



**SUN AND ULTRAVIOLET LIGHT-RELATED BEHAVIOURS
IN SCHOOLCHILDREN OF IRELAND:**

Data from the 2018 Health Behaviour in School-Aged Children (HBSC) study

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ABBREVIATIONS

| | |
|-------------------|--|
| HBSC | Health Behaviour in School-aged Children study |
| IPH | Institute of Public Health in Ireland |
| NUI Galway | National University of Ireland Galway |
| UV | Ultraviolet light |
| WHO | World Health Organization |

INTRODUCTION

Since the 1980s, an emergent public health issue is ultraviolet (UV) light exposure and sun protection in children and adolescents (e.g., Cockburn, Henrikus, Sanson-Fisher, & Scott, 1989). Outdoor exposure to sun and use of indoor solariums or sunbeds in children and adolescents are especially concerning as these are associated with an elevated risk of different types of skin cancer (Ziegler *et al.*, 1994; Armstrong and Kricger, 2001; Leiter & Garbe, 2008).

Exposure to UV light, sunburn, sunbed/tanning solarium use and UV protection (during outdoor activities and indoor sunbed use) have been investigated in epidemiological studies in Australia (e.g., Dobbins *et al.*, 2008; Fritschi, Green, & Solomon, 1992), in the United States (e.g., Coogan, Geller, Adams, Benjes, & Koh, 2001; Geller *et al.*, 2002), in Germany (e.g., Gefeller, Li, Uter, & Pfahlberg, 2014; Klostermann, Bolte, & GME Study Group, 2014; Schneider *et al.*, 2013), in Denmark (e.g., Køster, Søndergaard, Nielsen, Allen, Olsen, & Bentzen, 2017; Køster, Thorgaard, Clemmensen, & Philip, 2009; Hansen & Bentzen, 2014), and in the United Kingdom (Foster, Scarlett, & Stewart, 2012). In many of these studies – where results were broken down by sex and age – it was found that boys are more likely to stay outdoors without proper sun protection, while girls were more likely to use sunbeds compared to one another. In one study conducted in England, remarkable age differences were found in sun exposure, as younger children spend significantly longer times outdoors than older adolescents, but no sex differences were observed (Diffey, Gibson, Haylock, & McKinlay, 1996). Certainly geographical location makes a difference in UV exposure of children, however it seems that children who had more holidays in foreign countries (where they may be exposed to more sunshine than regularly) had a higher count of nevi, which may be a result of increased UV exposure (Dulon *et al.*, 2002). Beyond cross-sectional studies, trend analyses have been conducted (Cokkinides, Weinstock, Glanz, Albano, Ward, & Thun, 2006; Livingston, White, Hayman, & Dobbins, 2003; 2007; Volkov, Dobbins, Wakefield, & Slevin, 2013). While these studies suggest a general (small) decrease in sunburn and increase in protective behaviours in US and Australian young people, it remains unclear whether similar trends exist in European countries.

From the policy perspective it is important to assess the prevalence of children who do or do not meet certain aggregate criteria of sun and UV protection behaviours. The *Queensland Plan* prioritises sun and UV protection as in Queensland one in ten inhabitants are diagnosed with skin cancer, which is the highest rate in Australia (State of Queensland, 2014). The *Health and Wellbeing Strategic Framework 2017 to 2026* (State of Queensland, 2018) has set a target for a 4% increase in the prevalence of children who practice sun protection methods (using 30+ factor sunscreen, wear broad brimmed hats and protective clothing) from the baseline of 47% measured in 2014, the aim is to increase this to 51% in 2018 and 56% in 2026. The performance monitoring strategy of this framework operationalises the indicator somewhat more broadly, as using three or more defined sun safety practices. The Healthy Ireland survey uses a less stringent indicator, including all adults who use at least one form of five protective behaviours (use 30+ factor sunscreen, wear sunglasses, wear a hat, limit time in hot sun, stay in shade, and keep skin covered). Of all adults, 90% reported that they did not use any form of sun protection in 2018 (Ipsos MRBI, 2019).

Several behavior change trials have also been reported place to see what methods would facilitate children and adolescents to reduce risks of sun exposure. Primary care counselling, combined with minimal-intensity expert intervention, led to significantly more sun protection behaviour in the intervention group (25%) than in the control group (15%) in a large sample of Californian adolescents, aged 11–15 (Norman *et al.*, 2007). The SunSafe project sought to educate and activate adults and peers to act as role models, and actively promote sun-protection practices as well as to create a pro-sun protection community environment. The trial, carried out at ten Vermont and New Hampshire communities, used behavioural observations at beach / pool sites to assess percentage of body surface of adolescents, protected by sunscreen, clothing or shade. Researchers found that during the two years intervention phase, proportion of sun protected body surface declined at both intervention and control venues, but to a significantly lower rate at the prior (8%) than the

latter (23%) (Olson, Gaffney, Starr, Gibson, Cole, & Dietrich, 2007). However, a review of trials carried out in USA concluded that interventions are slow to induce behavioural change, and there are several barriers to their efficacy. The authors argue that Australian interventions were more successful, because in those the message had been delivered simultaneously through several channels, including media, schools, homes, recreation centres, and health care facilities. Part of their success can be attributed to that targeted individuals were repeatedly exposed to prevention messages, encountered messages from sources they had deemed credible, and the messages are consistent with each other (Dadlani & Orlow, 2008).

Especially salient topics in these studies – both surveys and trials – were:

1. **Protective measures taken against sun exposure** (e.g., wearing hat, sunglasses and clothes that cover limbs as well as avoiding the sun when at the peak ultraviolet radiation period of the day)
2. **Frequency of ever being sunburnt**
3. **Ever using a sunbed** (sometimes called a sunbed, indoor tanning machine or tanning solarium)
4. **Circumstances of sunbed use** (e.g., if the adolescents were asked about their age before permitting them using the machine, were told to use protective goggles, or told about the health risks).

In spite of the evidence available from other countries, to the best of our knowledge, no systematic epidemiological studies have been carried out in the Republic of Ireland to assess sun-related risky and protective behaviour in children and adolescents. Additional research is warranted to better understand the sex, age and socio-economic patterns underlying UV-related risky and protective behaviours. Therefore the Irish team from the Health Behaviour in School-aged Children (HBSC), a World Health Organization collaborative cross-cultural study included sun-related items in the 2018 HBSC data collection in the Republic of Ireland. This work was carried out in close co-operation with the Institute of Public Health in Ireland (IPH).

The HBSC is a cross-national research study conducted in collaboration with the WHO Regional Office for Europe and runs on a four-year cycle. In 2018, Ireland participated for the sixth time in the HBSC study (www.nuigalway.ie/hbhc). The overall aim of the HBSC study is to increase our understanding of young people's health and well-being, health behaviours and their social context. HBSC collects data on key indicators of health, health attitudes, and health behaviours, as well as the context of health for young people. The study is a school-based survey with information collected from children through self-completed questionnaires in classrooms. As of 2018, forty-nine countries are part of the HBSC International Network, from the geographical areas of Europe, North America, and former Soviet republics. HBSC Ireland 2018 was funded by the Department of Health. Further information on HBSC Ireland can be found at www.nuigalway.ie/hbhc. Findings from the International HBSC study are available at: www.hbhc.org.

We initially collected and reviewed questions from the epidemiological studies referred to above, and carefully considered which items would be relevant for the schoolchildren (aged 10–17) in Republic of Ireland. We piloted four groups of questions, which covered the topics: methods of sun protection, sunburn, indoor sunbed use, and circumstances of sunbed use. In line with the standard HBSC protocol (Currie, Inchley, Molcho, Lenzi, Veselska, & Wild, 2014), these items were piloted in five schools, with 363 schoolchildren. The results of the pilot study were reported by Költő, Harrington, Kavanagh, Tyrrell, and Nic Gabhainn (2018).

The results of the pilot study were in line with previous observations in the literature. Around 60–80% of the respondents at least sometimes used hats, sunglasses, protective clothing or sunscreen to avoid sun exposure. Girls reported markedly higher rates than boys. Approximately one third of the participants avoided peak UV hours of the day. There was no large difference between boys and girls. Older children, however, were more likely to avoid sun between noon and 3pm than younger ones. Around 60% of the respondents got sunburnt at least once last summer, and around 75% reported the same for their lifetime; boys and girls reported similar frequencies. Around 7% of the respondents used a sunbed in the last 12

months and 10% in their lifetime. Between 11–16% of the respondents reported that when using a sunbed, their age was asked, they were instructed to wear protective goggles, they received advice on their skin type, or they have been told about the risks. Regarding sunbed use and its circumstances, no remarkable sex differences were found. Older children reported a higher frequency of sunbed use than younger ones. Due to the low subsample sizes, the observations on age differences should be treated with caution.

In general, respondents found the questions understandable, acceptable and easily answerable. The researchers had encouraged children to underline words or phrases they found difficult, and after administration of the questionnaire, discussion was facilitated in the classroom. These also confirmed that children understood the importance of this topic, and in general agreed with including such items in the questionnaire. Some children raised whether we meant sunburn they got when being outside at their homes, or when going abroad for holidays. Among the younger children there were many who were not familiar with the terms 'sunbed' or 'tanning solarium'. Based on these remarks, we did not employ the term 'tanning solarium' in the questionnaire used during the main HBSC Ireland 2018 study.

In addition, as a part of HBSC's approach to the family's affluence, we asked how many times the children had been on a foreign holiday with their families. Although this is not fully conclusive of UV exposure (since the holiday may have taken place in winter season or in a country with low UV radiation), it nevertheless may indicate higher exposure to ultraviolet light.

Method

In this report, we present the findings on the individual sun protection and sunbed use items included in the 2018 HBSC Ireland data collection. The study was conducted in line with the International HBSC Protocol (Currie, Inchley, Molcho, Lenzi, Veselska, & Wild, 2014), and NUI Galway research ethics approval for the HBSC 2018 study was obtained. Data collection took place between April and December 2018 in 254 schools in Republic of Ireland (109 primary and 145 post-primary). Children from 3rd class in primary school to 5th year in post-primary school were invited to participate. The overall (raw) sample contained 15,556 responses from children.

In line with Australian (State of Queensland, 2018) and Irish evidence (Ipsos MRBI, 2019), we have also created two composite scores of sun protection behaviours. The first, relatively loose, criteria was that children report always or sometimes applying *at least one of three forms of protection* when going out at a sunny day: use sunscreen, use a hat, or wear clothes that cover their arms or legs. The other composite score is based on more stringent criteria: children using *at least three from five forms of protection* (use a hat, wear sunglasses, wear protective clothes, avoid the sun between 12 and 3pm, or use sunscreen).

For the present analysis, we have included all children who were asked to answer the sun protection items (ranging from 5th class in primary school to 5th year in post primary school). Further inclusion criteria were having valid responses for sex, age group, and social class variables, since the results are presented broken down by these three socio-demographic background factors. Thus, the final sample includes 10,271 respondents. Most of those participating in the main study but being eliminated from the present analysis had not provided sufficient detail on their parents' occupations to enable social class coding. The composition of the sample is displayed in Table 1.

Table 1. Composition of the sample

| | Frequency | Percent |
|----------------------------|--------------|------------|
| Overall^a | 10271 | 100 |
| Sex | | |
| Boy | 4800 | 46.7 |
| Girl | 5471 | 53.3 |
| Age group | | |
| 10-11 | 1796 | 17.5 |
| 12-14 | 5045 | 49.1 |
| 15-17 | 3430 | 33.4 |
| Social class | | |
| SC1-2 | 5550 | 54.0 |
| SC3-4 | 3621 | 35.3 |
| SC5-6 | 1100 | 10.7 |

^aIncluding only those who provided valid responses for sex, age, and social class.

School principals were invited to take part in the study by a letter of invitation and study information sheet, and participation was secured via phone calls from a designated member of HBSC Ireland Team. Once consent was obtained, the school principal (or a person mandated by them) and the HBSC Ireland team member arranged when and with which class(es) would data collection take place in the school. The participating classes were selected randomly in a way that from each school year, one class would be selected. School principals were informed that it was at their discretion whether active or passive parental consent should be sought from parents. Class teachers were invited to administer the questionnaire to students in their class. Parental consent letters, asking for either active or passive consent, along with questionnaires and study information sheets for the teachers, parents and students, were provided to the school in postal parcels. Prior to data collection children were informed that they were free to decide if they want to take part in the data collection or not, and that they did not have to answer the whole questionnaire or any questions if they did not want to. They were also assured that no one from the school, nor their parents, would be able to see their completed questionnaires.

Class teachers administered the questionnaires based on a standard protocol. The questionnaires were distributed, and children were reminded not to write anything that would identify them or their school on the questionnaires. When they completed the questionnaire, they put those to envelopes and sealed them. Subsequently, the school principal or the mandated school personnel collected completed questionnaires and returned them by post to the NUI Galway Health Promotion Research Centre.

Following data entry and a random data quality check, the dataset was cleaned and statistically analysed. In this report, we present results on sun- and UV-related questions overall and broken down for sex, age group, and social class. The presented findings are not weighted.

How to read this report

The findings are presented in the tables below. In each section, first an overall table is presented, indicating number and frequency (percentages) of respondents for each of the response options and also the missing responses. Then responses broken down by sex, age group, and social class with valid percentages (missing responses excluded) are presented. Chi-squared tests were conducted to check whether there are statistically significant differences in sex, age group and social class for the given variable. The results of significance testing are summarized for each variable below the breakdown tables. Threshold of significance was set at $p < 0.05$.

SUN PROTECTION

Using a sun hat

If you go outside on a sunny day, do you use a sun hat?

Table 2. Use of a hat on a sunny day, overall

| | Frequency | Percent | Valid percent |
|--------------|--------------|-------------|---------------|
| Always | 410 | 4.0 | 4.1 |
| Sometimes | 4331 | 42.2 | 43.2 |
| Never | 5291 | 51.5 | 52.7 |
| Total | 10032 | 97.7 | 100 |
| Missing | 239 | 2.3 | |

Table 3. Use of a hat on a sunny day, by sex (%)***

| | Boys | Girls |
|-----------|------|-------|
| Always | 5.5 | 2.8 |
| Sometimes | 45.1 | 41.5 |
| Never | 49.4 | 55.7 |

Table 4. Use of a hat on a sunny day, by age group (%)***

| | 10-11 years old | 12-14 years old | 15-17 years old |
|-----------|-----------------|-----------------|-----------------|
| Always | 7.0 | 3.6 | 3.3 |
| Sometimes | 56.5 | 42.4 | 37.4 |
| Never | 36.5 | 54.0 | 59.4 |

Table 5. Use of a hat on a sunny day, by social class (%)**

| | SC1-2 | SC3-4 | SC5-6 |
|-----------|-------|-------|-------|
| Always | 3.9 | 4.4 | 3.9 |
| Sometimes | 44.7 | 42.1 | 39.1 |
| Never | 51.4 | 53.5 | 57.0 |

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$: There are statistically significant differences in using a hat on a sunny day by sex and across, age groups and social classes.

Wearing sunglasses

If you go outside on a sunny day, do you wear sunglasses?

Table 6. Wearing sunglasses on a sunny day, overall

| | Frequency | Percent | Valid percent |
|--------------|--------------|-------------|---------------|
| Always | 1496 | 14.6 | 14.8 |
| Sometimes | 5836 | 56.8 | 57.8 |
| Never | 2762 | 26.9 | 27.4 |
| Total | 10094 | 98.3 | 100 |
| Missing | 177 | 1.7 | |

Table 7. Wearing sunglasses on a sunny day, by sex (%)***

| | Boys | Girls |
|-----------|------|-------|
| Always | 8.0 | 20.7 |
| Sometimes | 52.1 | 62.8 |
| Never | 39.8 | 16.5 |

Table 8. Wearing sunglasses on a sunny day, by age group (%)**

| | 10-11 years old | 12-14 years old | 15-17 years old |
|-----------|-----------------|-----------------|-----------------|
| Always | 13.5 | 14.4 | 16.2 |
| Sometimes | 60.5 | 57.0 | 57.6 |
| Never | 26.1 | 28.6 | 26.3 |

Table 9. Wearing sunglasses on a sunny day, by social class (%)

| | SC1-2 | SC3-4 | SC5-6 |
|-----------|-------|-------|-------|
| Always | 14.4 | 15.1 | 15.8 |
| Sometimes | 57.9 | 58.5 | 55.4 |
| Never | 27.7 | 26.4 | 28.9 |

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$: There are statistically significant differences in wearing sunglasses on a sunny day by sex and across age groups, but not across social classes.

Wearing protective clothes

If you go outside on a sunny day, do you wear clothes that cover arms and legs?

Table 10. Wearing protective clothes on a sunny day, overall

| | Frequency | Percent | Valid percent |
|--------------|--------------|-------------|---------------|
| Always | 620 | 6.0 | 6.2 |
| Sometimes | 4404 | 42.9 | 43.7 |
| Never | 5048 | 49.1 | 50.1 |
| Total | 10072 | 98.1 | 100 |
| Missing | 199 | 1.9 | |

Table 11. Wearing protective clothes on a sunny day, by sex (%)**

| | Boys | Girls |
|-----------|------|-------|
| Always | 6.8 | 5.6 |
| Sometimes | 42.1 | 45.2 |
| Never | 51.1 | 49.2 |

Table 12. Wearing protective clothes on a sunny day, by age group (%)***

| | 10-11 years old | 12-14 years old | 15-17 years old |
|-----------|-----------------|-----------------|-----------------|
| Always | 4.6 | 6.4 | 6.7 |
| Sometimes | 39.7 | 42.2 | 48.0 |
| Never | 55.7 | 51.5 | 45.3 |

Table 13. Wearing protective clothes on a sunny day, by social class (%)***

| | SC1-2 | SC3-4 | SC5-6 |
|-----------|-------|-------|-------|
| Always | 5.7 | 6.3 | 8.2 |
| Sometimes | 43.4 | 42.9 | 48.2 |
| Never | 50.9 | 50.9 | 43.6 |

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$: There are statistically significant differences in wearing protective clothes on a sunny day by sex and across, age groups and social classes.

Avoiding the sun at UV peak period

If you go outside on a sunny day, do you avoid the sun between 12 and 3pm?

Table 14. Avoidance of the sun between 12 and 3pm, overall

| | Frequency | Percent | Valid percent |
|--------------|--------------|-------------|---------------|
| Always | 338 | 3.3 | 3.4 |
| Sometimes | 2935 | 28.6 | 29.2 |
| Never | 6785 | 66.1 | 67.5 |
| Total | 10058 | 97.9 | 100 |
| Missing | 213 | 2.1 | |

Table 15. Avoidance of the sun between 12 and 3pm, by sex (%)***

| | Boys | Girls |
|-----------|------|-------|
| Always | 3.1 | 3.6 |
| Sometimes | 24.5 | 33.2 |
| Never | 72.4 | 63.2 |

Table 16. Avoidance of the sun between 12 and 3pm, by age group (%)***

| | 10-11 years old | 12-14 years old | 15-17 years old |
|-----------|-----------------|-----------------|-----------------|
| Always | 4.4 | 3.4 | 2.8 |
| Sometimes | 34.4 | 29.5 | 26.1 |
| Never | 61.1 | 67.1 | 71.2 |

Table 17. Avoidance of the sun between 12 and 3pm, by social class (%)**

| | SC1-2 | SC3-4 | SC5-6 |
|-----------|-------|-------|-------|
| Always | 3.4 | 3.0 | 4.3 |
| Sometimes | 28.2 | 29.7 | 32.5 |
| Never | 68.4 | 67.3 | 63.2 |

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$: There are statistically significant differences in avoiding the sun between 12 and 3pm by sex and across age groups and social classes.

Using sunscreen

If you go outside on a sunny day, do you use sunscreen?

Table 18. Use of sunscreen on a sunny day, overall

| | Frequency | Percent | Valid percent |
|--------------|--------------|-------------|---------------|
| Always | 3105 | 30.7 | 30.9 |
| Sometimes | 5248 | 51.1 | 51.6 |
| Never | 1781 | 17.3 | 17.5 |
| Total | 10180 | 99.1 | 100 |
| Missing | 92 | 0.9 | |

Table 19. Use of sunscreen on a sunny day, by sex (%)***

| | Boys | Girls |
|-----------|------|-------|
| Always | 22.8 | 38.1 |
| Sometimes | 54.1 | 49.3 |
| Never | 23.1 | 12.6 |

Table 20. Use of sunscreen on a sunny day, by age group (%)***

| | 10-11 years old | 12-14 years old | 15-17 years old |
|-----------|-----------------|-----------------|-----------------|
| Always | 45.6 | 31.8 | 22.1 |
| Sometimes | 45.7 | 50.5 | 56.1 |
| Never | 8.7 | 17.7 | 21.8 |

Table 21. Use of sunscreen on a sunny day, by social class (%)***

| | SC1-2 | SC3-4 | SC5-6 |
|-----------|-------|-------|-------|
| Always | 32.0 | 30.7 | 26.6 |
| Sometimes | 52.2 | 51.5 | 48.4 |
| Never | 15.8 | 17.8 | 25.0 |

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$: There are statistically significant differences in using sunscreen on a sunny day by sex and across age groups and social classes.

At least one of three protective behaviours

Prevalence of children reporting 'always' or 'sometimes' reporting one, two or all three of the following protective behaviours when going out on a sunny day: use sunscreen, use a hat, wear clothes that cover arms and legs

Table 22. At least one of three protective behaviours, overall

| | Frequency | Percent | Valid percent |
|-----------------------------------|--------------|-------------|---------------|
| At least one protective behaviour | 8885 | 86.5 | 87.0 |
| None of the behaviours | 1327 | 12.9 | 13.0 |
| Total | 10212 | 99.4 | 100 |
| Missing | 59 | 0.6 | |

Table 23. At least one of three protective behaviours, by sex (%)***

| | Boys | Girls |
|-----------------------------------|------|-------|
| At least one protective behaviour | 83.6 | 90.0 |
| None of the behaviours | 16.4 | 10.0 |

Table 24. At least one of three protective behaviours, by age group (%)***

| | 10-11 years old | 12-14 years old | 15-17 years old |
|-----------------------------------|-----------------|-----------------|-----------------|
| At least one protective behaviour | 94.2 | 86.6 | 83.9 |
| None of the behaviours | 5.8 | 13.4 | 16.1 |

Table 25. At least one of three protective behaviours, by social class (%)***

| | SC1-2 | SC3-4 | SC5-6 |
|-----------------------------------|-------|-------|-------|
| At least one protective behaviour | 88.2 | 87.0 | 81.0 |
| None of the behaviours | 11.8 | 13.0 | 19.0 |

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$: There are statistically significant differences in reporting at least one of the three sun protection methods by sex and across age groups and social classes.

According to the 2016 census, the 10 to 17-year-old population in Ireland is 503,426 (CSO, 2020). If the target for 2025 was to have at least **90%** of children practicing one or more sun protection behaviour, that would require $503,426 * 3\% = \mathbf{15,102 \text{ more children}}$ to use sunscreen, wear hats, or, to wear protective clothing to meet the target. If the target for 2025 was **95%**, that would require $503,426 * 3\% = \mathbf{40,274 \text{ more children}}$ to adopt at least one of these sun protection methods to meet the target.

At least three of five protective behaviours

Prevalence of children reporting 'always' or 'sometimes' reporting three or more of the following protective behaviours when going out on a sunny day: use a hat, wear sunglasses, wear clothes that cover arms and legs, avoid sun between 12 and 3pm, use sunscreen

Table 26. At least three of five protective behaviours, overall

| | Frequency | Percent | Valid percent |
|-------------------------------------|--------------|-------------|---------------|
| Three or more protective behaviours | 6212 | 60.5 | 60.6 |
| One or two protective behaviours | 3714 | 36.2 | 36.3 |
| None of these protective behaviours | 319 | 3.1 | 3.1 |
| Total | 10245 | 99.7 | 100 |
| Missing | 26 | 0.3 | |

Table 27. At least three of five protective behaviours, by sex (%)***

| | Boys | Girls |
|-------------------------------------|------|-------|
| Three or more protective behaviours | 54.3 | 66.2 |
| One or two protective behaviours | 40.8 | 32.3 |
| None of these protective behaviours | 4.9 | 1.5 |

Table 28. At least three of five protective behaviours, by age group (%)***

| | 10-11 years old | 12-14 years old | 15-17 years old |
|-------------------------------------|-----------------|-----------------|-----------------|
| Three or more protective behaviours | 68.8 | 59.0 | 58.7 |
| One or two protective behaviours | 28.9 | 37.7 | 37.9 |
| None of these protective behaviours | 2.2 | 3.2 | 3.4 |

Table 29. At least three of five protective behaviours, by social class (%)

| | SC1-2 | SC3-4 | SC5-6 |
|-------------------------------------|-------|-------|-------|
| Three or more protective behaviours | 61.1 | 60.7 | 58.3 |
| One or two protective behaviours | 35.9 | 36.1 | 38.4 |
| None of these protective behaviours | 3.0 | 3.2 | 3.3 |

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$: There are statistically significant differences in reporting at least three of the five forms of sun protection methods by sex and across age groups. There is no significant difference across social classes.

According to the 2016 census, the 10 to 17-year-old population in Ireland is 503,426 (CSO, 2020). If the target for 2025 was to have at least **65%** of children practicing three or more types of sun protection, it would require that $503,426 * 4.4\% = \mathbf{22,150}$ more children need to use any three of a hat, sunscreen, sunglasses, clothes that cover arms and legs, or avoid sun between 12 and 3pm, to meet the target. If the same target for 2025 was **70%**, it would require that $503,426 * 9.4\% = \mathbf{47,322}$ more children need to apply at least three of these sun protection methods to meet the target.

SUNBURN

Sunburn, last summer

How many times did you get sunburn (red skin for hours after being in the sun) last summer?

Table 30. Frequency of sunburn last summer, overall

| | Frequency | Percent | Valid percent |
|-----------------|--------------|-------------|---------------|
| Never | 2666 | 26.0 | 26.5 |
| 1 time | 2594 | 25.3 | 25.8 |
| 2 times | 2249 | 21.9 | 22.4 |
| 3-4 times | 1553 | 15.1 | 15.4 |
| 5 times or more | 997 | 9.7 | 9.9 |
| Total | 10059 | 97.9 | 100 |
| Missing | 212 | 2.1 | |

Table 31. Frequency of sunburn last summer, by sex (%)***

| | Boys | Girls |
|-----------------|------|-------|
| Never | 29.0 | 24.3 |
| 1 time | 25.8 | 25.6 |
| 2 times | 21.0 | 23.5 |
| 3-4 times | 13.9 | 16.8 |
| 5 times or more | 10.4 | 9.5 |

Table 32. Frequency of sunburn last summer, by age group (%)***

| | 10-11 years old | 12-14 years old | 15-17 years old |
|-----------------|-----------------|-----------------|-----------------|
| Never | 32.4 | 26.9 | 22.8 |
| 1 time | 26.8 | 27.0 | 23.6 |
| 2 times | 20.1 | 22.2 | 23.8 |
| 3-4 times | 12.2 | 14.0 | 19.1 |
| 5 times or more | 8.5 | 9.9 | 10.6 |

Table 33. Frequency of sunburn last summer, by social class (%)***

| | SC1-2 | SC3-4 | SC5-6 |
|-----------------|-------|-------|-------|
| Never | 26.0 | 25.8 | 31.5 |
| 1 time | 26.6 | 25.6 | 21.6 |
| 2 times | 22.7 | 22.2 | 21.4 |
| 3-4 times | 15.4 | 16.1 | 13.4 |
| 5 times or more | 9.4 | 10.0 | 12.1 |

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$: There are statistically significant differences in frequency of sunburn last summer by sex and across, age groups and social classes.

Sunburn, lifetime

How many times did you get sunburn (red skin for hours after being in the sun) in your lifetime?

Table 34. Frequency of sunburn, lifetime, overall

| | Frequency | Percent | Valid percent |
|-----------------|-------------|-------------|---------------|
| Never | 1177 | 11.5 | 11.8 |
| 1 time | 1042 | 10.1 | 10.4 |
| 2 times | 1156 | 11.3 | 11.6 |
| 3-4 times | 2061 | 20.1 | 20.6 |
| 5 times or more | 4556 | 44.4 | 45.9 |
| Total | 9992 | 97.3 | 100 |
| Missing | 279 | 2.7 | |

Table 35. Frequency of sunburn, lifetime, by sex (%)

| | Boys | Girls |
|-----------------|------|-------|
| Never | 12.6 | 11.0 |
| 1 time | 10.4 | 10.4 |
| 2 times | 11.4 | 11.7 |
| 3-4 times | 19.7 | 21.5 |
| 5 times or more | 45.8 | 45.4 |

Table 36. Frequency of sunburn, lifetime, by age group (%)***

| | 10-11 years old | 12-14 years old | 15-17 years old |
|-----------------|-----------------|-----------------|-----------------|
| Never | 14.7 | 12.7 | 8.9 |
| 1 time | 15.7 | 10.6 | 7.5 |
| 2 times | 13.1 | 12.2 | 9.8 |
| 3-4 times | 21.5 | 20.5 | 20.3 |
| 5 times or more | 35.0 | 43.9 | 53.5 |

Table 37. Frequency of sunburn, lifetime, by social class (%)***

| | SC1-2 | SC3-4 | SC5-6 |
|-----------------|-------|-------|-------|
| Never | 11.1 | 11.3 | 16.9 |
| 1 time | 10.0 | 10.7 | 11.7 |
| 2 times | 11.4 | 11.9 | 11.7 |
| 3-4 times | 21.7 | 20.4 | 16.1 |
| 5 times or more | 45.9 | 45.8 | 43.7 |

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$: There are statistically significant differences in lifetime frequency of sunburn across age groups and social classes, but not by sex.

SUNBED USE

Sunbed use, last 12 months

How many times have you used a tanning solarium or sunbed (lying down or standing up) in the last 12 months?

Table 38. Frequency of sunbed use in the last 12 months, overall

| | Frequency | Percent | Valid percent |
|-----------------|--------------|-------------|---------------|
| Never | 9753 | 95.0 | 97.4 |
| 1 time | 108 | 1.1 | 1.1 |
| 2 times | 51 | 0.5 | 0.5 |
| 3-4 times | 36 | 0.4 | 0.4 |
| 5 times or more | 70 | 0.7 | 0.7 |
| Total | 10018 | 97.5 | 100 |
| Missing | 253 | 2.5 | |

Table 39. Frequency of sunbed use in last 12 months, by sex (%) *

| | Boys | Girls |
|-----------------|------|-------|
| Never | 97.8 | 96.9 |
| 1 time | 0.9 | 1.2 |
| 2 times | 0.4 | 0.6 |
| 3-4 times | 0.2 | 0.5 |
| 5 times or more | 0.5 | 0.9 |

Table 40. Frequency of sunbed use in last 12 months, by age group (%)

| | 10-11 years old | 12-14 years old | 15-17 years old |
|-----------------|-----------------|-----------------|-----------------|
| Never | 97.7 | 97.5 | 96.9 |
| 1 time | 1.2 | 1.0 | 1.2 |
| 2 times | 0.4 | 0.6 | 0.4 |
| 3-4 times | 0.3 | 0.3 | 0.5 |
| 5 times or more | 0.4 | 0.6 | 1.0 |

Table 41. Frequency of sunbed use in last 12 months, by social class (%) ***

| | SC1-2 | SC3-4 | SC5-6 |
|-----------------|-------|-------|-------|
| Never | 98.0 | 96.6 | 97.4 |
| 1 time | 0.9 | 1.3 | 1.4 |
| 2 times | 0.3 | 0.9 | 0.6 |
| 3-4 times | 0.3 | 0.4 | 0.3 |
| 5 times or more | 0.5 | 0.8 | 1.3 |

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$: There are statistically significant differences in sunbed use in the last 12 months by sex and across social classes, but not across age groups.

Sunbed use, lifetime

How many times have you used a tanning solarium or sunbed (lying down or standing up) in your lifetime?

Table 42. Frequency of sunbed use, lifetime, overall

| | Frequency | Percent | Valid percent |
|-----------------|--------------|-------------|---------------|
| Never | 9747 | 94.9 | 96.7 |
| 1 time | 111 | 1.1 | 1.1 |
| 2 times | 49 | 0.5 | 0.5 |
| 3-4 times | 66 | 0.6 | 0.7 |
| 5 times or more | 104 | 1.0 | 1.0 |
| Total | 10077 | 98.1 | 100 |
| Missing | 194 | 1.9 | |

Table 43. Frequency of sunbed use, lifetime, by sex (%)*

| | Boys | Girls |
|-----------------|------|-------|
| Never | 97.3 | 96.2 |
| 1 time | 0.9 | 1.3 |
| 2 times | 0.4 | 0.6 |
| 3-4 times | 0.6 | 0.7 |
| 5 times or more | 0.8 | 1.2 |

Table 44. Frequency of sunbed use, lifetime, by age group (%)

| | 10-11 years old | 12-14 years old | 15-17 years old |
|-----------------|-----------------|-----------------|-----------------|
| Never | 97.2 | 96.9 | 96.2 |
| 1 time | 1.0 | 1.1 | 1.2 |
| 2 times | 0.6 | 0.5 | 0.4 |
| 3-4 times | 0.4 | 0.5 | 0.9 |
| 5 times or more | 0.7 | 1.0 | 1.3 |

Table 45. Frequency of sunbed use, lifetime, by social class (%)***

| | SC1-2 | SC3-4 | SC5-6 |
|-----------------|-------|-------|-------|
| Never | 97.5 | 95.9 | 95.8 |
| 1 time | 1.0 | 1.1 | 1.5 |
| 2 times | 0.4 | 0.7 | 0.3 |
| 3-4 times | 0.5 | 0.8 | 0.9 |
| 5 times or more | 0.6 | 1.4 | 1.5 |

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$: There are statistically significant differences in lifetime sunbed use across social classes, but not by sex or across age groups.

CIRCUMSTANCES OF SUNBED USE

Asking about age

If you have used a tanning solarium or sun bed (lying down or standing up) were you asked how old you were?¹

Table 46. Frequency of being asked their age when using a sunbed, overall

| | Frequency | Percent | Valid percent |
|---------------------|-------------|-------------|---------------|
| Never used a sunbed | 9111 | 88.7 | 94.0 |
| Yes, every time | 55 | 0.5 | 0.6 |
| Yes, at least once | 80 | 0.8 | 0.8 |
| No | 339 | 3.3 | 3.5 |
| I don't remember | 110 | 1.1 | 1.1 |
| Total | 9695 | 94.4 | 100 |
| Missing | 576 | 5.6 | |

Table 47. Frequency of being asked their age when using a sunbed, by sex (%)***

| | Boys | Girls |
|---------------------|------|-------|
| Never used a sunbed | 93.5 | 94.4 |
| Yes, every time | 0.5 | 0.6 |
| Yes, at least once | 0.6 | 1.0 |
| No | 4.3 | 2.8 |
| I don't remember | 1.2 | 1.1 |

Table 48. Frequency of being asked their age when using a sunbed, by age group (%)***

| | 10-11 years old | 12-14 years old | 15-17 years old |
|---------------------|-----------------|-----------------|-----------------|
| Never used a sunbed | 92.1 | 93.9 | 95.1 |
| Yes, every time | 0.3 | 0.6 | 0.6 |
| Yes, at least once | 0.8 | 0.8 | 0.9 |
| No | 5.1 | 3.6 | 2.6 |
| I don't remember | 1.7 | 1.1 | 0.8 |

Table 49. Frequency of being asked their age when using a sunbed, by social class (%)**

| | SC1-2 | SC3-4 | SC5-6 |
|---------------------|-------|-------|-------|
| Never used a sunbed | 95.0 | 92.8 | 92.6 |
| Yes, every time | 0.4 | 0.8 | 1.0 |
| Yes, at least once | 0.7 | 0.9 | 1.0 |
| No | 2.9 | 4.3 | 3.9 |
| I don't remember | 1.0 | 1.2 | 1.5 |

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$: There are statistically significant differences in the frequency of being asked about age when using a sunbed by sex and across age groups and social classes.

¹ Not cleaned by reported sunbed use.

Protective goggles

If you have used a tanning solarium or sunbed (lying down or standing up), were you told to wear protective eye goggles?²

Table 50. Frequency of being told to wear protective goggles when using a sunbed, overall

| | Frequency | Percent | Valid percent |
|---------------------|-------------|-------------|---------------|
| Never used a sunbed | 9073 | 88.3 | 93.9 |
| Yes, every time | 110 | 1.1 | 1.1 |
| Yes, at least once | 51 | 0.5 | 0.5 |
| No | 349 | 3.4 | 3.6 |
| I don't remember | 84 | 0.8 | 0.9 |
| Total | 9667 | 94.1 | 100 |
| Missing | 604 | 5.9 | |

Table 51. Frequency of being told to wear protective goggles when using a sunbed, by sex (%)***

| | Boys | Girls |
|---------------------|------|-------|
| Never used a sunbed | 93.4 | 94.3 |
| Yes, every time | 0.8 | 1.5 |
| Yes, at least once | 0.4 | 0.6 |
| No | 4.4 | 2.9 |
| I don't remember | 1.0 | 0.7 |

Table 52. Frequency of being told to wear protective goggles when using a sunbed, by age group (%)***

| | 10-11 years old | 12-14 years old | 15-17 years old |
|---------------------|-----------------|-----------------|-----------------|
| Never used a sunbed | 91.6 | 93.8 | 95.1 |
| Yes, every time | 1.1 | 1.0 | 1.3 |
| Yes, at least once | 0.5 | 0.5 | 0.6 |
| No | 5.4 | 3.8 | 2.4 |
| I don't remember | 1.5 | 0.8 | 0.6 |

Table 53. Frequency of being told to wear protective goggles when using a sunbed, by social class (%)**

| | SC1-2 | SC3-4 | SC5-6 |
|---------------------|-------|-------|-------|
| Never used a sunbed | 94.8 | 92.8 | 92.5 |
| Yes, every time | 1.0 | 1.2 | 1.5 |
| Yes, at least once | 0.5 | 0.5 | 0.6 |
| No | 2.9 | 4.5 | 4.1 |
| I don't remember | 0.7 | 1.0 | 1.2 |

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$: There are statistically significant differences in the frequency of being instructed to use protective goggles at the sunbed by sex and across age groups and social classes.

² Not cleaned by reported sunbed use.

Advice on skin type

If you have used a tanning solarium or sunbed (lying down or standing up) were you given advice on your skin type?³

Table 54. Frequency of being given advice on their skin type when using a sunbed, overall

| | Frequency | Percent | Valid percent |
|---------------------|-------------|-------------|---------------|
| Never used a sunbed | 9048 | 88.1 | 93.7 |
| Yes, every time | 80 | 0.8 | 0.8 |
| Yes, at least once | 70 | 0.7 | 0.7 |
| No | 364 | 3.5 | 3.8 |
| I don't remember | 96 | 0.9 | 1.0 |
| Total | 9658 | 94.0 | 100 |
| Missing | 613 | 6.0 | |

Table 55. Frequency of being given advice on their skin type when using a sunbed, by sex (%)**

| | Boys | Girls |
|---------------------|------|-------|
| Never used a sunbed | 93.3 | 94.0 |
| Yes, every time | 0.6 | 1.1 |
| Yes, at least once | 0.7 | 0.8 |
| No | 4.2 | 3.4 |
| I don't remember | 1.2 | 0.8 |

Table 56. Frequency of being given advice on their skin type when using a sunbed, by age group (%)***

| | 10-11 years old | 12-14 years old | 15-17 years old |
|---------------------|-----------------|-----------------|-----------------|
| Never used a sunbed | 91.4 | 93.7 | 94.9 |
| Yes, every time | 0.6 | 0.8 | 1.0 |
| Yes, at least once | 1.1 | 0.6 | 0.7 |
| No | 5.2 | 3.9 | 2.8 |
| I don't remember | 1.7 | 1.0 | 0.6 |

Table 57. Frequency of being given advice on their skin type when using a sunbed, by social class (%)**

| | SC1-2 | SC3-4 | SC5-6 |
|---------------------|-------|-------|-------|
| Never used a sunbed | 94.7 | 92.6 | 92.3 |
| Yes, every time | 0.7 | 0.9 | 1.2 |
| Yes, at least once | 0.6 | 0.9 | 0.5 |
| No | 3.2 | 4.4 | 4.6 |
| I don't remember | 0.8 | 1.2 | 1.4 |

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$: There are statistically significant differences in being advised on skin type when using the sunbed across sexes, age groups and social classes.

³ Not cleaned by reported sunbed use.

Being told about health risks

If you have used a tanning solarium or sunbed (lying down or standing up), were you told about the health risks?⁴

Table 58. Frequency of being told about health risks when using a sunbed

| | Frequency | Percent | Valid percent |
|---------------------|-------------|-------------|---------------|
| Never used a sunbed | 9033 | 87.8 | 93.5 |
| Yes, every time | 100 | 1.0 | 1.0 |
| Yes, at least once | 74 | 0.7 | 0.8 |
| No | 353 | 3.4 | 3.7 |
| I don't remember | 98 | 1.0 | 1.0 |
| Total | 9658 | 94.0 | 100 |
| Missing | 556 | 6.0 | |

Table 59. Frequency of being told about health risks when using a sunbed, by sex (%)**

| | Boys | Girls |
|---------------------|------|-------|
| Never used a sunbed | 93.0 | 93.9 |
| Yes, every time | 0.8 | 1.2 |
| Yes, at least once | 0.8 | 0.8 |
| No | 4.1 | 3.3 |
| I don't remember | 1.3 | 0.8 |

Table 60. Frequency of being told about health risks when using a sunbed, by age group (%)***

| | 10-11 years old | 12-14 years old | 15-17 years old |
|---------------------|-----------------|-----------------|-----------------|
| Never used a sunbed | 90.7 | 93.6 | 94.9 |
| Yes, every time | 0.9 | 1.0 | 1.2 |
| Yes, at least once | 1.1 | 0.7 | 0.7 |
| No | 5.2 | 3.8 | 2.6 |
| I don't remember | 2.1 | 0.9 | 0.6 |

Table 61. Frequency of being told about health risks when using a sunbed, by social class (%)***

| | SC1-2 | SC3-4 | SC5-6 |
|---------------------|-------|-------|-------|
| Never used a sunbed | 94.6 | 92.3 | 92.9 |
| Yes, every time | 0.7 | 1.2 | 1.8 |
| Yes, at least once | 0.6 | 0.9 | 0.9 |
| No | 3.1 | 4.4 | 3.7 |
| I don't remember | 0.9 | 1.1 | 1.3 |

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$: There are statistically significant differences in being told about health risks when using the sunbed across sexes, age groups and social classes.

⁴ Not cleaned by reported sunbed use.

FAMILY HOLIDAYS

How many times did you and your family travel out of Ireland for a holiday last year?⁵

Table 62. Frequency of holidays abroad, overall

| | Frequency | Percent | Valid percent |
|-----------------|-------------|-------------|---------------|
| Not at all | 2181 | 21.2 | 22.2 |
| Once | 3921 | 38.2 | 39.9 |
| Twice | 2028 | 19.7 | 20.7 |
| More than twice | 1685 | 16.4 | 17.2 |
| Total | 9815 | 95.6 | 100 |
| Missing | 456 | 4.4 | |

Table 63. Frequency of holidays abroad, by sex (%)**

| | Boys | Girls |
|-----------------|------|-------|
| Not at all | 2.2 | 3.1 |
| Once | 41.4 | 8.7 |
| Twice | 21.1 | 20.3 |
| More than twice | 16.2 | 18.0 |

Table 64. Frequency of holidays abroad, by age group (%)*

| | 10-11 years old | 12-14 years old | 15-17 years old |
|-----------------|-----------------|-----------------|-----------------|
| Not at all | 20.0 | 21.5 | 4.5 |
| Once | 41.1 | 40.1 | 39.1 |
| Twice | 21.0 | 21.0 | 20.0 |
| More than twice | 17.9 | 17.4 | 16.4 |

Table 65. Frequency of holidays abroad, by social class (%)***

| | SC1-2 | SC3-4 | SC5-6 |
|-----------------|-------|-------|-------|
| Not at all | 18.7 | 24.9 | 1.5 |
| Once | 38.9 | 41.5 | 40.2 |
| Twice | 23.0 | 18.4 | 16.5 |
| More than twice | 19.5 | 15.2 | 11.8 |

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$: There are statistically significant differences in the frequency of holidays abroad across sexes, age groups and social classes.

⁵ No further questions were about the location, length, or season of the holiday(s).

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Further information on HBSC Ireland, and publications arising from the study are available at <http://www.nuigalway.ie/hbsc>.

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