Sun Exposure Survey 2013 Methodology Report

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The Health Promotion Agency (HPA) commission was managed by Kerri Kruse, Researcher.

This research was undertaken as part of the national monitoring of sun exposure and related knowledge, attitudes, and behaviours. In addition to monitoring, this project helps to inform the activities of the skin cancer prevention sector, which includes HPA's Sun Safety programme. The Sun Exposure Survey (SES) is an ongoing, triennial survey that has been conducted since 1994. Data collection waves prior to 2013 also involved the Cancer Society of New Zealand and the University of Otago. The survey has undergone re-developments at different times, the most recent occurring in 2010. These re-developments were strategically conducted to ensure high quality research methodology and data collection procedures while maintaining to the extent possible comparability to previous years' data.

TNS New Zealand Limited was commissioned to carry out the 2013 data collection activities, which consisted of a national telephone survey conducted over the summer period from January to March 2013. The methodology is consistent with that of previous years and involved a design that takes into account regional weekend weather as a criterion for sampling. Along with quotas for region, gender, and age group, the use of random digit dialling helped to ensure a nationally representative sample was obtained. The data have been weighted (adjusted) so that the sample reflects the makeup of the 2013 New Zealand population.

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ACKNOWLEDGEMENTS:

The HPA would like to thank the respondents who participated in this research. Any findings learned would not be possible without their contribution to the project. In addition, the HPA received input on the questionnaire content from Anthony Reeder, Research Associate Professor and Co-Director of the Cancer Society Social & Behavioural Research Unit, University of Otago as well as from Barbara Hegan, Health Promotion Advisor (Skin Cancer Control), Cancer Society of New Zealand. In addition, the HPA would like to thank Dr. Suzanne Dobbinson and the Centre for Behavioural Research in Cancer at the Cancer Council Victoria for allowing the adaption of some of the questionnaire content of the National Sun Survey.

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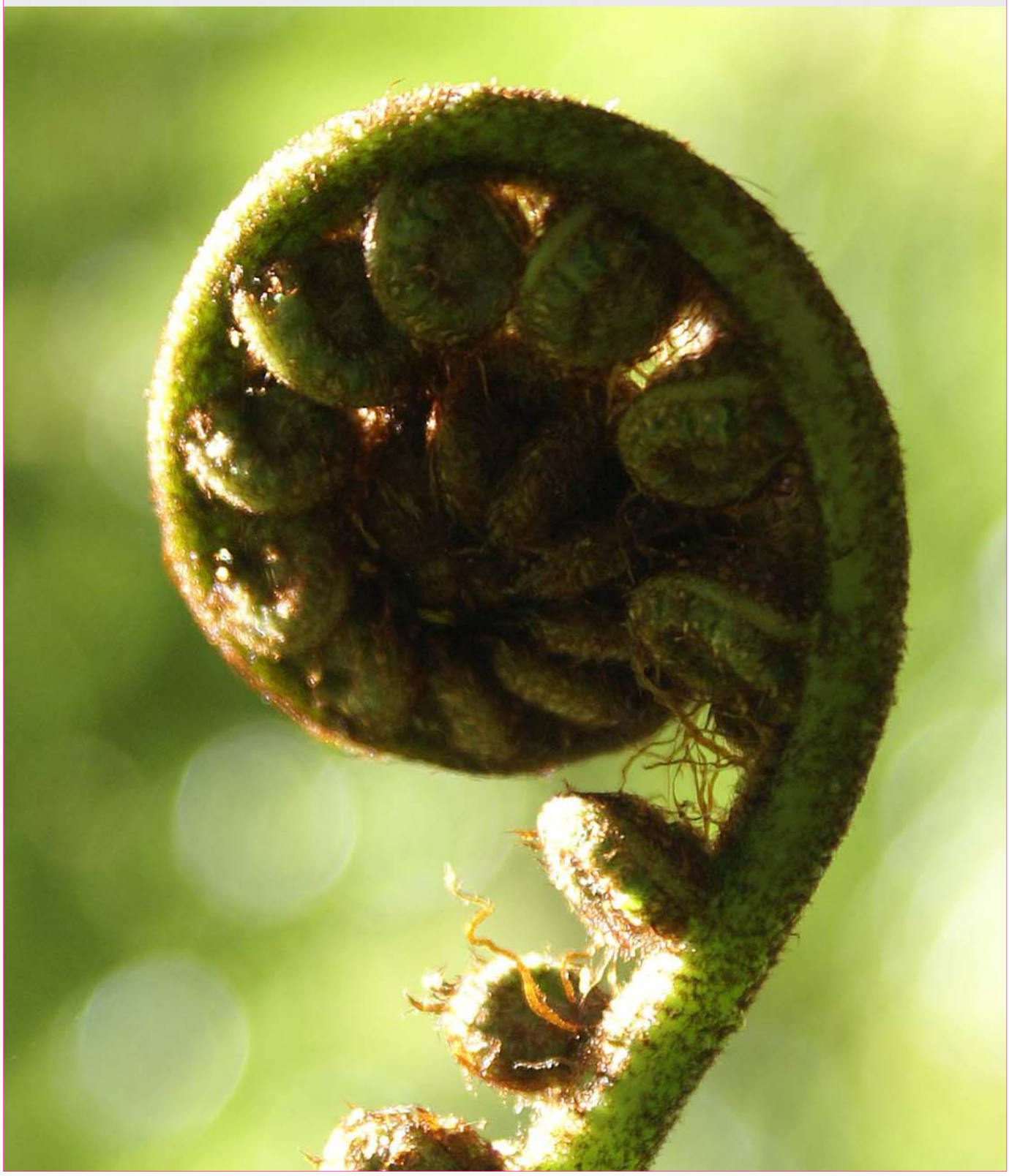
Methodology Report

Sun Exposure Survey

Prepared for: Health Promotion Agency

29th May 2013



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Sponsors and Contractors

The survey was commissioned by the Health Promotion Agency and undertaken by TNS New Zealand Limited

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Background

The scope of the Sun Exposure Survey is to improve evidence of the prevalence and trends in sun safety behaviour, inclusive of risk factors and protective strategies to aid decision making

The Health Promotion Agency (HPA) is a New Zealand government agency that has the aim of inspiring New Zealanders to lead healthy lives.

Skin cancer is by far the most common cancer affecting New Zealanders and is responsible for about 300 deaths each year. Melanoma, the most serious form of skin cancer is directly attributed to sunlight exposure in around 90% of occasions.

Recognising that the most efficient long term strategy to reduce the burden of melanoma is prevention that targets excessive sun exposure, the HPA requires regular and consistent information about sun exposure and sun safe attitudes and behaviours to inform the skin cancer control programme. The primary objective of the Sun Exposure Survey is to provide quality fact based information to inform

decision making for such programmes. A secondary aim is to provide a mechanism to enable New Zealand data to be compared internationally.

We note that a substantial review had been undertaken in 2009 as a foundation for the 2010 Sun Exposure Survey and accordingly, the 2013 survey was designed to be highly consistent with the adopted structure and methodologies. The survey was designed to be nationally representative of the New Zealand population across the age group 13 years to 54 years and to measure attitudes and behaviours in relation to sun exposure over the summer period at times when the risk of skin damage from excessive exposure was at its highest.

Accordingly, the research was designed to interview people about their sun exposure and measures taken to prevent excessive exposure over the preceding weekend in regions where weather conditions presented a high risk of sunburn if fair skinned people had been unprotected. Data collection was undertaken during the months of January, February, and March 2013 and used a questionnaire that was substantially the same as that used in 2010.

The questionnaire incorporated a set of core questions that ask about skin-type, sun exposure, outdoor activities, sunburn, sunburn prevention behaviours, risk behaviours, motivation such as role modelling sun safe behaviours and barriers, and unanticipated sun exposure. The questionnaire also included a set of non-core questions to examine prevention behaviour, campaign awareness and risk perception, plus a set of demographic questions.

A total of 1,754 people were interviewed with the sample divided between adults and teenagers, and distributed by region according to quota targets based on known population distributions.

Previous Surveys

The history of the survey has been summarised for completeness from information provided by the HPA

The Triennial Sun Protection Survey (TSPS) was initiated in 1994 by the Cancer Society of New Zealand, along with the Department of Preventive and Social Medicine at the University of Otago. The survey was based on a seminal study from Victoria, Australia. The aims of the survey were to describe patterns and associations between outdoor behaviour: activities, sun protection, attitudes, knowledge, tanning preferences and sunburn. The purpose of the TSPS was to provide regular and consistent information about sun exposure and sun safe attitudes and behaviours to inform skin cancer control programmes in New Zealand focussed on prevention. Five waves of the survey, every three years (1994, 1997, 2000, 2002/2003, 2005/2006), were administered. The evidence suggests New Zealand's sun safety data collection to date at a national level provides the longest-running trend information internationally[1].

The TSPS survey population (largely driven by a need for cost-effectiveness) was adults (15 to 69 years) with approximately n=1,250 per wave) and some children (12 to 14 years), from within the same households. The inclusion of children varied across years. Only people living in New Zealand's five largest metropolitan centres (Auckland, Hamilton, Wellington, Christchurch, and Dunedin) were included in the survey. Interviewing was conducted by computer assisted telephone interviewing (CATI).

Random digit dialling (RDD) was used as the original sampling method; however, in 2000, the sample frame was changed to the electoral roll, with tele-matching used to generate phone numbers. This change was made so that a pre-contact letter could be sent to households in the hope that this might improve response rates. Additionally, in order to improve participation rates for younger adults, interviewers asked to speak to the youngest person in the household over 15 years of age, rather than

1 Watts, C et al (2009) Review of Practice and Options for the New Zealand Sun Exposure Survey

selecting an adult at random. Additionally, for each wave of the survey, quotas were set for males and females (50:50), and within each geographical area (n=250). The surveys were carried out each week from December to early March from 2000 onwards (previously January to late March). The locations where the survey was conducted each week were selected using meteorological data to identify "fine" weekends to increase the probability of people having been outdoors, exposed to the sun and engaging in sun safe behaviours, or not. The area with the highest calculated 'chance of sunburn' (based on climate, sky conditions and UVR data), was selected for the survey, although priority was given to the southernmost centres as these were less likely to experience consistently sunny conditions relative to northern centres. Each centre was surveyed twice during each survey.

Interviews were carried out on the Monday and Tuesday following the weekend to maximise recall about activities undertaken and sun safe behaviours. This approach limited the number of call-backs to people unavailable on the first call (5 in 2006). As a result of the method used, the TSPS measured 'weekend prevalence' of sunburn, not 'all of summer' prevalence.

The 2010 survey followed a somewhat different approach with respondents being selected from the white pages by systematically selecting each 15th residential number from the first and third columns. The sample was then drawn in two strata: in stratum one a residential number was sampled for each of the adult and teen sample, and in stratum two a residential number was selected for the teen sample only. A total of 10,000 households were drawn with 7,500 assigned to stratum one and 2,500 assigned to stratum two.

Research Objectives

The research has the aim of quantifying the prevalence and trends in sun safety behaviour

As noted, a review was undertaken in 2009 that was aimed at improving the survey, and this formed the basis of the 2010 research. The review included advice from a group of experts in the field of skin cancer prevention and sun safety. The revised survey was renamed the Sun Exposure Survey and its overall goal was to:

> *Improve evidence available on prevalence and trends in sun safety behaviour, inclusive of both risk factors and protective strategies in multivariable analyses that will aid future sector decision making.*

The aim of the research is to provide nationally representative information about attitudes and behaviours towards sun exposure and to facilitate comparison with both historical survey data and that being collected by other organisations internationally.

Survey Outcomes 2013

Comments on the outcome and improvement opportunities for the future

The 2013 survey reverted to using Random Digit Dialling (RDD) as this enables the highest proportion of the target population to be included. The survey was conducted over the period 21st January to 12th March with interviews conducted Monday to Wednesday to ask respondents about their outdoor activities the previous weekend. Our assessment is that the survey was well designed and administered and has resulted in a data set that is of high quality, and representative of the national population. Overall, 1,754 responses were collected, comprising 1,250 adults aged 18 years to 54 years, and 504 youths aged 13 years to 17 years. The total responses represent 27% of the available and eligible sample.

Observation of elements that assisted with the quality of the outcome:

- The use of RDD meant that some 92% of the population was potentially able to be included in the survey, whereas in 2010 we estimate that as many as 25% of the population would have been excluded due to issues associated with White Pages listings
- The use of cognitive testing identified a small number of wording changes that would otherwise have presented a risk of bias through respondents incorrectly interpreting the questions
- Various introductions to the questionnaire were tested with the aim of maximising the response rate. We found that including reference to the Ministry of Health made a noticeable improvement

We have also identified opportunities for improvement:

- The survey used weather data that was provided by the Meteorological Service of New Zealand Ltd (Metservice) from 29 regional weather stations. For determining the regions to be surveyed, each territorial authority was assigned to a weather station. While this may be a reasonably good representation of weather conditions in most areas, it is possible that conditions may vary within a region and these will not be reflected in determining eligibility. The most notable example is the association of Southland with Milford Sound. We understand that NIWA has a more comprehensive set of weather stations that may enable more granular monitoring and that the survey could be enhanced if each town and city was to be linked with these weather stations prior to planning the 2016 survey
- Eligibility is based on regional location with respondents being sought from regions that have met the fine weather criteria the previous weekend. Although the questionnaire does ask where the respondent was the previous weekend, if this location is outside of their home location, there is no check made to verify that their actual location over the weekend also meets the fine weather criteria. This was a decision made in light of the very few cases (n=11) in the 2010 data that were identified as the respondent having been interviewed despite having spent the weekend in another area of the country that did not meet the fine weather eligibility criteria. For the 2013 survey we found a total 472 respondents who stated that they were at a different location to their home location with 62 of these being in a different regional council area. We recommend that in future the questionnaire be based on the location outdoors at Q5. This will necessitate matching each town / city with a weather station prior to the project and importing weather data into the CATI system to enable interviewers to determine eligibility before proceeding
- Use of Random digit dialling makes an assumption that respondents are within the geographical area to which the telephone number is assigned. In conducting the survey we have found a number of examples where a respondent's physical location is outside of the target area. This occurs where people are located on boundaries between district council regions or where they have moved location and been allowed to retain their telephone number. Basing future interviews on the stated location and verifying that this location meets the fine weather criteria prior to continuing the interview would overcome this issue
- The ethnicity question contains a relatively short code-frame and this results in a reasonably large number of responses being entered as 'other specify' and potentially need to be re-coded. Developing a more useful code-frame would be beneficial

The Questionnaire	*The questionnaire was substantially the same as that administered in 2010, but with some minor changes*

The proposed questionnaire was provided by the HPA and had been based on the 2010 questionnaire with input from a number of other stakeholder groups. The following question areas from 2010 were **maintained** in the 2013 survey:

- Days spent outdoors on previous weekend
- Days sunburnt on previous weekend
- Parts of body sunburnt on previous weekend, and day sunburnt
- Main outdoor activity on selected day, including whether or not water-based
- Location of main activity
- Total time spent outdoors doing main activity
- Start and finish times of main activity
- Time intended to spend outside
- Use of shade
- Body coverage by hats, clothing and sunscreen
- Number of times sunscreen applied
- Use of sunglasses
- Planning for sun protection
- Perceived risk of sunburn due to weather
- Deliberate attempts to get a sun tan in previous weekend (this was only asked of Youth aged 13-24 years in previous years but was extended to all respondents in 2013)
- Tanning intentions (this was only asked of Youth aged 13-24 years in previous years but was extended to all respondents in 2013)
- Attitudes towards tanning (some of these questions were only asked of Youth aged 13-24 years)
- Skin cancer risk perception
- Recall of sun safety advertising
- Skin type and lifetime sunburn

The following questions from 2010 were **removed** for the 2013 survey:

- Actions to improve Vitamin D levels (only Adults aged 18-54 years were asked this in previous years)
- Melanoma knowledge (this was only asked of Youth aged 13-24 years in previous years)

The following questions were **new** to the 2013 survey:

- The main reason for which respondents think they got sunburnt[2]
- Availability of shade while doing main outdoor activity
- For those participants who reported that no shade available, likelihood of using shade, had it been available
- Attitudes relating to the following: Vitamin D deficiency, encouragement of others to protect their skin, self-efficacy related to the ability to oneself from skin cancer[2], ease of treating melanoma by a GP, melanoma leading to the loss of life

[2] The 'main reason sunburnt' and self efficacy questions were adapted from Australia's National Sun Protection Survey:

Volkov A, Dobbinson S, Wakefield M, Slevin T. (2013). "Seven-year trends in sun protection and sunburn among Australian adolescents and adults." Australian & New Zealand Journal of Public Health **37**(1): 63-69.

Dobbinson S, Wakefield M, Hill D, Girgis A, Aitken JF, Beckmann K, Reeder AI, Herd N, Fairthorne A, Bowles KA (2008). "Prevalence and determinants of Australian adolescents' and adults' weekend sun protection and sunburn, summer 2003-2004." Journal of the American Academy of Dermatology **59**(4): 602-614.

- Attitudes about tanning causing skin to age faster and likelihood of already having some permanent damage to skin from sun exposure (these were asked of Youth aged 13-24 years only)
- Unprompted recall of promotions about the Don't Let the Sun Get Under Your Skin campaign
- Unprompted and prompted recall and understanding of the Sun Protection Alert and any behaviour as a result of having seen/heard it
- Attitudes toward the role of local councils in providing shade in public spaces and willingness to pay more in rent or rates so that councils can provide more shade
- Family history of skin cancer
- Percent of work week spent working outdoors

Questionnaire design and format is a critical component of any project since failures to adequately explain the required information potentially leads to a reduction in data quality. Potential problems encountered can be summarised as:

- Failure to comprehend the question correctly
- Failure to recall. Often the questionnaire assumes that respondents have information, or are readily able to recall particular information
- Problem summarising information. If the respondent is thinking of a lot of information as a result of the question, difficulty could be experienced verbalising this in a succinct manner. This potentially results in inconsistencies or incorrectly summarised information
- Problems answering the questions. Questions that are vague lead to variability and inconsistency

As a preliminary phase of the project, TNS completed cognitive testing of the questionnaire to investigate how well questions performed when asked of survey respondents; i.e. to ensure that respondents understood the questions correctly and were able to formulate accurate answers. In particular, the testing aimed to ensure that the questions successfully captured the intended information and at the same time, made sense to respondents.

Face-to-face testing was undertaken with a total of eight respondents who fitted a cross section of people within the primary target group of interest; i.e. fair skinned Europeans aged between 13 years and 54 years. Table 1 profiles the eight respondents:

Table 1: Respondent Profile

Age	Male	Female	Total
13 years to 17 years	1	2	3
18 years to 50 years	2	2	4
51 years +	-	1	1
Total	3	5	8

Interviews were conducted in our Newmarket office and involved a senior researcher reading through each question within the draft script and assessing the level of comprehension being achieved, how respondents were recalling information, and summarising and assessing their responses.

Results from the cognitive testing were used in finalising the questions and to provide explanations to interviewers to help overcome potential response issues. A number of relatively minor wording changes were made to the questionnaire as a result of this process.

Prior to the main phase of data collection, a pilot was conducted across 100 respondents in relation to the weekend of 15/16 December. The pilot confirmed that the questionnaire was working well and recommended that reference be made to the Ministry of Health in the introduction to help maximise the response rate.

Sample Design

The sample design is a critical component of the survey since decisions affect how representative the resulting data are of the population

Since an objective of the study was to achieve a nationally representative sample of those aged 13 years to 54 years, each person within this population would ideally have the same non-zero probability of selection and therefore the aim of the approach has been to achieve an outcome that is as close to this desired position as possible.

As previously noted, the 2010 survey involved creating a sample frame from the White Pages Directories with each 15th residential number in columns one and three being extracted to create the sample frame with regional quota targets based on the adult population in these areas. This approach presents a potential issue and source of bias since a significant proportion of the population would likely have been excluded from selection. Specifically:

1. **Unlisted Numbers:** The 2006 Census established that 92% of the population lived in households with landline telephones. However, it is known that a reasonably high percentage of people have unlisted numbers, and while this proportion is unknown, estimates have put the figure at around 14%

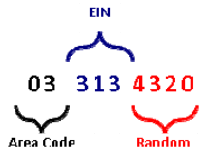
2. **Changed Residence:** Electronic White Pages are updated only every one or two years, hence they are slow to reflect mobility within the population. According to the 2001 Census data, 944,757 (out of 3,586,731) people stated that they lived in a different urban/rural area five years ago. Thus, in any two year period, up to 10% of the population may be excluded from listings due to having changed residence

3. **Disconnected Numbers:** The 2004 Quality of Life Survey (p43 appendices) noted that samples taken from the White Pages shows that approximately 9.7% of those numbers were disconnected. Since the number of landlines has remained relatively constant, this provides further evidence of a proportion of the population being omitted from the White Pages Directories due to mobility

Overall, up to 25% of the population of interest may potentially be omitted from selection in the survey where sampling is based on the White Pages Directories. This estimate was further substantiated in a nationally representative survey of 1,500 households undertaken by DigiPoll in Hamilton that indicated that the actual proportion of unlisted numbers may be as high as 25%[3].

To overcome potential issues with the White Pages Directories, the 2013 survey was based on Random Digit Dialling. The core principle of the Random Digit Dialling (RDD) method for sampling is targeting Exchange Information Numbers (EIN). Each EIN is attached to a geographic area, per the example below in Figure I. The last four numbers are randomized:

Figure I: Example of Exchange Information Numbers



This allows accurate representation of the geographic area surveyed since calls are scattered across the entire area and thus responses reflect the underlying population characteristics. Respondents were selected from each household using the 'next birthday' rule, this being consistent with the 2010 survey.

Quota targets were established based on known population distributions from the 2006 census data for both the adult and teen samples. Quota targets were established as 'hard' targets that had to be

[3] DigiPoll, Hamilton, national random sample size 1,500 admitted that their landline telephone was unlisted. Respondents were assured that the questions related to market research.

achieved and 'soft' targets that permitted a variation of +/-10%. Targets were set for broad geographic region, regional council boundary, age group and gender. Quota targets applied are detailed in Table 2-5.

Table 2: Hard Quota Targets: Region

Grouped Region	Teens	Adults
Upper NI	264	655
Lower NI	120	296
Upper SI	80	209
Lower SI	35	89
	500	1,250

Table 3: Soft Quota Targets: Region

Region	Teens	Adults
Northland Region	19	41
Auckland Region	164	427
Waikato Region	49	115
Bay of Plenty Region	32	73
Gisborne Region	6	13
Hawke's Bay Region	19	42
Taranaki Region	13	30
Manawatu-Wanganui Region	29	65
Wellington Region	54	145
Marlborough Region	5	12
Nelson Region	5	13
Tasman Region	5	13
West Coast Region	4	9
Canterbury Region	61	162
Otago Region	24	62
Southland Region	11	27
	500	1,250

Table 4: Soft Quota Targets: Age

Age Group	Teens	Adults
13-17 Years	500	0
18-29 Years	0	380
30-44 Years	0	540
45-54 Years	0	330
	500	1,250

Table 5: Soft Quota Targets: Gender

Gender	Teens	Adults
Male	250	610
Female	250	640
	500	1,250

Respondent Selection	*Respondent selection was based on their location having fine weather during the preceding weekend such that fair skinned people would have been at risk of excessive sun exposure if unprotected*

Interviews were conducted between Monday and Wednesday of each week with calls being made to those regions that met the fine weather criteria for the preceding weekend. The reason for restricting interviewing to the first part of the week was to help ensure that events were still in recent memory and therefore able to be recalled with accuracy.

All respondents were selected using random digit dialling to regions that met the fine weather criteria. Initially teen interviews were also sought from the same household as an adult interview with only one interview with each group from a single household. Once the adult sample for a region had been achieved, random digit dialling focussed on achieving interviews with teens only until the targets for each respective region had been achieved.

In contrast, the 2010 survey sample was drawn in two strata: in stratum one a residential number was sampled for each of the adult and teen sample, and in stratum two a residential number was selected for the teen sample only. A total of 10,000 households were drawn with 7,500 assigned to stratum one and 2,500 assigned to stratum two.

The effect of both designs will have resulted in a random sample that was representative of the population, noting however that the 2010 sample was limited to White Pages listings.

The fine weather criteria used the same scoring system as applied for the 2010 survey and is detailed in table 6 below:

Table 6 Fine Weather Criteria

Temperature	**Score**
Greater than or equal to 20 degrees	1.0 pt
Greater than or equal to 15 degrees, and less than 20 degrees	0.5 pt
Less than 15 degrees	0.0 pt

Sky Conditions	**Score**
Fine	1.0 pt
Cloudy	0.5 pt
Any form of precipitation	0.0 pt

UVI(1)	**Score**
Greater than, or equal to 10	1.0 pt
Greater than or equal to 6, and less than 10	0.5 pt
Less than 6	0.0 pt

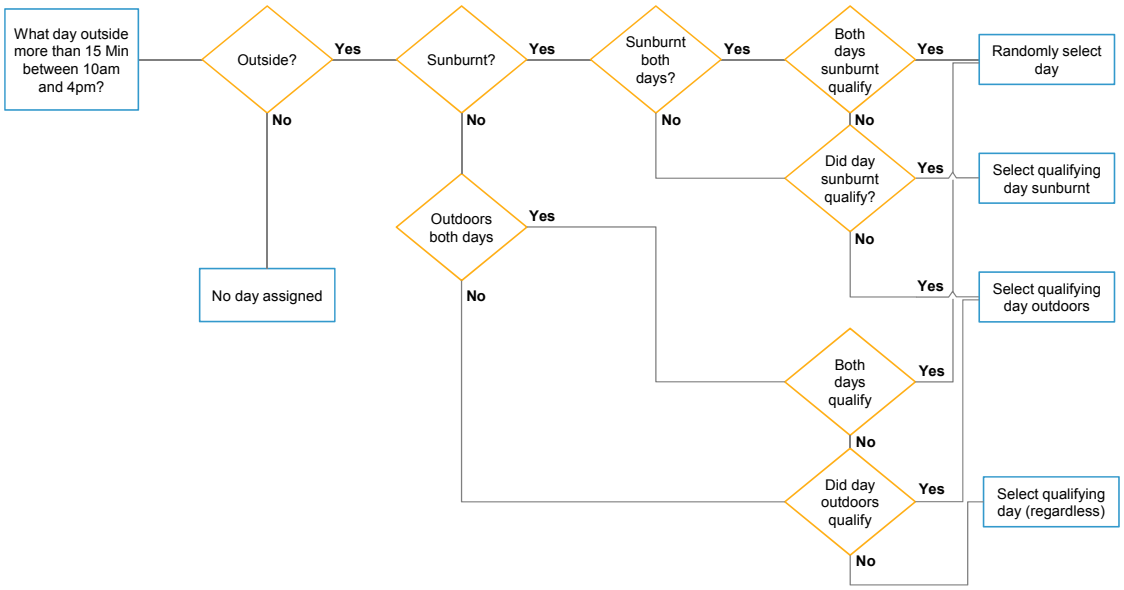
Note: (1) The UV Index was rounded to the nearest whole number for the calculations

The scores were applied for each hour from 11am to 4 pm and were summed for the day. While the hours during which one needs to use sun protection often begin before 11am, this time was used to be consistent with previous survey years. Where an area had at least one weekend day with a score of greater than 10, this area was eligible to be interviewed the following week. Interviews were conducted in relation to the day that met the fine weather criteria, if only one of the days met the criteria. If both Saturday and Sunday were eligible, then the interview was conducted in relation to the day that the respondent was outdoors for at least 15 minutes between 10am and 4pm. If the respondent was outdoors during that time on both days, then one day was randomly selected. If the respondent got

sunburnt, then priority was given to the day on which they got burnt (assuming it met the fine weather criteria).

The eligibility decision criteria for determining the day of the weekend that the interview would relate to is illustrated in the flowchart in Figure II

Figure II: Eligibility Decision for Day of Weekend



To enable the fine weather criteria to be determined, the Meteorological Service provided a report each Monday detailing the hourly daytime weather conditions for each of its weather stations. Table 7 summarises the qualifying weather stations for each week of the survey period.

Table 7: Eligibility to Interview by Weather Station

	Weekend									
City	19/20 Jan	26/2 7 Jan	02/03 Feb	09/10 Feb	16/17 Feb	23/24 Feb	02/03 March	09/10 March	Total	% Qualifying
Northland Kerikeri	YES	YES	YES	YES	YES	YES	YES	YES	8	100%
Northland Whangarei	YES	YES	YES	YES	YES	YES	YES	YES	8	100%
Auckland Whenuapai	YES	YES	YES	YES	YES	YES	YES	YES	8	100%
Auckland Airport	YES	YES	YES	YES	YES	YES	YES	YES	8	100%
Waikato Hamilton	YES	YES	YES	YES	YES	YES	YES	YES	8	100%
Bay of Plenty Tauranga	YES	YES	YES	YES	YES	YES	YES	YES	8	100%
Bay of Plenty Whakatane	YES	YES	YES	YES	YES	YES	YES	YES	8	100%
Bay of Plenty-Rotorua	YES	YES	YES	YES	YES	YES	YES	YES	8	100%
BOP (Central)-Taupo	YES	YES	YES	YES	YES	YES	YES	YES	8	100%
Gisborne-Gisborne	YES	YES	YES	YES	YES	NO	NO	YES	6	75%
Hawke's Bay-Napier	YES	YES	YES	YES	YES	YES	NO	YES	7	88%
Taranaki-New Plymouth	YES	YES	YES	YES	YES	YES	YES	YES	8	100%
Manawaru Wanganui	YES	YES	YES	YES	YES	NO	YES	YES	7	88%
Manawatu P North	YES	YES	YES	YES	YES	YES	YES	YES	8	100%
Manawatu Ohakea	YES	YES	YES	YES	YES	YES	YES	YES	8	100%
Wellington Airport	YES	YES	YES	YES	YES	YES	NO	NO	6	75%
Wellington Paraparaumu	YES	YES	YES	YES	YES	NO	YES	YES	7	88%
Wellington Masterton	YES	YES	YES	YES	YES	YES	NO	YES	7	88%
Tasman Nelson	YES	YES	YES	YES	YES	YES	YES	YES	8	100%
Marlborough Blenheim	YES	YES	YES	YES	YES	NO	NO	YES	6	75%
West Coast Westport	NO	YES	YES	YES	YES	NO	YES	NO	5	63%
West Coast Hokitika	NO	YES	YES	YES	NO	YES	NO	NO	4	50%
Canterbury Christchurch	YES	YES	YES	YES	YES	YES	NO	NO	5	63%
Canterbury Timaru	YES	YES	YES	YES	YES	NO	NO	NO	5	63%
Otago Oamaru	YES	YES	YES	YES	NO	NO	NO	NO	4	50%
Otago Queenstown	YES	YES	YES	YES	NO	NO	NO	NO	4	50%
Otago Dunedin	NO	YES	YES	YES	NO	NO	NO	NO	3	38%
Southland Invercargill	NO	YES	YES	YES	NO	NO	NO	NO	3	38%
Milford Sound	NO	YES	YES	YES	NO	YES	NO	YES	5	63%

For the purpose of determining the regions that qualify for the survey, each territorial authority region was assigned to one of the 29 weather stations. The territorial authority and weather station assignments are detailed in Appendix II. Since there are 67 territorial authorities, this meant a relatively granular regional breakdown was achieved ensuring that the climatic conditions were accurately reflected. Random digit dialling was then able to be targeted to the qualifying regions using the exchange codes.

While most regions will have had weather that is highly reflective of the nearby weather station, not all regions are well serviced. For example, the large Southland region is serviced by a weather station at Milford Sound and another at Invercargill. As discussed, for the 2016 survey it may be worth using NIWA's weather stations and assigning each town, city and rural area to the closest weather station prior to data collection.

Data Collection

Data collection was undertaken by DigiPoll, a specialist computer assisted telephone interviewing (CATI) provider based in Hamilton

Data collection

The data collection method for the survey was computer assisted telephone interviewing (CATI) and this was undertaken by DigiPoll, a specialist data collection provider based in Hamilton. Interviewers received a briefing and were specifically trained with the questionnaire prior to commencing work. Data was collected in DigiPoll's CATI software Flo-Stat and after collection the data was exported to SPSS.

Interviewing

All calls, including arranged call-backs, were made between Monday and Wednesday to areas that had met the 'fine weather' criteria for the previous weekend. Call-backs could be made in subsequent weeks, provided fine weather criteria had been met for the previous weekend. Most of the interviewing happened between 4.00pm until 8.30pm.

The team of interviewers were supervised by three senior operations staff who had previously participated in a teleconference briefing with TNS and the HPA.

Number of calls

Each respondent received an initial call and up to six call-backs at different times / days if they could not be contacted. Appointments were made with respondents who were willing to participate but not at the time that the call was made. Options for daytime appointments or interviews following the next fine weekend were offered.

Survey dates

The interviews were carried out between 21 January and 12 March 2013 as detailed in Table 8:

Table 8: Interview Dates

Week	Interviewing dates	Weekend days
1	21 - 23 January	19 - 20 January
2	29 - 30 January	26 - 27 January
3	4 - 5 February	2 - 3 February
4	11 - 13 February	9 - 10 February
5	18 - 20 February	16 - 17 February
6	25 - 27 February	23 - 24 February
7	4 - 6 March	2 - 3 March
8	11 - 12 March	9 - 10 March

Performance and quality control

All interviewers attended a face-to-face briefing with their supervisor prior to commencing the survey. The CATI questionnaire also had briefing notes on the first page which the interviewers could refer to if they had any doubts. The quality team monitored approximately 10% of all the calls made during the live interviews to ensure that interviewers were strictly adhering to the training and instructions that had been provided, and to further verify that no issues were occurring with the questionnaire.

Ethics

All survey procedures were consistent with the Code of Practice of the Market Research Society of NZ Inc. Where the selected respondent was a younger teenager, particularly those aged 13-15 years, the interviewer verbally sought permission from an adult in the household.

Confidentiality of all the information given by respondents was assured as provided for by the Privacy Act 1993. The final, stored electronic records contain no identification of the participating respondents and responses can only be analysed as aggregated data.

Interview duration

The average interview duration was 17.45 minutes. The adult survey had a duration of 18 minutes and the teen survey a duration of 16.12 minutes.

Respondents Profiles

The profiles achieved within the data set reflect the fact that quota targets were applied to ensure a close representation of the population

As outlined, quota targets were applied to ensure that the resulting data resembled the underlying population such that relatively minimal reliance would need to be placed on weighting to adjust the sample data. The following tables numbered 9-15 detail the unweighted demographic profiles for those interviewed within the 2013 Sun Exposure Survey:

Table 9: Gender Distribution

Gender	Frequency	Per cent
Male	841	48%
Female	913	52%
Total	1,754	100%

Table 10: Ethnicity

Ethnicity	Frequency	Per cent
Māori	201	11%
Pacific	77	4%
Asian	191	11%
European	1,241	71%
Other	26	1%
Don't Know/ Refused	18	1%
Total	1,754	100%

Table 11: Age

Age Group	Frequency	Per cent
13-17 years	504	29%
18 - 24 years	200	11%
25 - 34 years	227	13%
35 - 44 years	430	25%
45 - 54 years	390	22%
Refused	3	0%
Total	1,754	100%

Table 12: Geographic Region

Geographic Region	Frequency	Per cent
Auckland	603	34%
Upper NI	387	22%
Lower NI	350	20%
SI	414	24%
Total	1,754	100%

Table 13: Household Composition

Age Group	None	One	Two	Three	Four	Five or more	Refused
Under 13 years	58%	20%	15%	5%	1%	0%	1%
13 -17 years	53%	31%	13%	2%	0%	0%	1%
18 -24 years	65%	22%	10%	2%	0%	0%	1%
25 -54 years	6%	25%	63%	5%	1%	0%	1%
55 years & over	82%	13%	4%	0%	0%	0%	1%

Table 14 Education Level (Adults)

Education	Frequency	Per cent
No school qualification	74	6%
Secondary qualification	377	32%
Other tertiary qualification	216	18%
Degree	449	38%
Other	76	6%
Valid Responses	1192	100%
Refused / Don't Know	58	
Total	1250	

Table 15: Income (Adults)

Household Income	Frequency	Per cent
$40,000 or less	120	13%
$40,001 - $70,000	204	22%
$70,001 - $100,000	222	24%
$100,001 or more	383	41%
Valid Responses	929	100%
Refused / Don't Know	321	
Total	1250	

Data Weighting

The data was weighted to ensure that it is highly reflective of the underlying population

The weighting approach was much the same as for the 2010 survey in terms of factors taken into account, but differed in the calculation of the selection weight. Specifically, we note that the selection weights for the 2010 survey calculated a weight for the youth sample being those aged 13 years to 24 years, however the sampling and questionnaire design specifically sought to recruit teens aged 13 years to 17 years to fulfil the teen quota. People in the household aged 18 years to 24 years were therefore not available for selection specifically for the youth group (those aged 13-24 years); rather, they had the same probability of being selected as did the others in the adult group (i.e. those aged 25-54 years) and therefore have the same weight as the general adult sample.

Our approach has been to calculate selection weights on the actual probability of selection as applied in the recruitment of respondents.

Prior to weighting a small number of adjustments were made to the age group and ethnicity assignment for some respondents. Two respondents provided age information that was inconsistent; i.e. they

indicated that they were aged 25 years and over, but gave their year of birth as 1992 and 1993. Prior to calculating weights, these respondents were recoded to age groups based on their year of birth. Three respondents indicated that they were aged between 25 and 54 years but refused to provide additional age related information. Since they could potentially belong to one of three age groups, a random number generator was used to assign them to an adult age group. A total of six adults and twelve teens did not indicate their ethnicity and were assigned to the 'European' group. These group assignments have been also been used when producing the various Table outputs.

Selection Weights

Selection weights adjust for the probability of a person being selected from within a household with more than one occupant. Sample selection arises when the observed sample is not a random draw from the population of interest and failure to take this into account can potentially lead to inconsistent and biased estimates of the parameters of interest.

In the case of respondents included in the adult sample (aged 18 to 54 years), a single respondent was randomly chosen and all eligible adults had an equal chance of selection.
Therefore, if the number of eligible adults in the *ith* dwelling was y_i, then the probability of selection was $\frac{1}{y_i}$ The selection weight was the inverse of this probability.

In the case of respondents included in the teen sample (aged 13 to 17 years) a respondent was randomly chosen from any usual residents aged 13 to 17 years. The design provided that only one adult and one teen could be interviewed from the same household, therefore if the number of eligible teens in the household was x_i, and the probability of selection was $\frac{1}{x_i}$

The selection weights were the inverse of these probabilities.

Where the number of people in the household was not answered, the selection weight used was the average selection weight for those on the same gender, ethnicity and age group.

Prioritised Ethnicity

Within the dataset, we have prioritised ethnicity according to the Ministry of Health's 2004 *Ethnicity Data Protocols for the Health and Disability Sector*[4]. Accordingly, based on respondent's self-identification of the ethnic group(s) they belong to (Q.45), they have been prioritised by Māori, then Pacific peoples, Asian peoples, and European and others. Thus four mutually exclusive groups were created.

Population Counts

Population weights adjust the sample data so it is representative of the population. Since the most recent census data available is 2006, the HPA provided counts that included estimated growth to 2013. The counts included age, ethnicity and gender.

The sample data were weighted with the selection weights to prepare the observed counts. The benchmark adjustments were then calculated by dividing the expected by the observed population counts. These benchmark adjustments were then applied to the data records and multiplied by the selection weights to give the final benchmark adjusted selection weights; i.e. the final weight.

The population counts used for arriving at the final weight are provided in Table 16 and the expected, observed and benchmark adjustments are provided in tables 17-19.

[4] Ministry of Health. 2004. *Ethnicity Data Protocols for the Health and Disability Sector*. Wellington: Ministry of Health. http://www.health.govt.nz/publication/ethnicity-data-protocols-health-and-disability-sector

Table 16: Growth Adjusted Population Counts

Ethnic Group	Age Group	Gender	Adjusted Count
Māori	13-17 years	Male	31,271
Māori	13-17 years	Female	29,688
Māori	18-24 years	Male	38,791
Māori	18-24 years	Female	38,247
Māori	25-34 years	Male	35,032
Māori	25-34 years	Female	40,502
Māori	35-44 years	Male	34,454
Māori	35-44 years	Female	41,113
Māori	45-54 years	Male	31,538
Māori	45-54 years	Female	36,287
Pacific	13-17 years	Male	11,642
Pacific	13-17 years	Female	11,163
Pacific	18-24 years	Male	15,173
Pacific	18-24 years	Female	14,703
Pacific	25-34 years	Male	17,360
Pacific	25-34 years	Female	18,073
Pacific	35-44 years	Male	14,068
Pacific	35-44 years	Female	15,635
Pacific	45-54 years	Male	11,529
Pacific	45-54 years	Female	12,352
Asian	13-17 years	Male	14,347
Asian	13-17 years	Female	13,475
Asian	18-24 years	Male	32,414
Asian	18-24 years	Female	30,421
Asian	25-34 years	Male	29,144
Asian	25-34 years	Female	32,661
Asian	35-44 years	Male	23,162
Asian	35-44 years	Female	30,900
Asian	45-54 years	Male	21,096
Asian	45-54 years	Female	25,347
European/Other	13-17 years	Male	93,323
European/Other	13-17 years	Female	87,792
European/Other	18-24 years	Male	139,764
European/Other	18-24 years	Female	127,092
European/Other	25-34 years	Male	185,368
European/Other	25-34 years	Female	186,042
European/Other	35-44 years	Male	199,221
European/Other	35-44 years	Female	214,788
European/Other	45-54 years	Male	228,627
European/Other	45-54 years	Female	241,102

The growth adjusted population count to 2013 was 2.45m, this being those aged 13 years to 54 years.

Table 17: Expected (Based on 1754 people)

		13-17 years	18-24 years	25-34 years	35-44 years	45-54 years
Māori	Male	22.3	27.7	25.0	24.6	22.5
	Female	21.2	27.3	28.9	29.4	25.9
Pacific	Male	8.3	10.8	12.4	10.1	8.2
	Female	8.0	10.5	12.9	11.2	8.8
Asian	Male	10.3	23.2	20.8	16.6	15.1
	Female	9.6	21.7	23.3	22.1	18.1
European/Other	Male	66.7	99.9	132.5	142.4	163.4
	Female	62.7	90.8	132.9	153.5	172.3

Table 18: Observed

		13-17 years	18-24 years	25-34 years	35-44 years	45-54 years
Māori	Male	55	44.4	28	59	27
	Female	43.9	41	34	52	45.4
Pacific	Male	32	24	14	12	2
	Female	27	19	13	9	12
Asian	Male	53.3	80	53	32	19
	Female	41.5	35	33.2	41.1	27
European/Other	Male	232.8	238	182.3	323.0	258.8
	Female	225.7	108.9	151.9	329.8	504.2

Table 19: Benchmark Adjustments

		13-17 years	18-24 years	25-34 years	35-44 years	45-54 years
Māori	Male	0.4063	0.6240	0.8940	0.4173	0.8346
	Female	0.4829	0.6666	0.8512	0.5649	0.5713
Pacific	Male	0.2600	0.4517	0.8860	0.8377	4.1190
	Female	0.2954	0.5529	0.9934	1.2413	0.7355
Asian	Male	0.1923	0.2895	0.3929	0.5172	0.7934
	Female	0.2321	0.6211	0.7026	0.5378	0.6708
European/Other	Male	0.2865	0.4196	0.7264	0.4407	0.6311
	Female	0.2779	0.8342	0.8749	0.4654	0.3417

Calculation of Benchmark and Final Weights

These population counts were ratioed down to obtain the 'expected' counts for the total sample size.

The sample data were weighted with the selection weights to calculate the 'observed' counts.

The benchmark adjustments were calculated by dividing the 'expected' by the 'observed'.

These benchmark adjustments were applied to the data records and multiplied by the selection weights to give the final benchmark adjusted selection weights or 'final' weight.

Age Standardisation

As with the 2010 survey, age standardisation has been applied using the World Health Organization (WHO) standard population (Ahmad et al 2000). This adjustment recognises that the age structure of

the population has changed over the years and unless taken into account can impact comparisons for health related data. The steps followed were:

1. Within each prioritised ethnic group, sum the benchmark weights by gender; e.g., all Māori males will have the same value; all Pacific females will have the same value, etc. as detailed in Table 20:

Table 20: Sum of Benchmark Weights by Gender

Māori		Pacific		Asian		European/Other	
Male	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
38.93	46.89	16.74	19.85	28.18	34.17	231.32	259.99

2. Within each prioritised ethnic group, within each gender, sum the benchmark weights by age group, as detailed in Table 21.

Table 21: Sum of Benchmark Weights by Age Group

	Māori		Pacific		Asian		European/Other	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
18-24 years	8.11	10.00	3.16	2.76	7.53	6.83	33.15	31.70
25-34 years	11.62	11.92	4.43	5.96	7.86	10.54	61.02	67.37
35-44 years	11.68	14.12	5.03	7.45	7.24	10.76	69.62	80.97
45-54 years	7.51	10.85	4.12	3.68	5.55	6.04	67.53	79.95

3. The variable from step two divided by the variable from step one multiplied by 100, as detailed in Table 22

Table 22: Ratio of Benchmark Weights: Age Group ÷ Gender x 100

	Māori		Pacific		Asian		European/Other	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
18-24 years	20.84	21.32	18.89	13.93	26.71	20.00	14.33	12.19
25-34 years	29.85	25.41	26.47	30.03	27.89	30.85	26.38	25.91
35-44 years	30.01	30.12	30.03	37.52	25.69	31.48	30.10	31.15
45-54 years	19.30	23.15	24.61	18.53	19.71	17.67	29.19	30.75

4. The WHO weights were then derived as detailed in Table 23

Table 23: World Health Weights

Age	Combined Counts	% of Total
18-24 (2/5 of 15-19yrs plus 20-24yrs)	11.6	22.2%
25-34yrs	15.5	29.7%
35-44yrs	13.7	26.3%
45-54yrs	11.4	21.8%
Total	52.3	100.0%

5. The WHO proportions were then merged into the dataset

6. The standard weight is then: variable from step four divided by the variable from step three as detailed in Table 24

Table 24: Standard Weights

	Māori		Pacific		Asian		European/Other	
	Male	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
18-24 years	1.0653	1.0412	1.1750	1.5939	0.8311	1.1102	1.5492	1.8208
25-34 years	0.9952	1.1691	1.1225	0.9895	1.0654	0.9631	1.1263	1.1466
35-44 years	0.8753	0.8722	0.8748	0.7002	1.0224	0.8344	0.8728	0.8435
45-54 years	1.1308	0.9427	0.8867	1.1778	1.1072	1.2348	0.7474	0.7096

7. The final benchmark adjusted weight is: variable from step six multiplied by the benchmark weight

Variables Added

The following variables have been added to the dataset:

- Selection weight for teens x_i
- Selection weight for adults y_i
- Combined selection weight (x_i and y_i) (single variable containing x_i or y_i as applicable)
- Population benchmark weight
- Final weight
- WHO age-standardised weights for each stem described above:
  - Stage 1 variable
  - Stage 2 variable
  - Stage 3 variable
  - Stage 5 variable
  - Stage 6 variable
  - Stage 7 variable, final WHO weight variable
- Adult sample indicator
- Youth sample indicator

Response Rates

The response rate has been calculated for those who were contactable and eligible for inclusion

A total of 36,350 telephone calls were made using random-digit dialling, of which 24,779 were not to valid residential numbers; i.e. fax, disconnected, businesses numbers or we were unable to achieve a reply after multiple attempts. This resulted in a valid sample of 11,571.

Table 25 provides details of the call outcomes for the survey:

Table 25: Call Outcomes

Description	Calls	% of Total
Total Calls	36,350	
Un-contactable / Disconnected / Fax etc.	24,779	
Total Available Sample	11,571	
Call Outcomes		
Not Eligible	3,161	
Quota Target Full	1,822	
Total Not Eligible	4,983	
Total Available & Eligible Sample	6,588	
Outcomes from Eligible Respondents		**% of Available / Eligible**
Refused	2,440	37%
Not Available During Survey	2,225	34%
Language or Health Barriers	169	3%
Survey Complete	1,754	27%
Total Outcomes	6,588	

A total of 6,588 respondents were classified as being eligible having removed those who were screened out for reasons such as being outside of the target age group or because the quota target for the age, gender or location had already been filled. Of these 37% refused the survey and a further 34% were unavailable for interview on the days that the survey was conducted. Because interviews were undertaken only on a Monday to Wednesday and related to the prior weekend, this had the impact of further limiting availability, particularly when the interview may have been deferred to the next week only to find that the particular region was non-qualifying for that week. Stated unavailability during the survey period is also frequently a soft refusal and therefore cannot necessarily be considered distinct from 'refusals'.

The completed interviews represent 27% of the available and eligible sample.

Appendix

Appendix I Variables	*The following details the derived variables that have been used in the various data tables*

A number of derived variables are to be used as “banners”, or column headings, for the analysis of each question.

Gender

Male

Female

Age Group (1)*

Based on respondent’s year of birth (Q.46a), or their age group if year of birth was refused (Q.46b).

18 - 24 years: Born 1988 - 1994. If refused age group, 18-19 years or 20-24 years.

25 - 34 years: Born 1978 - 1987. If refused age group, 25-29 years or 30-34 years.

35 - 44 years: Born 1968 - 1977. If refused age group, 35-39 years or 40-44 years.

45 - 54 years: Born 1958 - 1967. If refused age group, 45-49 years or 50-54 years.

Used in Adult Tables.

Age Group (2)*

Based on respondent’s year of birth (Q.46a), or their age group if year of birth was refused (Q.46b).

18 - 34 years: Born 1978 - 1994. If refused age group, 18-19 years, 20-24 years, 25-29 years or 30-34 years.

35 - 54 years: Born 1958 - 1977. If refused age group, 35-39 years, 40-44 years, 45-49 years or 50-54 years.

Used in Adult Tables.

Age Group*

Based on respondent’s year of birth (Q.46a), or their age group if year of birth was refused (Q.46b).

13 - 17 years: Born 1995 - 1999. If refused age group, 13-14 years or 15-17 years.

18 - 24 years: Born 1988 - 1994. If refused age group, 18-19 years or 20-24 years.

Used in Youth Tables.

*Respondents were assigned to an age group according to their year of birth and the age that they would be by the end of 2012. In each case, this recoded age group was compared to the respondent’s answer to Q.1 of the questionnaire. This question asked whether the respondent was aged 13-17 years, 18-24 years or 25-54 years, to ensure that the correct Adult and/or Teen questions were asked. In a small number of cases, the respondent’s age was on the cusp of these age groups - their year of birth put them in a younger age group; however their answer to Q.1 placed them in the next oldest age group

(because they were actually born in January or February before the interview date). In such cases, respondents were assigned the appropriate age group, according to their answer to Q.1.

Skin Colour

Based on respondent's self-identification of skin colour (Q.40).

Very fair / fair

Medium

Olive

Very dark / dark / black

Used in Adult Tables.

Skin Colour

Based on respondent's self-identification of skin colour (Q.40).

Very fair / fair

Medium

Olive / very dark / dark / black

Used in Youth Tables. Due to the smaller sample size, olive was combined with very dark/dark/black.

Ethnicity

Based on respondent's self-identification of the ethnic group(s) they belong to (Q.45), and prioritised by Māori, then Pacific peoples, Asian peoples, and European peoples to create five mutually exclusive groups.

Māori: Belonging to the Māori ethnic group.

Pacific: Belonging to Samoan, Cook Island Māori, Tongan, Niuean, Tokelauan, Fijian, Other Pacific Peoples ethnic group(s), but not Māori ethnic group.

Asian: Belonging to Chinese, Indian, Japanese, Korean, Sri Lankan, Vietnamese, Cambodian, Filipino, Other Asian Peoples ethnic group(s), but not Māori or Pacific peoples ethnic group.

European: Belonging to New Zealand European, Irish, Italian, Polish, Scottish, South African, South Slav, Welsh, American, Australian, Dutch, English, German, Greek, Other European ethnic group(s), but not Māori, Pacific or Asian ethnic groups.

Other: Belonging to Other ethnic group(s), but not Māori, Pacific Peoples, Asian Peoples or European Peoples ethnic groups.

Used in Adult Tables.

Ethnicity

Based on respondent's self-identification of the ethnic group(s) they belong to (Q.45), and prioritised by Māori, then Pacific peoples, Asian peoples, and European peoples to create five mutually exclusive groups.

Māori / Pacific: Belonging to Māori, Samoan, Cook Island Māori, Tongan, Niuean, Tokelauan, Fijian, Other Pacific Peoples ethnic group(s).

Asian / Other: Belonging to Chinese, Indian, Japanese, Korean, Sri Lankan, Vietnamese, Cambodian, Filipino, Other Asian Peoples ethnic group(s), but not Māori or Pacific peoples ethnic group. Belonging to Other ethnic group(s), but not Māori, Pacific Peoples, Asian, or European ethnic groups.

European: Belonging to New Zealand European, Irish, Italian, Polish, Scottish, South African, South Slav, Welsh, American, Australian, Dutch, English, German, Greek, Other European ethnic group(s), but not Māori, Pacific, or Asian ethnic groups.

Used in Youth Tables. Due to the smaller sample size, Māori and Pacific were grouped together, as were Asian and Other.

Area (1)

Based on respondent's self-identification of the type of area the live in (Q.49a or Q.49b).

Urban: Living in a city or town.

Rural: Living in a rural area.

Used in Adult and Youth Tables.

Area (2)

Based on the territorial authority.

Auckland: Auckland Council area

Upper North Island: Includes Northland, Waikato, Bay of Plenty, Gisborne and Taranaki

Lower North Island: Includes Hawkes Bay, Wanganui, Manawatu, Wairarapa and Wellington

South Island: Includes all South Island locations

Used in Adult and Youth Tables.

Highest Qualification

Based on highest qualification of respondent (Q.53).

No school qualification: No formal school qualification.

Secondary qualification: School Certificate / NCEA level 1, Sixth Form Certificate / UE before 1986 / NCEA level 2, NZ Higher School Certificate or Higher Leaving Certificate, University Entrance / Bursary / NCEA level 3, overseas secondary schooling.

Other tertiary qualification: Undergraduate diploma, Trade certificate, other tertiary certificate.

Degree: Degree / postgraduate degree / postgraduate diploma

Used in Adult Tables.

Household income

Based on the total income the household received from all sources, before tax, for the last 12 months (Q.55).

$40,000 or less

$40,001 - $70,000

$70,001 - $100,000

$100,001 or more

Used in Adult tables.

Lifetime sunburn

Based on whether, apart from the weekend just finished, the respondent had ever been sunburnt so badly that they got blisters or were in pain for two or more days (Q.42).

Yes

No

Used in Adult and Youth Tables.

Perceived personal risk

Based on the respondent's perception of their likelihood of getting skin cancer in the future (Q.28).

Very high / high

Medium

Low / Very low

Already had it

Used in Adult Tables.

Perceived personal risk

Based on the respondent's perception of their likelihood of getting skin cancer in the future (Q.28).

Very high / high / Already had it

Medium

Low / Very low

Used in Youth Tables.

Deliberate tan attempt

Did they make any deliberate attempts to get a sun tan on the weekend just passed (Q.25).

Yes

No

Used in Adult and Youth Tables.

Intend to sunbathe

Based on whether they intend to sunbathe regularly to get a suntan (Q.26c).

Agree: Strongly agree or Mildly agree.

Neither / nor: Neither agree nor disagree.

Disagree: Mildly disagree or Strongly disagree.

Used in Adult and Youth Tables.

Friends think suntan is good

Based on whether most of their friends think a suntan is a good thing (Q.27b).

Agree: Strongly agree or Mildly agree.

Neither / nor: Neither agree nor disagree.

Disagree: Mildly disagree or Strongly disagree.

Used in Adult and Youth Tables.

Tanning depictions influence

Based on whether seeing tanned people on TV, in films and in magazines make them want to have a tan (Q.27g).

Agree: Strongly agree or Somewhat agree.

Neither / nor: Neither agree nor disagree.

Disagree: Somewhat disagree or Strongly disagree.

Used in Youth Tables.

Sun Exposure Ad recall

Based on the respondent's unprompted recall of the danger of too much sun exposure, including the Never Let Your Child Get Sunburnt and other campaigns (Q.30 + Q.31).

Yes: Recalled scenes, slogans or messages which could be attributed to any HPA or HSC advertising campaign (e.g. Never Let Your Child Get Sunburnt, Tiger the Prawn, Slip/Slop/Slap/Wrap, SunSmart, Lobster, Pigs Only Look Good in Pink).

No: Recalled other ads, did not recall any advertising, or did not know.

Used in Adult and Youth Tables.

Outdoors during weekend

Based on whether the respondent was outdoors for longer than 15 minutes, between 10am and 4 pm, on the weekend just passed (Q.2).

Outdoors: Was outdoors on Saturday and/or Sunday.

Not outdoors: Was outdoors neither day.

Used in Adult and Youth Tables.

Sunburnt during weekend

Based on whether the respondent was sunburnt on the weekend just passed, where sunburnt is any amount of reddening of the skin after being in the sun (Q.3).

Sunburnt

Not sunburnt

Used in Adult and Youth Tables.

Amount of time outdoors

Based on the amount of time the respondent spent outdoors on the selected day, doing the main activity (Q.11).

2 hours or less

2 hours 15 mins - 4 hours

More than 4 hours

Used in Adult and Youth Tables.

Start time

Based on what time the respondent started doing the main activity (Q.12).

Before 9.30am

9.30am - 11.15am

11.30am - 1.15pm1.30pm or later

Used in Adult and Youth Tables.

Planned time outside

Based on what how much time they spent outside on the selected day, compare with the amount of time they intended to spend outside (Q.14).

Less: Less time outside than they had intended.

Same: About the same time outside as they had intended.

More: More time outside than they had intended.

No time intended: They had not intended any particular time.

Used in Adult Tables.

Planned time outside

Based on what how much time they spent outside on the selected day, compare with the amount of time they intended to spend outside (Q.14).

Less/Same: Less time or about the same time outside as they had intended.

More: More time outside than they had intended.

No time intended: They had not intended any particular time.

Used in Youth Tables.

Preparedness

Based on whether they had the things at hand to protect themselves from the sun they needed to on the selected day (Q.23).

Yes

No

Used in Adult and Youth Tables.

Use of shade

Based on whether they had stayed out of the sun, or stayed in the shade at any time, while doing the main activity on the selected day (Q.15a). If so, whether they had made choice to use shade, or whether it had just happened (Q.15b).

Made a choice: Made a choice to use shade.

Just happened: Just happened.

No shade: Did not stay out of the sun or stay in the shade at any time.

Used in Adult and Youth Tables.

Hat use

Based on whether they had any part of their body covered or shaded by a hat, cap or visor most of the time, while they were doing the main activity (Q.17).

Used: Yes

Didn't use: No.

Used in Adult and Youth Tables.

Clothing use

Based on whether they had their torso (including shoulders) covered or shaded by clothing most of the time, while they were doing the main activity (Q.19a). Clothing includes towels, scarves and covered shoes, but not hats.

Torso covered: Chest, stomach, back and shoulders all covered or shaded by clothing.

Torso not covered: Chest, stomach, back and shoulders not all covered or shaded by clothing.

Used in Adult and Youth Tables.

Sunscreen use

Based on whether they had any part of their body covered by sunscreen most of the time, while they were doing the main activity (Q. 20a).

Used: Yes.

Didn't use: No.

Used in Adult and Youth Tables.

Activity (1)

Based on the type of activity they were doing mostly during their time outdoors on the selected day (Q.10a).

Working: Gardening, doing general jobs around the house, working (ie. paid employment), volunteer work (ie. unpaid), farming / fencing.

Not working: Doing any other activities.

Used in Adult and Youth Tables.

Activity (2)

Based on the type of activity they were doing mostly during their time outdoors on the selected day (Q.10a).

Sport / exercise: Walking / running / tramping, Swimming, Cycling / biking, Playing sport.

Not sport / exercise: Doing any other activities.

Used in Adult and Youth Tables.

Activity (3)

Based on the type of activity they were doing mostly during their time outdoors on the selected day (Q.10a) and whether that activity was based in, or next to, the water (Q.10b).

Water-based: At the beach, Swimming, Boating / sailing / windsurfing / surfing / fishing, or doing another activity that was based in, or next to, the water.

Not water-based: Doing an activity that was not based in, or next to, the water.

Used in Adult and Youth Tables.

Perceived weather risk

Whether the weather on the selected day made them think they might get sunburnt if they went outside without protecting their skin (Q. 7 and Q.24).

Yes

No

Used in Adult and Youth Tables.

New variables for 2013

Family history

Whether or not they have a family history of skin cancer (Q.43).

Yes

No

Used in Adult and Youth Tables.

Outdoor Work

Proportion of time spent working outdoors (Q.54)

0%-29%

30%-59%

60% or more

Used in Adult Tables.

Appendix II
Weather Stations

Weather station and territorial authority assignments

Territorial Authorities	Weather Station Name
Far North District Council	Northland Kerikeri
Kaipara District Council	Northland Whangarei
Whangarei District Council	Northland Whangarei
Auckland Council	Auckland Whenuapai
Thames-Coromandel District Council	Auckland Airport
Hamilton City Council	Waikato Hamilton
Hauraki District Council	Waikato Hamilton
Matamata-Piako District Council	Waikato Hamilton
Otorohanga District Council	Waikato Hamilton
Waikato District Council	Waikato Hamilton
Waipa District Council	Waikato Hamilton
Tauranga City Council	Bay of Plenty Tauranga
Western Bay of Plenty District Council	Bay of Plenty Tauranga
Kawerau District Council	Bay of Plenty Whakatane
Opotiki District Council	Bay of Plenty Whakatane
Whakatane District Council	Bay of Plenty Whakatane
Rotorua District Council	Bay of Plenty-Rotorua
South Waikato District Council	Bay of Plenty-Rotorua
Taupo District Council	BOP (Central)-Taupo
Waitomo District Council	BOP (Central)-Taupo
Gisborne District Council	Gisborne-Gisborne
Wairoa District Council	Gisborne-Gisborne
Central Hawke's Bay District Council	Hawke's Bay-Napier
Hastings District Council	Hawke's Bay-Napier
Napier City Council	Hawke's Bay-Napier
New Plymouth District Council	Taranaki-New Plymouth
Ruapehu District Council	Taranaki-New Plymouth
South Taranaki District Council	Taranaki-New Plymouth
Stratford District Council	Taranaki-New Plymouth
Wanganui District Council	Manawaru Wanganui
Horowhenua District Council	Manawatu P North
Manawatu District Council	Manawatu P North
Palmerston North City Council	Manawatu P North
Tararua District Council	Manawatu P North
Rangitikei District Council	Manawatu Ohakea
Hutt City Council	Wellington Airport
Wellington City Council	Wellington Airport
Kapiti Coast District Council	Wellington Paraparaumu

Territorial Authorities	Weather Station Name
Porirua City Council	Wellington Paraparaumu
Upper Hutt City Council	Wellington Paraparaumu
Carterton District Council	Wellington Masterton
Masterton District Council	Wellington Masterton
South Wairarapa District Council	Wellington Masterton
Nelson City Council	Tasman Nelson
Tasman District Council	Tasman Nelson
Kaikoura District Council	Marlborough Blenheim
Marlborough District Council	Marlborough Blenheim
Buller District Council	West Coast Westport
Grey District Council	West Coast Westport
Westland District Council	West Coast Hokitika
Ashburton District Council	Canterbury Christchurch
Chatham Islands Council	Canterbury Christchurch
Christchurch City Council	Canterbury Christchurch
Hurunui District Council	Canterbury Christchurch
Selwyn District Council	Canterbury Christchurch
Waimakariri District Council	Canterbury Christchurch
Mackenzie District Council	Canterbury Timaru
Timaru District Council	Canterbury Timaru
Waimate District Council	Canterbury Timaru
Waitaki District Council	Canterbury Timaru
Central Otago District Council	Otago Queenstown
Queenstown Lakes District Council	Otago Queenstown
Clutha District Council	Otago Dunedin
Dunedin City Council	Otago Dunedin
Gore District Council	Southland Invercargill
Invercargill City Council	Southland Invercargill
Southland District Council	Milford Sound