Sun Exposure Survey 2016

Adult Topline Time Series Report

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REVIEW

This report has not undergone external peer review.

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1. SUMMARY

1.1 BACKGROUND

The Sun Exposure Survey (SES) is an ongoing piece of research that is undertaken by the Health Promotion Agency (HPA) every three years. The purpose of this research is to collect consistent information on attitudes and behaviours towards sun exposure, facilitate comparison with historical survey data, and inform future decision making in the sun safety and skin cancer prevention sector.

The SES was formerly known as the Triennial Sun Protection Survey (TSPS), which was conducted in 1994, 1997, 2000, 2003 and 2006. The SES was developed in 2009, following a review of the TSPS. The SES focuses on the same measures as the TSPS to allow for continued monitoring of trends over time, and also includes some new questions. The SES was conducted with adults between the ages of 18 and 54 years in 1994 up to 2006. The youth samples, aged 13 to 17-years-old, were added from 2010. The sample groups were further expanded in 2016 to include older adults (aged 55 years or older).

This is the first in a series of reports that provides an overview of results for the adult participants (aged 18 to 54-years-old) of the SES. It is intended to provide a technical summary of the survey findings rather than a detailed discussion of the results in the context of existing research and literature.

Three series of data analytical procedures were undertaken for this current report. The first series focused on examining the change in respondents' sun exposure, sun protection and related behaviours over the time period from 1994 to 2016. The results from this series were adjusted using the World Health Organization age standardised weights (Ahmad, 2001). The second series of data analyses focused on comparing questions asked in 2010, 2013 and 2016. The third series focused on analysing those questions that were asked for the first time in 2016. The results from this third series were grouped into five key thematic sections: skin type, sun sensitivity and sunburn; outdoor activity; sun protection behaviour; and sun protection knowledge and tanning.

1.2 METHODOLOGY

A total of 2,272 participants completed the survey interview. This comprised 1,270 adults, 486 youth and 516 older adults drawn from 16 regions in New Zealand (see the *Sun Exposure Survey 2016 Methodology Report* for full details, Health Promotion Agency, 2016). The sample frame was based on Random Digit Dialling (RDD) from the White Pages Directories. Quotas were set for broad geographic region, regional council boundary, age group, and gender. The use of RDD provides a more accurate representation of the geographic area surveyed, since calls are scattered across the entire area and responses, therefore, reflect the underlying population characteristics.

The data collection method was over the telephone. Interviewing was undertaken by Digipoll interviewers who were trained in the questionnaire prior to commencing the work. The interviews

were carried out between 11 January and 21 March 2016 on Monday, Tuesday and Wednesday between the hours of 4:00pm and 8:30pm. Sixty-four interviews were conducted on a Thursday following a long weekend.

1.3 KEY FINDINGS

1.3.1 Skin Type and Sunburn History

In 2016, the top three commonly reported skin types were “fair” (35%), “medium” (27%) and “olive” (20%) skin. Fewer respondents reported that they had very fair (12%) or dark (5%) skin types, and no respondents (0%) reported that they had “very dark or black” skin types.

When asked to describe their untanned skin’s reaction to strong sunshine, the majority of respondents (52%) stated that they would burn first and tan afterwards. The remaining respondents mostly reported that they would either just burn (23%) or just tan (23%). Seven in 10 respondents (71%) reported having no history of skin cancer in their family.

Around one-half of respondents (52%) reported that they had experienced moderate to severe sunburn at some point in their lives, which was so bad they got blisters, or were in pain for two or more days. This figure has not changed significantly compared to 2013 (48%).

Fifteen percent of respondents reported that they had been sunburnt on the previous weekend – a significant decrease compared to 2013 (22%). This shows the beginning of a general decreasing trend in the prevalence of sunburn since 1997. Respondents stated that the main reasons for getting sunburnt were because they “forgot to protect” (24%) or “stayed in the sun for too long” (18%). The most common body parts that had been sunburnt in 2016 were the shoulders (41%), nose (41%) and face (39%).

1.3.2 Outdoor Activity

In 2016, a significantly higher proportion of respondents (88%) reported having spent 15 minutes or more outdoors in the previous weekend compared to all TSPS and SES survey waves since 1994 (the proportions ranged between 73% and 81%), with the exception of the 2013 survey (91%). When asked whether the time they had spent outdoors was the amount of time they intended, the most common responses were “about the same amount of time outdoors as they intended” (31%) and “had not intended any particular time” (43%).

A significantly lower proportion in 2016 reported that they had spent “about the same amount of time outdoors as they intended” (31%) compared to 2010 (39%). Taken together, walking, running or tramping (22% combined) were the most popular main outdoor activities among respondents who were outdoors on the weekend. Gardening has been undergoing a decline in popularity since 1994 (25%), with record low numbers of respondents stating that this was their main outdoor activity in 2013 (11%) and 2016 (11%). In 2016, more than one-third of respondents (37%) who were outdoors either engaged in water-based activities or activities based next to the water (for example, at the beach and swimming).

1.3.3 Sun Protection Behaviour

The majority of respondents (65%) who were outdoors for 15 minutes or more in 2016 reported that they "had everything on hand to protect their skin from the sun" – a significant increase compared to 2010 (57%), but not significantly different from 2013 (66%).

Less than one-half of respondents (43%) reported having worn some form of hat or head covering in 2016. More than one-half of respondents (55%) wore sunglasses in 2016. There were no significant changes from 2013 in either hat use (38% in 2013) or sunglasses use (60% in 2013).

Exactly one-half of respondents (50%) who were outdoors during the weekend reported using sunscreen in 2016. This was a significantly higher proportion compared to 1997 (31%) and 2000 (36%). The most common body parts that sunscreen was applied to were the face (96%), nose (96%), and neck (87%). Respondents were applying sunscreen to a greater variety of body parts than they have in the past – since 1997, application of sunscreen to all of the body parts asked about in the survey has increased significantly. In 2016, a significantly higher proportion of respondents applied sunscreen twice while they were outdoors compared to the previous years.

1.3.4 Knowledge of Skin Cancer and Risk Factors

In 2016, the majority of respondents (63%) tended to agree with the statement "I feel confident I can protect myself from skin cancer", although this proportion has decreased significantly from 2013 (75%). Similar patterns were observed in the respondents' agreement with the statement "Even if treated, melanoma can lead to loss of life" – in 2016 most of respondents (79%) tended to agree with this statement but this proportion was significantly lower compared to 2013 (86%). Similarly, agreement with the statement "Melanoma can be easily treated by a GP" significantly declined from 30% in 2013 to 18% in 2016.

In relation to respondents' perceived risk of getting skin cancer, around four out of 10 respondents thought they had a "medium" risk (42%), while two out of 10 rated their risk as either "high" (15%) or "very high" (5%).

People who checked the weather forecast ahead of participating in outdoor weekend activities (77%), found the information about temperature (46%) and cloud cover (28%) most helpful for prompting themselves about using sun protection. Of those who used the Sun Protection Alert (7%) and the UV Index (10%), the majority reported that they saw the information on TV (41%) or on the MetService website (37%).

1.3.5 Attitudes to Getting a Tan

Most respondents (92%) reported that they had not tried to get a tan during the previous weekend and nearly all of them (79%) reported that they did not intend to sunbathe to get a tan for the rest of the summer. One half of respondents (50%) reported that they planned to actively avoid getting a suntan for the rest of the summer. Very few respondents (2%) reported that they were likely to use a sunbed to get a suntan.

In 2016, a significantly lower proportion of respondents agreed with the statement "I feel more healthy with a suntan" (26%) compared to all previous survey years from 2000 to 2013. Agreement with this statement ranged between 35% and 44% from 2000 to 2013. Similar patterns were

observed in the degrees of agreement with the statement “Most of my friends think a suntan is a good thing” – in 2016 a significantly lower proportion of participants (40%) agreed with this statement than in the 2000 to 2013 surveys (agreement ranged between 47% to 58% from 2000 to 2013).

In 2016, respondents (32%) were less likely to agree with the statement “A suntan makes me feel better about myself” than in all past survey years except for 1997 (the proportion of agreement ranged from 41% to 52% in previous surveys). These results show that tanning has been falling out of participants’ favour over time. In 2016, just under one-third of respondents (29%) agreed with the statement “protecting my skin from the sun can result in not getting enough vitamin D” – a decrease from 2013 (42%). In 2016, around four out of 10 respondents (43%) agreed with the statement “Tanning is part of the Kiwi summer”. The respondents’ attitude and sun behaviour across TSPS and SES survey waves are presented in Table 1-1.

Table 1-1:Summary of Respondents' Attitudes and Sun Behaviour from 1994 to 2016

	1994	1997	2000	2003	2006	2010	2013	2016
Sun exposure and sunburn								
Spent 15 minutes or more outside during previous weekend	76	76	80	75	73	81	91	88
Sunburnt during the previous weekend	11	34	24	21	23	20	22	15
Ever been severely sunburnt	47	48	39	42	47	51	48	52
Sun protection behaviour								
Wore a hat	33	34	39	41	43	48	38	43
Wore sunscreen	40	31	36	45	52	51	55	50
Wore sunglasses	59	42	53	57	55	31	60	55
Attitudes towards sun tanning								
Agreed on "A suntan makes me feel better about myself"	46	41	43	52	44	45	49	32
Agreed on "Most of my friends think a suntan is a good thing"	46	48	51	53	50	47	58	40
Agreed on "I feel more healthy with a suntan"	31	30	41	37	35	40	44	26

Note*:* Data presented in this table represents respondents aged 18-54 years. Because previous surveys included respondents aged up to 69 years, the figures presented here will differ to figures presented in reports for the TSPS in previous years.

2. BACKGROUND

2.1 PURPOSE

The Health Promotion Agency (HPA) undertakes the Sun Exposure Survey (SES) approximately every three years. The purpose of this ongoing research is to collect consistent information on attitudes and behaviours towards sun exposure, facilitate comparison with historical survey data, and inform future decision making in the sun safety and protection sector.

Topics focused on in the SES include:

- skin type, skin sensitivity and personal sunburn history
- outdoor activity and sun safety
- sun protection behaviours in the previous weekend
- sun safety knowledge including awareness of sources of sun protection advice and advertising
- perceptions of risk in relation to skin cancer
- attitudes towards tanning.

The SES was formerly known as the Triennial Sun Protection Survey (TSPS), which was conducted in 1994, 1997, 2000, 2003 and 2006. Following a review of the TSPS in 2009 the SES was developed, with a focus on the same measures to allow continued identification of trends over time, as well as the inclusion of some new questions. The SES was conducted with adults between the ages of 18 and 54 years and youth between the ages of 13 and 17 years in 2010 and 2013. In the 2016 SES, older adults aged 55 years and over were also included.

2.2 HISTORY

2.2.1 The Triennial Sun Protection Survey

The TSPS commenced in 1994 and was managed by the Cancer Society of New Zealand (CSNZ; Cancer Society NZ, 2016), in collaboration with the Department of Preventative and Social Medicine at the University of Otago. Subsequently, the Health Sponsorship Council managed the survey jointly with the Cancer Society of New Zealand before management shifted to the Health Promotion Agency. The survey was based on a seminal study from Victoria, Australia (Borland, Hill & Noy, 1990). The aims of the survey were to describe patterns and associations in outdoor behaviour including activities, sun protection, attitudes, knowledge, tanning preferences, and sunburn.

The TSPS survey population was largely driven by a need for cost-effectiveness and included adults (15 to 69 years, approximately n = 1,250 per wave) and some children aged 12 to 14 years, although the inclusion of children varied across years. New Zealand's five largest metropolitan centres were included in the survey. These centres were Auckland, Hamilton, Wellington, Christchurch, and Dunedin. The exclusion of rural and other urban populations meant that the findings could not be generalised.

A number of issues were identified following the 2005/06 wave of the TSPS. These issues included a drop in response rates (down to 21% in the 2006 survey), along with associated response bias issues, and problems with the representativeness of the sample, in addition to consistent data collection and analysis across surveys. Further to the identification of these issues, a review of the TSPS was initiated with the aim of improving the survey. In 2009, an Expert Reference Group (ERG), comprising experts in the field of skin cancer prevention and sun safety research, was established to provide advice on methodology and questionnaire content. In addition to this, a review of 'global' practice and options for a sun exposure survey was conducted by an independent research company[1].

The review process was initiated to inform the development of a revised quantitative survey, and to aid future sector decision making by improving the evidence available on prevalence and trends in sun safety behaviour. The substantial review undertaken in 2009 laid the foundation for the 2010 SES, which was funded jointly by the Health Sponsorship Council (HSC) and CSNZ. The 2016 survey has been designed to be highly consistent with the structure and methodology of the 2010 and 2013 survey editions. Key question themes of each survey between 1994 and 2016 is presented in Appendix One. Related reports and questionnaires for the 2010 and 2013 SES can be accessed through HPA's website: http://www.hpa.org.nz/research-library/research-publications

2.2.2 Oversight of the Survey From 2016 Onwards

The SES was initially co-funded by HSC and CSNZ and managed by HSC. From 2013, the survey is solely funded and managed by the HPA. The HPA is a Crown Entity established under the New Zealand Public Health and Disability Amendment Act 2012, comprised of a merger of HSC and the Alcohol Advisory Council (ALAC).

[1] *Review of Practice and Options for the New Zealand Sun Exposure Survey,* Watts, Heinemann, Marsh and Graham 2009.

3. METHODOLOGY

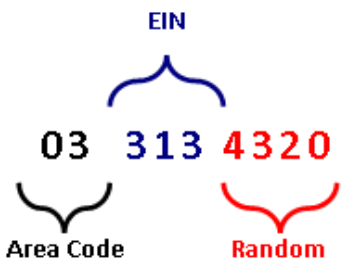
This section summarises the methodology used for the SES in 2016. For a full account of the methodology used refer to the *Sun Exposure Survey 2016 Methodology Report* (HPA, 2016).

3.1 SAMPLING

A total of 2,272 interviews were carried out, comprising 1,270 adults (aged 18-54 years), 486 teens (aged 13-17 years) and 516 older adults (55 years and over). An objective of the study was to achieve a nationally representative sample of the population over the age of 13 years and the approach to sampling reflected this aim. The sample frame was based on Random Digit Dialling (RDD). This method is commonly used in household surveys (see for examples: Boehm, Chen, Williams, Ryff & Kubzansky, 2015; Hollier, Pettigrew, Slevin, Strickland & Minto, 2016). A quota of interviews was set for broad geographic region, regional council boundary, age group and gender. Quota targets were established based on known population distributions from the 2013 census data for all sample groups (youth, adult and older adult samples).

The 2016 survey, based on RDD, was the same approach as taken in 2013. The methods that were implemented for the two latest surveys slightly differed compared to 2010, as the sampling frames were not generated from the White Pages Directories. The use of RDD in 2013 was initiated to overcome potential selection bias. Specifically, this method was introduced to avoid the exclusion of a significant proportion of the population due to inaccurate and incomplete White Pages Directory information as a result of unlisted numbers, disconnected numbers, and people having changed residence. The core principle of the RDD sampling method is targeting Exchange Information Numbers (EIN). As an example presented in Figure 3-1, each EIN is attached to a geographic area. The last four numbers are randomised.

Figure 3-1: Example of Exchange Information Numbers



This allows accurate representation of the geographic area surveyed as calls are scattered across the entire area and, thus, responses reflect the underlying population characteristics. In the 2010 and 2013 surveys, respondents were selected from each household using the ‘next birthday’ rule. In 2016, interviewers asked to speak with the youngest person in the household. This approach was necessary to achieve quota targets by age. Quota targets were established based on known population distributions from the 2013 census data for all sample groups. Two quota targets were established, namely the ‘hard’ targets that had to be achieved and the ‘soft’ targets that permitted a

variation of ±10%. The hard targets were set for broad geographic region, and soft targets were set for regional council boundary, age group and gender.

3.1.1 Fine Weather Criteria

During the fieldwork period meteorological data was accessed by the survey provider Key Research Ltd. The data included temperature, sky condition and Ultraviolet Index (UVI) readings. Scores were applied for each hour between 11am and 4pm and summed for the day. The scoring system is detailed in Table 3-1 below.

Table 3-1: Fine weather criteria

Temperature	Score
Greater than or equal to 20 degrees	1.0
Greater than or equal to 15 degrees and less than 20 degrees	0.5
Less than 15 degrees	0.0
Sky Conditions	**Score**
Fine	1.0
Cloudy	0.5
Any form of precipitation	0.0
UV Index	**Score**
Greater than or equal to 10	1.0
Greater than or equal to 6 and less than 10	0.5
Less than 6	0.0

Note: The UV Index score was rounded to the nearest whole number for the calculations.

Interviews were only conducted in areas in which a minimum of one weekend day received a score greater than 10. The interviews were then conducted the following week in relation to the eligible day when a respondent reported being outdoors for 15 minutes or more between 10:00am and 4:00pm.

3.2 DATA WEIGHTING

Weight is commonly used to assign to survey data observations to ensure the distribution of collected data is as close as possible to the population for which statistical inferences are being made. The main objective of this technique is to reduce a selection bias, non-response and non-coverage, all of which may occur during sampling procedures (Kalton & Flores-Cervantes, 2003; Pike, 2008). The technique was applied to the current survey data to ensure that no specific population was over- or under-represented in the survey sample and to ensure that they reflect the underlying New Zealand population. As can be seen in Table 3-2, four factors were included in the weight calculation procedures namely region, selection weight, benchmark group for the 2016 survey data.

Table 3-2: Weight variables for 2016 SES

Survey data setting in STATA	Variable	Description
Strata	Region	16 regions across New Zealand included Northland, Auckland and Wellington
Sampling weigh	Selection weight	An inverse probability of a participant will be selected from a sampled household
Post-strata	Benchmark group	An identifier of age, gender and ethnicity eg, Māori male aged 18 to 24 years old and data was coded as 111
Post-stratum weigh	2013 census data	An adjusted count of 2013 census population count by the benchmark groups
Post-stratum weigh	WHO age standardise	The distribution of the standard population obtained from the World Health Organization

Weighting was performed by calculating selection weights and by age, gender and ethnicity benchmarking using 2013 census data. The 2013 census data was used as the reference population because it was the most recent census data available at the time the survey was conducted. In addition, age standardisation was applied to the weights, to reflect the changing age structure of the population when compared between survey years (ie, from 1994 to 2016). The following sections provide greater details of all weight variables that were used in the SES 2016.

3.2.1 Selection Weights

Selection weights adjust for the probability of a person being selected to participate in the survey from within a household with more than one occupant. 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. In the small number of cases (n=18, 0.8%) where the number of people in the household was not stated, the mean values of selection weight was used. The mean values were calculated using the selection weight for those in the same gender, ethnicity and age benchmark grouping.

3.2.2 Benchmarking

Benchmarking refers to the adjustment of the data to ensure they are representative of the New Zealand population after selection weights have been applied. For the SES, participants were grouped based on their gender (male and female), age (18 to 24, 25 to 34, 35 to 44 and 45 to 54 years) and prioritised ethnicity (Māori, Pacific, Asian and European/Other). For instance, Māori male aged between 18 and 24-years-old was counted as one of the benchmark groupings. The details of prioritised ethnicity are addressed in section 4.6.

3.2.3 Age Standardisation

The age structure of the population is not static and this can impact the extent to which health-related data can be compared over time. To mitigate the possibility of any impact, age standardisation has been applied using the World Health Organization (WHO) standard population (Ahmad et al., 2001). The population adjustments made using the WHO standardised ratios were made to each gender by ethnic group used in the benchmarking. Age standardisation is necessary in this analysis because results are being compared over a long time span (22 years).

3.3 DATA COLLECTION

The data collection method was interviewing undertaken by telephone using Computer Assisted Telephone Interviewing (CATI). Interviewing was undertaken by Digipoll, a specialist data collection provider based in Hamilton, and conducted by trained interviewers who were fully briefed on the questionnaire prior to commencing the work.

3.3.1 Interview

The interviews were carried out between 11 January and 24 March 2016 on Monday, Tuesday and Wednesday between the hours of 4:00pm and 8:30pm. Sixty-four additional interviews were conducted on a Thursday following the weekend of interest. All calls, including arranged call-backs were made to areas that met the 'fine weather' criteria during the previous weekend. Call-backs could be made in subsequent weeks providing fine weather criteria had been met the previous weekend. Each respondent received an initial call and up to six call-backs at different times or days if they could not be contacted. Appointments were made with respondents who were willing to participate but could not do so at the time the call was made. The average interview duration was 15 minutes.

3.3.2 Response Rate

A total of 29,683 telephone calls were made using random-digit dialling. Of these, 18,279 were not to valid residential numbers or were not answered after multiple attempts. This resulted in a valid sample of 11,404. The details of the call outcomes for the survey are presented in Table 3-.

Table 3-3 shows that a total of 8,556 respondents were classified as being eligible. Respondents not eligible 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, 40% refused to participate in the survey. A further 29% were unavailable for interview (eg, people might be out of their home for work) on the days that the survey was conducted. Because interviews were undertaken on a Monday to Wednesday and related to the prior weekend, this further limited availability. 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 a response rate of 27% (2,272 ÷ 8,556) of the available and eligible sample. This is the same as the response rate for the 2013 survey.

Table 3-3: Call outcomes

	Calls		
Total Calls	29,683		
Uncontactable/disconnected/fax etc.	18,279		
Total Available Sample	11,404		
Not Eligible			
Not eligible	564		
Quota target full	2,284		
Total Not Eligible	2,848		
Eligible		**%**	
		2016	**2013**
Refused (R)	3,402	40%	37%
Not available during survey	2,512	29%	34%
Language or health barriers	369	4%	3%
Total Eligible non-response (E)	6,283		
Survey complete (I)	2,272	27%	27%
Total Eligible (I+E)	8,556		

3.4 QUESTIONNAIRE DEVELOPMENT

During the preliminary phase of the project, the survey provider (Key Research Ltd) undertook cognitive testing with 10 respondents. This was to ensure the questions asked of respondents were appropriate, effective and easily understood. Following this process a number of relatively minor wording changes were made to the questionnaire. Prior to the main phase of the data collection, a pilot was conducted across 60 respondents, with an equal number of 20 respondents from each age quota group (ie, youth, adults and older adults, over the weekend 29 and 30 November 2015). The pilot confirmed that the questionnaire flowed well and expected interview duration was approximately 15 minutes.

3.4.1 Key Differences Between the 2016 Survey and Previous Surveys

The final questionnaire has been kept as similar to the 1994 survey as possible to allow for comparison. Due to shifting areas of interest, in 2016 a small number of questions that appeared in the 2013 survey were not included. The 2016 SES includes three types of questions: (1) questions that have been repeated over several years since 1994, (2) questions that were asked for the first time in 2013 or 2010 and repeated in 2016, and (3) questions asked for the first time in 2016. Only one question was new to the 2016 survey, Q27a: the likely use of a sunbed. Two questions were amended for the 2016 survey namely Q1: the age groups were amended to reflect the different quota targets applied, and Q28g: About tanning previously asked only of teens, asked of all respondents.

3.5 GENERAL POINTS TO NOTE

3.5.1 Interpreting comparisons between years

In this report, results from the 2016 SES are compared with previous TSPS and SES survey results for adults between 1994 and 2013. As noted in the 2013 SES report (Armstrong, Gray, Tu, & Walton, 2013), results presented from the 1994-2006 TSPS may differ from those reported previously since this data will have been:

- recalculated using the same formulae or questions that are comparable with the 2010 SES
- reanalysed using only data from respondents aged 18-54 years, to maintain comparability with the 2010 adult data
- weighted by age, gender and ethnicity to be representative at the five metropolitan areas that respondents were selected from
- age-standardised, to ensure that the different distributions of age over the different years do not affect comparisons (see 3.2.3 for further explanation).

The data analyses for those newer questions that have been asked only for the three latest surveys (2016, 2013 and 2010) have not been age-standardised.

3.5.2 "The Day in Question" as Referred to in the Text

In the 2016 SES respondents were asked about their activities on either Saturday or Sunday of the previous weekend. This was consistent with the 2013 SES. Respondents were first asked whether they had spent 15 minutes or more outdoors on either day at the weekend. This was followed by a question on whether they were sunburnt on either day. Interviews were conducted in relation to the day that met the fine weather criteria. If both days met the criteria then the interview was conducted in relation to the day that the respondent was outdoors for at least 15 minutes between 10:00am and 4:00pm. 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.

3.5.3 Significance Testing

Data analyses were performed in STATA version 12. To detect a significant link between variables of interest, a series of statistical tests were used. These were the 95% Confidence Interval (CI), Chi-Square test and logistic regression. For the purposes of presentation, only those differences that were statistically significant as observed in the statistical tests (ie, the p-values were less than 0.05) have been commented on in this report.

3.5.4 Presentation of Results

For some questions, a breakdown in responses for 2016 only will be presented, followed by a comparison with previous years. All data being compared with previous survey years before 2010 has been age-standardised. Questions that were added in 2010 and/or 2013 and that were repeated in 2016 have been compared to show any significant differences between them. Questions that were asked in 2016 for the first time are presented alone, using data that has not been age-standardised. Sub-group analyses are not presented in this report, but will be explored in future publications. In the tables comparing responses between surveys, a dash (-) indicates that

there is no data. The term “base”, which is written under graphs and tables, is defined as the total number of participants who responded to an activity/question and this was used as a denominator for a specific analysis. For instance, if the proportion of participants who had sunburn was calculated out of those who were outside in the weekend, for this particular case the total number of participants who were outside was counted as the “base”. Please note that the “base” number applies to unweighted counts unless otherwise specified.

3.6 SAMPLE PROFILE

This section provides demographic profiles, such as gender and education levels, of all participants from each TSPS and SES waves from 1994 to 2016. The weighted proportions of gender and age groups are presented in Table 3-4. Crude weighted proportions are weighted by selection weight and benchmarked but are not age-standardised.

Table 3-4: Crude weighted percent across the gender and age groups, 1994 to 2016

	1994	1997	2000	2003	2006	2010	2013	2016
Gender								
Male	49	49	49	50	49	49	49	49
Female	51	51	51	50	51	52	51	51
Age								
18 to 24 years	22	20	19	19	20	19	20	20
25 to 34 years	31	30	29	29	26	25	25	25
35 to 44 years	27	28	28	28	29	30	27	27
45 to 54 years	20	21	23	24	25	26	28	28

Table 3-5 shows the prioritised ethnicity of participants. The prioritised ethnicity system was used because, in this current survey, participants could identify with as many ethnic groups that they felt they were affiliated with. The system of prioritising ethnicity is commonly used in analysing health data in New Zealand (Ministry of Health, 2016). It involves classifying each respondent into one ethnic group only, rather than every ethnic they identified with. The prioritised system (in order of priority) is Māori, Pacific, Asian and European/Other. Specifically, any participants who identified Māori as one of their ethnicities (eg, Māori and Asian) were classified as Māori. Participants identifying as having Pacific ethnicity, for example, by selecting Pacific and French ethnicities, were coded as Pacific, providing that they did not also select Māori as an ethnicity.

The prioritised ethnicity classification system makes it possible to compare survey variables of interest across different ethnic groups. Although the prioritised ethnicity system was included in the SES, less than 10% of participants were affected. This was because adult participants predominantly identified with one ethnic group (n=1159, 91%), 101 (8%) identified with two ethnic groups and a fraction of the adult respondents (n=10, 0.8%) identified with three or more ethnic groups.

Table 3-5: Crude weighted percent across the ethnic groups, 1994 to 2016

	1994	1997	2000	2003	2006	2010	2013	2016
Ethnicity*								
Māori	10	11	11	11	10	14	13	14
Pacific	3	5	5	4	5	6	6	5
Asian	6	7	8	9	12	10	7	10
Other	2	2	0	0	1	2	19	2
European	79	76	76	77	73	69	64	68

***** Note: In 2000–2016, respondents who identified with more than one ethnic group have been assigned to one of their ethnic groups in order of Māori, Pacific, Asian, European/Other (prioritisation). This means, for example, that someone who identifies with both Māori and Pacific ethnic groups were analysed as part of the Māori ethnic group. In the 1994 and 1997 TSPS waves a single-response ethnicity question was used, so no prioritisation has been applied.

Table 3-6 presents the crude weighted proportion of respondents' highest education level attained. Interestingly, the secondary education levels seemed to have a decreasing trend from 1994 (49%) to 2016 (32%), while, the degree had an increasing trend. More people reported that they graduated with a degree in 2016 (40%) than all other survey years.

Table 3-6: Crude weighted percent across the education levels, 1994 to 2016

	1994	1997	2000	2003	2006	2010	2013	2016
Highest qualification								
Nothing/None	15	14	10	7	3	10	6	5
Secondary qualification	49	44	43	46	33	36	32	32
Other tertiary qualification except degree	17	19	17	17	32	23	18	17
Degree	17	20	27	27	29	30	34	40
Other includes overseas qualification	1	2	1	1	1	0	6	2
Don't know/Refused	1	1	3	1	1	1	5	4

The distribution of respondents' skin types are presented in Table 3-7. This question was asked from 2000 onward. The proportions of participants reporting that they had very fair skin types in the first three surveys (2000: 25%, 2003: 25% and 2006: 21%) were nearly two times higher than the proportions in the latest three survey years (2010: 11%, 2013: 13% and 2016: 12%). The comparisons between the proportions of the skin types are presented in section 4.1.

Table 3-7: Crude weighted proportions of the skin type, 2000 to 2016

Skin type	2000	2003	2006	2010	2013	2016
Very Fair	25	25	21	11	13	12
Fair	27	29	34	32	32	34
Medium	22	24	19	28	28	29
Olive	23	21	22	22	21	20
Dark	2	2	4	5	6	5
Very dark/ black	0	0	1	1	1	0

Note: The skin type was not asked about in 1994 or 1997.

Information on time spent outdoors during the weekdays was collected in the 2013 and 2016 surveys. The same proportions of respondents in 2013 (41%) and 2016 (41%) reported that they spent most of the time indoors during the weekdays. The next most popular amount of time which they spent outdoors during the week was 1-14% (2013: 20% and 2016: 20%) (Table 3-8).

Table 3-8: Crude weighted proportions of time spent outdoors during the weekday, 2000 to 2016

Work week spent outdoors	2013	2016
0%	41	41
1 - 14%	20	20
15 - 29%	10	10
30 - 44%	5	6
45 - 59%	6	5
60 - 74%	3	3
75 - 79%	4	4
90% or more	7	7
Don’t know	4	3

4. SKIN TYPE, SUN SENSITIVITY AND SUNBURN

4.1 SKIN TYPE

All respondents were asked to describe their skin type. This was to help clarify how likely people were to burn when outdoors in the sun. The question asked was “How would you describe your natural, untanned skin colour at the end of winter?” Participants had choices of “very fair”, “fair”, “medium”, “olive”, “dark”, “very dark or black” and an open-ended option of “other, please specify.”

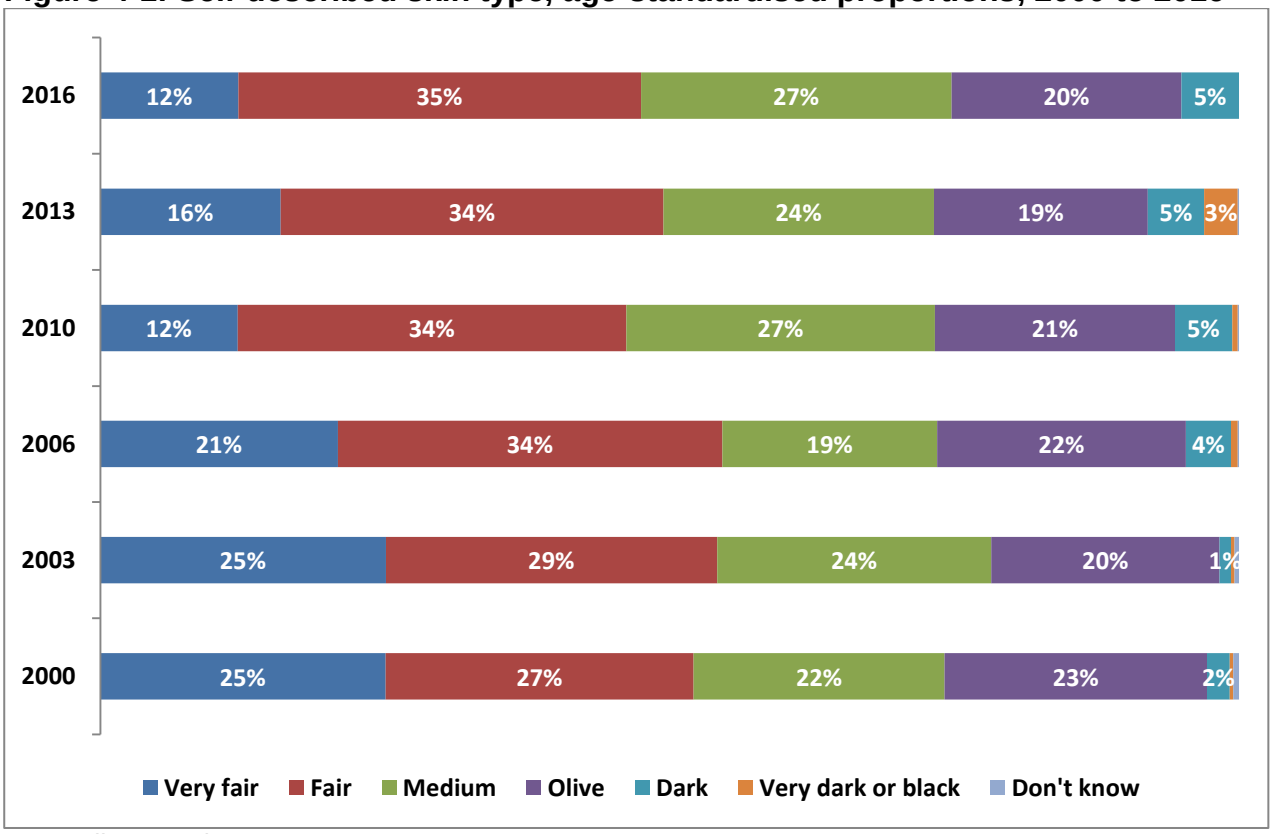
2016

As can be seen in Figure 4-1, in 2016, around one-third (35%) of respondents reported that they were fair skinned, while just over one out of 10 (12%) reported that their skin was very fair. Around one-quarter (27%) reported that their skin type was “medium”, with one in five (20%) identifying their skin type as “olive” and smaller proportions reporting dark (5%) or very dark (3%) skin.

Time Series

The skin type question was asked from 2000 onwards. In 2016, respondents (12%) were less likely to report that their skin was “very fair” compared to 2000 (25%), 2003 (25%) or 2006 (21%). On the contrary, in 2016 a larger proportion (5%) of participants reported that they had “dark” skin than in 2000 (2%) or 2003 (1%) (see Figure 4-1).

Figure 4-1: Self-described skin type, age-standardised proportions, 2000 to 2016



Base: all respondents

4.2 PERCEPTION OF SENSITIVITY TO THE SUN

All respondents were asked what would happen if their skin was exposed to strong sunshine for at least 30 minutes at the beginning of summer without using any sun protection (such as sunscreen). Participants were given four options of “just burn and not tan afterward”, “burn first then tan afterwards”, “not burn at all, just tan” and “nothing would happen.”

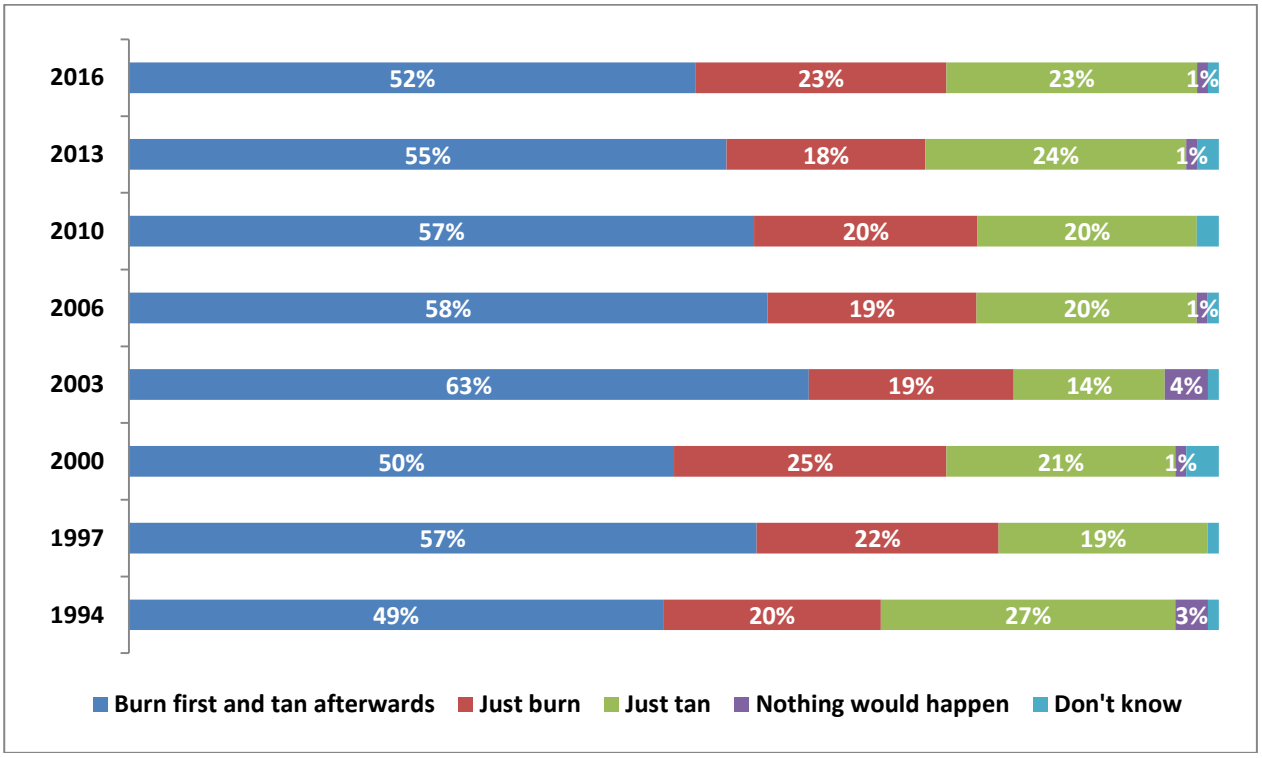
2016

Figure 4-2 illustrates that in 2016, just over one-half (52%) of respondents said they would *burn first and tan afterwards*, while just under a quarter (23%) of respondents said they would *just burn* or *just tan*.

Time Series

In 2016, respondents were less likely (52%) to say that they would *burn first then tan afterwards* than in 2003 (63%). However, respondents were more likely to say that they would *just tan* in 2016 (23%) compared to 2003 (14%). There were no other differences between 2016 and previous years (Figure 4-2).

Figure 4-2: Untanned skin’s reaction to 30 minutes of strong sunshine, age-standardised proportions, 1994 to 2016



Base: all respondents

4.3 FAMILY HISTORY OF SKIN CANCER

All respondents were asked about the historic incidence of skin cancer in their family. Participants were asked “do you have any family history of skin cancer?” They had two choices of answer, either “yes” or “no”. This question was asked from 2013 onwards.

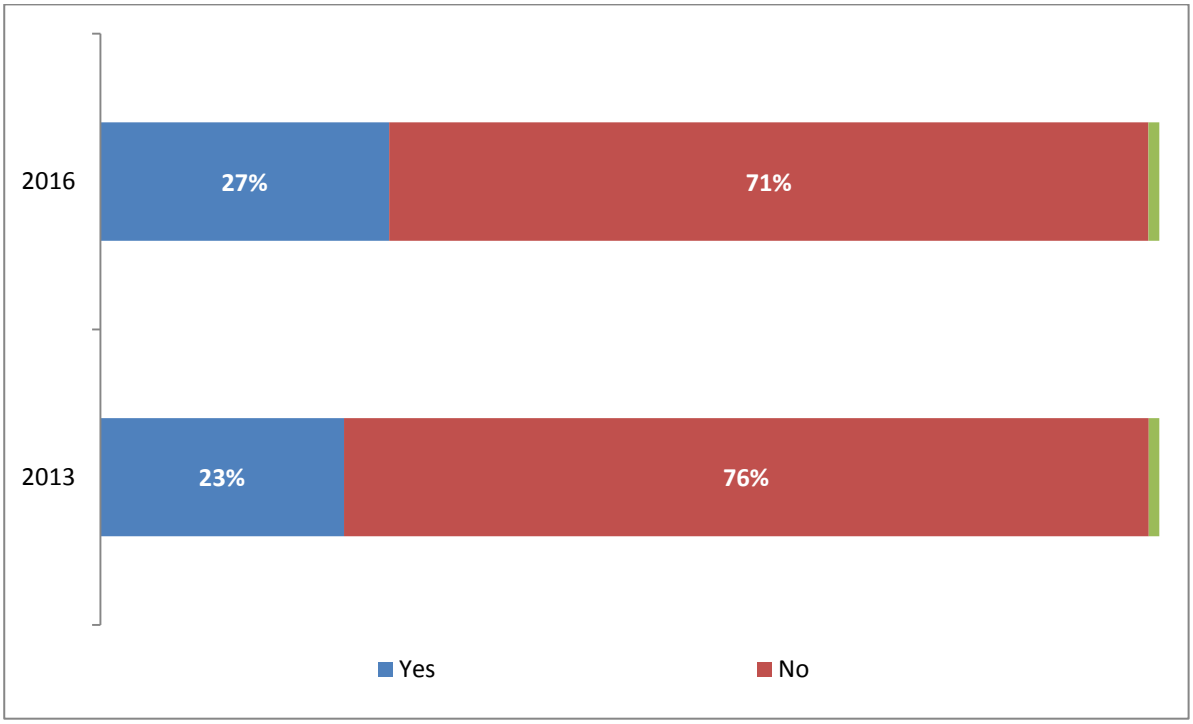
2016

As can be seen in Figure 4-3, over a quarter of respondents (27%) reported that they have a history of skin cancer in their family, while seven out of 10 (71%) did not.

Time Series

There was no significant difference of family history of skin cancer between 2013 and 2016.

Figure 4-3: Family history of skin cancer, age-standardised proportions, 2013 and 2016



Base: all respondents

4.4 SUN BURN HISTORY

All respondents were asked whether they had ever experienced "moderate to severe sunburn." Moderate to severe sunburn was defined as sunburn that resulted in blisters or pain that lasted for at least two days (apart from the previous weekend).

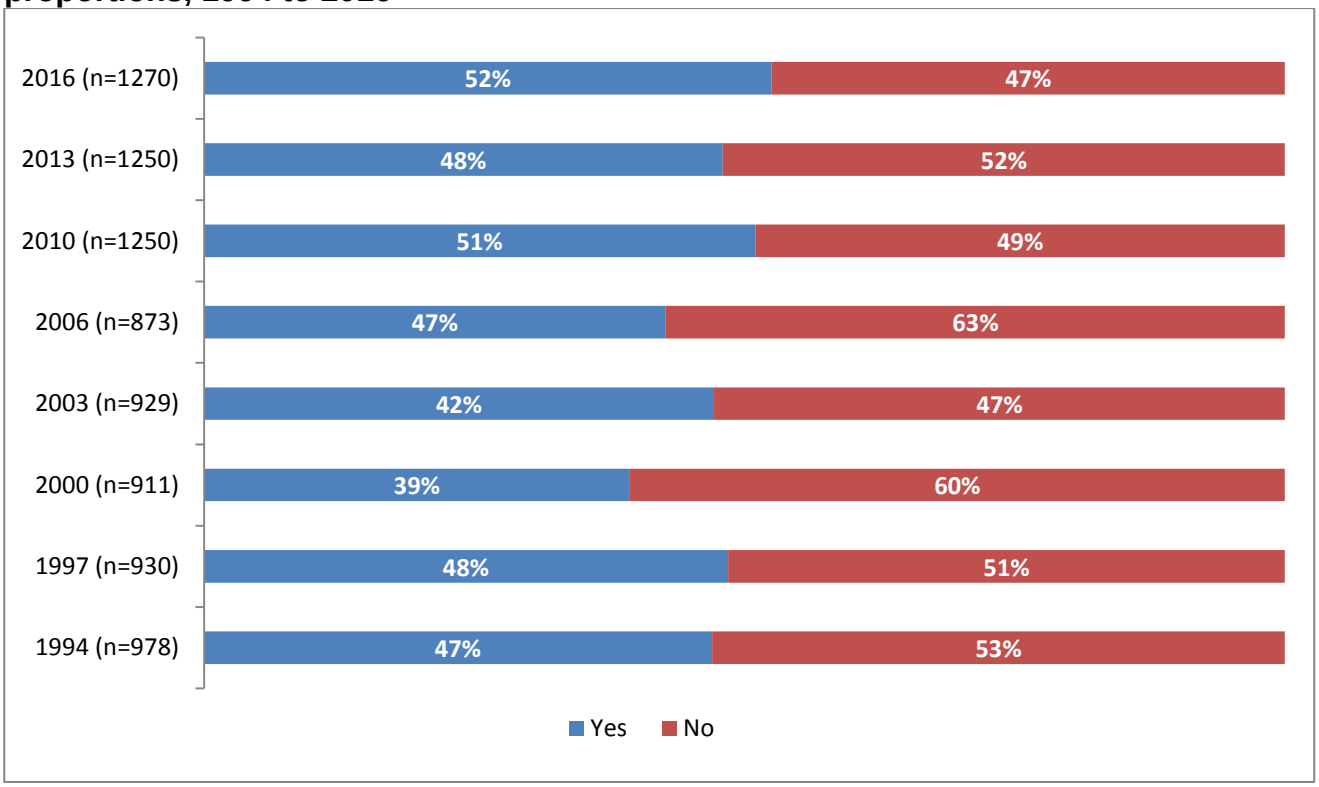
2016

In 2016, around just over half (52%) of respondents reported that they had experienced moderate to severe sunburn in the past and just under half (47%) had not (see Figure 4-4).

Time Series

In 2016, respondents (52%) were more likely to say they had experienced moderate to severe degrees of sunburn in the past in comparison to 2000 (39%) and 2003 (42%) (see Figure 4-4**)**.

Figure 4-4: Previous history of moderate/severe sunburn, age-standardised proportions, 1994 to 2016



Base: all respondents

4.5 RECENT SUNBURN

All respondents who had spent at least 15 minutes outside during the previous weekend were asked whether they had been sunburnt. Sunburn was defined as having experienced reddening of the skin after being in the sun on Saturday or Sunday of the weekend just passed. Further details of time spent outdoors are presented in section 5.1.

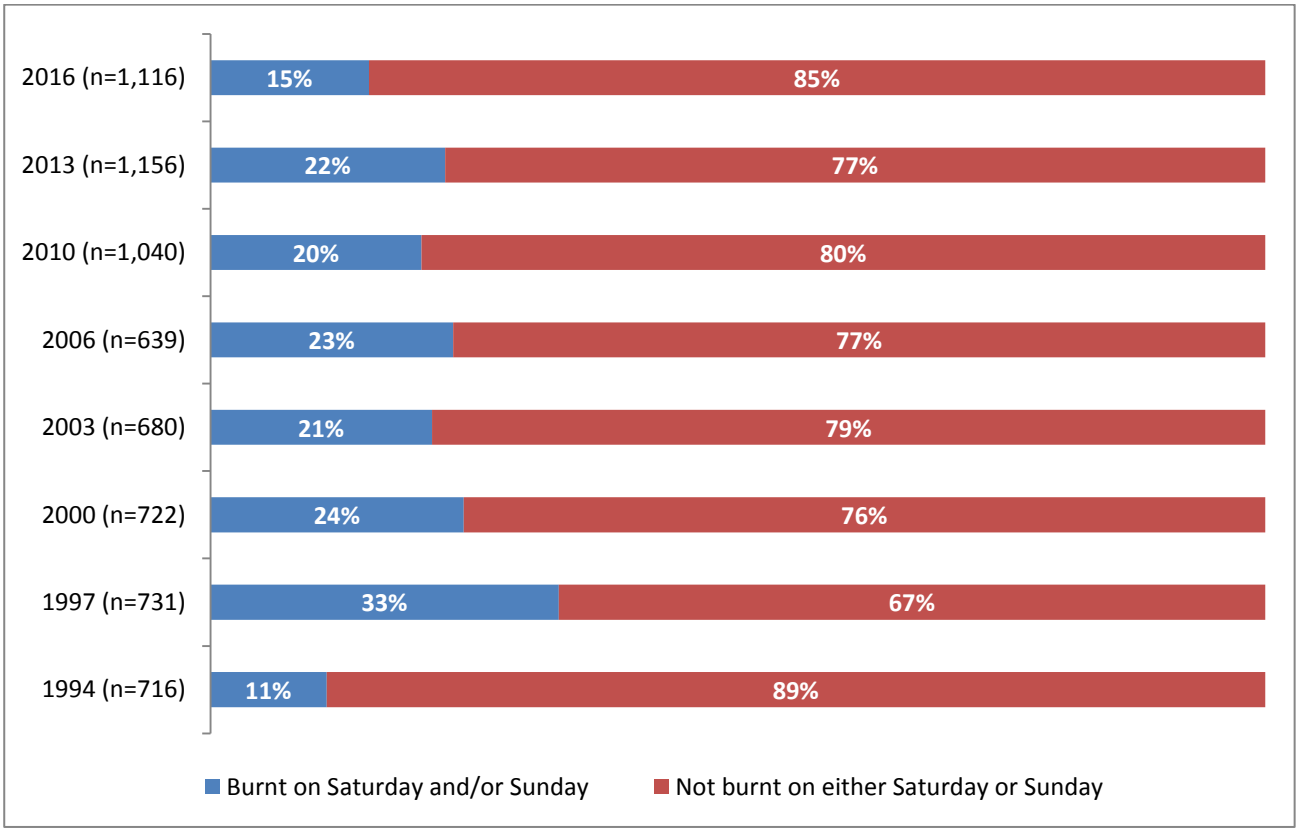
2016

In 2016, around one in six respondents (15%) reported that they had been sunburnt on either Saturday or Sunday of the previous weekend (see Figure 4-5).

Time Series

In 2016, respondents (15%) were less likely to report they had been sunburnt on the previous weekend in comparison to 1997 (33%), 2000 (24%), 2006 (23%) or 2013 (22%). Although the 2013 survey showed the trend in reported sunburn was relatively stable since the first survey in 1994, the 2016 findings now show the beginning of a general decreasing trend in sunburn prevalence (see Figure 4-5).

Figure 4-5: Sunburn during previous weekend, age-standardised proportions, 1994 to 2016



Base: outdoors during previous weekend

4.5.1 Reasons for Sunburn

All respondents who reported getting sunburnt were asked to identify the main reason they got sunburnt. The question was asked “Other than the fact that you were outdoors and exposed to the sun, what was the other main reason you got sunburnt?” Participants had 11 choices included “trying to get a sun tan”, “forgot to protect”, “didn’t think needed to protect” and “other” (specify). This question was asked for the first time in 2013.

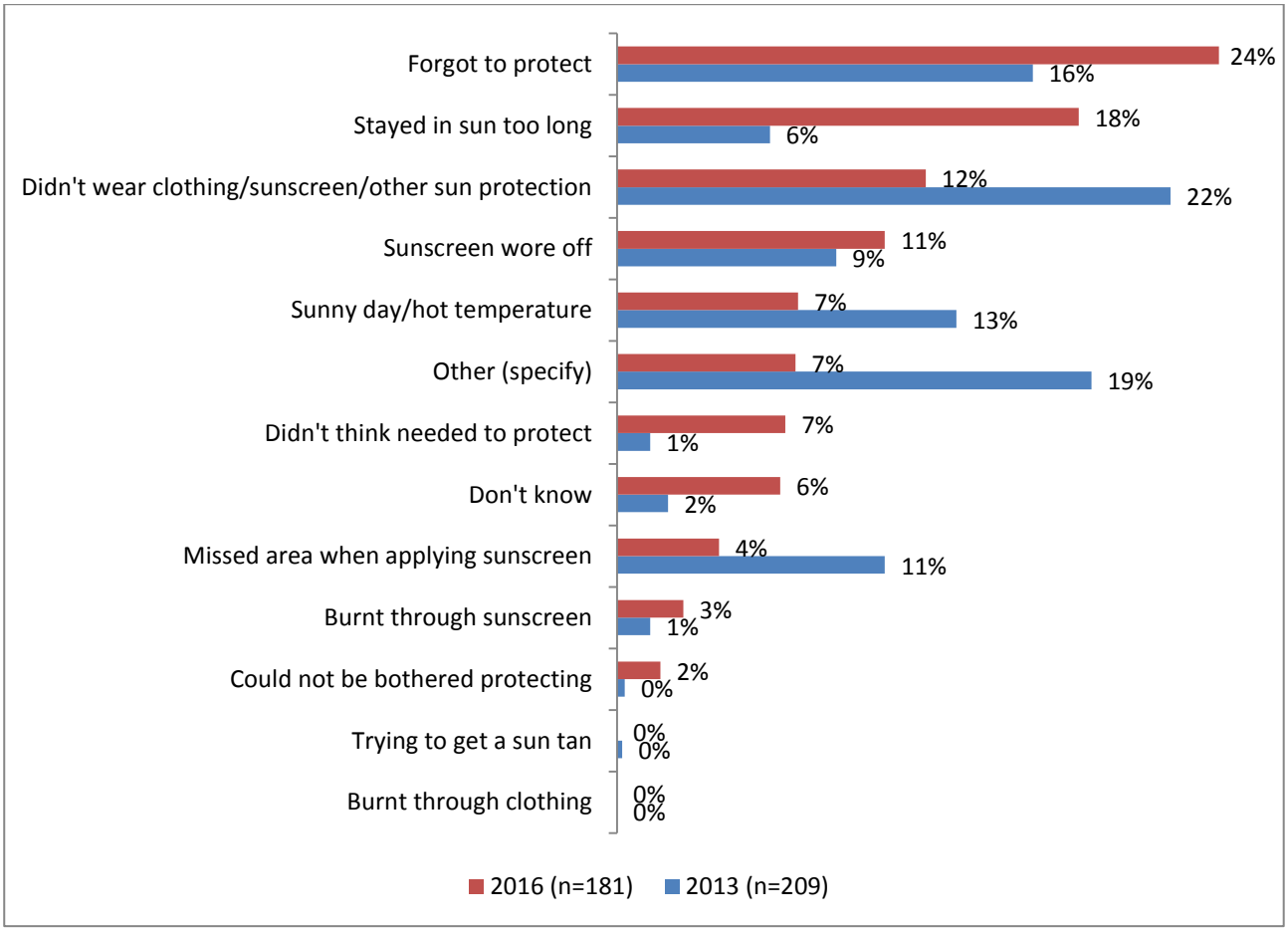
2016

Almost a quarter of respondents (24%) reported that they *forgot to protect themselves* from sunburn. Nearly one in five respondents (18%) *stayed in the sun for too long*, one in eight respondents (12%) simply did not have anything to cover their skin (such as clothing, sunscreen or other sun protection), and one in 10 (11%) were wearing sunscreen that wore off.

Time series

In 2016, respondents were more likely to say they *didn’t think they needed to protect* or they *stayed in the sun too long* than in 2013 (see Figure 4-6).

Figure 4-6: Perception of main reason for getting sunburnt, age-standardised proportions, 2013 and 2016



Base: sunburnt during previous weekend

4.5.2 Parts of the Body Sunburnt

Respondents who had been sunburnt on either or both days of the previous weekend were asked to identify which parts of their body were sunburnt.

2016

In 2016, the body parts identified as the most likely parts to have been sunburnt were the shoulders or nose. Just over four in 10 respondents (41%) reported having their shoulders or nose sunburnt. Other body parts that at least two out of 10 respondents reported as having been sunburnt were the face (39%), the neck (33%), the arms below the elbows (28%), arms above the elbows (24%) and the chest (20%) (see Table 4-1).

Time series

In 2016, respondents (28%) were less likely to have been sunburnt on the arms below elbows than in 2013 (48%). In addition, the 2016 survey showed there were no other body parts that had a significant decrease in the rate of sunburn compared to other years (see Table 4-1).

In 2016, respondents (33%) were more likely to have been sunburnt on the neck than in 2003 (18%). A higher rate of sunburn on the shoulders was observed in 2016 (41%) compared to 1994 (14%) and 1997 (11%). Participants were more likely to report that they had been sunburnt on the nose in 2016 (41%) than in 1994 (12%), 1997 (22%), 2000 (22%), 2003 (17%) and 2006 (16%). Similar patterns were observed among respondents who reported being sunburnt on the chest – in 2016 respondents (20%) were more likely to have been sunburnt on the chest than in 1994 (6%), 1997 (3%) and 2003 (6%). However, in 2016 there were no other body parts that had a significant increase in the rate of sunburn compared to other years.

Table 4-1: Areas of the body sunburnt, age-standardised proportions, 1994 to 2016

	1994	1997	2000	2003	2006	2010	2013	2016
Shoulder	14	11	24	32	34	31	47	41
Nose	12	22	22	17	16	30	30	41
Face	33	28	33	30	32	40	42	39
Neck	23	31	25	18	37	33	38	33
Arms - below elbows	-	24	37	31	26	37	48	28
Arms - above elbows	-	23	19	24	20	27	39	24
Chest	6	3	9	6	14	18	23	20
Back	11	15	11	20	22	15	24	19
Legs - below knees	-	13	17	13	15	16	27	18
Legs - above knees	-	10	7	6	11	8	25	12
Ears	1	10	7	4	6	10	19	10
Feet	3	5	20	3	6	9	19	10
Hands	-	11	8	7	4	12	9	9
Scalp	-	45	6	2	6	8	16	5
Stomach	1	1	4	4	7	8	5	4
Other	-	0	1	-	-	2	-	-
Arms	28	-	-	-	-	-	-	-
Legs	27	-	-	-	-	-	-	-
Head	2	-	-	-	-	-	-	-
Back of knees	1	-	-	-	-	-	-	-
Don't know	-	0	-	1	-	-	1	-
Base: Sunburnt previous weekend (n)	**122**	**177**	**154**	**131**	**139**	**194**	**209**	**181**

Note: - (dash) indicates the question was not asked

5. OUTDOOR ACTIVITY

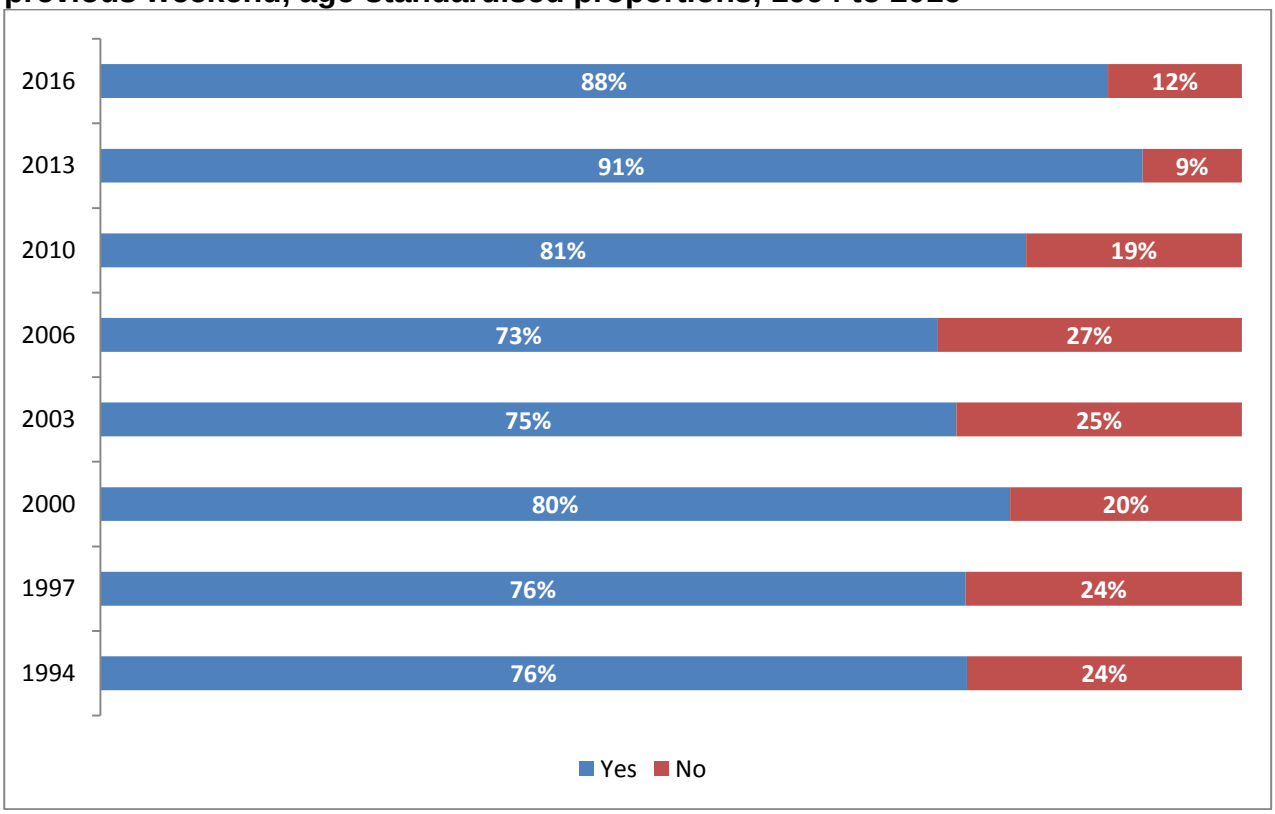
5.1 TIME SPENT OUTDOORS DURING THE PREVIOUS WEEKEND

All respondents were asked whether they had spent at least 15 minutes outdoors on either day of the previous weekend. Being 'outdoors' was defined as not being in a building and not in a covered vehicle. Participants were asked "thinking about last weekend, what day or days did you spend 15 minutes or more outdoors between 10:00am and 4:00pm?" Participants had four response options of "Saturday only", "Sunday only", "both days" and "neither day". One of these options was then chosen to ask about in greater detail (see section 3.5.2 for full details of day selection procedures).

2016

As can be seen in Figure 5-1, in 2016, almost nine out of 10 respondents (88%) reported that they had spent 15 minutes or more outdoors between 10am and 4pm on either Saturday and/or Sunday of the previous weekend.

Figure 5-1: Spent 15 minutes or more outside on either Saturday and/or Sunday of previous weekend, age-standardised proportions, 1994 to 2016



Base: all respondents

Time Series

This is the highest proportion of respondents who reported that they had spent 15 minutes or more outdoors since 1994, except for 2013 when it was 91%. The increase in 2016 was significant compared to all survey years from 1994 to 2010 (where the proportions for these years ranged from 73% to 81%).

Over time, the proportion of respondents who spent 15 minutes or more outside on both days of the weekend has increased from 30% in 1994 to 61% in 2016. The difference in proportions of people spending time outdoors between the 1994 and 2006 surveys and the 2010 and 2016 surveys may, in part, relate to differing sampling methods. From 2010 onwards respondents were selected from rural and urban locations around New Zealand, rather than drawing only from New Zealand's five main metropolitan areas (see section 3.4.1 for methodology used in 2016 SES compared to the previous surveys).

5.2 OUTDOOR ACTIVITIES

Respondents who had spent at least 15 minutes outdoors during the previous weekend were asked to describe the activity (such as gardening and walking) that they had spent the most time doing.

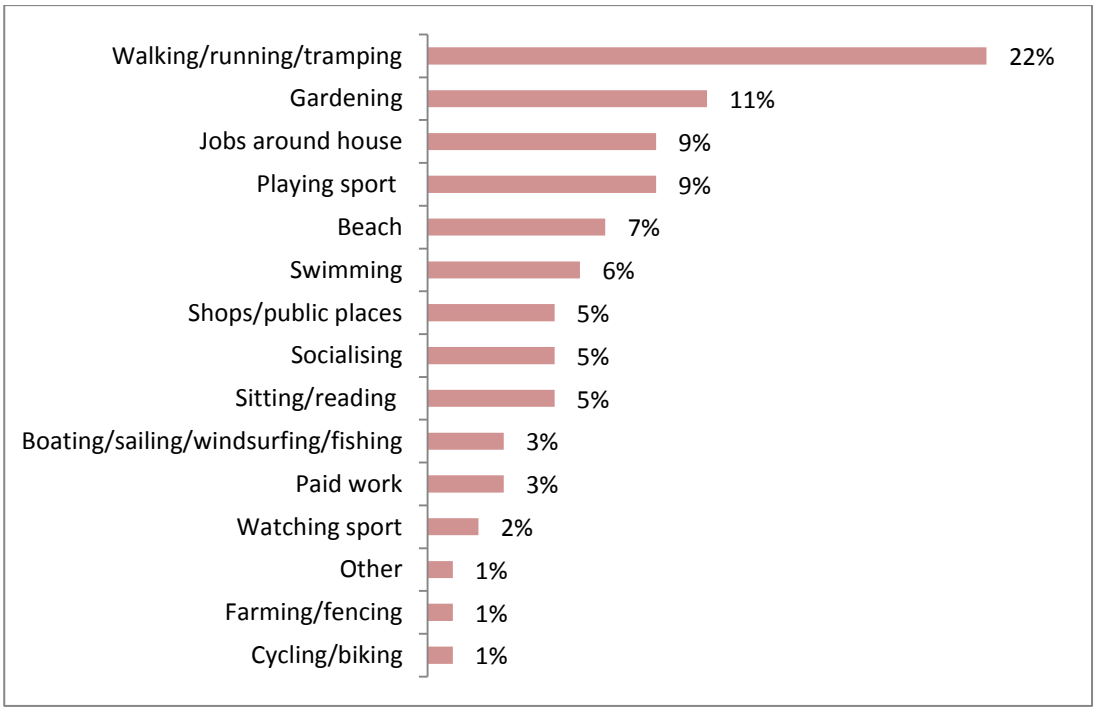
2016

As presented in Figure 5-2, the most popular activities in 2016 were walking/running/tramping, and gardening. Over two out of 10 of respondents (22%) reported participating in walking/running/tramping. One out of 10 reported participating in gardening (11%).

Time Series

The main outdoor activities respondents reported participating in for TSPS and SES surveys from 1994 to 2016 is shown in Table 5-1. In 2016, a significantly lower proportion of respondents reported having participated in gardening (11%) compared to 1994 (25%), 1997 (24%), 2000 (17%), 2006 (17%) and 2010 (16%). This represents a declining trend for this activity.

Figure 5-2: Main outdoor activity participated in during previous weekend, age-standardised proportions, 2016



Base: outdoors during previous weekend: (*n* = 1,116)

Table 5-1: Main outdoor activities participated in during previous weekend, age-standardised proportions, 1994 to 2016

	1994	1997	2000	2003	2006	2010	2013	2016
Walking/running/tramping	14	17	18	18	16	13	24	22
Gardening	25	24	17	14	17	16	11	11
Jobs around house	8	9	11	10	8	11	8	9
Playing sport	7	20	9	11	10	5	7	9
Beach	2	5	4	5	10	8	6	7
Swimming	1	1	2	4	4	3	7	6
Shops/public places	2	-	2	6	3	11	8	5
Socialising	6	2	11	7	10	9	8	5
Sitting/reading	21	6	7	6	7	5	5	5
Boating/sailing/windsurfing/fishing	2	2	5	2	2	5	5	3
Paid work	3	3	3	4	3	4	2	3
Watching sport	3	1	1	4	4	3	1	2
Other	2	8	8	3	4	4	3	1
Farming/fencing	2	2	-	-	1	3	1	1
Cycling/biking	1	-	1	1	2	2	3	1
Don't know	3	-	1	4	-	-	-	-
Base: Outdoors during the previous weekend (n)	**716**	**731**	**722**	**680**	**649**	**1040**	**1156**	**1116**

5.2.1 Water-based Activities

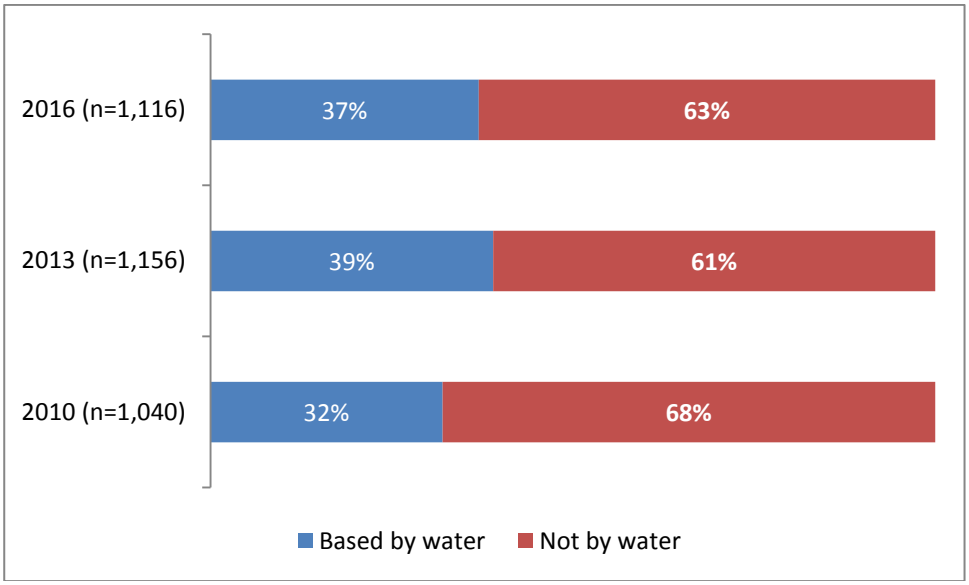
2016

In 2016, respondents who reported taking part in an activity that was not specifically water-based were asked whether their activity was based in or next to water. This was then used to calculate the proportion of respondents who were in, on or around water while they were doing their main activity outside on the previous weekend. As presented in Figure 5-3, over one-third of respondents (37%) reported that they had been based in or next to the water while undertaking their main activity.

Time series

There were no significant differences between 2016 and previous years (2010 or 2013).

Figure 5-3: Participation in activities based in or by water, age-standardised proportions, 2010 to 2016



Base: outdoors during previous weekend

5.2.2 Time Spent Doing Outdoor Activity

Respondents who had spent 15 minutes or more outdoors during the previous weekend were asked how long they had spent outside doing the main activity they mentioned, and the approximate times during the day that they began and finished the outdoor activity.

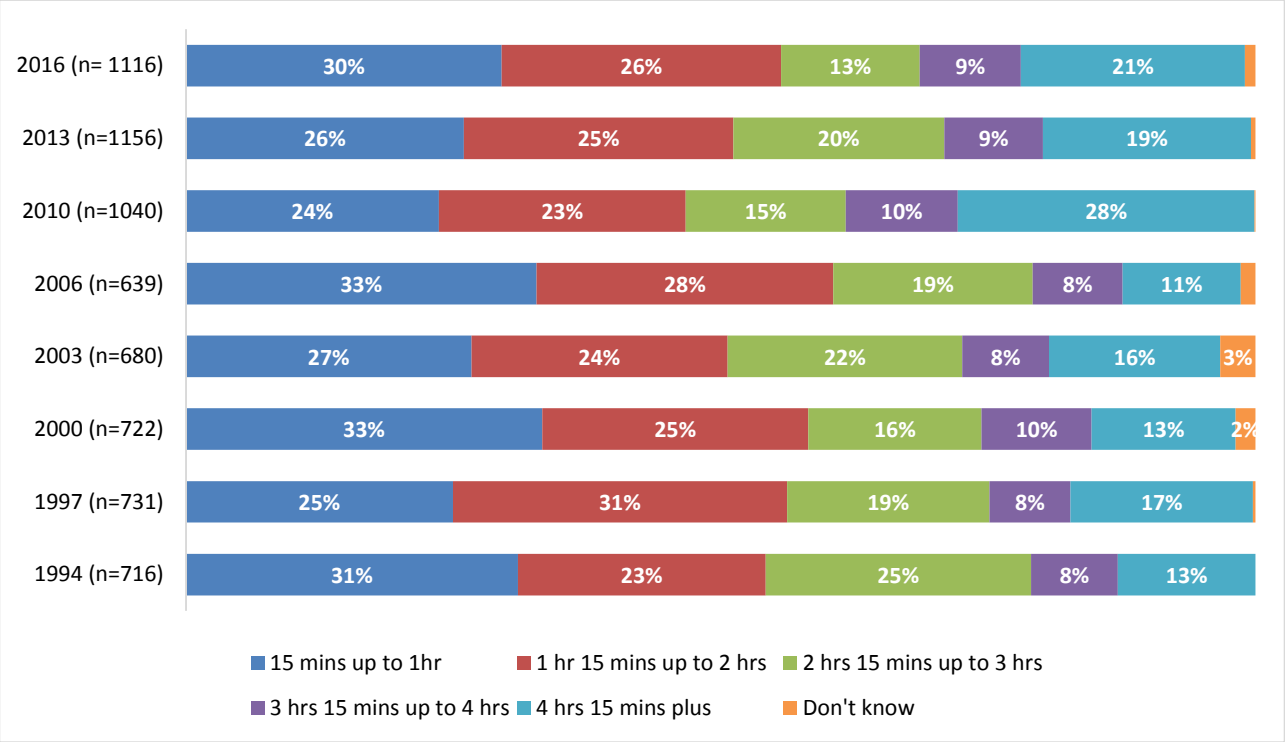
2016

In 2016, Figure 5-4 shows more than half (56%) of respondents reported that they spent two hours or less doing their main activity. Two out of 10 (21%) reported spending more than four hours doing their main activity the previous weekend.

Time series

In 2016, the proportion of respondents spending more than four hours doing their main outdoor activity was significantly higher than in 1994, 2000 and 2006. However, the proportion in 2016 (21%) was significantly lower than in 2010 (28%).

Figure 5-4: Amount of time spent doing outdoor activity during previous weekend, age-standardised proportions, 1994 to 2016



Base: outdoors during previous weekend

5.2.3 Planned Duration of Outdoor Activity

2016

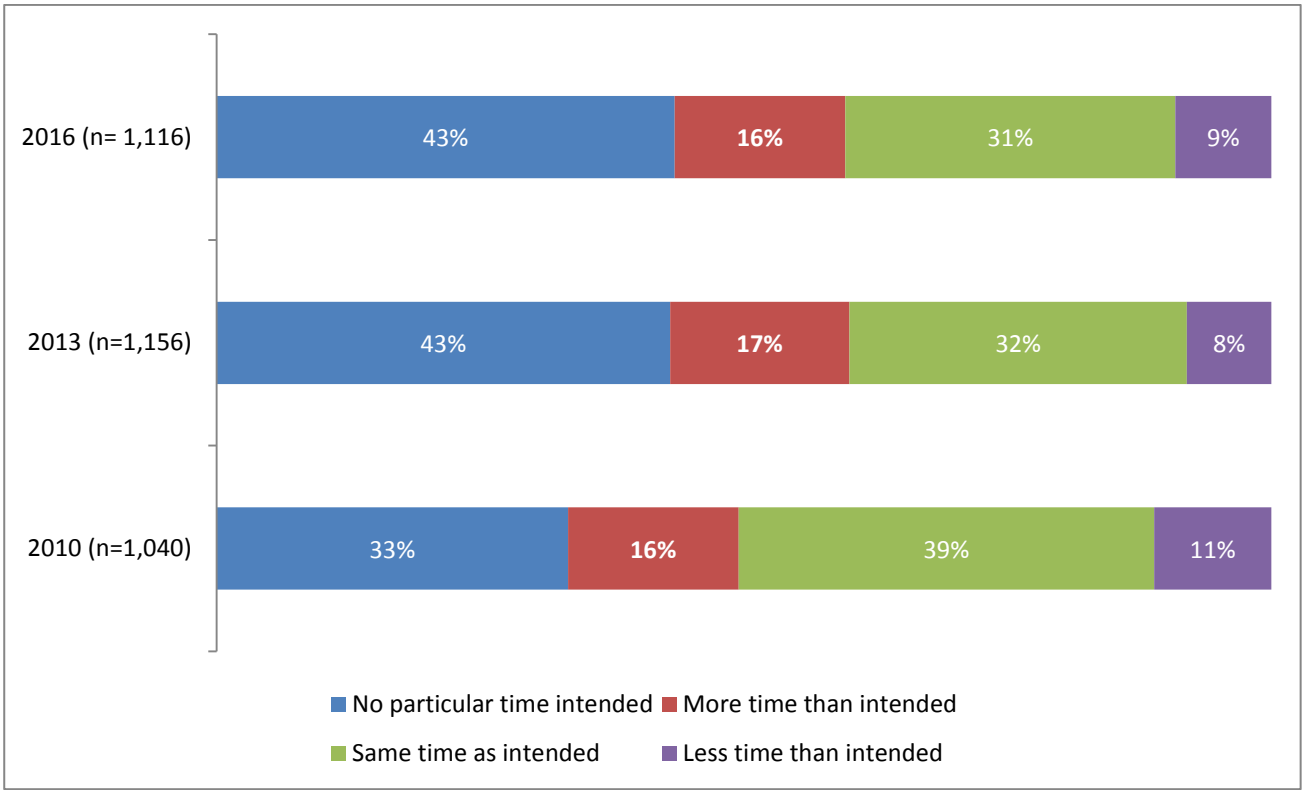
In 2016, respondents who had spent 15 minutes or more outdoors during the previous weekend were asked to consider the amount of time they had spent outdoors on the day compared to the amount of time they had anticipated being outdoors for.

As can be seen in Figure 5-5 one-third of respondents (31%) spent *about the same amount of time outdoors as they intended.* Around four out of 10 (43%) said that they *had not intended any particular time* when they went outside. Under two out of 10 (16%) respondents spent *more time outdoors than they intended*, and only one in 10 (9%) spent *less time outdoors than intended*.

Time series

In 2016, there were significantly fewer respondents (31%) who stated they had spent *about the same amount of time outdoors as they intended* compared to 2010 (39%).

Figure 5-5: Whether time spent outdoors was the amount intended, age-standardised proportions, 2010 to 2016



Base: outdoors during previous weekend

6. SUN PROTECTION BEHAVIOURS

This section presents results and key findings of the sun protection behaviour of participants. It is divided in six sections. The first section presents the findings on how participants prepare to protect themselves from the sun before going outside, including checking the weather conditions and taking sun protection items such as hats, sunglasses and sunscreen with them when going outdoors. The second to fourth sections present information on how participants used sun protection items. This is followed by a section on the use of clothing to cover the body when outdoors. The final section presents information on how participants use shade to protect their body from the sun.

6.1 PREPARATION TO PROTECT FROM THE SUN

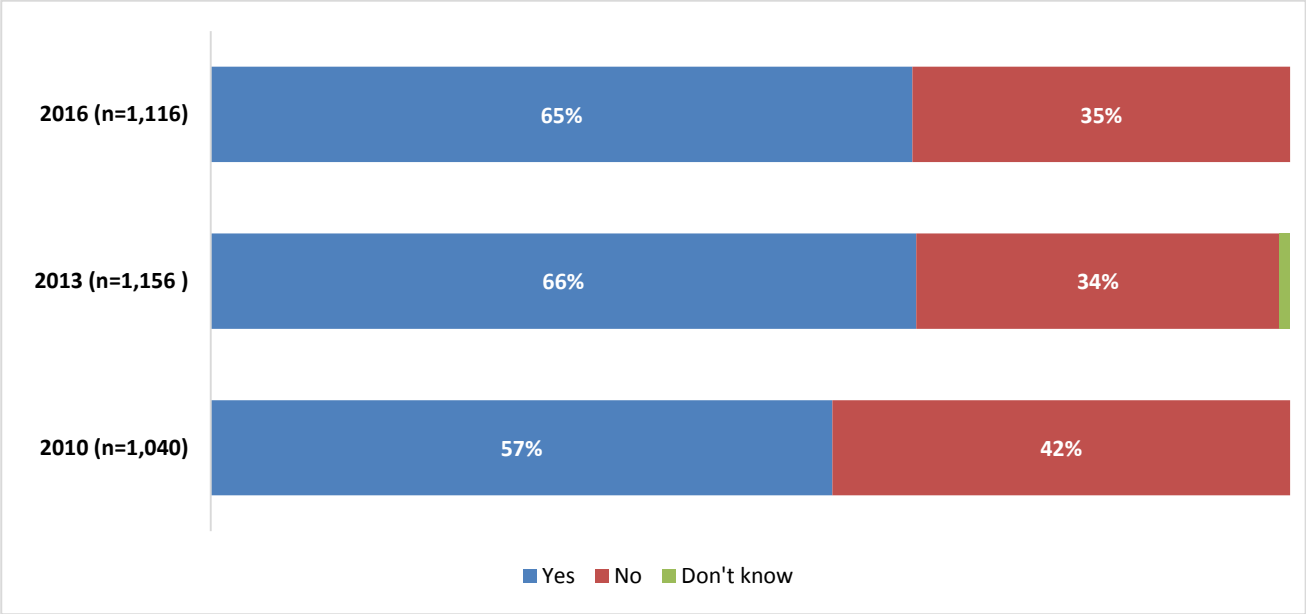
2016

In 2016, respondents who had spent 15 minutes or more outdoors during the previous weekend were asked whether they *had all the things they needed on hand to protect their skin from the sun* on the day in question. Around two-thirds (65%) of respondents reported having all the things on hand that they needed to protect their skin from the sun, while the remaining one-third (35%) of respondents did not.

Time Series

In 2016 there was a significant increase in the proportion of respondents who reported that they everything at hand that they needed to protect their skin from the sun (65%) compared with 2010 (57%), as can be seen in Figure 6-1.

Figure 6-1: Had everything needed at hand to protect their skin from the sun, age-standardised proportions, 2010 to 2016



Base: outdoors previous weekend

6.1.1 Perceptions of the Weather Condition Toward Sunburn

All respondents were asked if the weather on Saturday or Sunday had made them think that they could expect to get sunburnt if they went outside without protecting their skin.

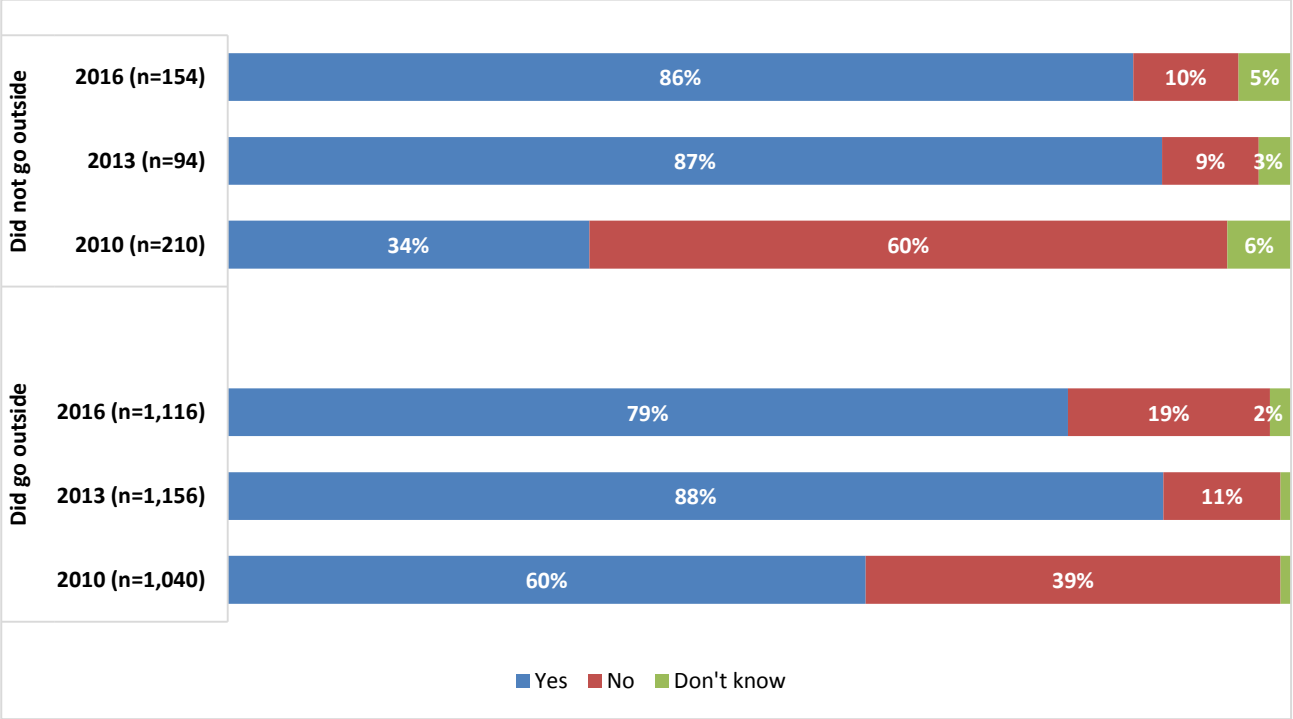
2016

As can be seen in Figure 6-2, of those 2016 respondents who had been outdoors over the weekend, around eight out of 10 (79%) reported that the weather conditions made them think they could get sunburnt. The remaining two out of 10 respondents (19%) said that it did not. Of those who did not go outside at the weekend, almost nine out of 10 (86%) said that the weather conditions made them think they could get sunburnt, while only one in 10 (10%) said it did not.

Time series

In comparison to 2010, there was a significant increase in respondents that did not go outside and thought they could get sunburnt during the previous weekend due to the weather conditions in 2016 (34% versus 86%). For respondents who did go outside during the previous weekend, in 2016 there were significantly more people (79%) who thought they could get sunburnt due to the weather conditions compared to 2010 (60%), but this proportion was significantly lower than in 2013 (88%).

Figure 6-2: Perceived likelihood of sunburn given the weather conditions, age-standardised proportions, 2010 to 2016



Base: previous weekend outdoor status

6.2 HAT USE

All respondents who had spent 15 minutes or more outdoors during the previous weekend were asked whether they were wearing something on their head most of time such as a hat, cap, scarf, visor or helmet.

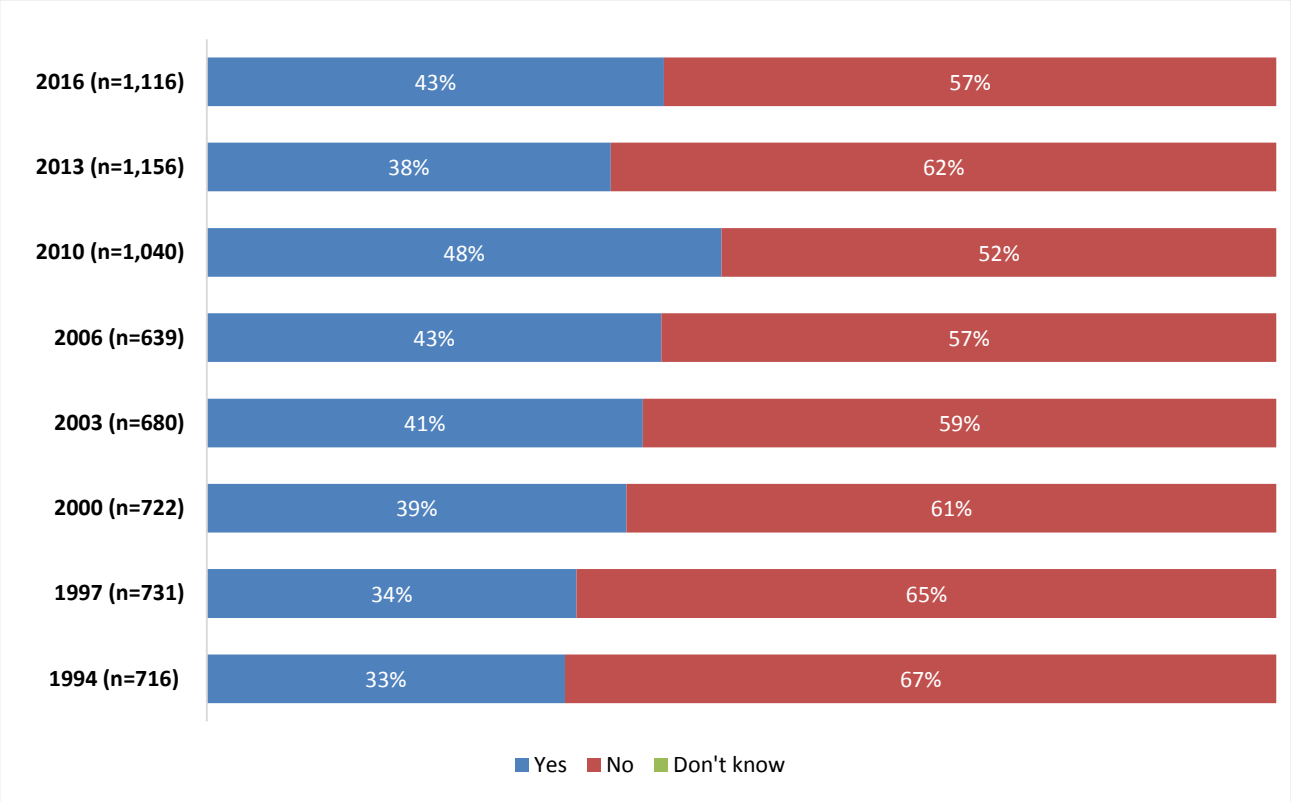
2016

In 2016, around four out of 10 (43%) respondents who had been outdoors reported that they had worn something on their head (see Figure 6-3).

Time Series

There were no significant differences between 2016 and previous years.

Figure 6-3: Use of hat while outdoors during previous weekend, age-standardised proportions, 1994 to 2016



Base: outdoors during previous weekend

6.2.1 Body Parts Covered by Hat

Respondents who reported wearing some form of head covering while they were participating in their main outdoor activity over the previous weekend, were asked to identify the body parts that were protected by the head covering.

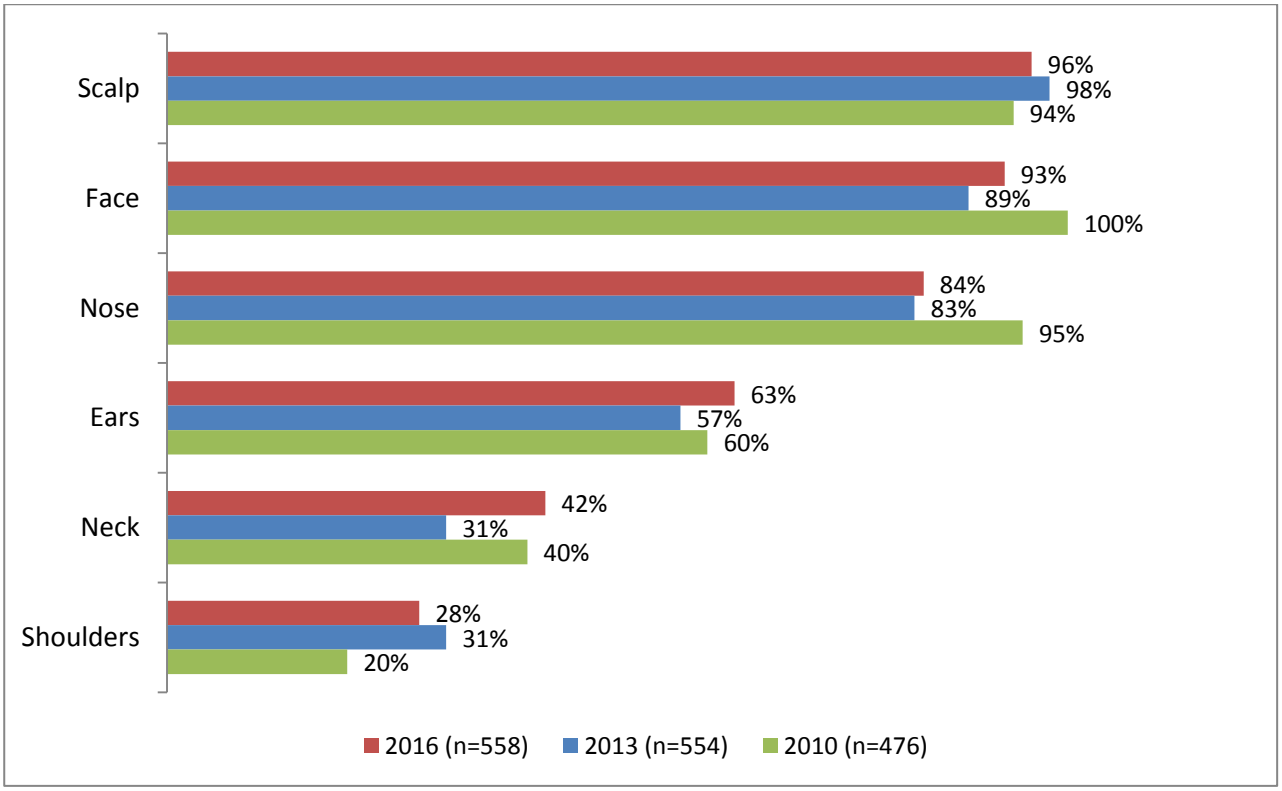
2016

As can be seen in Figure 6-4, almost everyone who wore a hat while outdoors, wore one that covered their scalp (96%) and their face (93%). Over eight in 10 people reported that their hat covered their nose (84%) and for almost two-thirds of people wore a hat that covered their ears (63%).

Time series

In 2016, significantly fewer respondents (84%) reported that their nose was covered by a hat in comparison to 2010 (95%). However, the rates of hat use to cover the shoulders significantly increased from in 2010 to 2016 (20% versus 28%). A possible explanation for this is that the question asked was slightly different in the 2010 survey year – the range of possible responses was expanded from the 2013 survey onwards to include helmets, scarves and visors. In 2016, significantly more respondents reported that their neck (42%) was covered by hats compared to 2013 (31%).

Figure 6-4: Coverage by hats worn while outdoors during previous weekend, 2010 to 2016



Base: wore a hat outdoors during previous weekend

6.3 SUNGLASS USE

Respondents who had spent 15 minutes or more outdoors during the weekend were asked whether they had worn sunglasses most of the time while participating in their main activity.

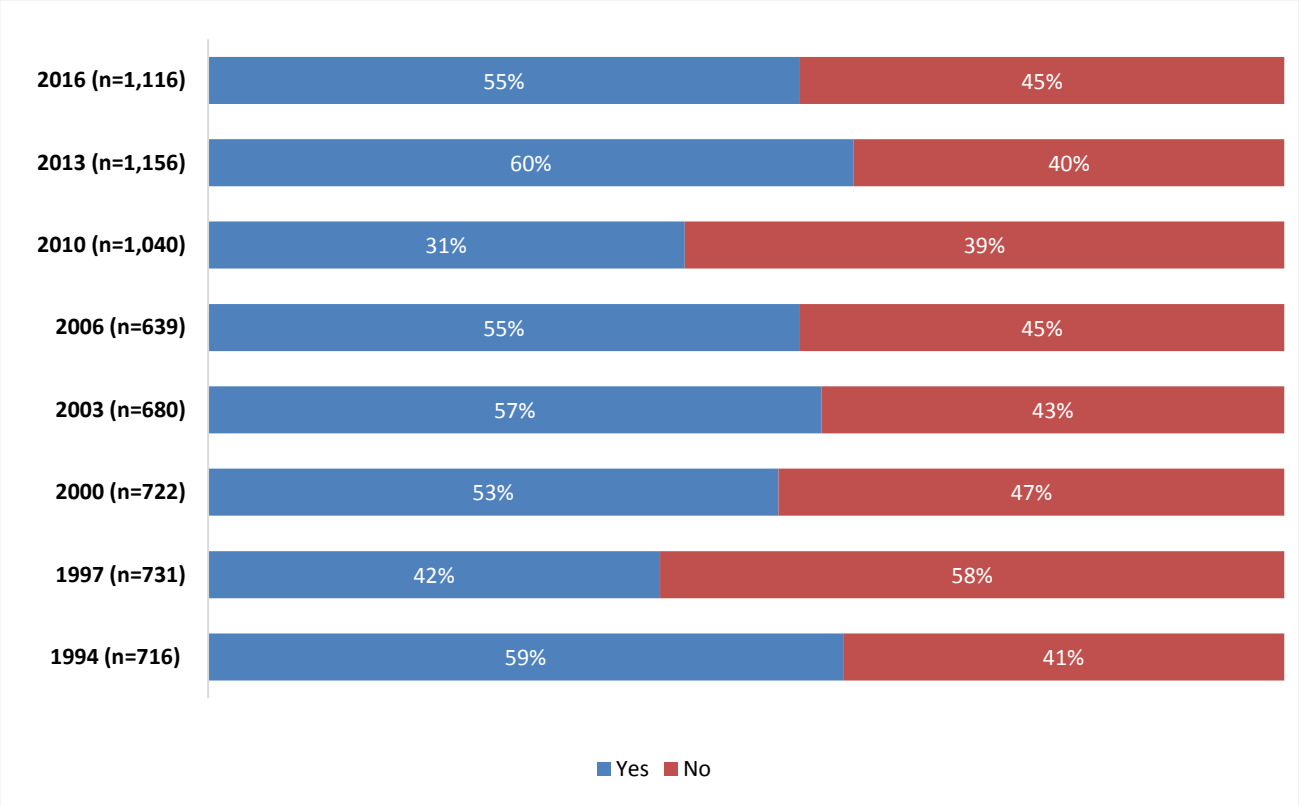
2016

As can be seen in Figure 6-5, in 2016 over half (55%) of respondents who had been outdoors had worn sunglasses.

Time Series

The rate for sunglasses use in 2016 (55%) was significantly higher than in 2010 (31%). The 2016 rate was similar compared to all other survey years.

Figure 6-5: Wearing of sunglasses while outdoors during previous weekend, age-standardised proportions, 1994 to 2016



Base: outdoors during previous weekend

6.4 SUNSCREEN USE

All respondents who had spent at least 15 minutes outdoors during the previous weekend were asked to identify which parts of their body were covered by sunscreen for most of the time while they were participating in their main outdoor activity (see Figure 6-6).

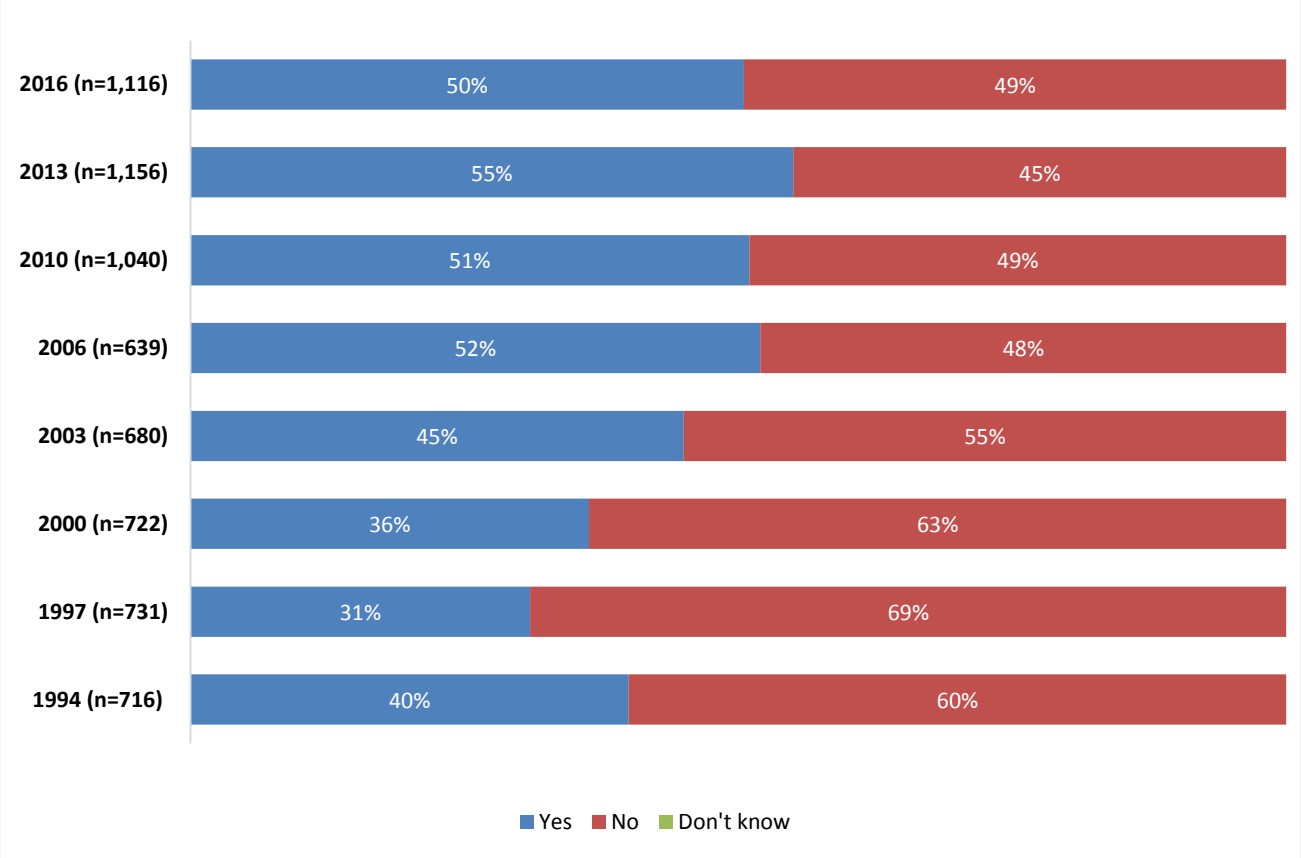
2016

In 2016, one-half of respondents (50%) who had been outdoors for at least 15 minutes reported using sunscreen.

Time Series

The proportion of respondents who reported that they used sunscreen was significantly higher in 2016 compared to 1997 and 2000.

Figure 6-6: Use of sunscreen while outdoors during previous weekend, age-standardised proportions, 1994 to 2016



Base: outdoors during previous weekend

6.4.1 Body parts covered by sunscreen

2016

In 2016 the body parts most likely to be covered by sunscreen by the people who were wearing it were the face and nose, for almost all of the respondents (96%). The next most likely areas to

apply sunscreen were the neck (87%), arms below the elbows (69%), the ears (65%), and the hands (59%) (see Table 6-1).

Time series

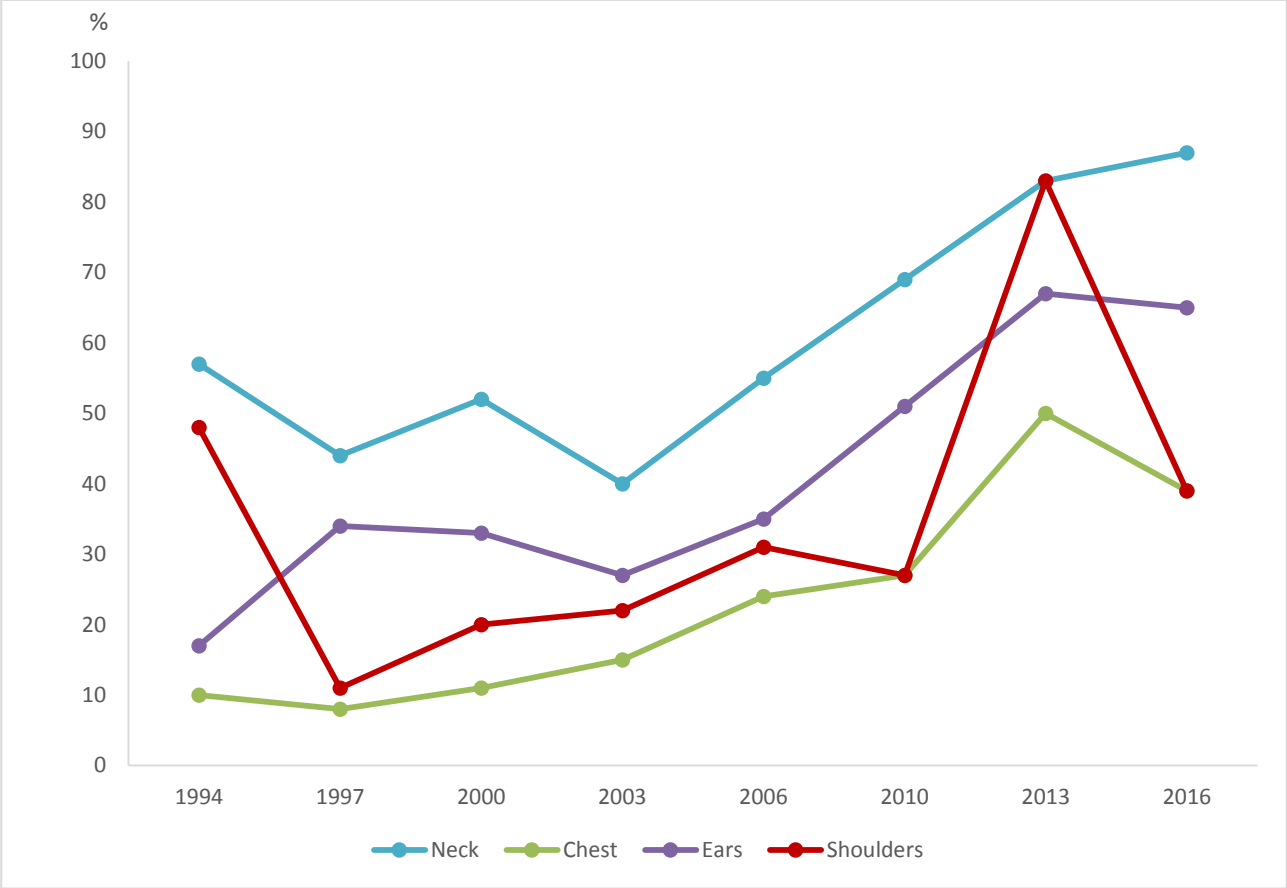
In 2016 significantly more respondents reported that they had applied sunscreen to every body part listed in comparison to 1997. There have not been many significant changes since 2013, although the rates of applying sunscreen to the shoulders and the feet have decreased. The time trends showing sunscreen application for the five body parts that had the biggest rate changes since 1997 is also depicted in Figure 6-7.

Table 6-1: Body parts covered by sunscreen while outdoors during previous weekend, age-standardised proportions, 1994 to 2016

	1994	1997	2000	2003	2006	2010	2013	2016
Face	46	87	88	91	87	92	95	96
Nose	48	90	90	92	89	80	94	96
Neck	57	44	52	40	55	69	83	87
Arms - below elbows	-	55	49	39	60	63	74	69
Ears	17	34	33	27	35	51	67	65
Hands	15	39	32	22	38	45	63	59
Arms - above elbows	-	21	31	26	42	39	63	54
Legs - below knees	-	36	31	28	40	39	48	48
Shoulders	48	11	20	22	31	27	83	39
Chest	10	8	11	15	24	27	50	39
Feet	9	16	10	14	17	24	52	28
Legs - above knees	-	17	19	12	18	18	34	28
Back	10	5	11	15	18	20	27	22
Stomach	8	5	5	11	9	12	18	15
Scalp	-	7	6	8	8	9	19	15
Base: Wore sunscreen (n)	**240**	**282**	**273**	**295**	**325**	**557**	**644**	**615**

- (dash) indicates that the data is not available

Figure 6-7: Body parts covered by sunscreen while outdoors during previous weekend, age-standardised proportions, 1994 to 2016



Base: wore sunscreen
Note: only the body parts with the largest change in sunscreen application between 1997 and 2016 are shown

6.4.2 Reapplication of sunscreen

Respondents who had worn sunscreen while they were outdoors during the previous weekend were asked how many times they applied sunscreen during the day in question.

2016

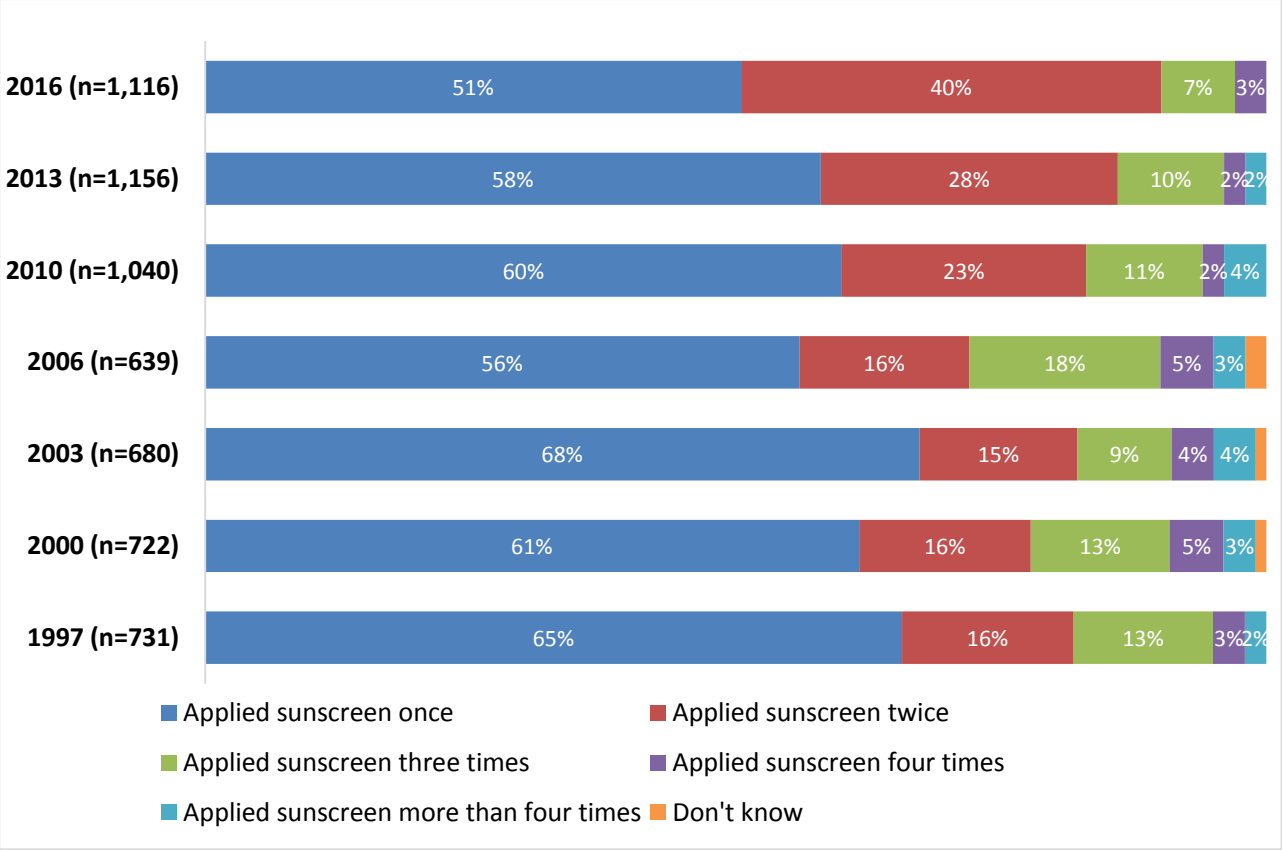
In 2016, as shown in Figure 6-8, around half (51%) of respondents who used sunscreen had applied sunscreen once, while four in 10 respondents (40%) applied it twice. Smaller proportions applied sunscreen three times (7%) or four times (3%).

Time series

Between 1997 and 2006 respondents were asked “how many times did you apply sunscreen during the day?” This question was altered in 2010 to form a single question asking about the overall number of times sunscreen was applied when they were outside. The proportion of respondents who reported applying sunscreen only once in 2016 was significantly lower than in 1997, 2000, 2003 and 2010. This was because of the significant increase in 2016 in the number of respondents who applied sunscreen twice compared to all the previous survey years. In 2006, there were significantly more respondents who applied sunscreen three times than in 2016. There

was no significant change in the number of respondents who reported applying sunscreen four or more times.

Figure 6-8: Number of times sunscreen applied, age-standardised proportions, 1997 to 2016



Base: wore sunscreen

6.5 USE OF CLOTHING TO COVER UP

Respondents who had spent 15 minutes or more outdoors during the previous weekend were asked which parts of their body were covered or shaded by clothing (see Table 6-2).

2016

In 2016 at least half of respondents reported that their stomach (92%), back (89%), chest (81%), shoulders (69%), legs above the knees (65%) and feet (55%) had been covered by clothing. The areas that were most commonly left exposed to the sun were the neck, arms below the elbows and the hands.

Time Series

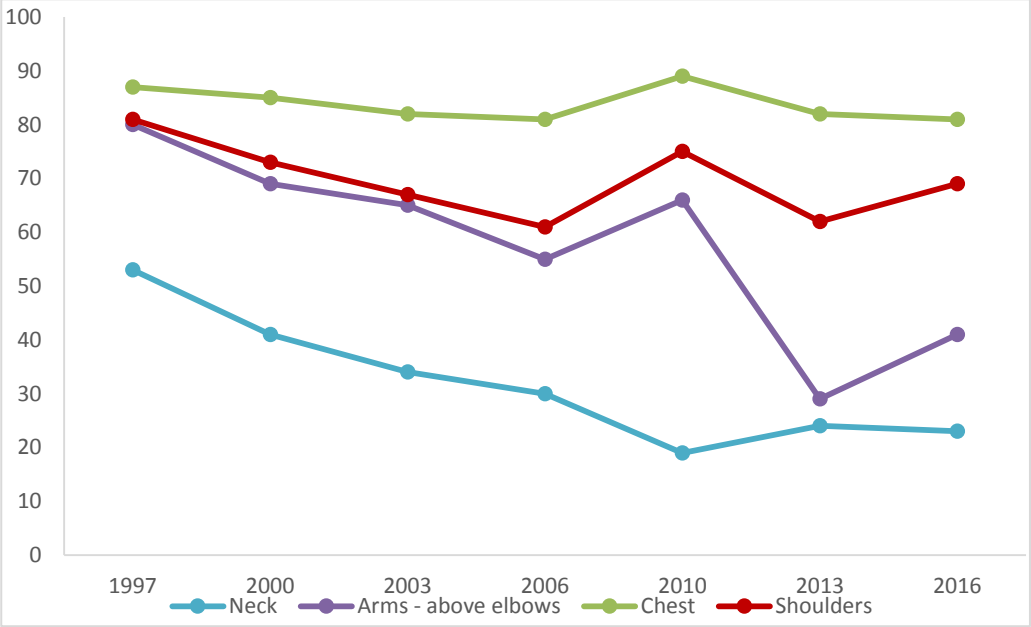
Taking 1997 as a comparison, in 2016 fewer respondents wore clothing on their neck, arms above and below the elbows, legs above and below the knees, and their feet. Compared to the last survey in 2013, more respondents wore clothing on their shoulders, arms above the elbows, and legs above the knees. It should be noted that in 2010, the description of clothing was expanded so

that “clothing” included towels, scarves and covered shoes, but *not* hats. This will account for some difference in responses from 2010 onwards (see Figure 6-9).

Table 6-2: Body parts covered by clothing, age-standardised proportions, 1994 to 2016

	1997	2000	2003	2006	2010	2013	2016
Stomach	91	88	87	87	92	90	92
Back	88	80	80	80	92	88	89
Chest	87	85	82	81	89	82	81
Shoulders	81	73	67	61	75	62	69
Legs - above knees	32	82	78	79	92	55	65
Feet	52	34	37	40	49	48	55
Arms - above elbows	80	69	65	55	66	29	41
Legs - below knees	37	38	40	32	28	21	24
Neck	53	41	34	30	19	24	23
Arms - below elbows	21	20	26	20	16	11	11
Hands	12	9	10	11	7	9	9
Scalp	-	33	32	35	36	-	-
Base: Outdoors during the previous weekend	**731**	**722**	**680**	**649**	**1040**	**1156**	**1116**

Figure 6-9: Body parts covered up by clothing, age-standardised proportions, 1997 to 2016



Base: outdoors during previous weekend
Note: only selected body parts are shown

6.6 USE OF SHADE

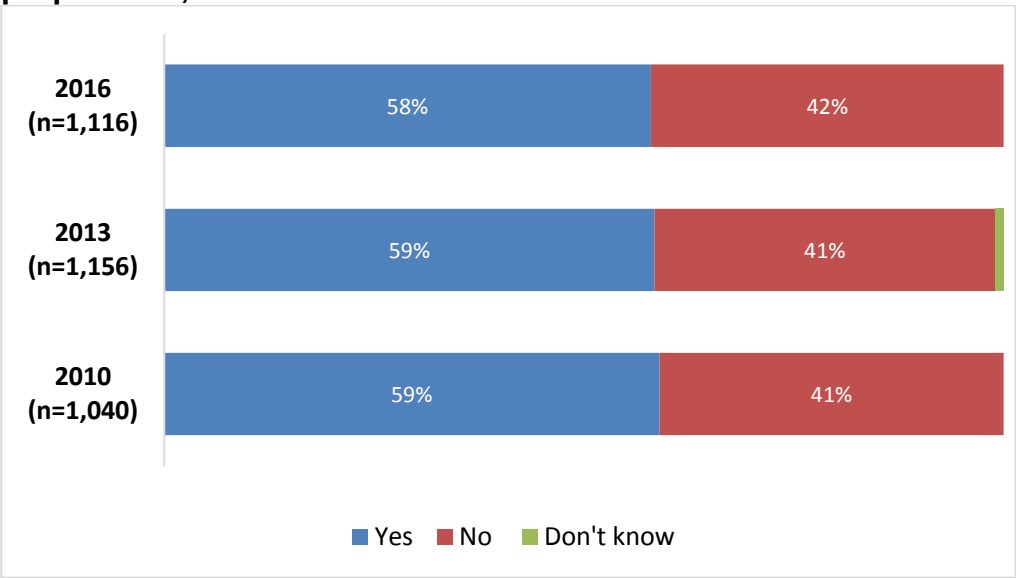
2016

In 2016 respondents who had spent 15 minutes or more outdoors during the previous weekend were asked whether they had stayed out of the sun, or stayed in the shade, at any time while undertaking their main outdoor activity. Almost six out of 10 respondents (58%) said that they had stayed out of the sun or in the shade at some time while they were outside. Around four out of 10 (42%) had not (see Figure 6-10).

Time Series

There was no significant difference in the use of shade between 2016 and the previous years.

Figure 6-10: Use of shade while outdoors during previous weekend, age-standardised proportions, 2010 to 2016

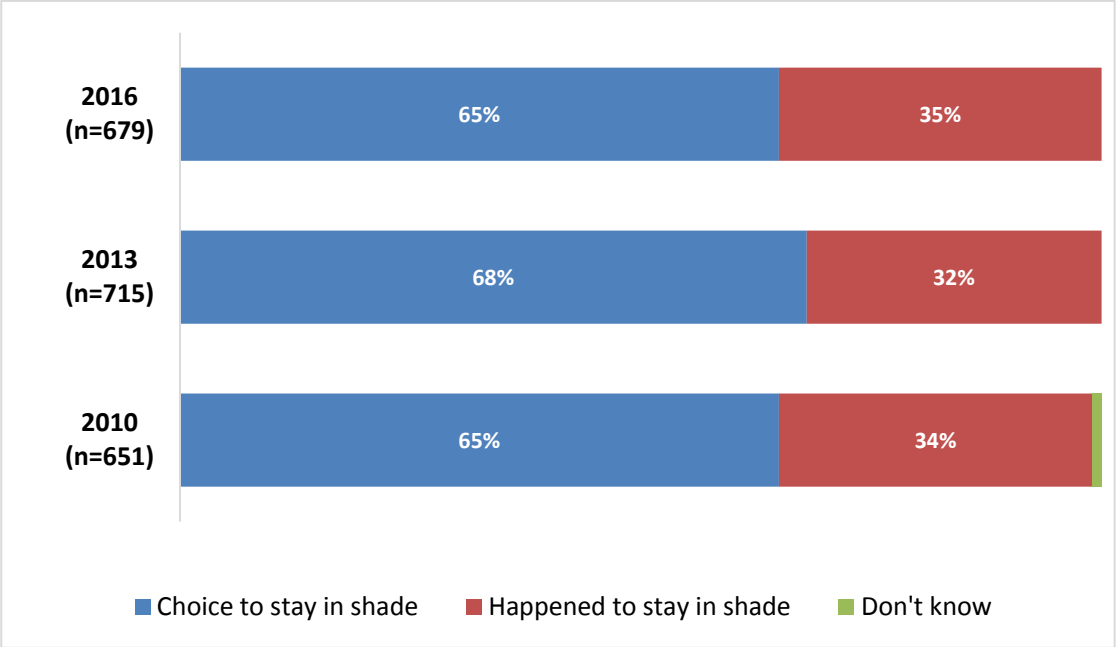


Base: outdoors during previous weekend

6.6.1 Choice to Stay in Shade

Among participants who were outdoors during the previous weekend, those who had stayed in the shade, or out of the sun, were asked whether they had *made a choice to use shade*, or whether it had *just happened*. The majority (65%) of those who had been in the shade reported that they had chosen to stay in the shade and one-third (35%) said they *just happened to be in the shade*. There were no significant differences between 2016 and previous years (see Figure 6-11).

Figure 6-11: Choice to stay in shade while outdoors during previous weekend, age-standardised proportions, 2010 to 2016

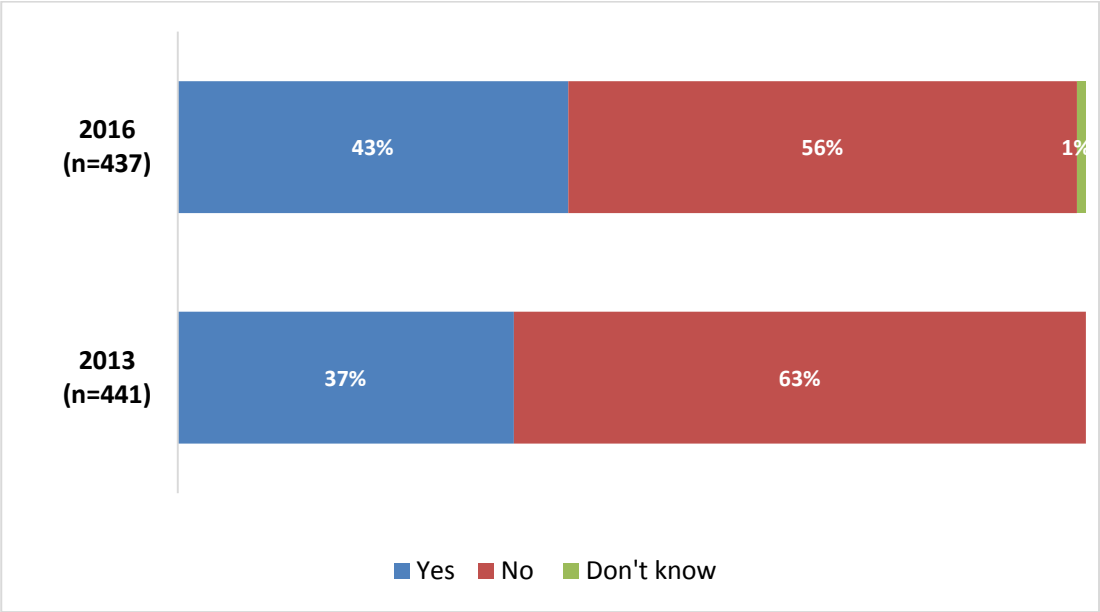


Base: outdoors and stayed in shade during previous weekend

6.6.2 Availability of Shade

In 2016, respondents were asked whether shade was available while they were participating in their main outdoor activity. Four out of 10 (43%) respondents reported that shade was available to them, while six out of 10 (56%) reported that it was not (see Figure 6-12). There were no significant differences between 2016 and 2013.

Figure 6-12: Availability of shade while participating in outdoor activity the previous weekend, age-standardised proportions, 2013 to 2016



Base: respondents who selected did not stay in shade during previous weekend.

7. SUN PROTECTION KNOWLEDGE

This section presents key findings on participants' sun protection knowledge. It is divided into two main sections. The first section presents information on use of the Sun Protection Alert, including checking weather forecasts and action that participants took after checking the forecast. This is followed by a section on participants' agreement on a series of statements about knowledge of skin cancer. The final section presents their perceived risk of skin cancer and also their knowledge of risk factors for skin cancer.

7.1 SUN PROTECTION ALERT

Four questions were used to capture participants' use of the Sun Protection Alert. These were checking forecast ahead of outdoor activities, information used from the weather forecast, source of information such as website and radio, awareness of feature in the weather forecast, and actions taken after received the weather information.

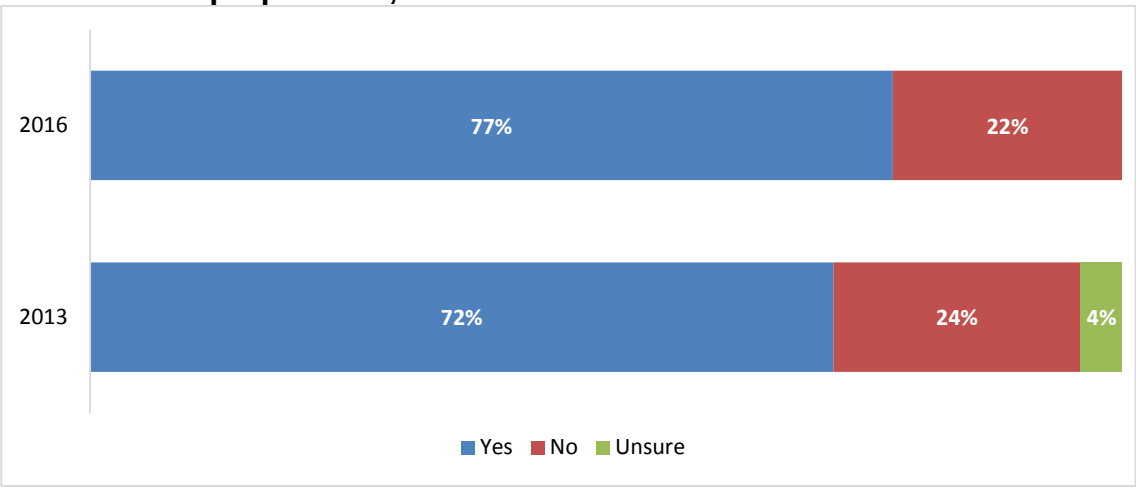
7.1.1 Checking Weather Forecast Ahead of Outdoor Activities

All respondents in 2013 and 2016 were asked about their use of the weather forecast ahead of outdoor activities. The question was asked "Do you typically look at the weather forecast ahead of outdoor activities?" Participants had three options of "yes", "no" and "unsure".

2013 and 2016 comparison

As can be seen in Figure 7-1, in 2016 over three-quarters of respondents (77%) reported looking at the weather forecast ahead of outdoor activities and around two out of 10 (22%) did not. There was no significant difference in checking the weather forecast between 2013 and 2016.

Figure 7-1: Checking of the weather forecast before outdoor activities, age-standardised proportions, 2013 and 2016



Base: all respondents

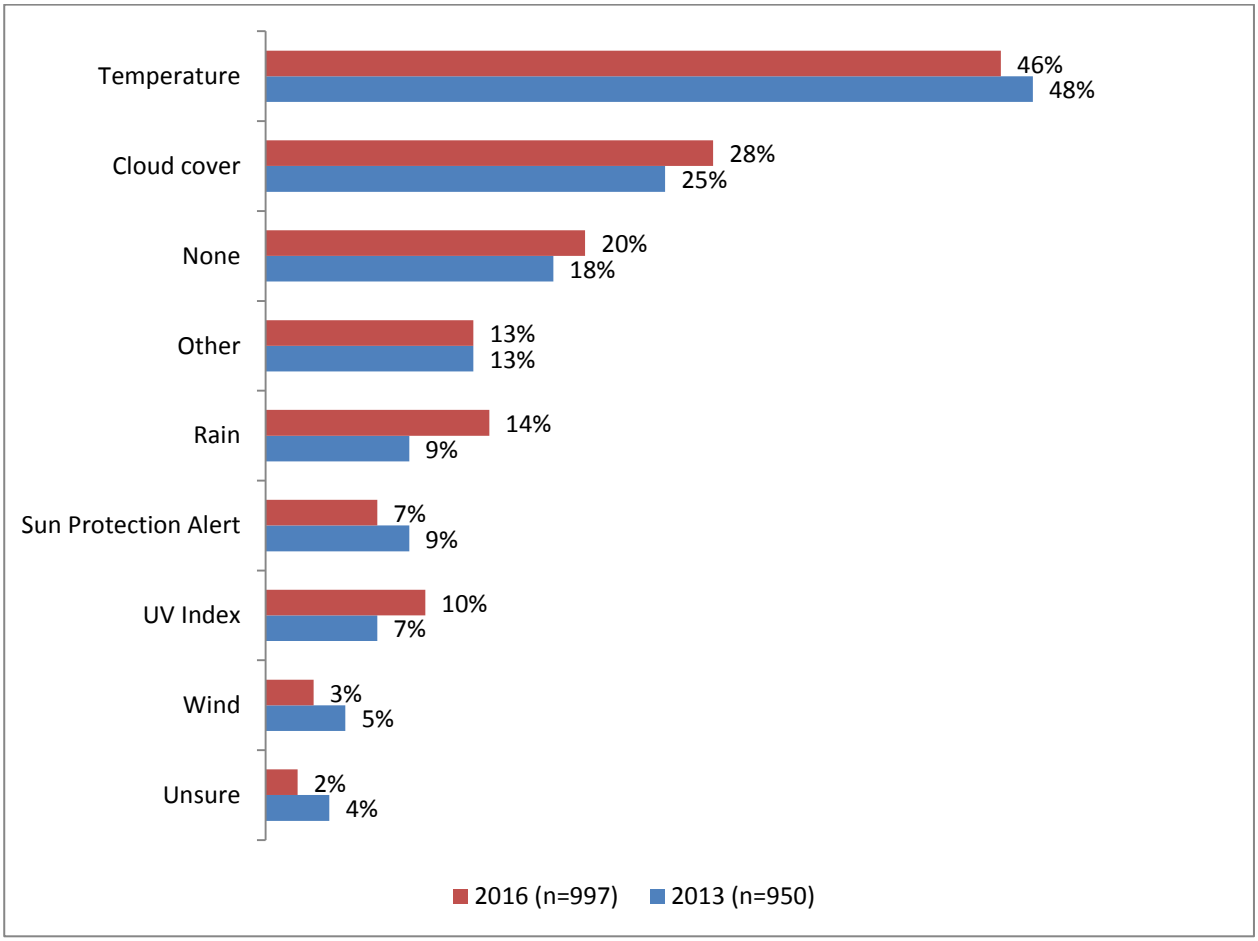
7.1.2 Aspects of Weather Forecast Used for Sun Protection

Respondents were asked to describe the aspects of the weather forecast they used to prompt them about sun protection. Almost half of respondents (46%) referred to “temperature”, three out of ten (28%) to “cloud cover”, and two out of ten (20%) reported that they did not pay attention to any specific aspects of the weather forecast. Fewer respondents referred to “rain” (14%), UV Index (10%) and Sun Protection Alert (7%) (see Figure 7-2).

2013 and 2016 comparison

The only significant difference in the aspects of the weather forecast used for sun protection was the proportion of people using the UV Index, which increased from 7% in 2013 to 10% in 2016.

Figure 7-2: Use of specific information from the weather forecast to prompt about using sun protection, age-standardised proportions, 2013 and 2016

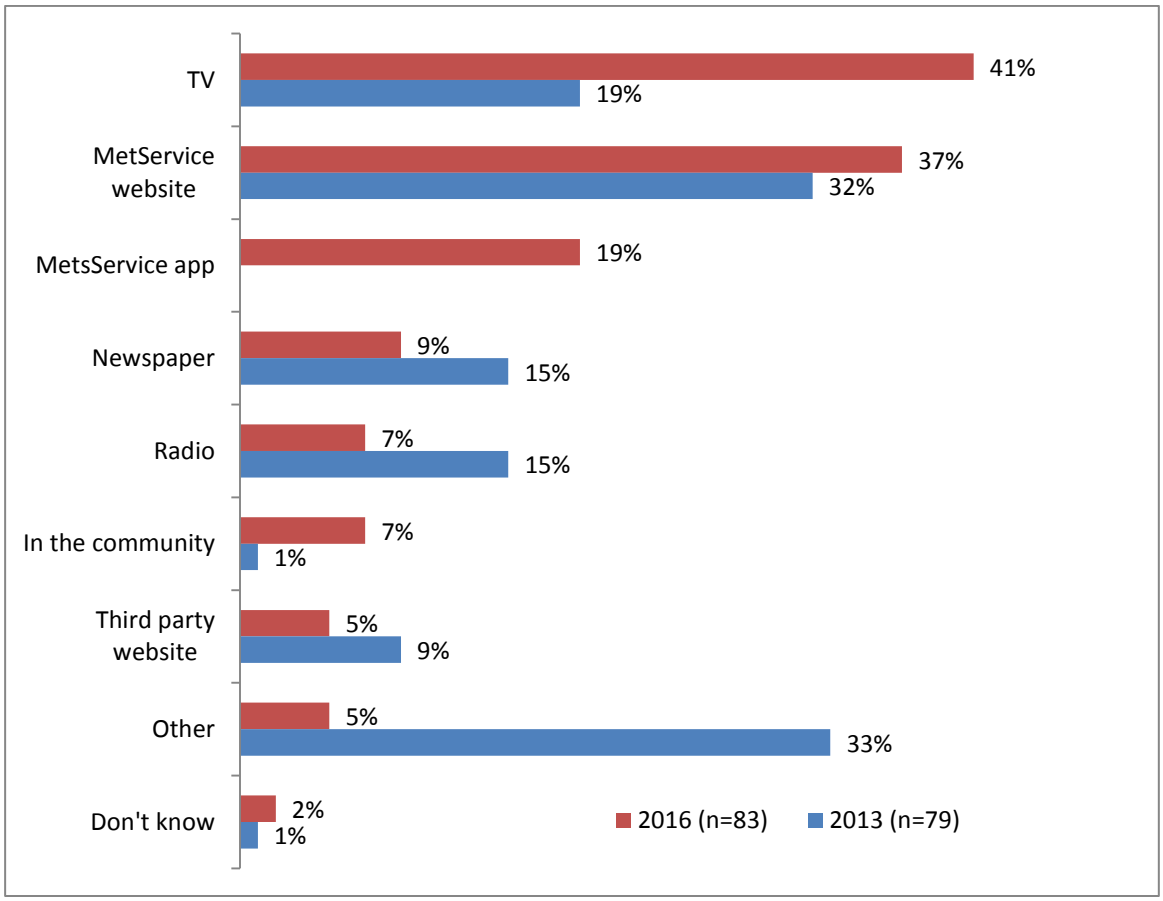


Base: looks at weather forecast ahead of outdoor activity.

7.1.3 Sun Protection Alert and UV Index

As can be seen, those respondents mentioning the Sun Protection Alert and the UV Index were asked to identify where they saw or heard this information (see Figure 7-3). Of those respondents who mentioned the Sun Protection Alert, four in 10 (41%) reported seeing or hearing this on the TV. This was a significant increase from the two in 10 (19%) who reported seeing of hearing about the Sun Protection Alert on TV in 2013. Almost four in 10 respondents saw the Sun Protection Alert on the MetService website (37%). Around two in 10 mentioned the MetService mobile app (19%) and one in 10 (9%) mentioned the newspaper. Far fewer respondents reported seeing the Sun Protection Alert in an "other" place in 2016 (5%) than in 2013 (33%).

Figure 7-3: Source of information on the Sun Protection Alert, age-standardised proportions, 2013 and 2016

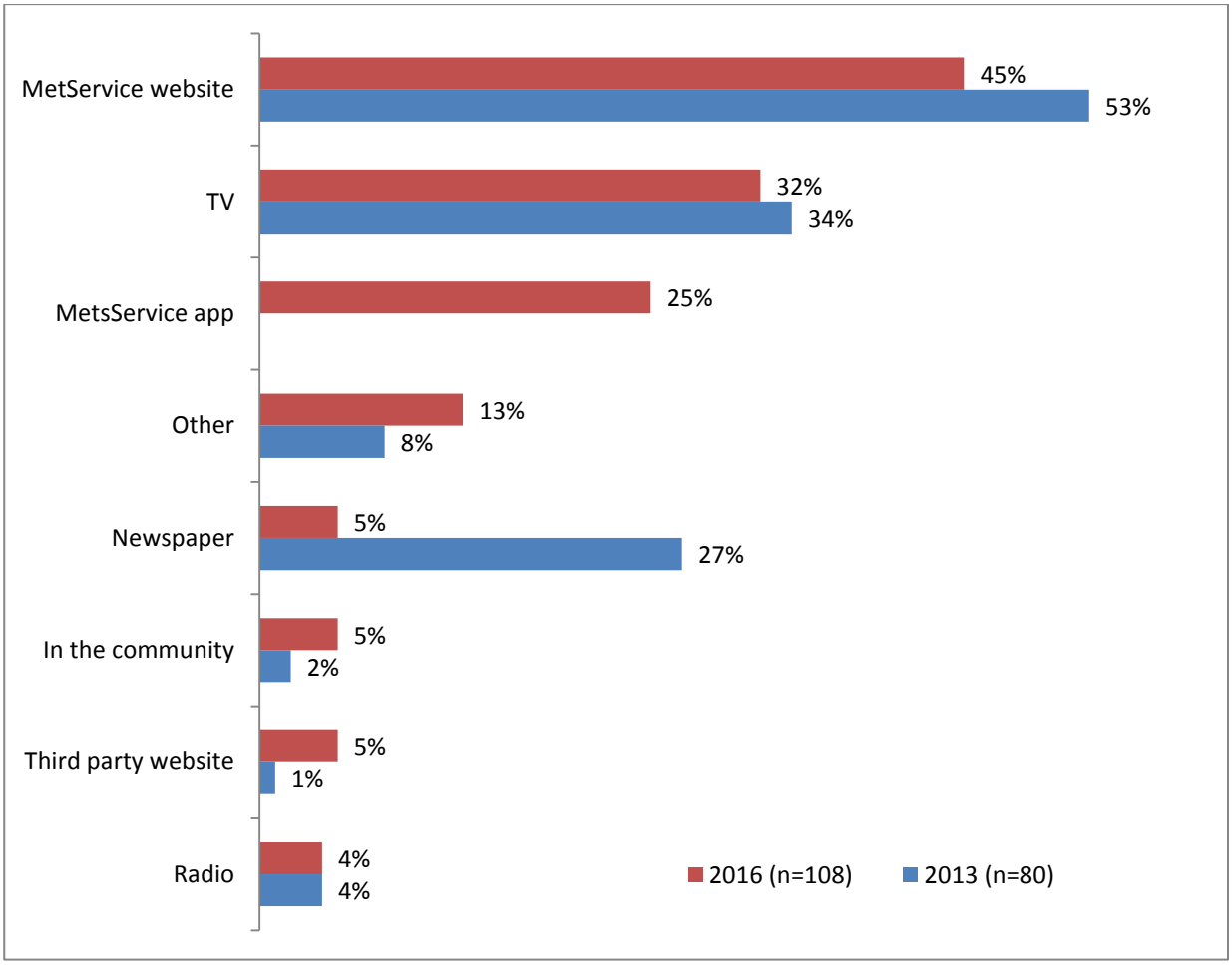


Base: mentioned the Sun Protection Alert

Among those respondents who made reference to the UV Index, just under one-half (45%) had seen or heard this information from the MetService website, while almost one-third (32%) cited the TV as the source of this information and one-quarter (25%) mentioned the MetService mobile app. There was a significant decrease in the proportion of respondents who saw the UV Index in the newspaper – down from more than one-quarter (27%) in 2013 to 5% in 2016 (see Figure 7-4).

The MetService mobile app is a new response category included in the SES since 2013. The Metservice mobile app has proved to be very popular; it is the third most commonly used place to source information on the Sun Protection Alert and the UV Index.

Figure 7-4: Source of information on the UV Index, age-standardised proportions, 2013 and 2016

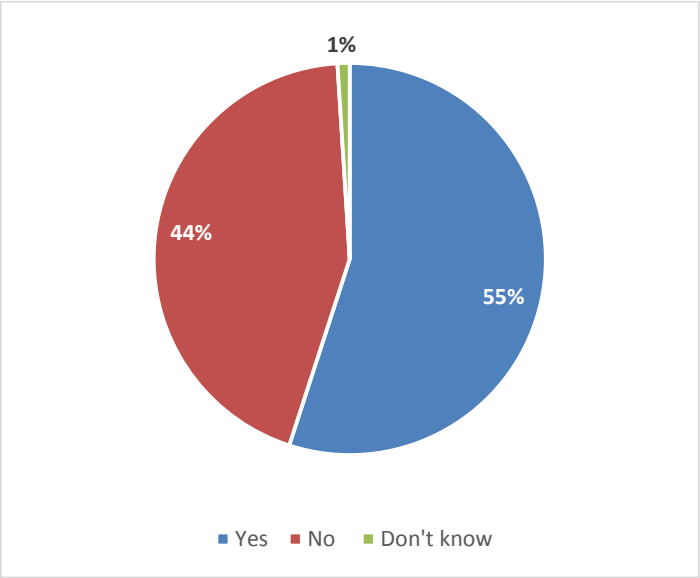


Base: mentioned the UV Index

7.1.4 Weather Forecast and Sun Protection

Respondents were asked whether they had seen a feature in the weather forecast with information on the times of day when sun protection was needed. In 2013, this question was only asked of respondents who did not mention the UV Index or the Sun Protection Alert, whereas in 2016 this question was asked of all respondents. These differences in the groups of people who were asked the question mean that no comparison between 2013 and 2016 could be drawn. In 2016, more than one-half of respondents (55%) reported that they had seen or heard of this feature (see Figure 7-5).

Figure 7-5: Awareness of feature in the weather forecast with information on the times of day when sun protection is needed, age-standardised proportions, 2016



Base: all respondents.

7.1.5 Actions Taken

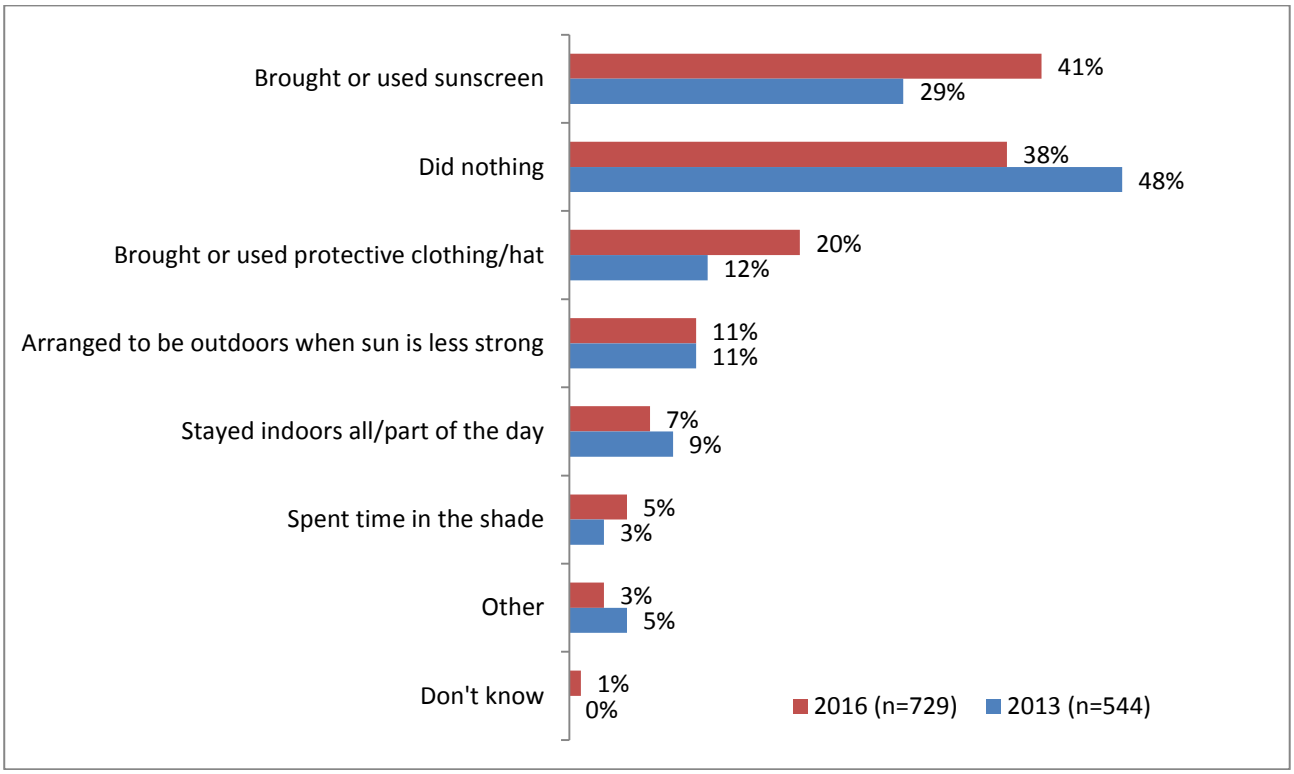
2016

Respondents were asked to describe the actions they had taken (if any) as a result of seeing or hearing information in the weather forecast that prompted them to use sun protection at certain times of the day. Around four out of 10 respondents (41%) reported that they had brought or used sunscreen, but a similar proportion said they did nothing (38%). Two in 10 (20%) reported bringing or using a hat, clothing or sunglasses for additional protection, while one in 10 (11%) reported that they arranged their schedule to be outdoors when the sun was less strong, or stayed indoors all or part of the day (7%).

2013 and 2016 comparison

In 2016, more respondents said that they would bring, or use, protective clothing or a hat (20%) than in 2013 (12%) There was also a significant increase in the proportion of people who reported that they would bring or use sunscreen – up from 29% in 2013 to 41% in 2016 (see Figure 7-6).

Figure 7-6: Actions taken as a result of seeing the times of day when sun protection is needed, age-standardised proportions, 2013 and 2016



Base: respondents who had seen a feature in the weather forecast with information on the times of day when sun protection was needed.

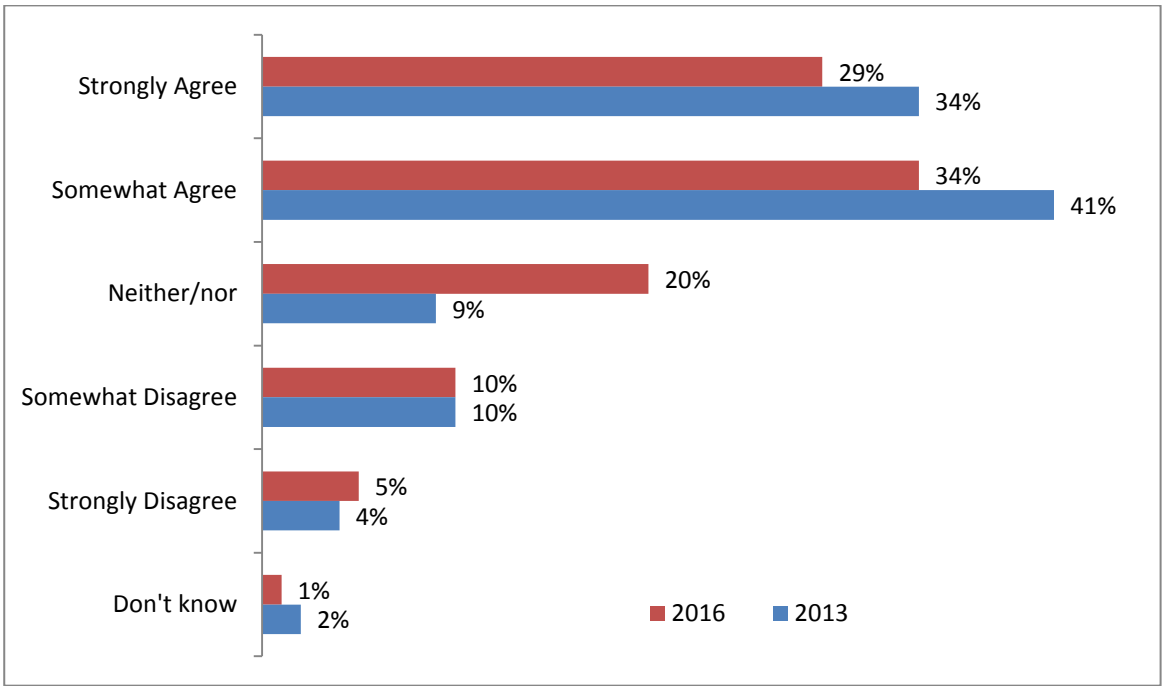
7.2 KNOWLEDGE OF SKIN CANCER AND RISK FACTORS

Since 2013, respondents were asked about their perceptions of risk and knowledge of risk factors for skin cancer, based on their agreement or disagreement with a number of attitudinal statements. All respondents were asked to indicate their agreement with three statements about skin cancer, choosing one of six responses. These statements were “I feel confident that I can protect myself from skin cancer”, “Melanoma can be easily treated by a GP”, “Even if treated, melanoma can lead to loss of life”. Participants rated themselves on 5-point scales from 1 (strongly disagree) to 5 (strongly agree).

“I feel confident that I can protect myself from skin cancer”

As can be seen in Figure 7-7, in 2016 nearly two-thirds (63%) of respondents reported that they agreed with this statement, including around three in 10 who strongly agreed. This was a significant decrease from 2013 when three-quarters of respondents (75%) agreed. Around one in 10 disagreed with the statement (15%) and this was not a significant change from 2013.

Figure 7-7: Agreement with "I feel confident I can protect myself from skin cancer", age-standardised proportions, 2013 and 2016



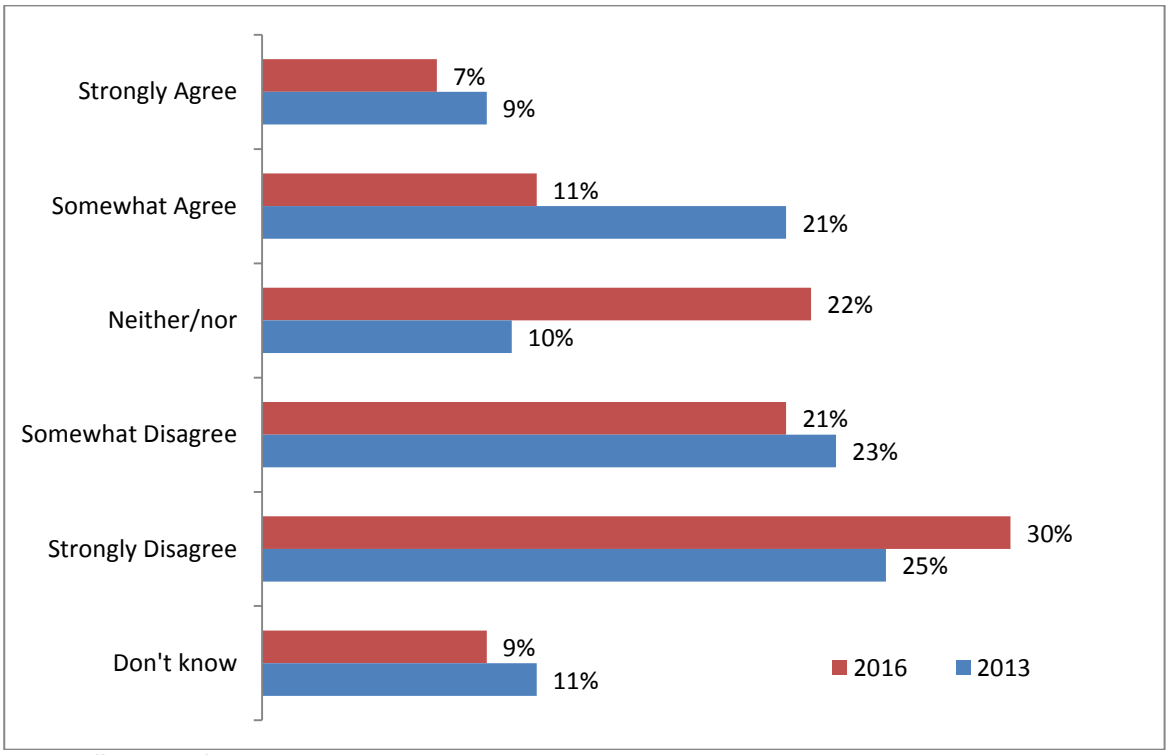
Base: all respondents

"Melanoma can be easily treated by a GP"

In 2016, around two out of 10 respondents (18%) indicated that they agreed with this statement, including around one in 10 (7%) who strongly agreed. This was a significant decrease since 2013 when almost one-third of respondents (30%) agreed.

One-half of all respondents (51%) disagreed, including around three in 10 who strongly disagreed. There was no significant change in the proportion of people who disagreed since 2013. In 2016, around one in 10 participants reported that they did not know whether melanoma could be easily treated by a GP (see Figure 7-8).

Figure 7-8: Agreement with "Melanoma can be easily treated by a GP", age-standardised proportions, 2013 and 2016

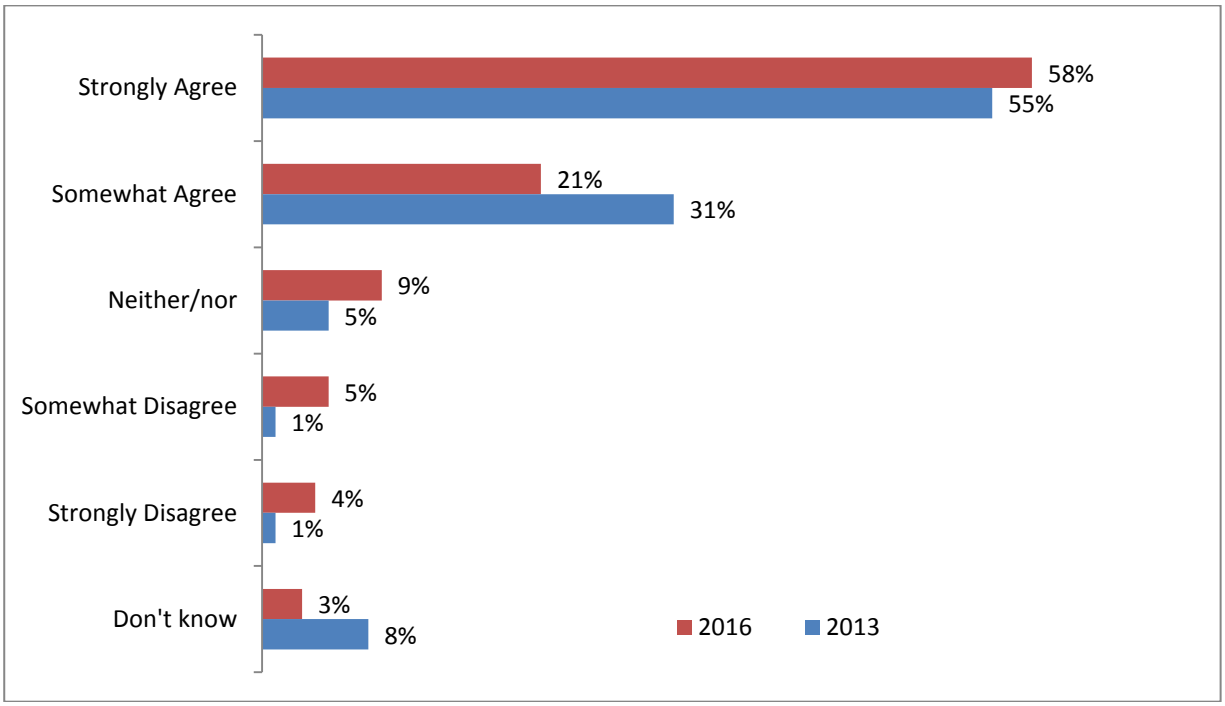


Base: all respondents

"Even if treated, melanoma can lead to loss of life"

In 2016 around eight out of 10 respondents agreed with this statement (79%), including around six out of 10 (58%) who strongly agreed. This was a significant decrease since 2013 when 86% of respondents agreed. Around one in 10 (9%) disagreed with the statement. This was a significant increase since 2013 when only 2% disagreed. In 2016, a very small proportion of respondents (3%) did not know whether they agreed or disagreed with this statement (see Figure 7-9).

Figure 7-9: Agreement with "Even if treated, melanoma can lead to loss of life", age-standardised proportions, 2013 and 2016



Base: all respondents

7.3 SKIN CANCER – INDIVIDUAL RISK PERCEPTION

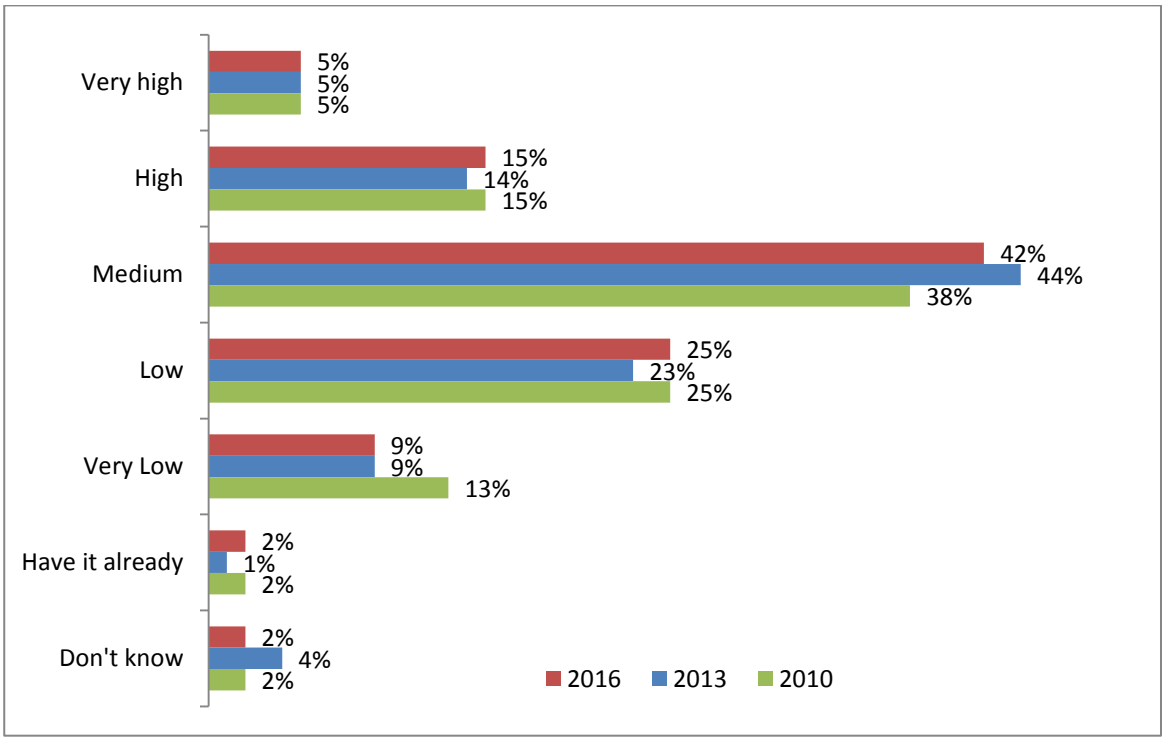
2016

Respondents were asked what they thought their likelihood was of getting skin cancer in the future. In 2016, two out of 10 respondents indicated that they thought they had a high or very high likelihood of getting skin cancer in the future (including 5% who thought their risk was very high). Around four out of 10 respondents (42%) thought they had a medium level risk of getting skin cancer in the future. The chance of getting skin cancer in the future was considered to be low or very low for around one-third of respondents (34%), including 9% who thought their risk was very low (see Figure 7-10).

Time Series

There were no significant changes between 2010 or 2013 compared with 2016.

Figure 7-10: Self-perceived risk of skin cancer, age-standardised proportions, 2010 to 2016



Base: all respondents

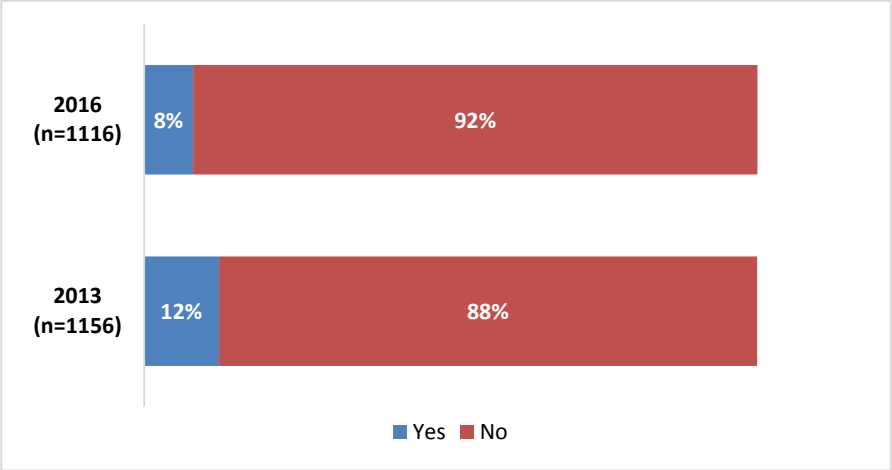
8. TANNING

All adult respondents were asked questions about their behaviours and attitudes regarding sun tanning.

8.1 TANNING BEHAVIOURS

Respondents were asked to indicate whether they had tried to get a suntan during the previous weekend. Around nine out of 10 respondents (92%) reported that they did not try to get a suntan in the previous weekend, while around one out of 10 reported that they had (8%). There was no significant change since 2013 (see Figure 8-1).

Figure 8-1: Attempted to get a suntan in the previous weekend, age-standardised proportions, 2013 and 2016

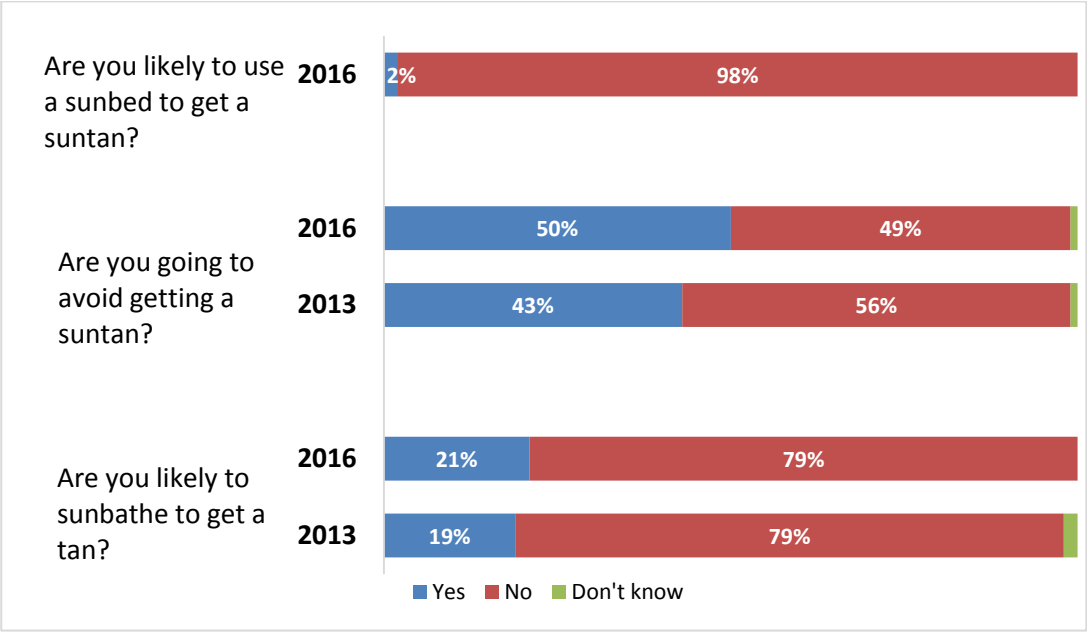


Base: outdoors during previous weekend

8.1.1 Intended Tanning Behaviour

Respondents were also asked a series of three questions relating to tanning behaviours for the rest of the summer. Figure 8-2 provides an overview of responses. Almost all of the respondents (98%) reported that they were not intending to use a sunbed to get a suntan. Half (50%) of the respondents reported that they intended to avoid getting a suntan for the rest of the summer. This was a significantly greater proportion than in 2013 when it was less than half (43%). Around two in 10 respondents reported that they were likely to sunbathe to get a suntan (21%), while almost eight out of 10 (79%) did not. There was no significant change since 2013.

Figure 8-2: Intended tanning behaviours for the rest of the summer, age-standardised proportions, 2013 and 2016



Base: all respondents

8.2 ATTITUDE AND RISK PERCEPTION

In 2016, nine statements were used to assess participants' attitudes and perceived risk (see the 2016 SES questionnaire for the full lists). These statements included: "I feel more healthy with a suntan", "Most of my friends think a suntan is a good thing", "A suntan makes me feel better about myself", "Protecting my skin from the sun can result in not getting enough vitamin D", and "Tanning is part of the Kiwi summer". Respondents rated themselves on a 5-point scale ranging from 'strongly disagree' to 'strongly agree'. For comparison purposes this section reports only the statements that were repeated from 2013. The key findings of participants' degrees of agreement for these statements are presented as follows.

"I feel more healthy with a suntan"

2016

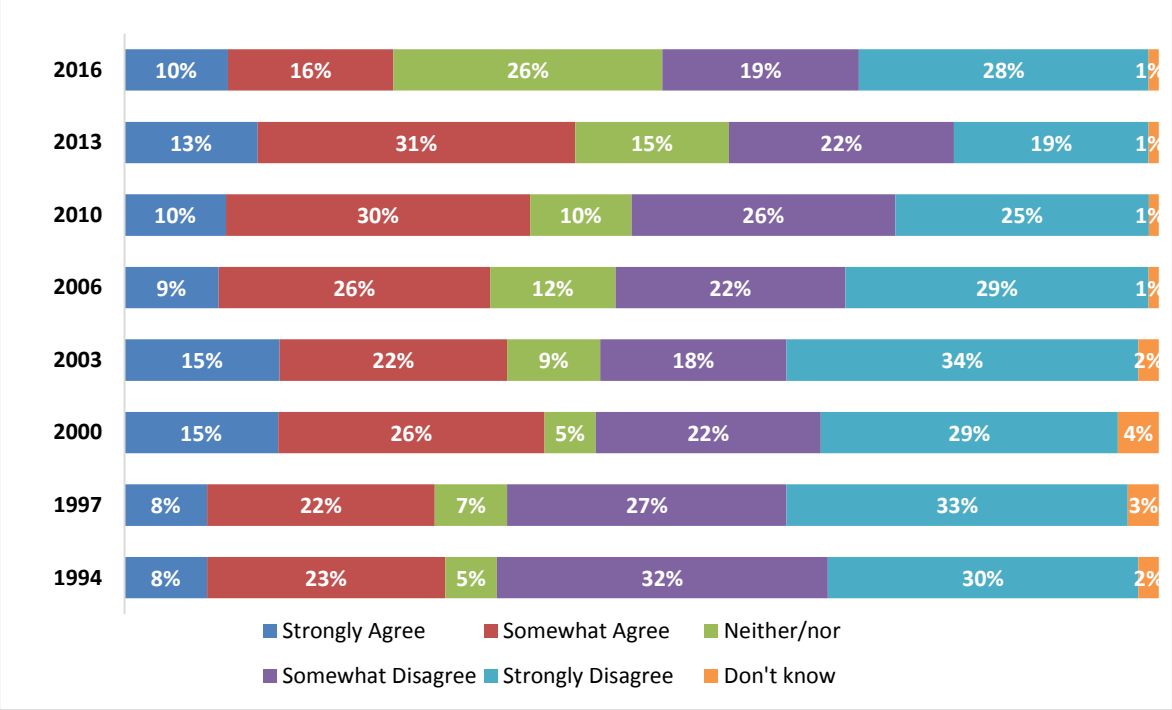
A quarter (26%) of respondents agreed with this statement, including around one in 10 (10%) who strongly agreed. Almost half (47%) of the respondents disagreed, including around three out 10 (28%) who strongly disagreed. Other respondents (26%) neither agreed nor disagreed with this statement (see Figure 8-3).

Time series

In 2016, respondents were less likely to say they agree, or strongly agree, with "I feel more healthy with a suntan" than in all years between 2000 and 2013. They were also more likely to take a

strong stance when disagreeing with the statement. There were more respondents who said they strongly disagree than in 2013.

Figure 8-3: Agreement with "I feel more healthy with a suntan", age-standardised proportions, 1994 to 2016



Base: all respondents

"Most of my friends think a suntan is a good thing"

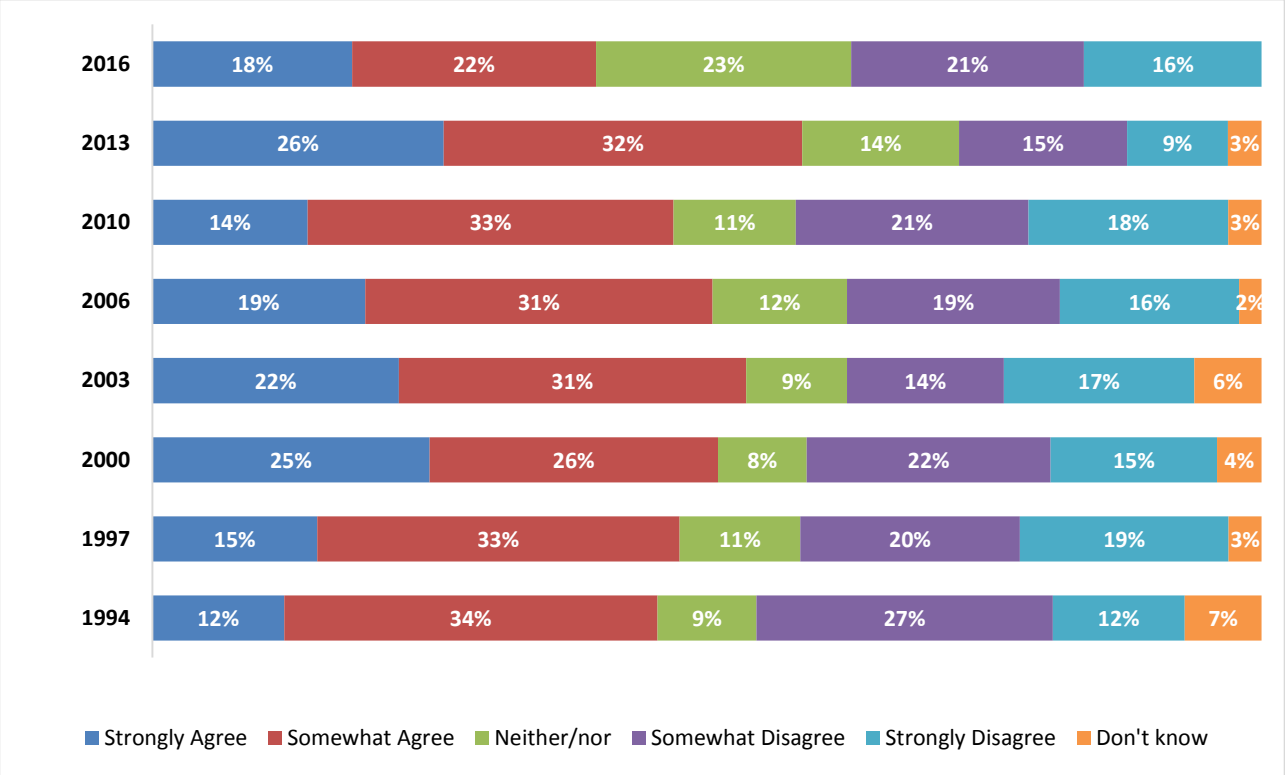
2016

Four out of 10 (40%) respondents agreed with the statement "most of my friends think a suntan is a good thing," including 18% who strongly agreed. Around four in 10 (37%) respondents disagreed, including 16% who strongly disagreed (see Figure 8-4).

Time series

In 2016, respondents were less likely to say that they agree, or strongly agree, with the statement "Most of my friends think a suntan is a good thing" than in all years between 2000 and 2013. They were also more likely to take a strong stance when disagreeing the statement, with more respondents stating that they strongly disagreed than in 2013.

Figure 8-4: Agreement with "Most of my friends think a suntan is a good thing", age-standardised proportions, 1994 to 2016



Base: all respondents

"A suntan makes me feel better about myself"

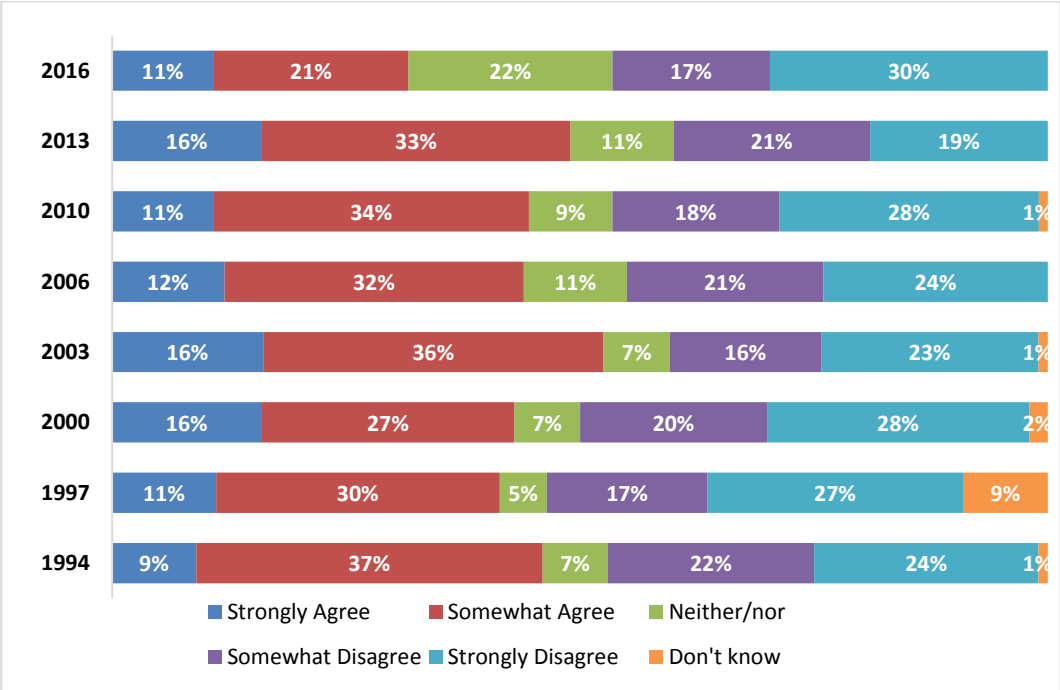
2016

In 2016, a third of respondents (32%) agreed with this statement, including 11% who strongly agreed. Almost a half of respondents (47%) disagreed, including 30% who strongly disagreed (see Figure 8-5).

Time series

In 2016, respondents were less likely to say that they agree, or strongly agree, with the statement "A suntan makes me feel better about myself" than in all of the previous years except 1997. They were also more likely to take a strong stance when disagreeing with the statement; there were more respondents who said they strongly disagree than in 2013.

Figure 8-5: Agreement with "A suntan makes me feel better about myself", age-standardised proportions, 1994 to 2016



Base: all respondents

"Protecting my skin from the sun can result in not getting enough vitamin D"

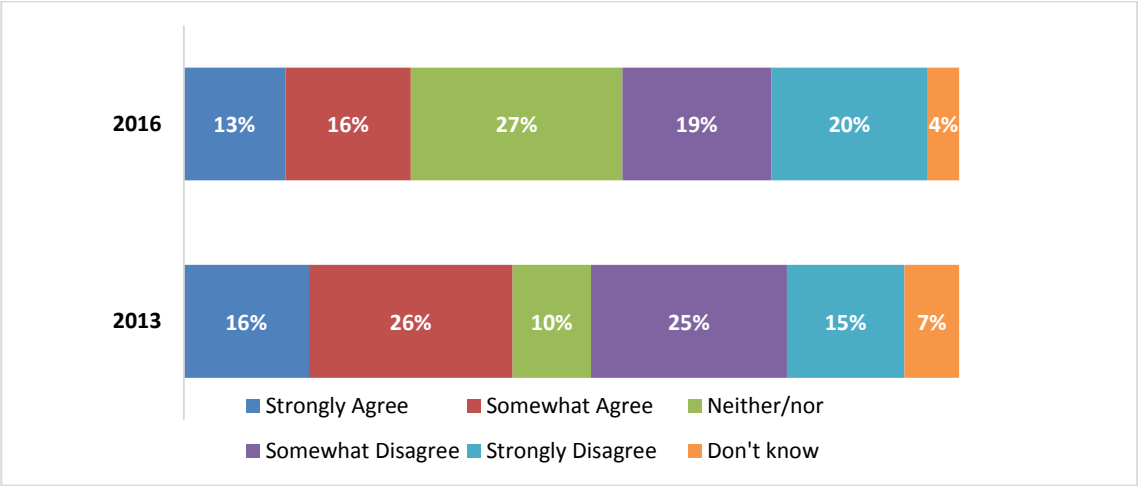
2016

The statement "protecting my skin from the sun can result in not getting enough vitamin D" was included for the first time in 2013. In 2016, less than one-third (29%) of respondents agreed with this statement, including over one in 10 (13%) who strongly agreed. Around four out of 10 respondents (39%) reported that they disagreed with this statement, including around two in 10 (20%) who strongly disagreed. Three in 10 respondents (27%) neither agreed nor disagreed with this statement Figure 8-6.

2013 and 2016 comparison

In 2016, respondents were less likely to agree with the statement "Protecting my skin from the sun can result in not getting enough vitamin D" than in 2013.

Figure 8-6: Agreement with "Protecting my skin from the sun can result in not getting enough vitamin D", age-standardised proportions, 2013 and 2016



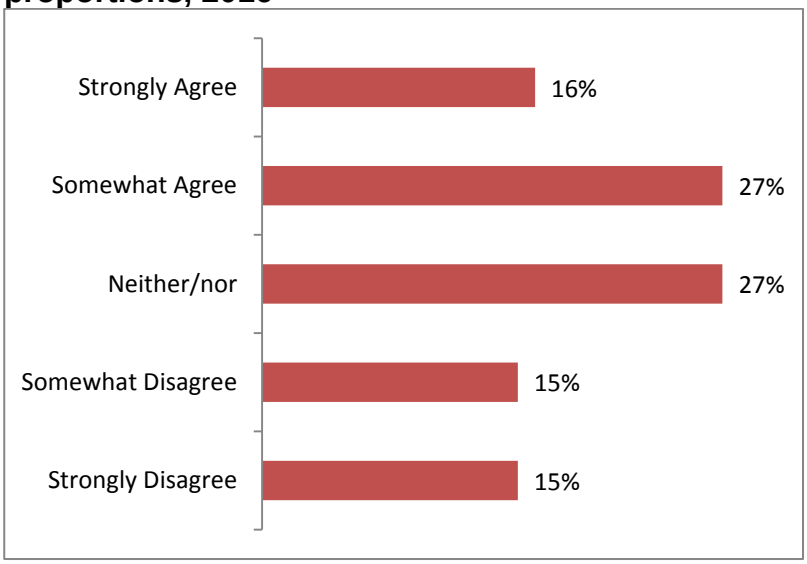
Base: all respondents

"Tanning is part of the Kiwi summer"

2016

The statement "tanning is part of the Kiwi summer" was included for adults for the first time in 2016. More than four in 10 (43%) respondents agreed with this statement, including almost two in 10 (16%) who strongly agreed. Three out of 10 respondents (30%) reported that they disagreed with this statement, including nearly two out of 10 (15%) who strongly disagreed. Almost three in 10 respondents (27%) neither agreed nor disagreed with this statement (see Figure 8-7).

Figure 8-7: Agreement with "Tanning is part of the Kiwi summer", age-standardised proportions, 2016



Base: all respondents

9. CONCLUSION

The results from the 2016 SES suggest the beginning of a general decreasing trend in the prevalence of sunburn. Previous surveys showed the prevalence of being sunburnt on the previous weekend was relatively stable. However, the 2016 results show the prevalence of weekend sunburn has decreased significantly from 22% in 2013 to 15% in 2016. Surveys in the coming years are required to confirm whether this decrease represents an overall declining trend in sunburn.

Compared to previous surveys, in both the 2016 and 2013 surveys, significantly higher proportions of respondents spent 15 minutes or more outdoors over the weekend. Taken together, walking/running/tramping (22% combined) was the most popular outdoor activity among respondents in 2016. Over one-third of respondents (37%) reported engaging in outdoor activities that were based either in or next to the water.

When outdoors during the previous weekend, most respondents (65%) in 2016 reported that they "had everything on hand that they needed to protect their skin from the sun." Sunscreen use when outdoors is still higher than previous survey years, with exactly one-half (50%) of respondents in 2016 reporting they used sunscreen while outdoors over the previous weekend (compared to 31% in 1997 and 36% in 2000). Compared to previous survey years, respondents in 2016 applied sunscreen to a greater variety of body parts and a significantly higher proportion reported that they applied their sunscreen twice (40%) while they were outdoors.

Attitudes towards tanning appear to have changed over time, with significantly fewer respondents (26%) in 2016 reporting that they "feel more healthy with a tan" than in all previous survey years from 2000 to 2013. Similarly, when compared with previous survey years, respondents in 2016 were less likely to agree with the statements that "a suntan makes me feel better about myself" or "most of my friends think a suntan is a good thing."

More than three-quarters of the 2016 respondents (77%) reported that they checked the weather forecast prior to engaging in outdoor weekend activities. The main aspects of the weather forecast these respondents used to prompt them about sun protection were temperature (46%) and cloud cover (28%). Fewer respondents used the UV Index (10%) or the Sun Protection Alert (7%) to prompt them about using sun protection. Of those who did use the UV Index or the Sun Protection Alert, most saw it or heard it on the TV, the MetService website, or the MetService mobile app.

10. REFERENCES

Armstrong, L., Gray., R, Tu, D., & Walton, D. (2013) *Sun Exposure Survey: Topline Time Series Report.* Wellington: Health Promotion Agency Research and Evaluation Unit

Ahmad, O. B., Boschi-Pinto, C., Lopez, A. D., Murray, C. J. L., Lozano, R., & Inoue, M. (2001). Age standardization of rates: a new WHO standard. *Geneva: World Health Organization*, *9*.

Boehm, J. K., Chen, Y., Williams, D. R., Ryff, C., & Kubzansky, L. D. (2015). Unequally distributed psychological assets: are there social disparities in optimism, life satisfaction, and positive affect?. *PloS one*, *10*(2), e0118066.

Borland, R., Hill, D., & Noy, S. (1990). Being SunSmart: Changes in community awareness and reported behaviour following a primary prevention program for skin cancer control. *Behaviour Change, 7*, 126-135.

Cancer Society NZ (2016, August 2. About us. Retrieved from https://auckland-northland.cancernz.org.nz

Health Promotion Agency (2016). *Sun Exposure Survey 2016 Methodology Report*. Wellington: Report prepared by Key Research Limited.

Hollier, L. P., Pettigrew, S., Slevin, T., Strickland, M., & Minto, C. (2016). Comparing online and telephone survey results in the context of a skin cancer prevention campaign evaluation. *Journal of Public Health*, fdw018.

Kalton, G., & Flores-Cervantes, I. (2003). Weighting methods. *Journal of Official Statistics*, *19*(2), 81.

Ministry of Health (2016, August 3). Ethnicity code tables. Retrieved from http://www.health.govt.nz/nz-health-statistics/data-references/code-tables/common-code-tables/ethnicity-code-tables

Pike, G. R. (2008). Using weighting adjustments to compensate for survey nonresponse. Research in Higher Education, 49(2), 153-171.

11. APPENDIX ONE

Main Variables Collected in the 1994, 1997, 2000, 2003, 2006, 2010, 2013 and 2016 Surveys

Section/module	1994	1997	2000	2003	2006	2010		2013		2016
						18-24 yrs	18-54 yrs	18-24 yrs	18-54 yrs	
Demographics										
Age	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Gender	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Employment status/ setting	✓	✓	✓	✓	✓					
Outdoor work									✓	✓
Household composition			✓	✓	✓	✓	✓	✓	✓	✓
"Socio-economic status" (based on occupation of main income earner)			✓	✓	✓					
Household income						✓	✓	✓	✓	✓
Education	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Ethnicity	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Area of residence	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
City, town or rural area						✓	✓	✓	✓	✓
Phenotypic factors										
Skin type (sensitivity to the sun)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Skin type (colour)			✓	✓	✓	✓	✓	✓	✓	✓
Hair colour	✓									
Previous severe sunburn	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Frequency of previous severe sunburn	✓	✓	✓	✓	✓					
Family history of skin cancer								✓	✓	✓
Weekend sunburn										
Body sites burnt	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Worst area burnt	✓	✓	✓	✓	✓					

Section/module	1994	1997	2000	2003	2006	2010		2013		2016
						18-24 yrs	18-54 yrs	18-24 yrs	18-54 yrs	
Severity of the burn	✓	✓	✓	✓	✓					
Day (s) of occurrence	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Perception of main reason for sunburn								✓	✓	✓
Behavioural factors										
Outdoors at weekend	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Location of outdoor activity (may be different from location of residence)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Main activity	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Duration of activity	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Timing of activity	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Total time spent outdoors	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Amount of time spent outside versus amount of time intended						✓	✓	✓	✓	✓
Choice to stay out of the sun for a period	✓	✓	✓	✓	✓			✓	✓	✓
Whether activity took place in a setting with shade provided	✓	✓	✓	✓	✓			✓	✓	✓
Type of shade chosen			✓	✓	✓					
Whether they would have used shade if shade was provided								✓	✓	
Staying out of the sun/in the shade and whether this was a conscious choice						✓	✓	✓	✓	✓

Section/module	1994	1997	2000	2003	2006	2010		2013		2016
						18-24 yrs	18-54 yrs	18-24 yrs	18-54 yrs	
Whether activity took place by water						✓	✓	✓	✓	✓
Coverage by clothing	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Wearing of hat	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Type of hat	✓	✓	✓	✓	✓			✓		
Body parts covered by hat						✓	✓	✓	✓	✓
Wearing of sunglasses	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Type of sunglasses			✓	✓	✓					
Use of sunscreen	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Areas covered by sunscreen	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Reapplication of sunscreen	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Use of separate makeup/moisturiser with sunscreen				✓	✓					
Type of sunscreen (SPF/broad spectrum)	✓	✓	✓	✓	✓					
Time of application of sunscreen	✓	✓	✓	✓	✓					
Use of UPF clothing			✓	✓	✓					
Preparation to protect from the sun						✓	✓	✓	✓	✓
Action taken to improve vitamin D levels						✓	✓			

Section/module	1994	1997	2000	2003	2006	2010		2013		2016
						18-24 yrs	18-54 yrs	18-24 yrs	18-54 yrs	
Weather perception										
Perception of cloud cover	✓	✓	✓	✓	✓					
Perception of temperature	✓									
Looking at the weather forecast before outdoor activities								✓	✓	✓
Awareness of Sun Protection Alert								✓	✓	✓
Awareness of UV Index								✓	✓	✓
Perception that weather could cause sunburn						✓	✓	✓	✓	✓
Information on sun protection – advertising										
Awareness of advertising/ promotions	✓	✓	✓	✓	✓	✓	✓	✓	✓	
Message outtake	✓	✓	✓	✓	✓					
Item recall - description				✓	✓	✓	✓	✓	✓	
Setting of advertising	✓	✓	✓	✓	✓					

Section/module	1994	1997	2000	2003	2006	2010		2013		2016
						18-24 yrs	18-54 yrs	18-24 yrs	18-54 yrs	
Melanoma/ Skin Cancer knowledge										
Agreement with statements about what could happen										
"It may mean loss of a limb"						✓				
"It would only leave a small scar, the size of the melanoma"						✓				
"It could lead to the loss of life"						✓		✓	✓	✓
"It could reappear on your organs, such as your lungs, liver or brain"						✓				
"It could get into your bloodstream and travel to other parts of your body"						✓				
Knowledge of which size melanoma could be deadly						✓				
"Melanoma can be easily treated by my GP"								✓	✓	✓
Knowledge of risk factors for skin cancer						✓	✓	✓	✓	
Perception of likelihood of getting skin cancer in the future								✓	✓	✓

Section/module	1994	1997	2000	2003	2006	2010		2013		2016
						18-24 yrs	18-54 yrs	18-24 yrs	18-54 yrs	
"I feel confident that I can protect myself from getting skin cancer"								✓	✓	✓
Tanning/ attitudes										
Like to get a suntan	✓	✓	✓	✓	✓					
Attempted to get suntan this summer	✓	✓	✓	✓	✓					
Attempted to get a sun tan this past weekend						✓		✓	✓	✓
Likelihood of trying to get a tan during rest of summer								✓	✓	✓
I intend to sunbathe regularly	✓	✓	✓	✓	✓	✓	✓			
Are you likely to sunbathe to get a tan?								✓	✓	✓
Whether planning to avoid getting a suntan								✓	✓	✓
Depth of preferred suntan	✓									
Use of sunbed			✓	✓	✓					✓
Use of tanning products			✓	✓	✓					
Use of fake tan			✓	✓	✓			✓	✓	
"I feel more healthy with a suntan"	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
"This summer I intend to sunbathe regularly to get a suntan"	✓	✓	✓	✓	✓	✓	✓	✓	✓	
"Most of my friends think a suntan is a good thing"	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Section/module	1994	1997	2000	2003	2006	2010		2013		2016
						18-24 yrs	18-54 yrs	18-24 yrs	18-54 yrs	
“A suntan makes me feel better about myself”	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
“A suntan makes me feel more attractive to others”	✓	✓	✓	✓	✓					
“Most of my close family think that a suntan is a good thing”	✓	✓	✓	✓	✓					
“A suntan protects you against melanoma and other skin cancers”	✓	✓	✓	✓	✓					
“A tan shows I care about my appearance”						✓		✓		
“Seeing tanned people on TV, in films and in magazines makes me want to have a tan”						✓		✓		
“Tanning is part of the Kiwi summer”						✓		✓		✓
“Protecting my skin from the sun can result in not getting enough vitamin D”								✓	✓	✓
“I often encourage others to protect their skin from the sun”								✓	✓	
“Over time tanning can make my skin age faster than it naturally would”								✓		
“It is likely that I already have some permanent damage to my skin from sun exposure”								✓		

Section/module	1994	1997	2000	2003	2006	2010		2013		2016
						18-24 yrs	18-54 yrs	18-24 yrs	18-54 yrs	
Attitudes and risk perception										
Barriers to sunscreen use	✓	✓	✓	✓	✓					
Reasons for sunscreen reapplication			✓	✓	✓					
Self-perception of risk of skin cancer in future						✓	✓	✓	✓	✓
Role of Local Councils										
"I expect local councils to use money from rates to provide shade in public places such as beaches, pools, parks and gardens"								✓	✓	
"I would pay $10/$20/$50 more on my annual rates or rent if it mean the local councils could provide more shade in public places								✓	✓	

Note: Ticks mean that question areas were covered in the survey that year – they do not necessarily mean that the questions were asked in an identical fashion. Some differences between the ways that questions were asked between surveys are noted in the report when comparing responses to these questions.