people who attended the Moomba Waterfest weekend. The purpose of the study was to provide baseline information in the absence of a public education campaign, and to provide recommendations for the continued promotion of the UV Alert as a tool for skin cancer control. In particular, the study was to identify aspects of the Alert which were poorly understood to assist in targetting future education and promotion.

METHOD

Procedure

People who walked past the Cancer Council Victoria marquee located on the south side of the Yarra between 10th and 12th March 2007 during the Moomba Waterfest were approached by trained research assistants and asked to take part in a brief intercept survey. The survey consisted of an interview which took approximately 3 minutes to complete; research assistants recorded responses on a 1-page questionnaire. Surveys were administered between 10am and 6pm each day to take into consideration peak and non-peak UV times.

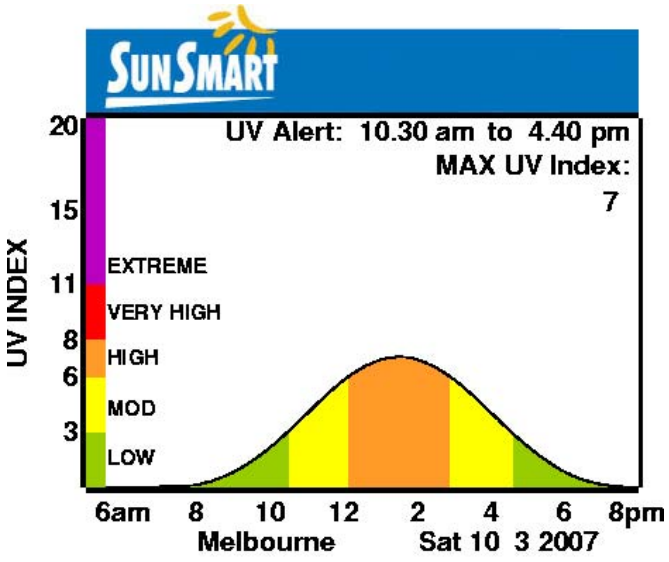
Sample

The target group were adult Victorian residents (aged 18 or over). Research assistants approached 593 males and females (approximately 50% of each) of mixed ages who appeared older than 18 years of age. Altogether 461 people (212 men and 249 women) completed a survey and 132 individuals (22%) chose not to participate. Completed surveys from 42 respondents who were aged under 18 or who were not resident in Victoria were excluded from the analysis. The analyses presented here are based on the remaining 419 respondents (54% female).

Questionnaire

The intercept survey included questions on sun protection on the day of the survey, knowledge and sources of forecast weather information, and awareness, use and understanding of the SunSmart UV Alert. Both unprompted and prompted awareness of the UV Alert was tested. Respondents who had looked at a weather forecast in the newspaper during the summer were asked whether they had seen a SunSmart UV Alert with a coloured graph in the most recent weather forecast they saw. They were then shown the UV Alert for the day of the survey and asked to confirm whether that was what they had seen (see Figure 3). Respondents who had not seen the Alert in the most recent weather forecast were shown the Alert and asked whether they had ever seen it. Respondents were asked to give their age and postcode. Research assistants also observed and recorded respondents' sex, and whether they were wearing a hat, sunglasses or sun protective clothing at the time of the interview. The survey was pre-tested with 10 members of the general public, several questions were revised as a result. The full questionnaire can be found in Appendix A.

Figure 3: SunSmart UV Alert for the first day of the survey[b]



[b] The SunSmart UV Alerts for the 3 days of the survey were very similar, beginning at 10.20 or 10.30 and ending at 16.30 or 16.40. The maximum forecast UV index was 7 on all 3 days.

Data analysis

Analyses were performed using Stata (version 9). Frequencies were calculated, and then comparisons between proportions were undertaken using Chi-squared analysis tests.

RESULTS

Demographics

The mean age of respondents was 40, with more than one third of respondents aged between 35 and 44 (see Table 1). This was expected, as many of Moomba's daytime activities are planned to appeal to families with young children. There were slightly more female than male respondents. The majority of respondents were resident in Melbourne and surrounds, with only 6% from country Victoria.

Table 1: Demographics

	(n=419)
Age	
18–24	6%
25–34	31%
35–44	36%
45–54	14%
55–64	8%
64+	5%
Sex	
Male	46%
Female	54%
Residence	
Melbourne & surrounds	94%
Other Vic.	6%

Sun protection

Respondents were asked whether they had done anything to protect themselves from the sun on the day of the survey; 73% said that they had (see Table 2). This was confirmed by research assistants who observed that 81% of respondents were wearing at least one of sunglasses, hat or sun-protective clothing. Sunscreen was the main reported method of sun protection, used by just over half of all respondents. Sunglasses were reported by 36% of respondents, but 64% were observed wearing sunglasses, indicating that many people do not wear sunglasses for their sun protective function. Only 5% of respondents reported protecting themselves from the sun using clothing; however, 33% of respondents were observed wearing at least knee-length pants or skirt and at least elbow-length sleeves. Again, this indicates that the sun protective properties of clothing are not salient to many people.

Table 2: Reported and observed sun protection, compared with Victorian population

	Reported (n=419)	*Observed (n=419)*	*Victoria 2000/01[11] (n=1051)*
Protected from sun (reported)/ observed using at least one method (observed)	73%	81%	–
Protected with:			
Sunscreen	51%	–	38%
Sunglasses	36%	64%	55%
Hat	33%	28%	44%
Shade	9%	–	–
Clothing (observed: at least knee-length pants/skirt and at least elbow-length sleeves)	5%	32%	–
Avoidance	1%	–	–
Other	1%	–	–

Note: The sun survey asks people a more general question asking about what the person was wearing during their main activity outdoors 11am–3pm; while the UV Alert survey asks specifically about what they have used for sun protection.

Reported sunscreen use among respondents was higher than among Victorians aged 14 to 69 who participated in a representative telephone survey of behaviour when outdoors on summer weekends conducted in summer 2000/2001.[11] Reported sunglasses and hat-wearing were lower than in the representative survey. Differences between the current survey respondents and the representative survey may reflect differences in sun protection behaviour while engaging in different activities, which were also noted in the representative survey. Alternately, they may be an artefact of for example the different timing, season/weather conditions and age groups surveyed in the two studies.

Weather information sources

Respondents were asked if they knew the forecast maximum temperature and/or the forecast UV levels for the day of the survey. A majority of respondents reported that they knew the forecast maximum temperature for the day (84%), and most of these reported the correct maximum temperature (80% on the Saturday, 77% on the Sunday, and 71% on the Monday). Only 9% reported that they knew the forecast UV levels, almost all of whom expressed this using category labels (moderate/high/extreme); only 3 respondents reported an approximate number range, and none gave UV Alert times.

Respondents were then asked from where they had accessed this weather information. A majority of respondents (55%) had accessed information from television (see Table 3). Other frequently mentioned sources of information were newspapers (15%), radio (11%) and the Bureau of Meteorology website (6%).

Table 3: Weather information sources used for the day of the survey

	(n=419)
Television	55%
Newspaper	15%
Radio	11%
Bureau of Meteorology website	6%
Other website	3%
Other person	2%
SMS	0.5%
Telstra Pocketnews	0.2%

Potential for use

Before being shown the UV Alert for the day of the survey, respondents were asked at what times they thought people should protect themselves from the sun on that day. More than half of respondents thought that sun protection should be used all the time when out in the sun (52%) (see Table 4). The next most frequently reported times were 'around noon/midday' (8%) and 'between 11 and 3' (8%). A variety of other times were given, none of which matched the SunSmart UV Alert for the day. Of the respondents who mentioned specific times, 35% said 'from 10am', 37% said 'from 11am, and 14% said 'from 12pm'. The most common end times given were 2pm (12%), 3pm (48%) and 4pm (22%). Given that the UV Alert on the 3 days of the survey began at 10.20/10.30am and ended at 4.30/4.40pm, there were a substantial number of respondents who did not think sun protection was necessary for at least some of the time when the UV index was 3 or above.

Table 4: Reported times when people should protect themselves from the sun on the day of the survey

	(n=405)
All day/when the sun is out/when outside	52%
Between ___ o'clock and ___ o'clock/From ___ o'clock	36%
Between 11am and 3pm	*8%*
Between 10am and 2/3/4pm	*9%*
Around noon/midday	8%
Other	4%
Not at all	0.3%

Awareness

Unprompted (i.e. without having been shown a UV Alert graphic), 18% of respondents recalled having seen the Alert in the most recent weather forecast they had looked at, either on the day of the survey or previously during the summer, and confirmed this upon viewing the graphic (see Table 5). Six percent of all respondents recalled seeing the Alert on the day of the survey. Upon being shown the graphic, a further 30% recalled previously having seen a similar Alert. Thus of the total number of respondents, 48% recalled having ever seen a SunSmart UV Alert, 50% did not recall ever seeing one, and 2% could not say whether they had ever seen an Alert. There were no significant variations in the percentage of respondents recalling having seen the Alert dependent on their age or sex.

Table 5: Percentage of respondents recalling having ever seen the UV Alert

	Sex		*Age*			*Total*
	Male	*Female*	*18-34*	*35-44*	*45+*	
	(n=186)	*(n=213)*	*(n=147)*	*(n=141)*	*(n=112)*	*(n=400)*
Yes (ever seen)	48%	47%	45%	48%	51%	48%
(unprompted & confirmed – most recent forecast)	*17%*	*18%*	*21%*	*16%*	*15%*	*18%*
(prompted – seen previously)	*31%*	*29%*	*24%*	*32%*	*36%*	*30%*
No (never seen)	50%	50%	52%	49%	47%	50%
Can't say	2%	3%	2%	3%	2%	2%

Among the 253 respondents who had looked at the weather forecast in a newspaper at least once during the summer, 29% recalled having seen a SunSmart UV Alert in the most recent weather forecast they looked at (see Table 6). This percentage was not related to the frequency with which respondents checked the forecast. Among the 61 respondents who had got weather information from a newspaper on the day of the survey, 43% recalled seeing the SunSmart UV Alert that day.

Table 6: Percentage of respondents recalling having seen the UV Alert

	Have looked at weather forecast in newspaper this summer	*Got today's weather information from:*	
		Newspaper	*BoM website*
	(n=253)	*(n=61)*	*(n=18)*
Saw UV Alert (unprompted & confirmed)	29%	43%	11%
Did not see UV Alert	70%	51%	83%
Can't say	2%	7%	6%

*Percentages are rounded and may not sum to 100%.

Understanding

When asked to explain the meaning of the SunSmart UV Alert graphic for the day of the survey, only 5% of respondents said they did not know what it meant (see Table 7). Almost half of respondents (48%) reported that the graphic showed the times when UV levels were high. One in 5 respondents said the graphic showed how UV levels varied during the day (22%), and 14% reported that the graphic showed the times when the sun was dangerous. Less than 1 in 10 noted that the graphic showed when to be SunSmart/use sun protection (8%).

Table 7: Understanding of UV Alert

	Recalled ever seeing UV Alert	*Did not recall ever seeing UV Alert*	*Total*
	(n=192)	*(n=199)*	*(n=419)*
Don't know	2%	9%**	5%
Shows times UV high/highest/peak/strongest/ intense/extreme/worst	58%**	42%	48%
Mentioned times corresponding to orange section or focussed on orange section	30%	26%	27%
Shows UV levels/conditions during the day	14%	29%**	22%
Shows times sun (most) dangerous/times (most) at risk	19%*	11%	14%
Be SunSmart/use sun protection	9%	6%	8%
Shows highest/peak UV	9%	7%	8%
Shows temperature	4%	7%	5%
Shows times when can be burnt/level of sunburn risk	4%	5%	4%
Reported UV max figure for the day (=7)	2%	5%	3%
Mentioned UV Alert times (=10.20/10.30-16.30/16.40)	2%	3%	3%
Shows lowest/minimum UV	3%	3%	2%

Multiple answers were possible, percentages do not sum to 100%.
*p<.05; **p<.01

Almost all respondents who mentioned specific time periods in their explanation of the meaning of the graphic (29% of all respondents) focussed on times corresponding approximately to the orange section of the bell curve (27% of all respondents). The lower end of the orange section corresponded exactly to the figure 12 (pm) on the X-axis (see Figure 3); 83% of the 121 respondents who noted specific times said 'from 12pm'. The higher end of the orange section was located a little less than half way between the figures 2 (pm) and 4 (pm) on the X-axis; 20% of respondents who noted specific times said 'until 2pm', 10% 'until 2.30pm', 50% 'until 3pm' and 9% 'until 4pm'. Only 3% of all respondents (11 respondents) correctly mentioned the UV Alert times for the day of the survey or correctly pointed out the section of the bell curve corresponding to the UV Alert. Of these respondents, only 3 also noted that people should use sun protection/be SunSmart during these times. Incorrect explanations of the graphic were relatively infrequent; only 5% of respondents reported that the graphic represented heat or temperature.

There were significant differences in understanding of the graphic between respondents who recalled previously seeing a SunSmart UV Alert and those who did not. Respondents who did not recall ever seeing an Alert were significantly more likely to reply that they did not know what the graphic meant (9% vs. 2%; χ^2 (1)= 8.92, $P < 0.01$), or to give a general answer relating to UV conditions (29% vs. 14%; χ^2 (1)= 13.07, $P < 0.01$). Respondents who recalled previously seeing a UV Alert were more likely to give more specific responses: that the graphic showed times when the UV was high (58% vs. 42%; χ^2 (1)= 10.14, $P < 0.01$) or when the sun was more dangerous (19% vs. 11%; χ^2 (1)= 5.88, $P < 0.05$).

Use

Among the 69 respondents who reported having seen the UV Alert on the day of the survey or in the newspaper during summer, 65% reported that seeing it helped remind them that they might need to use sun protection when they went outdoors. Eighteen out of 26 respondents (69%) who reported having seen the UV Alert on the day of the survey reported that seeing it helped remind them that they might need to use sun protection. Although respondents' reported and observed sun protection on the day of the survey was recorded, no conclusions can be drawn as to whether seeing the Alert was an effective reminder to use sun protection as only 27 respondents had seen the Alert for that day.

DISCUSSION

Awareness

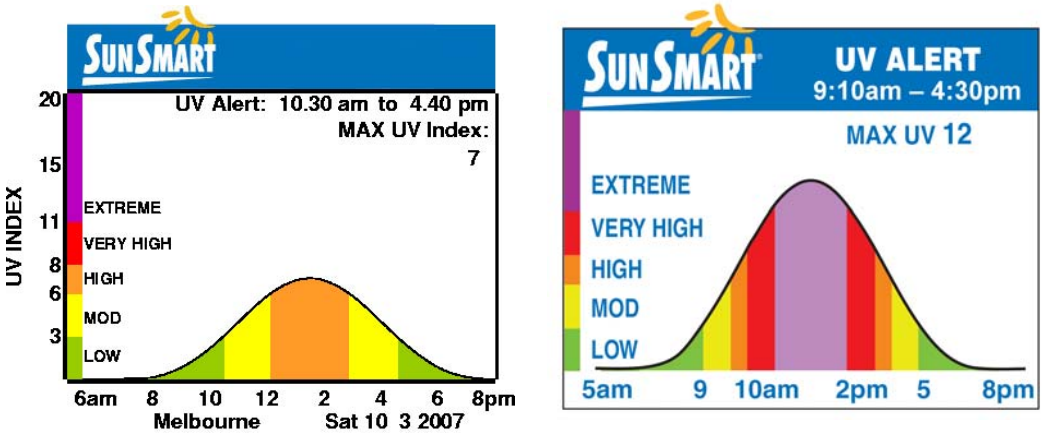
Given the limited media sources from which the SunSmart UV Alert can currently be accessed, awareness was high, with 48% of all respondents recalling having previously seen the Alert. However, as only 6% of respondents had seen the Alert on the day of the survey, there is still a substantial amount of work to be done in order to encourage routine use of the Alert in planning daily sun protection. Currently, the SunSmart UV Alert is disseminated only through newspaper weather forecasts, the BoM website, and Telstra Pocketnews. Together, these weather information sources were only accessed by 21% of respondents on the day of the survey. Instead, the majority of respondents got their weather information for the day from televised weather forecasts. It is therefore encouraging that the BoM have recently committed to including Alert times in weather information routinely provided to radio and television broadcasters. There is no doubt that television broadcasts of the SunSmart UV Alert offer the greatest potential to disseminate use of this sun protection tool. Skin cancer control advocates, the BoM and ARPANSA should continue to encourage broadcasters to routinely include the SunSmart UV Alert, and should monitor the uptake of this initiative nationwide.

Understanding

In addition, there is still further work to be done in educating people about how to understand and use the UV Alert. Most respondents had a basic understanding of the SunSmart UV Alert graphic, recognising that the Alert represents variations in UV levels throughout the day. However, only very few respondents noted the actual Alert times, either by reading them from the bell curve or from the text in the top right corner. This may be due to the responses reflecting a 'top-of-mind' reaction to the graphic, which was not fully probed. Respondents most commonly focussed on the orange ('high') section of the bell curve (see Figure 4). The exact correspondence of the lower end of the orange section with the figure 12 (pm) on the X-axis of the bell curve proved particularly salient. Respondents had difficulty in interpreting upper time limits, as this required an ability to estimate the time corresponding to the upper end of the orange section, which was not marked on the X-axis with a specific time. Very few respondents mentioned the yellow ('moderate') section of the bell curve.

In the pre-testing of the SunSmart UV Alert in Perth, when participants were initially asked to describe their thoughts and feelings about each concept in an open-ended manner, it was reported that 'the attention of two-thirds of respondents viewing either of the bell-curve concepts was immediately drawn to the purple aspect of the graphs highlighting the time of the day when UV conditions are 'extreme' (10am-2pm)'.[10] These times were also printed on the X-axis, making them even more salient (see Figure 4). When asked what the concept was actually telling them, 35% of respondents who saw the UV Alert bell curve said 'Be SunSmart 10am to 2pm', compared with just 7% who said 'Be SunSmart 9.10 to 4.30' (the times of the UV Alert). Thus, at pre-test respondents also had some difficulty in interpreting the bell curve colours and the times along the X-axis in a meaningful way.

Figure 4: SunSmart UV Alert graphs used in current survey and in pre-testing



From the findings of the current survey, together with the findings from the pre-testing of the SunSmart UV Alert, it appears that the key message of the UV Alert time period is poorly understood by a majority of respondents. Respondents' attention is drawn primarily by the bell curve, to the exclusion of the additional text-based information. When interpreting the bell curve, respondents' attention is drawn to the central colour(s) corresponding to the most extreme UV levels for the day, and to the times marked on the X-axis. More peripheral colours receive less attention, even if they represent time periods when the UV index is 3 or above. This indicates that more targeted education is necessary, in order to enable the general public to correctly interpret the SunSmart UV Alert and use it routinely when planning their daily sun protection. In addition, further research is needed to explore options for modifying the graphic in order to more easily and effectively convey the correct message. For example, some possible options which could be tested are:

- Develop a 2-colour version of the Alert with the colours corresponding to times when sun protection is/is not required.
- Retain the standard colours, but add an overlay to the sections of the bell curve corresponding to the Alert times.
- Retain the standard colours, but print only the Alert times on the X-axis of the bell curve.

This more detailed pre-testing needs to overcome a tendency noticed in previous pre-testing research (Unpublished data: Doyle pre-testing solarium information brochures 2005) for participants to choose the best alternative of the options provided to them. Further probing might ascertain whether each option on its own clearly conveys the desired message. Any modifications to the graphic would need to be developed in partnership with the BoM and TV weather producers to ensure the styles of the graphics would be suitable for their reports and broadcasts.

Use – effect on behaviour

While 65% of respondents who had seen the SunSmart UV Alert on the day of the survey or in the newspaper during summer agreed that seeing it helped remind them that they might need to use sun protection when they went outdoors, when asked to explain the meaning of the Alert, only 8% of all respondents mentioned sun protection/SunSmart behaviour. This was despite the fact that respondents had potentially been primed by several questions relating to sun protection asked prior to this question.

The research on the pre-testing of the SunSmart UV Alert graphic concluded that the bell curve plus UV Alert text was the most effective of the four concepts tested with regard to promoting sun protection.[10] However, this conclusion was based only on about 10-18% more respondents having reported that this graphic made them think of sun protection *a lot* or *quite a bit* (69% as compared with from 51% to 61% for the other three concepts tested). The proportion of respondents who agreed that the graphic or text they viewed implied 'Take extra sun protection precautions in these conditions' was the same for all four concepts tested. When participants were initially asked to describe their thoughts and feelings about the bell curve concept, only 20% spontaneously mentioned 'be SunSmart'. These responses to the SunSmart UV Alert graphic were recorded in Perth; it is possible that people exposed to different styles of weather forecasts in different states might respond differently to the SunSmart UV Alert graphics, with more or less comprehension of its value for informing them about the times they need to protect themselves when outdoors.

It appears that, at least for the respondents in this study, in its current form, the SunSmart UV Alert has been relatively ineffective in improving sun protection behaviour. Four possible reasons for this are:

1. Lack of awareness of the Alert, as discussed above.

2. Poor levels of understanding of the Alert, as discussed above.

3. A lack of an active sun protection message, or explicit links between the need for sun protection at certain times and either the UV Alert text, the bell curve colours or the category labels. This could be remedied either by modifying the graphic to provide more obvious cues for sun protection, and/or by developing an education campaign linking the UV Alert to sun protection through the use of images or slogans which are already well-recognised by the Victorian general public. For example, a more active sun protection message could be included in the UV Alert graphic, extending the SunSmart logo on the top banner to read "Be SunSmart between ____ AM and ____ PM". The UV Alert could also be marketed using for example Sid Seagull, and/or the well-known Slip! Slop! Slap! (Seek! Slide!) slogan.

4. A tendency among the general public to rely principally on immediate weather cues such as temperature and sunshine to guide sun protection behaviour, rather than planning sun protection in advance using weather forecast information in general, and UV forecast information in particular. A recently published randomised-controlled trial found that the provision of forecast maximum UV index levels did not markedly enhance weekend sun protection behaviours among a sample of Australian adults.[12] While participants who received UV forecasts were slightly more likely to report that they had taken 'precautions' in response to the forecasts, their reported specific sun protection behaviours did not differ from those who did not receive the UV forecasts. Most participants reported that their sun protection behaviour was based on observations of the weather at the time, and was also determined by their personal habits. This confirms results from a study conducted in Sweden, which found that UV index information did not decrease sunbathing and sunburn more than general, written information.[13]

Both studies which found that UV forecasts did not improve sun protection behaviours used forecast maximum UV index levels rather than the more detailed information included in the SunSmart UV Alert. The Alert graphic was rated during pre-testing as both more interesting and more believable than the text-based maximum UV forecast. In addition, with increasing media coverage of the need to balance sun protection with sun exposure for Vitamin D production, the UV Alert is also being promoted as a tool for

differentiating between 'safe' and 'unsafe' times for sun exposure, which may increase its perceived usefulness. However, it remains to be tested whether increased understanding and wider dissemination of the Alert could be sufficient to improve sun protection behaviours.

It is also possible that the Alert may be more effective when used as a behavioural prompt in a setting where sun protection is required, rather than when provided as weather forecast information. The SunSmart program has commissioned the design of a UV Alert sign, to be used to display UV Alert times for the day in schools, workplaces and community settings. The evaluation of this strategy should provide more information regarding the effectiveness of the Alert when used in this way.

Study limitations

The participants in this study may not be representative of all residents in Victoria. The prevailing weather conditions on the day and timing of the survey at the end of a long, very dry summer may also have influenced the salience of weather forecasts and need for sun protection amongst respondents.

Conclusions

In conclusion, the SunSmart UV Alert has achieved reasonable levels of awareness amongst the Victorian public, given the relatively short time it has been available, its limited dissemination and the lack of a public education campaign to promote its interpretation and referral as an important sun protection tool. Basic understanding of the Alert graphic was good; however, there is a need to improve awareness and understanding of the UV Alert times, in particular in reinforcing the link to the need for sun protection. Options for modifying the presentation of the Alert to convey the sun protection message more effectively should be explored, together with the development of a suitable broad-based public education campaign to promote awareness of its value for sun protection. At the same time, wider dissemination of the Alert through television and radio should continue to be sought. Further research is required to pre-test options for modifying the graphic, test whether providing education and access to the forecast Alert is sufficient to improve sun protection behaviours, and evaluate settings-based uses of the Alert as an immediate behavioural prompt. The SunSmart UV Alert is an innovative tool with clear potential for improving Victorians' sun protection behaviours, thus decreasing their exposure to UV radiation and reducing the current high rates of skin cancer. Improving its understanding and use should be a priority for skin cancer control advocates.

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APPENDIX A: QUESTIONNAIRE

UV Alert Evaluation – Moomba 2007 (252.80d)

Q1. Have you done anything to protect yourself from the sun today?

1❑ Yes 2❑ No →***Q3***

Q2. What? *(tick all that apply)*

1❑ Clothing 2❑ Sunscreen
3❑ Hat 4❑ Shade
5❑ Sunglasses 6❑ Avoidance
7❑ Other _____

Q3. At what times do you think people should (have) protect(ed) themselves from the sun today?

1❑ All day/when sun is out 2❑ Not at all
3❑ Around noon/middle of day
4❑ Between _____ and _____
5❑ Other _____

Q4. Do you know the forecast maximum temperature for today?

1❑ _____ degrees
2❑ Approx. _____ degrees
3❑ Checked, but can't remember
4❑ No

Q5. Do you know the forecast UV levels for today?

1❑ No 2❑ High/extreme 3❑ 3 or above
4❑ Max _____ 5❑ Colour (e.g. red)
6❑ High between _____ and _____
7❑ Other _____

If 'no' for Q4 and Q5, go to Q7.

Q6. Where did you get the information about today's temperature/UV levels? *(tick all that apply)*

1❑ Newspaper →***Q8***
2❑ BoM website →***Q8***
3❑ Telstra Pocketnews →***Q8***
4❑ Other website 5❑ Other mobile phone
6❑ TV 7❑ Radio 8❑ Recorded phone
9❑ Fax 10❑ SMS 11❑ Other person
12❑ Other _____

Q7. This summer, have you looked at any weather forecast in a newspaper?

1❑ Yes 2❑ No→***Q12*** 3❑ Can't say→***Q12***

Q8. How often do you check the forecast?

1❑ Daily/most days
2❑ At least once per week
3❑ At least once per month
4❑ Less than once per month

Q9. Thinking about the most recent weather forecast you saw, did you notice a SunSmart UV Alert with a coloured graph?

1❑ Yes 2❑ No →***Q12*** 3❑ Can't say

Q10. Is this what you saw? *(show today's UV alert)*

1❑ Yes 2❑ No→***Q12*** 3❑ Can't say→***Q12***

Q11. Did seeing this help remind you that you might need to use sun protection when you went outdoors?

1❑ Yes 2❑ No 3❑ Can't say
➔ ***Go to Q13***

Q12. Have you ever seen this before? *(show today's UV alert)*

1❑ Yes 2❑ No 3❑ Can't say

Q13. Could you tell me what this means? *(write verbatim and tick all that apply)*

1❑ No 2❑ Be SunSmart/sun protection
3❑ Times _____ to _____
4❑ Times UV high/highest 5❑ UV max
6❑ Times sun (most) dangerous
7❑ UV conditions – other 8❑ Other

_____

_____

_____

_____

Q14. To make sure we have a true cross-section of people could you please tell us your:

A Age _____ (years)

B 1❑ Vic. resident 2❑ Visitor

C Postcode _____

THANK YOU!

Q15. Tick (don't ask!)

A *Sex* 1❑ Male 2❑ Female

B *Hat* 1❑ No 2❑ WB 3❑ NB 4❑ Leg.
5❑ Cap 6❑ Other _____

C *Arms* 1❑ No 2❑ Short 3❑ Elbow 4❑ Long

D *Legs* 1❑ Short 2❑ Knee 3❑ Long

E *Sunglasses* 1❑ Yes 2❑ No

Interviewer Initials: _____ Date: ____/03/07 Time:_____ Office use: ID: _____