Solarium use in Australia, recent trends and context

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In Australia, more than 1,600 people die from skin cancer each year. Solaria emit high levels of UV radiation (UVR). Two systematic reviews have reported that the use of solaria is related to increased risk of melanoma and squamous cell carcinoma, with elevated risk of melanoma for solarium use under the age of 35 years.

Between 1996 and 2006, Australian consumers’ demand for solaria appeared to be increasing, indicated by a 319% increase in solarium listings in capital city telephone books. State-based studies (in Queensland, New South Wales and Victoria) conducted across different years reported that between 1.3% and 3.0% of adults and in New South Wales 12.4% of adolescents had used a solarium within the previous year. This brief report describes the findings of the first two national surveys that examined Australian adolescents’ and Australian adults’ use of solaria recent trends in prevalence, and context.

Methods
Data were gathered as part of a national skin cancer prevention survey established in summer 2003/04 and repeated in 2006/07 using equivalent methods. In each survey a representative sample of Australian adolescents (12–17) and adults (18–69) were recruited via weekly cross-sectional telephone calls on Mondays and Tuesdays following eight summer weekends to randomly selected households with a landline telephone. Respondents were informed that the survey was ‘about people’s attitudes towards being out in the sun’ and that ‘the opinion of people aged 12 to 69’ was being sought. Parental permission was requested for respondents under 16. The key questions relating to solaria included:

1) Have you ever used a solarium?
2) Have you been to a solarium in the last 12 months?
3) During the last 12 months how many times did you attend?
4) Thinking about the last time you went to a solarium, what prompted you to go?

Demographic information collected included: age, gender, and skin sensitivity to sunburn. Preference for a tan was assessed by the question Do you like to get a suntan or not? Demographic information collected included: age, gender, and skin sensitivity to sunburn. Preference for a tan was assessed by the question Do you like to get a suntan or not? Demographic information collected included: age, gender, and skin sensitivity to sunburn. Preference for a tan was assessed by the question Do you like to get a suntan or not? Demographic information collected included: age, gender, and skin sensitivity to sunburn. Preference for a tan was assessed by the question Do you like to get a suntan or not? Demographic information collected included: age, gender, and skin sensitivity to sunburn. Preference for a tan was assessed by the question Do you like to get a suntan or not?

The analysis was conducted following application of population weights to adjust for over-sampling of respondents in smaller states and territories, and minor variations by age, gender, city/country residence. Univariate statistics were used to describe the prevalence of solarium use for adults and adolescents in both surveys. A comparison of the prevalence of adults’ solarium use in 2003/04 and 2006/07 was examined via logistic regression using two dichotomous

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dependent variables ‘ever used’ and ‘recent solarium use’ adjusting for the covariates age, gender and skin-type. Unadjusted prevalence figures are reported to describe the trends in adolescents’ solarium use. Additional analyses examined the context of adults’ solarium use in 2006/07. Univariate statistics were used to describe frequency and reported reasons for use, while the relationship between adults’ beliefs and solarium use were examined using logistic regression adjusting for age, gender and skin type.

Results
In total, 11,509 respondents were interviewed across the two surveys and response rates were 24% in 2003/04 and 16% in 2006/07. The two samples were broadly representative of the estimated resident Australian population aged 12 to 69 in terms of age, sex, and state. At least two-thirds of respondents in both periods had either highly or moderately sunburn-sensitive skin. Among adolescents 66.2% in 2003/04 and 66.8% in 2006/07 reported they would burn only or burn then tan after 30 minutes strong sunshine in spring. Among adults 76.6% in 2003/04 and 74.6% in 2006/07 reported highly or moderately sunburn-sensitive skin.

In 2006/07, 2.5% (n=16) of adolescents reported ever having used a solarium. Only girls aged 15 to 17 reported using one within the last 12 months (Table 1). Adolescents’ solarium use was also low in 2003/04, with 3.4% (n=24) reporting they ever used a solarium and 1.2% (n=9) within the last 12 months. Solarium use was more common among adults, with 10.6% (n=539) reporting they had ever used a solarium in 2006/07, and 1.5% (n=78) within the 12 months prior to interview. The highest reported ever use of solaria was among women aged 25 to 44 years at 20.7%, and was also high among women aged 18 to 24 (17.1%). Women aged 18 to 24 years also had the highest prevalence (6.7%) of use in the last 12 months.

A similar pattern of solarium use by age and gender was noted for 2003/04 (Table 1). Logistic regression analyses showed there was little change in the percentage of adults who had ever used a solarium between surveys (10.9% to 10.6%; OR=0.96, 95% CI=0.85, 1.10). There was evidence of a decrease in adults’ solarium use within the last 12 months (2.2% to 1.5%; OR=0.69, 95% CI=0.52, 0.94).

In 2006/07 the majority of adults who reported having used a solarium in the last 12 months (n=78) had attended several times within the year with 15% (n=11) having been 25 times or more, 50% (n=39) had been 5 to 24 times. The main reported reasons adults in 2006/07 gave for their most recent use of a solarium (n=539) were preparing for a special event or holiday (30.6%), vanity/ to get a tan/ I’m too pale (19.9%) and fading tan (15.2%).

A number of adults’ attitudes and beliefs about tanning were associated with having ever used a solarium and with recent solarium use (Table 2). Adults who reported they liked to get a suntan were three times more likely to have ever used a solarium and approximately five times more likely to have used one in the last 12 months, when compared with adults who did not like to get a tan. Similarly, adults who believed a suntanned person looks more healthy were more likely to have used a solarium ever or within the last 12 months compared to those who did not agree that a tan looks more healthy. Adults who believed that their friends think a suntan is a good thing were twice as likely to report solarium use in the last 12 months than those who did not hold this belief. Adults’ perceived risk of getting skin cancer was also associated with adults’ solarium use.

Discussion
Overall, the study found a low prevalence of solarium use in Australia in 2006/07 except among young adult women. However, there was some evidence of a small decrease in recent solarium use among adults.

The levels of solarium use for adults were generally consistent with the few state-based surveys. The national figures for adolescents were somewhat lower than the figure reported for NSW school students’ solarium use (12% within the last 12 months), but even these figures were much lower than reported for the US

Table 1: Adolescent and adult use of solaria in 2003/04 and 2006/07, as a function of age and gender of participants (weighted data).

<table>
<thead>
<tr>
<th>Age Group</th>
<th>N</th>
<th>%</th>
<th>N</th>
<th>%</th>
<th>N</th>
<th>%</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>24,699</td>
<td>3.4</td>
<td>16,652</td>
<td>2.5</td>
<td>9,699</td>
<td>1.2</td>
<td>4,652</td>
<td>0.6</td>
</tr>
<tr>
<td>12 to 14 yrs</td>
<td>8,351</td>
<td>2.3</td>
<td>6,329</td>
<td>1.8</td>
<td>1,352</td>
<td>0.3</td>
<td>328</td>
<td>0</td>
</tr>
<tr>
<td>15 to 17 yrs</td>
<td>16,348</td>
<td>4.6</td>
<td>10,324</td>
<td>3.1</td>
<td>8,348</td>
<td>2.3</td>
<td>4,342</td>
<td>1.2</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>10,358</td>
<td>2.8</td>
<td>5,334</td>
<td>1.5</td>
<td>1,358</td>
<td>0.3</td>
<td>334</td>
<td>0</td>
</tr>
<tr>
<td>Female</td>
<td>13,340</td>
<td>3.8</td>
<td>11,319</td>
<td>3.4</td>
<td>8,341</td>
<td>2.3</td>
<td>4,318</td>
<td>1.3</td>
</tr>
<tr>
<td>Overall</td>
<td>255,073</td>
<td>10.9</td>
<td>539,085</td>
<td>10.6</td>
<td>110,507</td>
<td>2.2</td>
<td>78,508</td>
<td>1.5</td>
</tr>
<tr>
<td>18 to 24 yrs</td>
<td>74,741</td>
<td>10.0</td>
<td>76,737</td>
<td>10.3</td>
<td>29,740</td>
<td>3.9</td>
<td>31,736</td>
<td>4.2</td>
</tr>
<tr>
<td>25 to 44 yrs</td>
<td>346,2,246</td>
<td>15.4</td>
<td>304,2,199</td>
<td>13.8</td>
<td>70,2,246</td>
<td>3.1</td>
<td>38,2,199</td>
<td>1.7</td>
</tr>
<tr>
<td>45 to 69 yrs</td>
<td>136,2,087</td>
<td>6.5</td>
<td>159,2,150</td>
<td>7.4</td>
<td>11,2,087</td>
<td>0.5</td>
<td>10,2,150</td>
<td>0.5</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>164,2,538</td>
<td>6.5</td>
<td>139,2,550</td>
<td>5.5</td>
<td>33,2,538</td>
<td>1.3</td>
<td>24,2,550</td>
<td>0.9</td>
</tr>
<tr>
<td>Female</td>
<td>391,2,535</td>
<td>15.4</td>
<td>399,2,535</td>
<td>15.7</td>
<td>77,2,535</td>
<td>3.0</td>
<td>54,2,535</td>
<td>2.1</td>
</tr>
</tbody>
</table>

Notes: a) Some n/figures do not round exactly due to weighting.
and northern Europe. Nonetheless, public health advocates will be concerned that some Australians were undergoing intense regular exposure to artificial UVR in solaria and that a number of adolescents had accessed and used solaria.

Although the characteristics of tanning bed users have been studied in the US and Europe there have been few such studies in Australia. The findings that Australian solarium users were more likely than non-users to place a high value on a tan, perceive it looks healthy and perceive a high risk of getting skin cancer are not surprising. These associations suggest that interventions that focus on alternatives for improving appearance including use of fake tans or resisting peer pressure and improving self-efficacy to reverse perceptions that skin cancer risk is inevitable, may be worth further trial to attempt to reduce solarium use among young women in particular.

The observed decline in the prevalence of recent solarium use nationally between 2003/04 and 2006/07 occurred coincidentally with an intensive national skin cancer campaign on TV in 2006, and boosted in some states by extra campaigns. The strong correlation of solarium use and social norms suggests that skin cancer prevention campaigns may well influence solarium use by lessening the social acceptability of tanning, as the amount of exposure to skin cancer prevention television advertising is associated with improvements in public attitudes to tans.

Study limitations include the low response rate, which can be attributed to timing constraints of the interviews and decline in response to telephone surveys more generally. Our findings pre-date the widespread publicity about the dangers of solarium use by Clare Oliver and the later introduction of state-based regulations on solaria. These data relate to a time of rapid increase in the number of solaria operating in Australia. Thus, lower rates of solarium use by the population might be already anticipated in line with the altered regulatory environment. Nevertheless, these new state-based regulations (banning people under 18 and people with fair skin (Fitzpatrick Skin type I) would not prevent an adult with skin type II that burns easily and tans minimally, or less sensitive skin types (II or IV) with propensity to tan using solaria. There may also be unintended effects on patronage, if people perceive the regulations make solaria safer. Moreover, as the intense media on Clare Oliver’s death subsides resurgence in solarium tanning may occur. Access to solaria is still a concern as while limits on frequency and length of sessions, hygiene standards and provision of protective eyewear are newly regulated, solaria may still emit levels of UVR three times higher than midday summer sun.

It is important to evaluate the public health impact of these substantial regulatory changes to ensure that they are effective in reducing people’s use of these artificial UVR sources for tanning. Future studies need to monitor industry compliance with regulations and advertising practices and to assess the impact on actual solaria use, with the present study providing a valuable baseline for future comparisons.

Acknowledgements

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Table 2: Adult solarium users’ versus non-users’ attitudes and beliefs regarding sun tanning and skin cancer, 2006/07 sample (N=5,085).

<table>
<thead>
<tr>
<th>Beliefs about solarium</th>
<th>Solarium use in last 12 months</th>
<th>Adjusted Odds Ratiob</th>
<th>95% CI</th>
<th>Adjusted Odds Ratiob</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ever used a solarium</strong></td>
<td>(2006/07)</td>
<td>(2006/07)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Like to get a tan (yes)</td>
<td>Yes (%)</td>
<td>(%)</td>
<td>2.97</td>
<td>2.41-3.66</td>
<td></td>
</tr>
<tr>
<td><strong>Beliefs about suntans</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A suntanned person looks more healthy (agree)</td>
<td>44.2</td>
<td>62.9</td>
<td>1.69</td>
<td>1.37-2.08</td>
<td></td>
</tr>
<tr>
<td>A suntanned person is more healthy (agree)</td>
<td>12.1</td>
<td>14.7</td>
<td>1.09</td>
<td>0.81-1.46</td>
<td></td>
</tr>
<tr>
<td><strong>Perceived social norms</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Close family think a suntan is a good thing (agree)</td>
<td>22.5</td>
<td>29.7</td>
<td>1.09</td>
<td>0.86-1.38</td>
<td></td>
</tr>
<tr>
<td>Friends think a suntan is a good thing (agree)</td>
<td>36.3</td>
<td>44.6</td>
<td>0.95</td>
<td>0.76-1.18</td>
<td></td>
</tr>
<tr>
<td><strong>Beliefs about skin cancer</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>There is little chance I will get skin cancer (disagree)</td>
<td>52.9</td>
<td>59.9</td>
<td>1.30</td>
<td>1.07-1.58</td>
<td></td>
</tr>
<tr>
<td>If I regularly protect myself from the sun, I can avoid skin cancer (disagree)</td>
<td>12.8</td>
<td>13.5</td>
<td>1.12</td>
<td>0.84-1.49</td>
<td></td>
</tr>
</tbody>
</table>

Notes: % Unadjusted weighted percentages.

a) Results of logistic regression model predicting ever used a solarium adjusting for age, gender, and skin-type. n=4,939, Nagelkerke R² = 0.158, Hosmer-Lemeshow p>0.05.

b) Results of logistic regression model predicting used a solarium last 12 months, adjusting for age, gender, and skin-type. n=4,939, Nagelkerke R² = 0.206, Hosmer-Lemeshow p>0.05.

The models excluded ‘state’ as a covariate, given limited data for smaller states/territories (NT, ACT, Tas) and state-based population weights were applied to these data.
References