

Summer weekend sunburn by non-modifiable personal risk factors for developing melanoma

Background

New Zealand and Australia have the highest rates of melanoma in the world (Erdmann et al., 2013; Parkin, Bray, Ferlay, & Pisani, 2005). Three risk factors for developing melanoma include skin type, skin colour, and family history of skin cancer (Gandini, Sera, Cattaruzza, Pasquini, Zanetti, et al., 2005). In addition, New Zealand has higher rates of melanoma registrations for males (Ministry of Health, 2012) and for those over age 59 (Liang et al., 2010).

Aside from these non-modifiable personal characteristics, sun exposure is the main modifiable risk factor for developing melanoma (Australian Cancer Network Melanoma Guidelines Revision Working Party, 2008). In particular, intermittent sun exposure (as opposed to chronic sun exposure, which is often occupational in nature) has been shown to play a significant role in melanoma incidence (Gandini, Sera, Cattaruzza, Pasquini, Picconi, et al., 2005). It is therefore important to monitor (and work to reduce) the incidence of sunburn on a population level.

Australian data on weekend sun exposure reveal that there are some differences in sunburn incidence across these risk factor groups. Adolescents have had consistently higher rates of sunburn compared with adults (21% and 13%, respectively in 2010-11) (Dobbinson et al., 2008; Volkov, Dobbinson, Wakefield, & Slevin, 2013). Further analyses for Melbourne residents revealed that males had consistently higher rates of sunburn compared to females until 2006-07; there was no clear pattern, however, by skin type (Makin, Warne, Dobbinson, Wakefield, & Hill, 2013).

The key source of New Zealand data on sun exposure is the Health Promotion Agency's (HPA's) Sun Exposure Survey (SES), formerly called the Triennial Sun Protection Survey. This fact sheet relates to the latest wave of data, which was collected in the summer of 2013.

Methodology

Participants in the 2013 SES were asked about their outdoor activities over the weekend prior to the interview date, including whether or not they had been sunburnt. Analyses were restricted to those respondents who were outdoors for at least 15 minutes between 10am and 4pm over the weekend. Responses were examined by the following risk factors in separate univariate analyses to determine any statistically significant differences in sunburn incidence by the sub-groups:

- Age (13 to 17 years; 18 to 24 years; 25 to 34 years; 35 to 44 years; 45 to 54 years)
- Gender (Male; Female)
- Skin colour (Very fair; Fair; Medium; Olive; Dark/very dark/black)
- Skin type (Sunburn sensitivity: High; Moderate; Not sensitive)
- Known family history of skin cancer.

Skin type was adapted from the Fitzpatrick Scale (Fitzpatrick, 1988; Makin et al., 2013) using the following question: "Suppose your untanned skin was exposed to strong sunshine at the beginning of summer using no sun protection at all. If you stayed in the sun for 30 minutes, would your untanned skin...?" Three groups (high, moderate, or not sensitive to sunburn) comprised skin type according to the respective response options: "Just burn and not tan afterwards"; "Burn first, then tan afterwards"; "Not burn at all, just tan".



Sunburn incidence

Respondents who were outdoors for at least 15 minutes between 10am and 4pm during the previous summer weekend were asked, “Did you get sunburnt? By sunburnt we mean any amount of reddening of the skin after being in the sun”. Overall, 19.0% (16.5-21.4%) said “Yes”.

Differences in sunburn rates by groups at risk of melanoma

Table 1 summarises sunburn incidence among the sub-groups of the five non-modifiable, personal risk factors. Respondents whose skin is moderately sensitive to the sun had a higher rate of sunburn (23.1%) compared to those with non-sensitive skin (11.7% OR=2.3, $p=.00$). This finding may be partly due to the fact that because they can tan, those with moderately sensitive skin increase their sun exposure, which can lead to a sunburn if appropriate sun protection measures are not taken.

Analyses showed that no statistically significant differences were found among the sub-groups of gender, age, skin colour, or family history of skin cancer. This finding remained when further analyses combined certain sub-groups (i.e. comparing 13 to 34-year-olds with 35 to 54-year-olds and grouping similar skin colours). The analyses, however, did not take into account other factors that affect sunburn incidence,

such as sun protection behaviours or sun exposure. Furthermore, these analyses are restricted to cross-sectional 2013 data only. It will be important to conduct additional analyses on available trend data from 1994 to investigate any patterns over time.

Key points

Cross-sectional data from the SES revealed the following findings related to the 2013 summer:

- Of the New Zealanders who were outside for at least 15 minutes from 10am until 4pm during the previous summer weekend, 19.0% reported having been sunburnt.
- Respondents whose skin is moderately sensitive to the sun had a higher rate of sunburn (23.1%) compared to those with non-sensitive skin (11.7%).
- There were no differences in reported sunburn among the different groups of respondents by gender, age, skin colour, or known family history of skin cancer.
- It will be important to conduct additional analyses on available trend data from 1994 to investigate any patterns over time and to incorporate other factors into the analysis, such as sun exposure and sun protection behaviours.

Table 1: Sunburn incidence by non-modifiable personal risk factors

	n**	Sunburn incidence (%)	Confidence Interval	Odds Ratio	p value
Total	1,754	19.0	16.5-21.4	-	-
Gender					
Males	841	18.4	14.9-21.9	1.0	-
Females	913	19.5	16.0-22.9	1.1	.75
Age					
13-17 years	504	21.1	16.7-25.5	1.3	.87
18-24 years	194	20.5	13.6-27.4	1.2	.89
25-34 years	234	21.6	15.4-27.8	1.3	.89
35-44 years	431	16.6	12.8-20.5	1.0	.98
45-54 years	391	16.6	11.5-21.8	1.0	-
Skin colour					
Very fair	201	18.9	11.0-26.7	1.0	-
Fair	582	24.2	19.6-28.8	1.4	.64
Medium	516	15.9	11.9-19.8	0.8	.83
Olive	364	17.0	11.9-22.1	0.9	.82
Dark/very dark/black	86	13.0	-2.7-28.6	0.7	.85
Skin type					
Highly sensitive	310	16.9	11.9-21.9	1.5	.13
Moderately sensitive	936	23.1	19.4-26.8	2.3	.00*
Non-sensitive	463	11.7	7.7-15.6	1.0	-
Family history of skin cancer					
Yes	357	22.0	16.6-27.4	1.3	.50
No	1,003	18.0	15.1-20.8	1.0	-

*Statistically significant at $p<.05$

**Sub-groups may not total 1,754 due to ‘Don’t know’ or ‘Other’ responses

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Citation

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About the Sun Exposure Survey

- The SES is a triennial, nationwide telephone survey conducted with New Zealand households and asks about respondents' weekend activities including time spent outside, sun exposure, sun protection behaviours, attitudes, and knowledge relating to sun safety.
- Household sampling was conducted such that only those respondents who lived in an area of the country that met a set of 'fine weather' criteria for the previous weekend were contacted. This helped to ensure that they had an opportunity to be sunburnt, should they have spent time outside in the sun during the hours of 10am and 4pm. Fine weather eligibility was determined on a weekly basis by analysis of data provided by Meteorological Service of New Zealand and the National Institute of Water and Atmospheric Research (NIWA) on 29 weather stations throughout the country.
- The 2013 SES was conducted with a sample of 504 teens (13 to 17-year-olds) and 1,250 adults (18 to 54-year-olds). Hard and soft quotas were set in order to assist in achieving a sample that was nationally representative according to respondents' geographic region, age, and gender.
- The overall response rate was 27%, which represents a typical response rate for a survey of this type.
- The data have been adjusted (weighted) to ensure they are representative of the population of New Zealanders aged 13 to 54 years.
- For this analysis, proportions and 95% confidence intervals were produced. Odds ratios were undertaken to compare responses between groups. The significance level used for statistical analyses was set to $\alpha=0.05$.
- A full description of the 2013 SES methodology can be found at <http://www.hpa.org.nz/research-library/research-publications>.

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