

# **SunSmart Beach Signage**

**Report on**

**Evaluation of the Pilot Implementation of  
SunSmart Beach Signs in Ireland**

**October 2003**

**Mairead Mc Daid  
Dr. Margaret Barry  
Jane Sixsmith**

**Centre for Health Promotion Studies  
National University Of Ireland, Galway**

## **ACKNOWLEDGEMENTS**

This study was commissioned by the Irish Cancer Society. We wish to express our appreciation to all those who participated in this study. In particular we would like to thank Elaine Glynn of the Irish Cancer Society for her support throughout and our colleagues in the Centre for Health Promotion Studies, NUI Galway

# CONTENTS PAGE

<b>Chapter 1</b>	<b>Introduction</b>	.....
<b>Chapter 2</b>	<b>Literature Review</b>	.....
<b>Chapter 3</b>	<b>Methodology</b>	.....
<b>Chapter 4</b>	<b>Results</b>	.....
<b>Chapter 5</b>	<b>Discussion</b>	.....
<b>References</b>		.....
<b>Appendices</b>		.....

## **SUMMARY**







## **INTRODUCTION**

Skin cancer is the most common and the most preventable form of cancer (Cummins and Tripp, Hermann, 1997). The Irish National Cancer Registry reports that there are approximately 5,500 cases of skin cancer in Ireland per year. The incidences of skin cancers as a group are on the rise worldwide, currently accounting for up to one third of all diagnosed malignancies (Wright and Bramwell, 2001).

In response to this serious public health issue, the SunSmart campaign was launched by the Irish Cancer Society. The aim of the campaign is to reduce the incidence, morbidity and mortality of skin cancer. As part of the SunSmart campaign, a pilot study was conducted to evaluate the effectiveness of SunSmart Signage in recreation settings. Signs visually representing the sun smart code were erected in six beaches on the South East Coast of Ireland. The sun smart code includes six sun protection messages, the heading on the sign is Sun Smart- Save your Skin. The messages include: use an umbrella, avoid the mid-day sun (11am-3pm), wear a hat, wear sunscreen SPF15+, wear sunglasses and wear a t-shirt with a collar. The objective of the SunSmart signage is to ascertain the effectiveness of beach signs in increasing awareness of sun safety.

Eight signs were erected on beaches in County Wexford and seven signs were erected on beaches in County Wicklow. The beaches chosen for the evaluation include Britas Bay (North and South) in County Wicklow, Courtown in County Wexford. Tramore beach in County Waterford was selected as the control beach, at which there was no SunSmart sign present.

The objectives of this study are to evaluate the effectiveness of the SunSmart beach signs in Britas Bay and Courtown. Specifically the survey addressed reported behaviour, knowledge, attitudes and beliefs, recall of the SunSmart sign, perceived relevance and the influence of the sign to change behaviour. Closed questions were used and prompts were given when necessary.

## **Key Findings**

A quasi-experimental study was carried out with 600 respondents. At each site 200 people were surveyed. 68% of the respondents are female and 38% male. The majority of respondents were visitors (83%), belong to the age category 31-45 (45%) and are parents (73%).

- Approximately half of the respondents in the intervention sites recalled the SunSmart sign. 42% of respondents in Courtown recalled the sign and 52% recalled the sign in Britas Bay. 60% of total respondents stated that the sign is relevant to them personally, 25 % stated that the sign would increase their knowledge levels and 39% stated that it would influence them to change their behaviour.
- Protect your skin at the beach was identified as the main point of the sign by those who recalled the sign (unprompted). Avoid the mid-day sun was identified as the main point of the sign by those who had not recalled the sign and were shown the sign (prompted).
- Knowledge: Knowledge levels are low. Respondents generally reported sunscreen as the primary method of effective sun protection. The control beach Tramore had lower knowledge levels suggesting the sign is effective in increasing knowledge levels within the intervention sites.
- Attitudes and Beliefs: A Suntan is viewed as attractive, fashionable and personally important. 95.3% agree that skin cancer is a dangerous disease and 41.3% strongly agree that they are susceptible to skin cancer.
- Reported Behaviour: Sunscreen is the primary method of sun protection. This finding is similar across the three sites. There is a lack of comprehensive sun protection methods.

### **Influences on Recall of Sign and Sign Effectiveness**

- Males, parents, respondents with tertiary education, and those from higher socio-economic groups are more likely to recall the SunSmart sign. Respondents with heightened awareness, positive sun protection behaviour and high knowledge levels are also more likely to recall the sign.
- Females, respondents from age category 31-45, visitors, married respondents and parents, are more likely to see the sign as being relevant to them personally. Respondents with heightened awareness and positive sun protection behaviour are also more likely to recall the sign.
- Females and visitors are more likely to say that the sign would influence them to change their sun protection behaviour.

### **Influences on Knowledge, in Relation to Sun Protection**

- Respondents with tertiary education are more likely to have higher knowledge levels.

### **Influences on Attitudes and Beliefs**

- Females, respondents from the age category 17-30, non-married respondents, non-parents and those with tertiary education are more likely to say that a sun tan is important to them personally. Respondents from lower SES groups are more likely to feel susceptible to skin cancer.

### **Influences on Reported Behaviour**

- Females, visitors, married respondents, parents, higher socio-economic groups and those with tertiary education are more likely to have higher sun protection levels.
- Males are more likely to wear hats and clothes to cover up and females are more likely to use sunscreen.

## **LITERATURE REVIEW**

The rising incidence of skin cancer in many parts of the world is now a serious public health concern (Easer et al., 1995). Cancer of the skin refers to several types of malignancies that can occur, including basal cell carcinoma, squamous cell carcinoma and melanoma. The non-melanoma skin cancers, basal cell carcinoma and squamous cell carcinoma are the most common types of skin cancer. Fortunately, more than 90% of patients with basal cell carcinoma and squamous cell carcinoma are completely cured. Malignant melanoma is the least common and the most dangerous form of skin cancer. Skin cancer can be seen on the skin surface and it can be diagnosed early and cured. If malignant melanoma is diagnosed early the prognosis is very good.

Current etiological evidence suggests a casual link between excessive sun exposure and skin cancer, especially for sun exposure received in the first twenty years of life (Abroms et al., 2003). Primary prevention of skin cancer involves promoting sun protection behaviours. Preventive behaviours include applying sunscreen SPF 15+, dressing in protective clothing, using shade, limiting exposure during peak sun hours and avoiding artificial sources of ultraviolet radiation such as tanning beds.

### **Knowledge, Attitudes, Beliefs and Behaviour**

A consistent finding across studies is that many people demonstrate high knowledge levels of the dangers of excessive sun exposure and the need for sun protective behaviours, however, this knowledge is not translated into positive behaviour (Stephan and Valerie, 1995). Researchers continue to report high rates of intentional sun exposure and infrequent sunscreen use (Banks et al., 1992). These findings are consistent with a recent Irish National survey (Irish Cancer Society, 2003). The results indicated low levels of sun protection. Only eight percent of respondents stated that they would cover up in the sun and four percent stated that they would stay out of the sun during peak hours. Half of the respondents use sunscreen as their primary method of sun protection, of which one quarter of the respondents use a sunscreen with a sun protective factor of 15 or higher (Irish Cancer Society, 2003). Research suggests that there is an over reliance on sunscreen and a lack of comprehensive protection methods (Howard, 1997). According to Grey (1998) many people who use sunscreen as their main method of sun protection,

generally feel protected and therefore, believe they can stay out in the sun for longer and achieve a `safe tan`.

The major predictors of sun protection behaviours are perceived threat of skin cancer, including susceptibility and severity, the benefits and the barriers of different types of sun protection behaviours, social factors and knowledge about skin cancer (Eid and Schwerzmeizer, 1997; Hill et al., 1984). Other factors associated with more preventative behaviours include having fairer skin, higher education and knowing someone diagnosed with skin cancer (Arthey and Clarke, 1995; Newman et al., 1996). Newman et al., (1996) stated that in general people take more precautions when they are on holiday rather than in their everyday context, for example at work outdoors.

Gerbert et al., (1996) reported that to improve skin cancer prevention, interventions must attend to individuals' attitudes about sun exposure and address the barriers related to them. Sun exposure is often sought intentionally. The major motivational predictor for unprotected sun exposure is the desire for a suntan. The belief that a suntan improves one's physical appearance is the strongest predictor of suntanning. Findings from numerous correlational studies state that a suntan is considered to be indicative of both health and beauty. Although the level of knowledge of sun protection and skin cancer is generally high, many people appear to believe that the benefits of a suntan outweigh the risks involved in getting the tan (Miller et al., 1990).

According to Naidoo and Wills (2000), behaviour cannot be separated from the social context in which it takes place. Social factors have an important influence on sun protection. Use of sun protection is correlated with peers' sun protection behavior, parental influence, and parental sun protection behavior. Subjective norms play a crucial role in sun protection, where the perceived opinions of others have an important effect on people's sun tanning, and consequently sun protection.

The perceived threat of skin cancer depends on the perceived severity of and the susceptibility to, skin cancer. People who rate skin cancer as a severe disease and who think that they are more susceptible to skin cancer are more likely to use sun protection.

Furthermore, individuals with sensitive and fair skin, both of whom are more prone to skin cancer, use sun protection more often.

### **Demographic Effects on Sun Protection**

Skin cancer is universal in the sense that it crosses all demographic boundaries (Montague et al., 2001). However, a variety of demographic factors account for differences in the propensity to undertake behaviour related to sun protection.

#### **Gender**

Relative to males, females have a higher level of knowledge of skin cancer, believe they have a higher susceptibility to skin cancer, have fewer barriers to covering-up (Cody and Lee, 1990) engage in more skin-protective behaviours (Keesling and Friedman, 1987) and perceive a lighter suntan level to be healthier and more attractive (Broadstock et al., 1992). However, males are more likely to wear a hat, to be less likely to sunbathe or to use indoor tanning equipment (Abroms et al., 2003). A barrier against the use of sunscreen for men is the belief that sunscreen is associated with beauty products and therefore, is not masculine. Barriers against wearing hats for women are the beliefs that hats are inconvenient to wear and they also cause problems with hairstyle.

#### **Age**

The type of sun protection preferred varies according to age and gender. Younger people are more likely to use sunscreen, while older people are more likely to cover themselves up. Adolescents are the group who, as a whole, spend the most time in the sun (Johnsen et al., 1984), are the most determined to get a suntan, and the most resistant to adult advice on what to wear and how to behave in the sun. A study into the attitudes of older people in relation to skin cancer revealed that older people do not feel susceptible to skin cancer. The main reason quoted is that they are no longer exposing themselves to the sun (Wright and Bramwell, 2001).

#### **Education**

People with higher levels of education are more aware of the dangers of over-exposure and are also more likely to report covering-up when in the sun. This is similar to findings in other areas of behavioural health research, where those with higher levels of education are more likely to be aware of the health risks associated with their behaviour.

## **Skin Cancer Prevention**

Primary prevention, especially improved sun protection, holds great promise for reducing the burden of skin cancer (Glanz et al., 1999). About 90% of all skin cancers diagnosed could have been prevented by protection from the sun's rays (American Cancer Society, 1995). Accumulating evidence reveals that in spite of the large campaigns against excessive sun exposure undertaken worldwide, people are still spending long periods in the sun, and do not follow the recommended sun protection guidelines.

Primary prevention for skin cancer has generally taken the form of increasing public awareness and knowledge of the dangers of excessive sunlight exposure and educating the public as to the best ways to avoid over-exposure. According to Bennets et al., (1991) health education campaigns may be successful in increasing levels of information and knowledge, but this has not yet resulted in acceptable levels of sun protection behaviour. Research into improving sun protection levels reveals that knowledge does not necessarily produce behaviour change (Arthey and Clarke, 1995). Knowledge gains must precede any attempts to alter behaviour, but it should only be seen as the first step, rather than the main instrument with which to achieve it (Mc Guire, 1981; Arthey and Clarke, 1995; Eiser et al., 1995). Knowledge based strategies for promoting positive attitudes for sun protection, among adolescents in particular, has been found to have limited effectiveness (Cockburn et al., 1989).

A goal of skin cancer prevention programmes must be the removal of specific barriers against sun protective behaviours. Arthey and Clarke (1995) believe that because skin protection and sun tanning both have such a strong social influence that health promotion programmes aiming to promote skin protection must incorporate a social influence component to account for peer pressure, social norms, fashion and other social barriers to skin protection. Arthey and Clarke (1995) also recommend that interventions should be directed at high-risk groups, for example outdoor workers and children. Lowe et al, (2001) strongly agree, stating that a reduction in levels of exposure among children is more likely to have a greater impact on the incidence of skin cancer than reducing exposure levels among adults. Hill and Dixon (1999) reiterate the importance of focusing on children emphasizing the importance of developing good sun protection habits early in life. Grob et al, (1993) report that parents and caregivers are essential targets of

interventions aimed at children in their capacity as role models and as those in control of the children's exposure levels.

Montague et al., (2001) recommend that interventions directed at relevant organizational settings are important elements of the overall campaign against skin cancer. It is increasingly being recognized that environmental and structural factors have enormous potential within skin cancer prevention (Minle et al., 1999).

The majority of interventions report an increase in knowledge levels (Borland et al., 1990; Mermelstein and Riesenber, 1992), some interventions have reported changes in attitudes toward sun protection (Girgis et al., 1994), but only a few have reported behaviour change as a result of an intervention. (Montague et al, 2001, Glanz, et al., 1999)

### **Skin Cancer Prevention Programmes**

Campaigns to effect behaviour change in sun protection have been ongoing in Victoria, Australia since 1981, when the Anti-Cancer Council of Victoria launched the "Slip! Slop! Slap!" Campaign. This was followed by the Sun Smart Campaign, which was launched in 1988 with substantial funding from the Victorian Health Promotion Foundation. According to Morris and Elwood (1996) the "Slip! Slop! Slap!" and the "Sun Smart" interventions in Victoria are the most successful skin cancer prevention programmes ever reported.

The long-term aim of the Sun Smart Campaign is a reduction in the incidence of morbidity and mortality from skin cancer in Victoria. This campaign included macro and micro components and was targeted at various groups in a variety of settings (Montague et al., 2001). The results indicate that many inhabitants of Victoria are displaying high levels of knowledge of the dangers of over exposure to the sun. There has also been a shift in attitudes towards suntans. The proportion of Victorians who liked to get a suntan has markedly decreased from 61 % in 1988 to 35% in 1998. Most importantly, there have also been positive changes in behaviour, with consistent increases in the proportion of people reporting seeking shade, using a hat and sunscreen, covering up and choosing to avoid the mid-day sun ( Montague et al., 2001). Other public campaigns such as the Arizona "Sun Awareness" Project and the British "Are You Dying to Get a Sun Tan"

campaign have also reported success in increasing knowledge and sun protection levels (Cameron and Mc Guire, 1990).

### **Settings for Skin Cancer Prevention Programmes**

It is suggested that outdoor recreation settings are ideal sites for skin cancer prevention activities (Glanz et al., 2000; Rosenburg et al., 1997). Programmes which promote sun protection in outdoor recreation settings, are currently used to take the health promotion message out of the `health setting` and place it into more everyday contexts (Grey, 1998).

An evaluation was conducted on several beaches displaying promotional sun protection messages (Bennets et al., 1991). The results revealed that knowledge levels were increased. All of the respondents interviewed stated that it was important to protect their skin from the harmful effects of the sun. However, despite this awareness both children and parents were inadequately protected against the sun.

The “Pool Cool” programme, which included both educational (posters and lessons) and environmental strategies (increase in shade provision), proved to be a more successful intervention. An evaluation into the effectiveness of the intervention revealed statistically significant improvements in children’s sunscreen use, shade seeking and total sun protection habits. A reduction in sunburn levels among fair skinned children was reported. Improvements were also reported in parents’ use of sunscreen, hat wearing and total sun protection behaviours (Glanz et al., 1999). According to Naidoo & Wills (1994) media messages can only be effective in changing behaviour when other supporting strategies are in place.

### **Media Messages for Skin Cancer Prevention**

In relation to the use of media messages to promote health, Rodrigue (1996) proposed several principles that are essential for these messages to be effective. These include, highlighting the threat of the disease (severity and susceptibility), demonstrating that modification of the behaviour will greatly reduce risk and that the benefits of behaviour change out weigh current practices. It is also important these messages are accompanied by advice on how to implement behaviour change.

The type of messaging used to promote sun protection is important. A comparison study examining the effectiveness of both 'gain framed' (highlighting the positive effects of the displayed sun protection behaviours) signs and 'loss frame' (Which highlight the negative effects of not participating in the recommended behaviour) signs to motivate beach goers to use sunscreen, resulted in the discovery that gain framed messages are far more effective than loss framed messages. (Detweiler, 1999).

Grey (1998) conducted an evaluation into the effectiveness of a Sun Smart sign, which displayed the sun safe code. The findings revealed that in order to have an impact on people's behaviour the sun safe code should have a motivational message or a clear warning for example, incidence of skin cancer, to attract people's attention. Visual images proved vital in attracting attention to the code and sustaining interest. Visual images also provided a clear, concise and instant means of conveying the information. Grey (1998) concludes that the sun safe code is an ideal way to convey the sun smart message within the context of every day life.

In conclusion, health promotion efforts against skin cancer need to be intensified (Adedeji et al., 2002). A key challenge for future campaigns is to bridge the gap between knowledge and its application to improve sun protection behaviour (Bennets et al., 1991).

## **METHODOLOGY**

This section of the report describes the methodology used in this evaluation research. Following a brief description of the intervention to be evaluated, an outline of the research design is presented with the aims and objectives of the study. Information on the sample, data collection methods and analysis are provided.

The SunSmart campaign, launched by the Irish Cancer Society includes the erection of signs in recreation settings depicting pictorial representations of the sun smart code. This code includes six sun protection messages which are: use shade, avoid the mid-day sun (11am-3pm), wear a hat, wear sunscreen SPF15+, wear sunglasses and wear a t-shirt with a collar. The aim of the signage is to raise awareness of sun safety. A total of 15 signs were erected *on access routes* to beaches in Counties Wicklow and Wexford.

This research is a pilot study conducted to evaluate the effectiveness of the SunSmart signage. The study aims and objectives are set out below.

### **Study Aims**

- To measure the effectiveness of the SunSmart signs in raising awareness of the SunSmart code among those using the beach.
- To measure the effectiveness of the SunSmart beach signs in changing attitudes to sun protection behaviour among the target group.
- To measure the effectiveness of the SunSmart signage in increasing intended/reported adherence to the SunSmart code among the target group.

### **Study Objectives**

- To measure awareness of the SunSmart signage on the intervention beaches.
- To measure awareness of the SunSmart code on the control and intervention beaches.
- To measure any differences between control and intervention beaches on attitudes to sun protective behaviours.

- To measure any differences between the control and intervention beaches on reported sun exposure behaviours
- To measure views on the clarity and efficacy of the Sun Smart Signs.

### **Study Design**

This study uses a quasi-experimental design to evaluate SunSmart signage. Two intervention sites, beaches displaying the signage were identified along with a control site, a beach without signage for comparison.

### **Sample**

The two beaches, Courtown within Wexford County Council and Britas Bay (North and South) within Wicklow County Council were chosen as the intervention sites. Tramore beach in County Waterford was chosen as the control beach, in which no SunSmart sign was present.

The three beaches were each surveyed at two points in time, July 2003 and August 2003 in order to sample an accurate account of a typical beach population. At each data point 100 questionnaires were administered. In total 200 questionnaires were completed from each beach providing a total sample size of 600.

The study focused on men and women aged seventeen years and over who were on the beach at the time the research was undertaken. Parents, both mothers and fathers were actively targeted. An attempt was made to interview equal numbers of men and women.

### **Data Collection**

An administered questionnaire was developed by drawing on pre-existing survey instruments developed by The Cancer Council of South Australia (*ref*) and the Cancer Council of Western Australia (*ref*) for evaluation of media campaigns promoting sun protection.

The questionnaire gathered information on four main sections:

- Sign awareness and effectiveness
- Knowledge
- Attitudes and beliefs
- Reported behaviour

Socio-demographic information was also ascertained. (See Appendix 1)

The questionnaire was piloted with participants at a beach in Salt Hill, County Galway. This provided an opportunity to assess the clarity of the questions as well as the length of time the questionnaire would take to administer with each person.

### **Data analysis**

The data was analysed using SPSS (Statistical Package for Social Science). The data analysis aimed to meet original objectives of the study.

## **RESULTS**

Three beaches were approached and people were randomly selected and invited to participate in the survey. 713 people were approached and 600 surveys were completed, giving a response rate of 84%. 200 surveys were completed on each beach and they were completed at two stages. The intervention beaches had a number of SunSmart signs present on or near the beach. The control beach had no SunSmart sign present.

The intervention beaches included Courtown (n 200) & Britas Bay (n 200).

The control beach was Tramore (n 200).

The questionnaire was composed of five sections including:

- Awareness of SunSmart sign
- Knowledge
- Attitudes and Beliefs
- Reported behaviour
- Demographics

### **Demographic Profile of Respondents**

The age of respondents ranged from 18-82 years, (sd=12.76). Socio Economic Status (SES) was determined according to the reported principal wage earners' occupation.

SES was categorized as follows:

SES Groups 1 and 2 = Professional, Managerial, Technical

SES Groups 3 and 4 = Non-manual skilled, Manual Skilled

SES Groups 5 and 6 = Manual semi-skilled and Manual unskilled

**Table 1: Demographic characteristics of all the respondents across sites.**

(values are as percentages).

<b>Demographics</b>	<b>Total N=600</b>	<b>Courtown% N=200</b>	<b>Britas Bay% N=200</b>	<b>Tramore% N=200</b>	<b>Significance P Value</b>
<i><u>Gender</u></i>					
Male	38.3	38	39	38	P= .972
Female	61.7	62	61	62	
<i><u>Local/Visitors</u></i>					
Local	17.5	20.5	12.5	19.5	P= .072
Visitor	82.5	79.5	87.5	80.5	
<i><u>Age Category</u></i>					
17-30	25.5	23.0	23.5	30.0	<b>P= .030</b>
31-45	44.8	49	50	35.5	
46+	29.7	28	26.5	34.5	
<i><u>Education</u></i>					
Primary	3.5	3.5	2.5	4.5	<b>P= .001</b>
Secondary	45.8	47.0	35.5	55	
Tertiary	50.7	49.5	62.0	40.5	
<i><u>Marital Status</u></i>					
Married	65.3	69.5	64.5	62.0	P= .276
Other	34.7	30.5	35.5	38.0	
<i><u>Parental Status</u></i>					
Parent	72.8	79.0	73.0	66.5	<b>P= .019</b>
Non-Parent	27.2	21.0	27.0	33.5	
<i><u>Socioeconomic Status</u></i>					
Groups 1 & 2	38.5	36.5	50	29	<b>P= .001</b>
Groups 3 & 4	44.2	45.5	39	48	
Groups 5 & 6	9.7	10	6.5	12.5	
Other	7.7	8	4.5	10.5	

The demographic characteristics of each site varied slightly. Chi square tests of statistical significance revealed the following differences:

- Respondents in the intervention groups were significantly more likely to come from Social Group 1&2 ( $\chi^2=13.51$   $p \leq .001$ ) and are more likely to have third level education ( $\chi^2=18.73$   $p \leq .001$ ) than those in the control group.

- Respondents from the intervention groups were significantly more likely to be parents than the control group ( $\chi^2=7.90$   $p \leq .001$ ).
- Respondents from the control group were significantly less likely to belong to the 31-45 year age category than the intervention group ( $\chi^2=10.68$   $p \leq .001$ ).

Because of the significant differences, all variables were analysed separately to determine the influence of demographic factors on the results.

### **Sign Awareness and Effectiveness**

Respondents were asked if they saw a sign near or on the beach in the past week promoting sun protection. If they recalled a sign they were asked what they could recall from the content of the sign.

**Table 2: Recall of the SunSmart sign across the intervention sites**

<b>Recall of beach sign</b>	<b>Total</b>	<b>Courtown % N=20</b>	<b>Britas Bay % N=200</b>
Yes	47	42	52
No	53	58	48
<i>Recalled information</i>			
Sun protection general	18	12.5	23.5
Irish cancer society	2.3	2.5	2
Sun Smart	1	1	1
Umbrella	7.8	8	7.5
Avoid mid-day sun (11-3pm)	18	18	18
T-shirt	16.3	13	19.5
Sun factor 15+	32.7	25.5	39.5
Sun glasses	19.8	19.5	20
Hat	24.5	20	29

Respondents were asked to identify the main point of the sign. Those who could recall the SunSmart sign were not shown the sign (unprompted). Respondents from the control beach Tramore and those who did not recall the SunSmart sign were shown the sign (prompted) and asked to identify the main point of the sign.

**Table 3: Most frequent response for unprompted and prompted respondents.**

Most frequent response	Unprompted	Prompted
1 <sup>st</sup>	Protect your skin at the beach	Avoid the mid day sun
2 <sup>nd</sup>	Avoid the mid day sun	Protect your skin at the beach
3 <sup>rd</sup>	Use Sunscreen 15+	Use Sunscreen 15+

**Table 4 : Unprompted view on main point of the sign across each site (values are as percentages)**

Main Point of the sign	Total	Courtown %	Britas Bay %
(Unprompted) (recall of sign)		N=200	N=200
Protect your skin at the beach	45.7	54.8	36.5
Use a variety of protection - Methods	6.1	8.3	3.8
Use shade	.5	0	1.0
Avoid mid-day sun (11-3pm)	17	19.5	14.4
Use of Hat	2.15	2.4	1.9
Use any factor sunscreen	.15	0	2.9
Use sunscreen 15+	6.8	4.8	8.7
Sun glasses	.5	0	1

**Table 5 : Prompted view on main point of the sign across each site (values are as percentages)**

Main Point of the sign	Total	Courtown %	Britas Bay %	Tramore %
(Prompted)-no recall of the sign		N=200	N=200	N=200
Protect your skin at the beach	28.9	36.5	22.9	27.5
Variety of protection methods	6	11.3	4.2	2.5
Use shade	3.7	6.1	2.1	3
Avoid mid-day sun (11-3pm)	40.7	37.4	42.7	42
Use of Hat	6.5	8.7	4.2	6.5
Use any factor sunscreen	6.8	6.1	8.3	6
Use sunscreen 15+	15.1	20.0	12.5	13
Sun glasses	4.5	7.8	4.2	1.5

Chi square tests of statistical significance revealed the following:

- Overall, 60.3% of the respondents viewed the sign as being relevant to them personally.
- Respondents from Intervention group Britas Bay were significantly more likely to say the sign is relevant to them than those from the other sites ( $\chi^2=14.23$   $p \leq .005$ ).
- 25.5% of the total respondents stated that the SunSmart sign would increase their knowledge levels regarding sun protection. There was no significant difference in this response across the three sites.
- 39% of the total respondents stated that the SunSmart sign would influence them to change their sun protection levels. There was no significant difference in this response across the three.
- 6.3% of respondents recalled that the Irish Cancer Society produced the SunSmart sign.
- Respondents from control group Tramore were significantly more likely to state that `avoid the mid day sun (11-3pm)` was the main point of the sign ( $\chi^2=11.214$   $p \leq .005$ ).

### **Demographic Influences on Recall and Effectiveness of the SunSmart Sign**

Demographic influences on recall and effectiveness of sign were analysed. Significant statistical demographic variations were revealed. Males are significantly more likely to recall the sign, however females are significantly more likely to state that the sign is relevant to them personally. Females are also significantly more likely to report that the sign would increase their knowledge levels and influence them to increase their sun protection levels. Chi square tests of statistical significance revealed the following:

## Gender

**Table 6 : Recall & Effectiveness of the sign & Gender**

<b>Recall &amp; Effectiveness of the Sign</b>	<b>Males</b>	<b>Females</b>	<b>Significance</b>
<u>Recall of beach sign</u>			
Yes	57.1	41.1	P= .002
No	42.9	58.9	
<u>Main point of the sign</u>			
Use of shade	.9	3.8	P= .031
Use of sunscreen any factor	2.2	6.8	P= .012
<u>Relevance of the sign</u>			
Relevant	66.1	83.8	P= .000
Not relevant	33.9	16.2	
<u>Effects on knowledge levels</u>			
Increase	18.7	27.0	P= .020
No increase	81.3	73.0	
<u>Influence of sign to change behaviour</u>			
Yes	27.0	46.5	P= .000
No	73.0	53.5	

## Age Category

Results revealed no significant differences in recall of the Sun Smart sign between the age categories. However, Chi square tests of statistical significance revealed that respondents within the age category 31-45 are significantly more likely to perceive the sign as being relevant to them personally

**Table 7 : Recall and Effectiveness of the sign and Age Category**

<b>General &amp; Sign Awareness</b>	<b><u>17-30</u></b>	<b><u>31-45</u></b>	<b><u>46+</u></b>	<b>Significance</b>
<u>Relevance of the sign</u>				
Relevant	65.4	85.5	74.2	<b>P= .000</b>

## Local/Visitor

Visitors are significantly more likely to state that the sign is relevant to them personally ( $\chi^2=9.15$   $p \leq .005$ ) and that the sign would influence them to change their sun protection levels ( $\chi^2=12.35$   $p \leq .001$ ).

## Education

Results revealed that respondents from tertiary level education are significantly more likely to recall the Sun Smart sign.

**Table 8 : Recall and Effectiveness of the sign and educational attainment**

Recall and Effectiveness of the sign	Primary	Secondary	Tertiary	Significance
<i>Recall of beach sign</i>				
Yes	41.7	38.2	54.3	<b>P= .007</b>

**Marital Status**

Results revealed no significant differences in recall of the SunSmart sign by marital status. Chi square tests of statistical significance revealed the following: married respondents are significantly more likely to see the sign as being relevant to them personally ( $\chi^2=12.24$   $p \leq .001$ ).

**Parental Status**

Results revealed no significant differences in recall of the SunSmart sign among parental status, however, Chi square tests of statistical significance revealed that parents are significantly more likely to see the sign as being relevant to them personally ( $\chi^2=11.44$   $p \leq .005$ ).

**Socioeconomic Status**

Findings reveal significant differences in recall of SunSmart beach sign, relevance of beach sign and influence of beach sign to change behaviour across SES groups. Respondents from SES groups one and two are significantly more likely to recall the sign. Chi square tests of statistical significance revealed the following:

**Table 9 : Recall and Effectiveness of the sign and Socioeconomic Status.**

Recall and Effectiveness of the sign	SESgrp 1&2	SESgrp 3&4	SESgrp 5&6	Others	Significance
<i>Recall of beach sign</i>					
Yes	54.7	45.9	27.3	32.0	<b>P= .009</b>
<i>Relevance of beach sign</i>					
Relevant	83.1	74.3	79.3	58.7	<b>P= .002</b>
<i>Influence of sign to change behaviour</i>					
Yes	36.4	38.5	59.9	32.6	<b>P= .026</b>

## **Knowledge Levels**

Knowledge levels were determined by the respondents' view on what are the most effective methods of sun protection for adults and children. The most common reply is Sunscreen factor 15+.

**Table 10: Knowledge of effective sun protection methods for adults. (values are as percentages).**

<b>Knowledge Levels</b>	<b>Total</b>	<b>Courtown%</b> <b>N=200</b>	<b>Britas Bay%</b> <b>N=200</b>	<b>Tramore%</b> <b>N=200</b>	<b>Significance</b> <b>P value</b>
<i><b>Effective Methods of Sun Protection for Adults:</b></i>					
<i>Use of sunscreen any factor</i>	29.8	36.5	24	26.5	<i>P= .023</i>
<i>Use of sunscreen 15+</i>	53.3	46.5	63.5	50	<i>P= .002</i>
<i>Wear sunglasses</i>	3	4.5	2.5	2	<i>P= .300</i>
<i>Limit time exposed</i>	5	6.5	4.5	4	<i>P= .479</i>
<i>Avoid sunburn</i>	4.2	3	4.5	5	<i>P= .542</i>
<i>Stay out of sun</i>	20.7	16.5	20.5	25	<i>P= .110</i>
<i>Stay out of sun (11-3pm)</i>	8.2	8	9.5	12	<i>P= .656</i>
<i>Wear a hat</i>	16.5	15.5	24	10	<i>P= .001</i>
<i>Wear a t-shirt/shirt with a collar</i>	7.2	4.5	10.5	6.5	<i>P= .060</i>
<i>Cover up</i>	27.3	25.5	34.5	22	<i>P= .032</i>
<i>Gradually increase time exposed</i>	1.7	2	1	2	<i>P= .666</i>
<i>Use shade</i>	3.2	1.5	5.5	1.5	<i>P= .059</i>

Knowledge levels of the most effective sun protection methods for adults varied slightly in each site. Respondents from intervention site Britas Bay have significantly higher levels of knowledge of the most effective methods of sun protection for adults. It should be noted that respondents from Britas Bay also have higher SES and levels of education.

With regard to the most effective method of sun protection for adults, chi square tests of statistical significance revealed the following:

- Respondents from intervention site Courtown are significantly more likely to report sunscreen any factor ( $\chi^2=7.53$   $p \leq .001$ ).

- Respondents from intervention site Britas Bay are significantly more likely to report sunscreen factor 15+ ( $x^2=12.42$   $p \leq .001$ ) and to report covering up ( $x^2=14.44$   $p \leq .001$ ).
- Respondents from control site Tramore are significantly less likely to report wearing a hat ( $x^2=8.37$   $p \leq .001$ ).

**Table 11: Knowledge of effective sun protection methods for children. (values are as percentages)**

Knowledge Levels	Total	Courtown % N=200	Britas Bay % N=200	Tramore % N=200	Significance P value
<u>Effective Methods of Sun Protection for Children</u>					
Use of sunscreen any factor	20	24	14.5	21.5	$P = .047$
Use of sunscreen 15+	63.2	62.5	73	54	$P = .000$
Limit time exposed	4.2	6	2.5	4	$P = .213$
Avoid sunburn	2.5	1.5	2	4	Not Valid
Stay out of sun	18.8	16.5	21	19	$P = .514$
Stay out of sun (11-3pm)	9	6	19	7	$P = .009$
Wear a hat	29.5	32	34.5	22	$P = .015$
Wear a t-shirt/shirt with a collar	15.2	18	16.5	11	$P = .121$
Cover up	43.2	44.5	51	34	$P = .002$
Gradually increase time exposed	1.6	3	1	1	Not Valid
Use shade	3	3	6.5	.5	$P = .014$

Significant variations are revealed in each site. Respondents from the control group Tramore are significantly less likely to report hat usage, sunscreen factor 15+ and covering up as effective methods of sun protection.

With regard to the most effective method of sun protection for children, chi square tests of statistical significance revealed the following:

- respondents from control site Tramore are significantly less likely to report sunscreen factor 15+ ( $x^2=6.095$   $p \leq .001$ ), wearing a hat ( $x^2=18.05$   $p \leq .001$ ), wearing a t-shirt ( $x^2=9.41$   $p \leq .001$ ) and covering up ( $x^2=8.41$   $p \leq .001$ ).
- Respondents from intervention site Courtown are significantly less likely to report use of shade ( $x^2= 4.22$   $p \leq .001$ ).

- Respondents from intervention site Britas Bay are significantly less likely to report sunscreen any factor ( $\chi^2=12.00$   $p \leq .001$ ) and stay out of the sun (11-3pm) ( $\chi^2=8.59$   $p \leq .001$ ).

### **Demographic Effects on Knowledge**

Demographic effects of gender, age category, local/visitor, education, marital and parental status and SES were examined to check for significant differences in Knowledge levels. Chi square tests of statistical significance revealed the following:

#### **Gender**

Males are significantly more likely to report `staying out of the sun` as an effective method of sun protection for both adults ( $\chi^2=13.12$   $p \leq .001$ ) and children ( $\chi^2=6.67$   $p \leq .05$ ).

#### **Age Category**

Respondents within the Age Category 46+ are significantly more likely to report staying out of the sun as an effective method of sun protection ( $\chi^2=9.78$   $p \leq .05$ ).

#### **Local/Visitor**

Locals are significantly more likely to report `staying out of the sun` as an effective method of sun protection for both adults ( $\chi^2=7.47$   $p \leq .05$ ) and children ( $\chi^2=5.11$   $p \leq .05$ ).

#### **Education**

The results demonstrate that overall the respondents with tertiary level education have higher knowledge levels.

**Table 12: Educational attainment and Knowledge levels**

<b>Knowledge</b>	<b>Primary</b>	<b>Secondary</b>	<b>Tertiary</b>	<b>Significance</b>
Hat usage for adults	19	11.2	21	P= .006
Cover up for adults	19	22.5	32.5	P= .023
Stay out of mid-day sun for adults	9.5	5.8	8.2	P= .042
Hat usage for children	38.1	18.2	39.1	P= .000
T-shirt use for children	23.8	10.2	19.1	P= .006

#### **Marital Status**

Married respondents are significantly more likely to report limiting exposure time as a effective method of sun protection

### Parental Status,

Parents are significantly more likely to report limiting exposure time ( $\chi^2= 4.70 p \leq .05$ ) and wearing a t-shirt ( $\chi^2= 4.98 p \leq .05$ ) as an effective method of sun protection.

**Table 13: Parental Status and Knowledge levels**

Knowledge	Parent	Non- parent	Significance
Limiting time exposed	6.2	1.8	P= .030
T-shirt use for children	17.2	9.8	P= .026

### Socioeconomic Status

The findings revealed slight variations in knowledge levels according to SES. Respondents from SES Group 5&6 are significantly less likely to report staying out of the mid day sun ( $\chi^2= 9.42 p \leq .05$ ) and covering up ( $\chi^2= 10.36 p \leq .05$ ) as an effective sun protection method for children.

## **Attitudes And Beliefs**

Respondents were asked about their beliefs and attitudes in relation to sun protection, perceived severity of skin cancer, perceived susceptibility to skin cancer, desire to achieve a suntan, and other barriers related to sun protection.

Overall, there is very little difference in attitudes or beliefs across the three sites. A suntan is viewed as attractive (75%), fashionable (60.3%) and popular among friends (82%). Approximately half the respondents believe that clothing which covers the arms and legs in the summer are not fashionable (41%).

- 75% of respondents agree that a suntanned person looks more attractive than an untanned person. There is no significant difference across the three sites.
- 68.5% of total respondents disagree that a tan is important to them personally and 10.5% report that it is important to them personally. There is no significant difference across the three sites.
- 82% of total respondents agree that friends think a sun tan is a good thing. There is no significant difference across the three sites.
- 60.3% disagree that a tan is less fashionable than it was before. There is no significant difference across the three sites.
  
- 41.2% of respondents agree that clothing which covers the arms and legs in the summer is not fashionable. There is no significant difference across the three sites.
- 23% of the respondents agree that sun protection is a hassle, however 47% disagree with this. There is no significant difference across the three sites.
- 95.3% of respondents agree that skin cancer is a dangerous disease. There is no significant difference across the three sites.

**Table 14: Attitudes and Beliefs across sites (values are as percentages).**

<b>Attitudes and Beliefs</b>	<b>Total N=600</b>	<b>Courtown % N=200</b>	<b>Britas Bay % N=200</b>	<b>Tramore % N=200</b>	<b>Significance P value</b>
<u>Susceptibility to skin cancer</u>					
Agree	41.3	41	36.5	46.5	<b>P= .027</b>
Disagree	51.2	51.58	53.5	43.5	
Can't say/Don't know	7.3	7.5	4.5	10	
<u>Using a sun bed is a safer way to tan</u>					
Agree	3.3	4.5	2.5	3	<b>P=.026</b>
Disagree	93.8	93	94	94.5	
Can't say/Don't know	2.8	2.5	3.5	2.5	
<u>Sun burn causes skin cancer</u>					
Agree	89.8	86	93	90.5	<b>P= .000</b>
Disagree	6.8	8	6	6.5	
Can't say/Don't know	3.3	6	1	3	
<u>Sun tan protects against skin cancer</u>					
Agree	21	22.5	19	21.5	<b>P= .007</b>
Disagree	72.5	68.5	78	71	
Can't say/Don't know	6.3	8.5	3	7.5	

Chi square tests of statistical significance revealed the following:

- Respondents from control group Tramore are significantly more likely to perceive themselves susceptible to skin cancer than respondents from the other sites ( $\chi^2=10.97$   $p \leq .05$ ).
- Respondents from intervention group Courtown are significantly less likely to agree that sunburn causes skin cancer than the other sites ( $\chi^2=32.63$   $P \leq .001$ ).
- Respondents from intervention group Courtown are significantly more likely to agree that a suntan protects against skin cancer than respondents from the other sites ( $\chi^2=20.37$   $p \leq .05$ ).

### **Demographic Effects on Attitudes and Beliefs**

One way analysis of variance was conducted to examine the demographic effects on attitudes and beliefs. Results revealed that demographic factors which are associated with a positive perception of sun tan and perceiving a sun tan as socially desirable include being female, respondents from age category 17-30, respondents with tertiary education, those who are unmarried and non-parents. Chi square tests of statistical significance revealed the following:

## **Gender**

Results revealed that females are significantly more likely to think that having a tan is important to them personally ( $F= 7.835 P\leq .005$ ) and that sunburn causes skin cancer ( $F= 6.06 P\leq .05$ ).

Males are more likely to agree that protecting their skin against the sun is a hassle ( $F= 6.77 P\leq .05$ )

## **Age Category**

Respondents from the age category 17-30 are significantly more likely to agree that having a tan is important to them personally. ( $F= 10.01 P\leq .001$ ) and that most of their friends think a sun tan is a good thing. ( $F= 6.44 P\leq .005$ )

## **Local/Visitor**

Local/Visitor had no significant effect on the attitudes of the respondents.

## **Education**

Respondents with tertiary education are significantly more likely to agree that a tan is important to them personally ( $F= 3.37 P\leq .05$ ) and that sunburn causes skin cancer ( $F= 4.10 P\leq .05$ ).

## **Marital Status**

Unmarried respondents are significantly more likely to agree that a tan is important to them personally ( $F= 12.54 P\leq .000$ ) and that clothing which covers the arms and legs in the summer is not fashionable ( $F= 6.41 P\leq .05$ ).

## **Parental Status**

Non-Parents are significantly more likely to agree that having a tan is important to them personally ( $F= 12.15 P\leq .001$ ), that protecting their skin against the sun is a hassle ( $F= 6.89 P\leq .05$ )

## **Socioeconomic Status**

- Respondents from SES groups one and two are significantly more likely to agree that a tan is important to them personally ( $F= 3.06 P\leq .05$ ) and they are significantly more likely to disagree that a suntan protects against skin cancer ( $F= 2.66 P\leq .05$ ).

**Table 15: Severity of skin cancer and SES**

<b>Skin cancer is a dangerous disease</b>	<b>SESgrp 1&amp;2</b>	<b>SESgrp 3&amp;4</b>	<b>SESgrp 5&amp;6</b>
Strongly/slightly agree	98.3%	95%	98.2%
Strongly/slightly disagree	1.7%	4.6%	0%

- Respondents from SES groups five and six are significantly less likely to perceive that they are susceptible to skin cancer ( $F= 2.85$   $P\leq .005$ ).

**Table 16: Susceptibility to skin cancer and SES**

<b>There is little chance that I will get cancer</b>	<b>SESgrp 1&amp;2</b>	<b>SESgrp 3&amp;4</b>	<b>SESgrp 5&amp;6</b>
Strongly/slightly agree	41.2	41.8	51.7
Strongly/slightly disagree	52.8	50.2	41.4

## **Behaviour**

Respondents were asked to report their behaviour in terms of:

- Time spent in the sun.
- Did they get sun burnt in the previous weekend?
- Use of sun protection.

**Table 17: Reported behaviour across sites (values are as percentages).**

<b>Behaviour</b>	<b>Total %</b>	<b>Courtown% N=200</b>	<b>Britas Bay% N=200</b>	<b>Tramore% N=200</b>	<b>Significance P Value</b>
<i><u>Hours in the sun on Sunday</u></i>					
Up to 4 hrs	65	60.5	69	65.5	P= .508
More than 4 hrs	6.5	7.5	5	7	
Not at all	30.1	3.7	26	27.5	
<i><u>Hours in the sun on Saturday</u></i>					
Up to 4 hrs	40.5	57	70	57.5	P= .218
More than 4 hrs	6.2	6	4.5	8	
Not at all	21	37	4.41	34.5	
<i><u>Sunburnt during the past weekend</u></i>					
Yes	14.2	18	7.5	17	<b>P= .002</b>
No	85.8	82	92.5	83	
<i><u>Exposure Levels</u></i>					
High	49.5	46	49.5	53	P= .117
Medium	16.7	15.5	14.5	20	
Low	33.8	38.5	36	27	
<i><u>Bought sunscreen in the past year</u></i>					
Yes	66.8	68.5	69	63	P= .368
No	33.2	31.5	32	37	
<i><u>Use of fake tan in the past 6 months</u></i>					
Yes	24.5	26.0	27.5	20	P= .182
No	75.5	74	72.5	80	
<i><u>Use of sun bed in past year</u></i>					
Yes	7.5	11.5	6.5	4.5	<b>P= .024</b>
No	92.5	88.5	93.5	95.5	
<i><u>Overall sun protection levels</u></i>					
High	60.5	59.5	62	60	P= .965
Low	37.5	38	37.5	37	

The reported behaviour of respondents from each site is similar. Significant variations exist between sites for respondents who got sunburnt at the weekend and use of sun bed.

Chi square tests of statistical significance revealed that respondents in the intervention group Britas Bay were significantly less likely to get burnt at the weekend than the other two sites ( $\chi^2=11.05$   $p \leq .005$ ). Respondents in the control group Tramore are significantly less likely to use a sun bed than in the intervention sites ( $\chi^2=7.50$   $p \leq .05$ ).

Overall there was no statistical significance in sun protection levels. These included the use of hat, shade, sunscreen factor 15+, clothes and sunglasses.

**Table 18. Reported Sun Protection Levels for the Total Number of Respondents**  
(Values are as percentages).

	Hat% N=600	Clothes% N=600	Shade% N=600	Sunglasses% N=600	Sunscreen 15+% N=600
Never/Rarely	56	32	42.7	25.5	33.8
Sometimes	23	18	28.7	14	17.2
Usually	10.1	26	14.8	17.4	18.5
Always	10.8	24	13.8	43.1	30.5

### **Demographic Influences on Behaviour**

Demographic effects on behaviour were analysed and the main results found that gender, age category, local/visitor, education, marital status, parental status and SES had varying degrees of impact upon the behaviour of the respondents. For the purpose of analysis, reported behaviour levels were categorised as high and low based on reported frequencies.

### **Gender**

The findings revealed that males are more likely to cover up with clothes or hat to protect them from the sun. Females are more likely to use sunscreen and to have higher levels of sun protection overall.

Chi square tests of statistical significance revealed the following:

- Males are significantly more likely to wear a hat in the summer ( $\chi^2=14.97$   $p \leq .005$ ) and to wear clothes covering their arms and legs in the summer ( $\chi^2=18.81$   $p \leq .001$ ).

- Females are significantly more likely to; wear sunglasses ( $\chi^2=13.765$   $p \leq .005$ ); wear sunscreen factor 15+ or higher ( $\chi^2=76.34$   $p \leq .001$ ); have bought sunscreen in the past 12 months ( $\chi^2=85.07$   $p \leq .001$ ) and to have high sun protection levels overall ( $\chi^2=5.54$   $p \leq .05$ ).

**Table 19: Sun protection levels for Males and Females**

Sun protection levels	Total	Male	Female	Significance
High	61.7	55.7	65.4	P= .019
Low	38.3	44.3	34.6	

### Age category

The age of the respondents had a significant effect on reported behaviour. The results revealed significant differences in level of exposure, purchase of sunscreen and use of fake tan among the age categories.

Chi square tests of statistical significance revealed the following:

- Respondents from the 46+ age category are significantly more likely to have higher levels of exposure between 11-3pm in the average week than those from any other age category ( $\chi^2=13.36$   $p \leq .05$ ).

**Table 20: Level of exposure for each age category**

Level of exposure	17-30	31-45	46+	Significance
High	46.4	44.6	59.6	P= .010
Medium	13.7	20.1	14	
Low	39.9	35.3	26.4	

- Respondents from the 46+ age category are significantly less likely to have bought sunscreen in the past 12 months than those from any other age category ( $\chi^2=12.667$   $p \leq .005$ ).
- Respondents from the 17-30 age category are significantly more likely to have used fake tan in the past 6 months than those from any other age category ( $\chi^2=20.917$   $p \leq .001$ ).

### Local/Visitor

Overall findings indicate that being a visitor is associated with higher levels of sun protection than being a local. Significant differences were found in levels of exposure, use of sunglasses, purchase of sunscreen and overall sun protection levels. Chi square tests of statistical significance revealed the following: Locals are significantly more likely to have high levels of sun exposure between 11am-3pm in a average week than visitors ( $\chi^2=8.74$   $p \leq .05$ ).

**Table 21: Level of exposure and Local/Visitor**

Level of exposure	Locals	Visitors	Significance
High	61.0	47.1	P= .013
Medium	17.1	16.6	
Low	21.9	36.4	

Visitors are more likely to wear sunglasses than locals ( $\chi^2=9.27$   $p \leq .05$ ), they are more likely to wear sunscreen factor 15+ than locals ( $\chi^2=16.34$   $p \leq .005$ ) they are more likely to buy sunscreen in the past year than locals ( $\chi^2=17.20$   $p \leq .001$ ) and finally visitors are more likely to have higher sun protection levels overall than locals ( $\chi^2=11.43$   $p \leq .005$ ).

**Table 22: Sun protection levels and Local/Visitor**

Sun protection levels	Local	Visitor	Significance
High	47.1	64.9	P= .001
Low	52.9	35.1	

### Education

Educational attainment revealed slight variations in reported behaviour. The significant differences in reported behaviour were in respondent's use of fake tan and exposure levels. Chi square tests of statistical significance revealed the following:

- respondents who have third level education are significantly more likely to use fake tan than those who have either secondary or primary level education ( $\chi^2=6.98$   $p \leq .05$ )

- respondents who have primary or secondary level education are significantly more likely to have high exposure levels than those who have third level education ( $\chi^2=12.63$   $p \leq .05$ ).

**Table 23: Level of Exposure and Educational Attainment**

Level of exposure	Primary	Secondary	Tertiary	Significance
High	61.9	56.0	42.8	P= .013
Medium	14.3	16.0	16.7	
Low	23.8	28.0	33.8	

### Marital Status

The results revealed that married respondents are more likely to have reported positive behaviours than unmarried respondents. Chi square tests of statistical significance revealed the following: those who are married are significantly more likely to wear sunscreen factor 15+ or higher than those who are unmarried ( $\chi^2=9.23$   $p \leq .001$ ); married respondents are significantly more likely to have bought sunscreen in the past 12 months than those who are unmarried ( $\chi^2=4.027$   $p \leq .001$ ); and those who are married are significantly less likely to have used a sun bed in the past 12 months than those who are un married ( $\chi^2=5.81$   $p \leq .001$ ).

However, married respondents are significantly more likely to have a high level of exposure between 11am-3pm in the average week than those who are unmarried ( $\chi^2=9.22$   $p \leq .05$ ).

**Table 24: Marital Status and Level of Exposure**

Level of exposure	Married	Unmarried	Significance
High	53.2	42.8	P= .010
Medium	17.3	15.4	
Low	29.6	41.8	

### Parental Status

Respondents who are parents are significantly more likely to have more reported positive behaviours than non-parents. Chi square tests of statistical significance revealed the following: Parents are significantly more likely to seek shade than non-parents ( $\chi^2=14.64$   $p \leq .005$ ).

61.8% of parents report seeking shade in the summer however only 45.4% of non-parents report seeking shade in the summer.

Parents are significantly more likely to have bought sunscreen in the past year than non-parents ( $\chi^2=4.55$   $p \leq .001$ ).

**Table 25: Purchase of sunscreen in past 12 months and Parental status**

Bought sunscreen	Parent	Non parent	Significance
Yes	69.3	60.1	P= .033
No	30.7	39.9	

### Social Economic Status (SES)

The results revealed significant differences in sun protection levels across the SES groups. Higher SES groups (1&2) & (3&4) have higher sun protection levels than lower SES groups (5&6). Chi square tests of statistical significance revealed the following: Respondents from SES group 5&6 are significantly more likely to have lower sun protection levels than respondents from others SES groups ( $\chi^2=12.05$   $p \leq .05$ ).

**Table 26: Sun protection levels and SES groups**

Sun protection levels	SES GRP 1&2	SES GRP 3&4	SES GRP 5&6	Other	Significance
High	68.6	58.9	52.6	70	P= .017
Low	31.4	41.4	47.4	30	

### **Heightened Awareness**

Heightened awareness was determined by knowledge of someone diagnosed with skin cancer and if the respondents had read, heard or seen any information/advertisements about sun protection in the past month. Chi square tests of statistical significance revealed the following. Overall, there were no significant differences in heightened awareness across the sites. Findings revealed one significant variation, respondents from intervention group Britas Bay are significantly more likely to have seen billboards advertising sun protection in the past month than respondents from the other sites.

**Table 27: Heightened awareness and Recall of Sun Smart Sign across sites.**

<b>Heightened Awareness and Sign Effectiveness</b>	<b>Total</b>	<b>Courtown % N=200</b>	<b>Britas Bay % N=200</b>	<b>Tramore % N=200</b>
<b><u>Know someone with skin cancer</u></b>				
Yes	43	44	43	42
No	56.7	56.5	57	57.5
<b><u>General awareness heightened</u></b>				
Yes	68.2	66	74.5	64
No	31.8	34	25.5	36
<b><u>Source of information</u></b>				
TV	39	36	40.5	40.5
Newspapers	21.2	7.5	10.5	12.5
Radio	10.8	8.5	11	13
Billboard	6.2	5	13	.5
Beach sign	11.5	17	17	.5

### **Demographic Influences on Heightened Awareness**

The demographic influence on heightened awareness was analysed. Results revealed that parents and respondents from high SES groups are significantly more likely to have heightened awareness of sun protection in general. Males are significantly more likely to identify the TV and females are more likely to identify magazines as a source of information about skin cancer. Respondents with tertiary education are more likely to report billboards and the Sun Smart sign as a source of information about skin cancer. Older people and married respondents are more likely to know someone diagnosed with skin cancer.

**Table 28: Heightened Awareness and Gender**

Heightened Awareness	Males	Females	Significance
<i>Source of information re: sun protection</i> TV	<u>65.6</u>	<u>52.2</u>	<b>P= .008</b>
Magazine	<u>5.7</u>	<u>20.7</u>	<b>P= .000</b>

**Table 29: Heightened Awareness and Age**

Heightened Awareness	17-30	31-45	46+	Significance
<i>Know person diagnosed with skin cancer</i> Yes	30.7	42.7	54.5	<b>P= .000</b>
<i>Heightened Awareness of sun protection</i> Yes	60.1	71.1	69.7	<b>P= .042</b>
<i>Source of information re: sun protection</i> Newspaper	7.5	12.6	22.0	<b>P= .01</b>
Billboard	9.7	20.7	3.2	<b>P= .018</b>
Beach Sign	10.8	22.7	12.1	<b>P= .010</b>

**Table 30: Heightened Awareness and Educational Attainment**

General & Sign Awareness	Primary	Secondary	Tertiary	Significance
<i>Source of information re: sun protection</i> Billboard	0	3.9	13.9	<b>P= .001</b>
Beach Sign	8.3	8.2	24.4	<b>P= .000</b>

**Table 31: Heightened Awareness and SES**

General & Sign Awareness	SESgrp 1&2	SESgrp 3&4	SESgrp 5&6	Others	Significance
<i>Heightened awareness</i> Yes	74.5	62.6	67.2	69.6	<b>P= .046</b>
<i>Source of information re: sun protection</i> Billboard	14	36.7	0	6.3	<b>P= .016</b>
Beach Sign	23.3	14.9	2.6	9.4	<b>P= .006</b>

## **Knowledge of Someone Diagnosed with Skin Cancer**

Analysis was conducted to assess if there was a relationship between knowledge of someone diagnosed with skin cancer and behaviour, knowledge and attitudes.

### **Behaviour**

Analysis revealed little relationship between knowledge of someone diagnosed with skin cancer and behaviour. One significant relationship was found between knowing someone diagnosed with skin cancer and seeking shade in the summer ( $r = -.110$   $p \leq .01$ ).

### **Knowledge**

Spearman correlation was conducted to assess the relationship between knowledge of someone diagnosed with skin cancer and knowledge in relation to sun protection. The results reveal that:

- Knowledge of someone diagnosed with skin cancer is significantly related to reporting hat usage as an effective method of sun protection for adults ( $r = .09$   $p \leq .05$ ).
- Knowledge of someone diagnosed with skin cancer is significantly related to reporting sunscreen factor 15+ as an effective method of sun protection for children ( $r = -.099$   $p \leq .05$ ).

### **Attitudes**

Results reveal that knowledge of someone diagnosed with skin cancer is significantly related to the respondent's attitudes. Spearman correlation was conducted. The results reveal that:

- Knowledge of someone diagnosed with skin cancer is negatively related to personal importance of having a tan ( $r = -.92$   $p \leq .05$ ). Respondents who know someone with skin cancer are significantly more likely to disagree that a sun tan is personally important.
- Knowledge of someone diagnosed with skin cancer is negatively related to thinking a person with a tan looks more attractive than a person without a tan ( $r = -.94$   $p \leq .05$ ). Respondents who know someone with skin cancer are significantly more likely to disagree that a person with a sun tan looks more attractive.

- Knowledge of someone diagnosed with skin cancer is negatively related to having friends who think that a suntan is a good thing ( $r = -.09$   $p \leq .05$ ). Respondents who know someone diagnosed with skin cancer are significantly more likely to disagree that their friends think that a suntan is a good thing.
- Knowledge of someone diagnosed with skin cancer is positively related to thinking that a tan is less fashionable than it used to be ( $r = .09$   $p \leq .05$ ). Respondents who know someone diagnosed with skin cancer are significantly more likely to agree that a sun tan is less fashionable than it used to be.
- Knowledge of someone diagnosed with skin cancer is negatively related to perceived severity of skin cancer ( $r = -.09$   $p \leq .05$ ). Respondents who know someone diagnosed with skin cancer are significantly less likely to agree that skin cancer is a dangerous disease.

### **Recall of the Sun Smart Sign**

Analysis was conducted to assess the impact of behaviour, knowledge and attitudes and beliefs on recall of the sun smart sign. Chi square tests of statistical significance revealed the following:

#### **Heightened Awareness**

Heightened awareness (read, seen or heard advertisements or information about skin cancer in the past month) had a significant impact on recall of sun smart sign.

Respondents who reported heightened awareness are significantly more likely to have recalled the sun smart sign ( $\chi^2=21.62$   $p \leq .001$ ).

Respondents who saw an advertisement for skin cancer on the TV ( $\chi^2=10.76$   $p \leq .001$ ) and respondents who saw an advertisement or information about skin cancer in the newspaper ( $\chi^2=5.15$   $p \leq .05$ ) are significantly more likely to recall the beach sign.

The results revealed that there was no significant relationship between knowledge of someone diagnosed with skin cancer and recall of beach sign.

## **Behaviour**

Respondents who wear sunscreen factor 15+ are significantly more likely to recall the beach sign ( $\chi^2=10.19$   $p \leq .05$ ).

Respondents who wear clothes covering their arms and legs in the summer are significantly more likely to recall the beach sign ( $\chi^2=9.48$   $p \leq .05$ ).

Levels of exposure had no significant impact on the recall of the Sun Smart sign.

## **Attitudes and Beliefs**

Analysis revealed that attitudes and beliefs had very little effect on recall of the Sun Smart sign. However, respondents who stated that a tan was personally important were significantly less likely to recall the sun smart sign ( $\chi^2=07.22$   $p \leq .05$ ).

## **Knowledge levels**

Results revealed that knowledge levels had a highly significant impact on recall of the sun smart sign. High knowledge levels are associated with recall of the beach sign.

Respondents were asked what they thought the most effective methods of sun protection are for adults.

- Respondents who reported sunscreen factor 15+ ( $\chi^2=8.09$   $p \leq .005$ ); use of hats ( $\chi^2=9.33 \leq .05$ ); and to cover up ( $\chi^2=7.22 \leq .05$ ) as effective methods of sun protection for adults are significantly more likely to recall the sun smart sign.

Respondents were also asked what they thought the most effective methods of sun protection are for children. Again those who demonstrated the highest knowledge levels are significantly more likely to recall the beach sign.

- Respondents who reported to avoid the mid day sun ( $\chi^2=4.22 \leq .05$ ); use of a hat ( $\chi^2=5.14 \leq .05$ ) and covering up ( $\chi^2=7.04 \leq .005$ ) as effective methods of sun protection for children are significantly more likely to recall the Sun Smart sign.

## **Relevance of the Sun Smart Sign**

Analysis was conducted to assess the impact of behaviour, knowledge and attitudes and beliefs on relevance of the sun smart sign. Chi square tests of statistical significance revealed the following:

### **Heightened Awareness**

Heightened awareness had a significant impact on relevance of the Sun Smart sign. Respondents who reported heightened awareness ( $\chi^2=6.32 p \leq .05$ ) and those who saw an advertisement/information about skin cancer in the newspaper ( $\chi^2=8.24 p \leq .005$ ) are significantly more likely to say that the sun smart sign is relevant to them personally. There was no significant relationship between knowledge of someone diagnosed with skin cancer and relevance of the Sun Smart sign.

### **Behaviour**

Respondents who; bought sunscreen in the past 12 months ( $\chi^2=14.11 p \leq .001$ ); wear sunscreen factor 15+ ( $\chi^2=36.30 p \leq .001$ ); wear clothes covering their arms and legs in the summer ( $\chi^2=10.60 p \leq .05$ ); and seek shade in the summer ( $\chi^2=10.73 p \leq .05$ ) are significantly more likely to see the sign as being relevant to them personally.

### **Attitudes and Beliefs**

Respondents who; say that a suntanned person looks more attractive than an untanned person ( $\chi^2=10.34 p \leq .05$ ); and agree that protecting their skin against the sun is a hassle ( $\chi^2=8.03 \leq .05$ ) are significantly more likely to say that the sign is relevant to them personally.

Respondents who agree that having a suntan protects against skin cancer are significantly less likely to say that the sign is relevant to them personally ( $\chi^2=15.27 \leq .001$ ).

### **Knowledge Levels**

Results revealed that knowledge levels had no significant impact on personal relevance of the sign. Analysis conducted on exposure levels revealed that respondents with the highest exposure levels are significantly less likely to have bought sunscreen in the past 12 months ( $\chi^2=11.63 \leq .005$ ).

### **Attitudes and Beliefs**

Pearson Correlations were conducted to assess the relationship between the respondent's attitudes and beliefs. Findings revealed that the attitudes and beliefs of respondents on one area of sun protection are often related to their attitudes and beliefs in other areas of sun protection resulting in major barriers against sun protection overall.

### **Attitudes to Suntan**

Personal importance of having a tan is significantly positively related to having friends that think having a tan is a good thing ( $r = .19$   $p \leq .01$ ). Personal importance of having a tan is also significantly positively related to thinking that a person with a sun tan looks more attractive than an untanned person ( $r = .23$   $p \leq .01$ ). Having friends that think a sun tan is a good thing is significantly positively related to thinking a person with a sun tan looks more attractive than a untanned person ( $r = .31$   $p \leq .01$ ).

### **Perceived Severity of Skin Cancer**

There is a significant negative relationship between people who say that protecting their skin against the sun is a hassle and perceived severity of skin cancer ( $r = -.12$   $p \leq .05$ ). There is also a significant positive relationship between perceived severity of skin cancer and thinking that a suntan protects against skin cancer ( $r = .25$   $p \leq .01$ ). This finding suggests that perceived severity is not related to accurate perceptions regarding sun protection.

### **Perceived Susceptibility to Skin Cancer**

There is a significant positive relationship between perceived susceptibility to skin cancer and a perception that clothing that covers the arms and legs in the summer is not fashionable ( $r = .10$   $p \leq .05$ ). This finding suggests that perceived susceptibility is not related to accurate perceptions regarding sun protection. Finally, there is a significant positive relationship between thinking a sun tan protects against skin cancer and thinking that a sun bed is a safer way to tan ( $r = .13$   $p \leq .01$ ).

## **DISCUSSION**

A variety of demographic, environmental and social factors account for individual's propensity to undertake sun protection behaviours. The patterns of behaviour need to be explored in order to gain an understanding of the complex barriers to sun protection. This study demonstrates that SunSmart signage is effective in increasing knowledge levels in relation to sun protection and reinforcing existing positive behaviours. The results also indicate that there is a need for heightened awareness and supportive strategies to significantly impact on individual's behaviour.

### **Recall and Effectiveness of the Sign**

Approximately half the respondents in the intervention sites recalled the SunSmart sign (42% in Courtown & 52% in Britas Bay). The most frequently recalled message from the sign is the use of Sunscreen SPF 15+. This is associated with the respondents' existing behaviour and knowledge levels, which suggests that the sign is acting as a re-enforcer. This reflects the findings of the Irish Cancer Society Survey, which found that sunscreen was the primary method of sun protection (2003).

Results indicated a lack of understanding of the main message that the sign aims to convey, which is to use comprehensive sun protection methods. Only 5.5% of the total respondents reported use of a variety of sun protection methods. The majority of respondents reported that the main point of the sign was to advise you to protect your skin at the beach. To avoid the mid day sun was reported more frequently as the main point of the sign among the respondents who were prompted i.e., shown the SunSmart sign.

Overall 60% of the respondents stated that the sign is relevant to them personally and 25% of the respondents stated that the sign would increase their knowledge levels. The majority of people, who stated that the sign would not increase their knowledge, believed that their knowledge levels were already sufficient.

Nearly 40% reported that the sign would influence them to change their behaviour. However, based on previous research intention does not necessarily translate into action. It is likely that further structural support will be needed to facilitate behaviour change.

These findings suggest that the SunSmart sign can contribute to significant improvements in behaviour.

### **Reported Behaviour**

Sun protection levels across the three sites are inadequate. Sunscreen is the primary, and often sole method of sun protection. There is an obvious lack of comprehensive sun protection methods. Grey (1998) reported that people who use sunscreen as their main method of sun protection very often feel adequately protected with sunscreen use, they feel that they can expose themselves for longer periods in the sun and possibly achieve a `safe tan`. Sunscreen, sunglasses and use of clothes to cover up are the most frequently reported methods of protection. Use of hat and shade are the least common methods of sun protection.

### **Knowledge**

Sunscreen is reported the most frequently as an effective method of sun protection. There is an overall lack of knowledge in relation to comprehensive sun protection. The intervention beach Britas Bay, which has higher SES levels and educational attainment, has higher knowledge levels in relation to sun protection. Respondents from the control site Tramore are significantly less likely to report key messages from the Sun Smart sign. For example, the use of a hat, use of sunscreen SPF 15+ and covering up as effective methods of sun protection. This suggests that the sign has improved knowledge levels among the intervention sites.

### **Attitudes and Beliefs**

The strongest belief and consequently barrier against sun protection is that a sun tan is desirable. Percieved social norms are significantly influencing attitudes to sun tanning and sun exposure. This includes having friends who think a suntan is a good thing and viewing a tan as fashionable and attractive, notably in the younger female population.

Respondents from the control site Tramore are more likely to view themselves as susceptible to skin cancer than respondents from the intervention sites. This suggests that

the SunSmart sign is failing to impact on existing attitudes and beliefs. However, another possible explanation for this finding is that the respondents from the intervention site have higher knowledge levels and therefore may feel that they have more control to prevent themselves from being susceptible to skin cancer.

### **Heightened Awareness**

There is no difference across the sites in respondents who know someone who has been diagnosed with skin cancer. The sources of information in relation to skin cancer are similar across the sites except that respondents from Britas Bay are more likely to report billboards as a source as opposed to respondents from other sites. An explanation for this is that Britas Bay is located within closer proximity to Dublin, where the majority of the billboards are displayed.

### **Influential Factors**

#### **Recall and Effectiveness of the Sign**

Men, parents, people with tertiary education, and those from higher SES groups are more likely to recall the SunSmart sign. Respondents with heightened awareness, positive sun protection behaviour and high knowledge levels are also more likely to recall the sign. This suggests that those who need the knowledge the most are not recalling the SunSmart sign. However, the sign appears to act as a re-enforcer for current knowledge and positive behaviours. Respondents who stated that they have read, seen or heard information on the television and/or in newspapers about skin cancer prevention are more likely to recall the sign. This suggests that heightened awareness acts as a confounder in the recall of the SunSmart sign. Respondents who stated that a tan is personally important are less likely to recall the SunSmart sign. This suggests that positive attitudes to tanning need to be deconstructed before respondents will choose to take health promoting messages on board.

Women, respondents from age category 31-45, visitors, married respondents and parents are more likely to see the sign as being relevant to them personally. Respondents with heightened awareness and positive sun protection behaviour are also more likely to recall the sign. Women and visitors are more likely to say that the sign would influence them to change their sun protection behaviour. This supports findings that women are more likely to feel responsible for their health behaviours. Parents are also more likely to view health information as important, especially for the protection of their children.

An interesting finding is that respondents from lower socio economic groups are more likely to state that the sign would influence them to change their behaviour. It must be remembered that to facilitate any expressed intention to change behaviour structural supports should be provided.

### **Reported Behaviour**

The impact of demographic factors on reported behaviour is consistent with numerous other studies. There is a gender related effect on the type of sun protection used, males preferring to cover up and females preferring to use sunscreen. Females overall have higher sun protection levels. There is also an age related effect. Respondents over the age of 45 have higher exposure levels and are less likely to use sunscreen. It is suggested that older people prefer to cover themselves than use sunscreen.

There are no age related differences in viewing a tan as personally important. However, respondents from the age category 17-30 are more likely to use fake tan. This might suggest a possible trend among younger people to choose a safe alternative to achieve a suntan.

The results strongly indicate that visitors have significantly higher sun protection levels. This supports the theory that people who are on holidays are more likely to protect themselves from the harmful effects of the sun.

Respondents with tertiary education have higher sun protection levels. Despite this the desire for a suntan remains strong suggesting, that within this sub group, subjective and social norms are influential. These respondents are also more likely to use a fake tan.

Married respondents, high socio economic groups and parents are more likely to report positive sun protection behaviours. Outdoor workers have the highest exposure levels however, they have low sun protection levels specifically for the use of sunscreen.

### **Knowledge**

The main influences on knowledge levels are education and socioeconomic status (SES). Respondents with tertiary education and higher SES are more likely to have higher levels of knowledge in relation to sun protection. Lower SES groups are less likely to identify key messages from the SunSmart sign such as covering up and avoid the mid day sun. This may be influenced by the fact that these respondents are also less likely to recall the SunSmart sign.

### **Attitudes**

Women, respondents from age category 17-30, high SES groups, respondents with tertiary level education and non-parents are significantly more likely to desire a sun tan and are influenced by the social and subjective norms related to sun tanning. Respondents from lower SES groups are more likely to feel susceptible to skin cancer. Overall, respondents` attitudes and beliefs about personal importance of having a tan is strongly related to having friends who think a tan is a good thing, and thinking that a tan is fashionable and attractive.

### **Heightened Awareness**

Knowing someone diagnosed with skin cancer is strongly related to increased knowledge in relation to sun protection. This is also related to attitudes. Respondents who know someone diagnosed with skin cancer are less likely to think that a tan is attractive and fashionable. They are also less likely to have friends who think a suntan is a good thing. Knowing someone diagnosed with skin cancer did not impact on recall or relevance of the SunSmart sign.

### **Key Points**

Recall rates of the Sun Smart sign are reasonable good. The sign is effective in improving knowledge levels, however attitudes and behaviour remained relatively unchanged.

Respondents did not specifically identify the use of a variety of sun protection methods as the key message of the sign; however, respondents from the intervention sites are more likely to identify a wider variety of methods as effective methods of sun protection. The sign is acting as reinforcement for current sun protection behaviour, particularly among parents and care givers, however, the sign is not recalled or perceived as relevant by sub groups who are not practicing sun smart behaviour.

The main barriers to sun protection are socially influenced and in particular are related to suntanning. The desire for a sun tan outweighs the concern of the susceptibility to skin cancer.

There is a lack of comprehensive sun protection behaviour and knowledge regarding the variety of sun protection methods recommended.

### **Implications**

Due to the diversity of influence of demographic factors on sun protection, it is recommended that Sun Smart programmes examine the patterns of sun protection behaviour and target interventions to meet the needs of individual sub groups within the population.

The use of sun protection in every day contexts in Ireland needs to be highlighted. Use of sun protection is highest among people on holiday, while outdoor workers and locals visiting the beach have low sun protection levels.

Supportive strategies for example, shade provision, readily available, low cost sunscreen, and interventions aimed at settings need to be targeted such as the workplace, especially outdoor workers, in schools, and in the community are required to bridge the gap between knowledge and sun protection behaviour and finally, programmes need to tackle social norms and to deconstruct positive attitudes related to suntanning.

## REFERENCES

- Abroms L., Jorgensen, C.M., Southwell, B.G., Geller, A.C., Emmons, K.M. (2003) Gender differences in young adults beliefs about sunscreen use. *Health Education and Behavior*, 30 (1) 29-43
- Adedeji, O.T., Pitchard, C., Conway, C., and Godsell, G. (2002) Skin Cancer Prevention and Care in the sun: an evaluation of knowledge, attitudes and reported behaviour of Nottingham citizens. *Health Education Journal*, 61 (3) 221-230
- Arthey, S and Clarke, V.A. (1995) Sun tanning and sun protection: a review of the psychological literature. *Social Science and Medicine*, 40 265-274.
- Banks, B.A., Silverman, R.A., Schwartz, R.H., and Tunnessen, W.W. (1992) Attitudes of teenagers toward sun exposure and sunscreen use. *Pediatrics*, 89, 40-42.
- Bennets, K., Borland, R., Swerissen, H. (1991) Sun protection behaviour of children and their parents at the beach. *Psychology and Health*, 5, 279-287.
- Cameron, I.H., and Mc Guire, C (1990) `Are You Dying To Get a Sun tan?` - The pre and post-campaign survey results. *Health Education Journal*, 49, 166-170.
- Cockburn J., Hennibus D., Scott, R., and Sanson. (1989) Adolescents use of solar protection. *Medical Journal of Australia*, 151, 136-140.
- Cody, R., and Lee, C (1990) Behaviours, beliefs and intentions in Skin Cancer Prevention. *Journal of Behavioural Medicine*, 13, 373-389.
- Detweiler, J.B., Bedell, B.T., Solovey, P., Pronin, E., and Rothman, A.J. (1999) Message framing and sunscreen use: Gain framed messages motivate beachgoers. *Health Psychology*, 18, 2, 189-196.

Eid, M., and Scwenkmezger, P (1997) *Sun protection behaviour*. In Schwarzer (ed)., (1997) *Health Psychology*.

Eiser, J.R., Eiser, C., Sani, F, Sell, L., and Casas, R.M. (1995) Skin Cancer attitudes: a cross national comparison. *British Journal of Social Psychology*, 34, 23-30.

Foltz, A.T. (1993) Parental knowledge and practices of skin cancer prevention: a pilot study. *Journal of Pediatric Health Care*, 7, 220-225.

Gerbert, B., Jonston, K., Bleecker, T., and Mc Phee, S. (1996) Attitudes about skin cancer: a qualitative study. *Journal of Cancer Education*, 11(2) 96-101.

Glanz, K., Chang, L., Song, V., Silverio, R., and Muneoka, L. (1998) Skin cancer prevention for children, parents and caregivers: a field test of Hawaii`s Sun Smart Program. *Journal of the American Academy of Dermatology*, 38, 413-417.

Glanz, K., Lew, R.A., Song, V., and Murkami, L. (2000) Skin Cancer Prevention in outdoor recreational settings: Effects of Hawaii Sun Smart programme. *Effective Clinical Practice*, 3, 53-61.

Girgis, A., Sanson, R.W., and Watson, A. (1994) A workplace intervention for increasing outdoor workers use of solar protection. *American Journal of Public Health* 84, 7-81.

Grey A. (1998) The development of a `Sun Safe Code`. *Health Promotion International*, 13, 4.

Grob J.J., Guglielmina, C., Gouvernet, J., Zarour, H., and Noc, C. (1993) A study of sunbathing habits in adolescents and children: application to the prevention of melanoma. *Dermatology*, 186, 94-98.

Hague, P. (1993) *Questionnaire Design*, Kogan Page.

Hill, P., White, V., Marks, R., Theobald, T, Borland, R., and Roy, C. (1992) Melanoma prevention: behavioural and non-behavioural factors in sunburn among an Australian urban population. *Preventative Medicine*, 21, 651-655.

Hill, P., and Dixon, H. (1999) Promoting sun protection in children: rationale and challenges. *Health Education and Behaviour*, 26, 409-417.

Hill, P., Rossaby, J., and Gardner, G. (1994) Determinants of Intention to take Precaution against Skin Cancer. *Community Health Studies*, 8, 33-44.

Keesling, B., and Friedman, H.S. (1987) Psychological factors in sunbathing and sunscreen use. *Health Psychology*, 6, 477-493.

Lovats, C.Y., Shoveller, J.A., Peters, L., and Rives, J.K. (1998) Canadian survey on sun exposure and protection behaviours: parents report on children. *Cancer Prevention and Control*, 2, 123-128.

Lowe, J.B., Mc Dermott, L.J., Stanton, W.R., Clarivino, A., and Mc Whirter, B. (2002) Sun exposure and primary prevention of skin cancer for infants from exposure to the sun in Queensland, Australia. *Health Education Research*, 17, 405-414.

Marks, R., and Hill, D.(1988) Behavioural change in adolescents: A major challenge for skin cancer control in Australia. *Medical Journal of Australia*, 149-514.

Milne, E., Corli, B., English, D.R., Costa, C., and Johnston, R. (1999) The use of observational methods for monitoring sun protection activities in schools. *Health Education Research* 14 (2) 167-175.

Mc Guire, W.J. (1981) *Theoretical foundations in campaigns*. In public Communication Campaigns. Sage. Beverly Hills.

Montague, M., Borland, R., and Sinclair, C. (2001) Slip! Slop! Slap! and Sun Smart 1980-2000: Skin Cancer Control and 20 years of population based campaigning. *Health Education Journal*, 28 (3) 290-305.

Morris, J., Mc Geer, R., and Bandaranayake, M. (1998) Sun protection behaviour and the prediction of sun burn among young children. *Journal of Pediatric Child Health*, 34, 557-562.

Naidoo, J., and Wills, J. (2000) *Health Promotion- foundations for practice*. Balliere Tindall, UK.

Newman, W., Agro, A., Woodruff, S., and Mayor, J. (1996) A survey of recreational sun exposure of residents of San Diego, California. *American Journal of Preventative Medicine*, 12 186-194.

Polgar, S., and Thomas, S.A. (1995) *Introduction into research in Health Sciences*. Churchill Livingstone.

Rodrigue, J.R. (1996) Promoting Health Behaviours, Attitudes and Beliefs toward sun exposure in parents of young children. *Journal of consulting and Clinical Psychology*, 64 (6) 1431-1436.

Rosenberg, C., Mayer, J.A., and Eckhart, L. (1997) Skin Cancer Prevention education: A national survey of YMCAs. *Journal of Community Health*, 22, 373-385.

Stanton, W.R., Chakma, B., O`Riordan, D.L., and Eyeson, M.A. (2000) Sun Exposure and Primary prevention of skin cancer for infants and young children during Autumn and Winter. *Australian and New Zealand Journal of Public Health*, 24, 178-184.

Stephan C., and Valerie, M. (1995) Suntanning and Sun Protection: A review of the Psychological Literature. *Social Science and Medicine*, 40 (2).

Weinstein, J., Yarnold, P.R., and Hornung, R.L. (2001) Parental knowledge and practice of primary skin cancer prevention: Gaps and solutions. *Pediatric Dermatology*, 18 (6) 473-477.

Wright, L., and Bramwell, R. (2001) A qualitative study of older peoples perceptions of skin cancer. *Health Education Journal*, 60, (3) 256-264.

### Electronic Sources

[www.cancerwa.asn.au](http://www.cancerwa.asn.au)

[www.cancersa.org](http://www.cancersa.org)

# **APPENDICES**

# Appendix 1

## Questionnaire

Beach.....

Date.....

Time.....

Interview no.....

**1. OVER THE PAST WEEKEND, DID YOU SPEND TIME IN THE SUN? *If yes: ABOUT HOW LONG WERE YOU IN THE SUN ON SUNDAY? WHAT ABOUT SATURDAY?***

*If 'No, not at all' on Sunday and Saturday go to Q 3*

SUNDAY	SATURDAY
Yes, less than 1 hour	Yes, less than 1 hour
Yes, about 1 hour	Yes, about 1 hour
Yes, about 2 hours	Yes, about 2 hours
Yes, about 3 hours	Yes, about 3 hours
Yes, about 4 hours	Yes, about 4 hours
Yes, more than 4 hours ( <i>specify</i> )	Yes, more than 4 hours ( <i>specify</i> )
No not at all	No not at all

**2. DID YOU GET SUNBURNT ON SUNDAY? WHAT ABOUT SATURDAY?**

Sunday
Saturday
Neither day

**3. WHICH OF THE FOLLOWING STATEMENTS BEST DESCRIBES YOUR SUNBURN?**

RED WITHOUT BEING TENDER
RED AND TENDER
RED, TENDER AND BLISTERED

**4. WHAT ARE THE MOST EFFECTIVE METHODS OF SKIN PROTECTION FOR YOU AND FOR YOUNG CHILDREN (Don't Read)**

	<u>Yourself</u>	<u>Young Children</u>
Use sunscreen/cream/sun block factor unspecified ...		
Use sunscreen/cream/sun block High SPF factor (15+)		
Wear sunglasses .....		
Limit amount of time exposed ... ..		
Avoid sun burning/sunburn.		
Stay out of the sun.....		
Stay out of sun at peak UV period (11am – 3pm)		
Wear a hat .....		
Wear a t-shirt/shirt with collar .....		
Cover up.....		
Gradually increase time exposed .....		
Wear long shorts/trousers.....		
Use shade		
Reapply sunscreen every 2 hrs if sweating/swimming		
Other.....		

**5. DURING THE SUMMER, HOW OFTEN WOULD YOU SPEND TIME OUTDOORS BETWEEN 11AM and 3PM?**

Daily
4-5 days per week
2-3 days per week
1 day per week
Never/ Rarely

**6. DURING SUMMER, WHEN YOU ARE OUTDOORS FOR AN HOUR IN THE MIDDLE OF THE DAY:**

**a) HOW OFTEN DO YOU WEAR A HAT? *Prompt if necessary***

NEVER/RARELY
SOMETIMES
USUALLY
ALWAYS/ALMOST ALWAYS
DON'T KNOW

**b) HOW OFTEN DO YOU WEAR CLOTHES COVERING MOST OF OR ALL OF YOUR BODY INCLUDING YOUR ARMS AND YOUR LEGS? *Prompt if necessary***

NEVER/RARELY
SOMETIMES
USUALLY
ALWAYS/ALMOST ALWAYS
DON'T KNOW

**c) HOW OFTEN DO YOU TRY TO SEEK SHADE SUCH AS A TREE, UMBRELLA OR OTHER STRUCTURE? *Prompt if necessary***

NEVER/RARELY
SOMETIMES
USUALLY
ALWAYS/ALMOST ALWAYS
DON'T KNOW

**d) HOW OFTEN DO YOU WEAR SUNGLASSES? *Prompt if necessary***

NEVER/RARELY
SOMETIMES
USUALLY
ALWAYS/ALMOST ALWAYS
DON'T KNOW

e) **HOW OFTEN DO YOU WEAR SPF 15+ OR HIGHER SUNSCREEN?** *Prompt if necessary*

NEVER/RARELY
SOMETIMES
USUALLY
ALWAYS/ALMOST ALWAYS
DON'T KNOW

**7. HAVE YOU BOUGHT SUNSCREEN WITHIN THE LAST 12 MONTHS?**

Yes
No
Cant Say/ Don't Know

**8. OVER THE PAST 6 MONTHS HAVE YOU USED A PRODUCT TO MAKE YOU LOOK MORE TANNED THAN YOU WERE? THAT IS USED A FAKE TANNING LOTION.**

Yes
No
Can't say/Don't know

**9. IN THE PAST 12 MONTHS HAVE YOU USED A SOLARIUM, ALSO KNOWN AS A SUNBED, TO GET A TAN?**

Yes	
No	<b>Go to</b>
Can't say/Don't know	<b>QS. 11</b>

**10. HOW MANY TIMES IN THE LAST 12 MONTHS HAVE YOU USED A SOLARIUM TO GET A TAN?**

Once
2 or 3 times
4 or more times

**DO YOU AGREE OR DISAGREE WITH THE FOLLOWING STATEMENTS:**

**11. “A SUNTANNED PERSON LOOKS MORE ATTRACTIVE THAN AN UNTANNED PERSON”**

STRONGLY AGREE
SLIGHTLY AGREE
Neither
SLIGHTLY DISAGREE
STRONGLY DISAGREE
Can't say/Don't know
Agree only if it is a light tan

**12. “HAVING A TAN IS IMPORTANT TO ME”**

STRONGLY AGREE
SLIGHTLY AGREE
Neither
SLIGHTLY DISAGREE
STRONGLY DISAGREE
Can't say/Don't know

**13. “PROTECTING MY SKIN AGAINST THE SUN IS A HASSLE”**

STRONGLY AGREE
SLIGHTY AGREE
Neither
SLIGHTLY DISAGREE
STRONGLY DISAGREE
Can't say/Don't know

**14. “MOST OF MY FRIENDS THINK A SUNTAN IS A GOOD THING”**

STRONGLY AGREE
SLIGHTLY AGREE
Neither
SLIGHTLY DISAGREE
STRONGLY DISAGREE
Can't say/Don't know

**15. "USING A SOLARIUM IS A SAFER WAY TO TAN"**

STRONGLY AGREE
SLIGHTLY AGREE
Neither
SLIGHTLY DISAGREE
STRONGLY DISAGREE
Can't say/Don't know

**16. "HAVING A TAN IS LESS FASHIONABLE THAN IT USED TO BE"**

STRONGLY AGREE
SLIGHTLY AGREE
Neither
SLIGHTLY DISAGREE
STRONGLY DISAGREE
Can't say/Don't know

**17. "SKIN CANCER IS A DANGEROUS DISEASE"**

STRONGLY AGREE
SLIGHTLY AGREE
Neither
SLIGHTLY DISAGREE
STRONGLY DISAGREE
Can't say/Don't know

**18. "THERE IS LITTLE CHANCE THAT I'LL GET SKIN CANCER"**

STRONGLY AGREE
SLIGHTLY AGREE
Neither
SLIGHTLY DISAGREE
STRONGLY DISAGREE
Can't say/Don't know

**19. “A SUNTAN PROTECTS YOU AGAINST SKIN CANCER”**

STRONGLY AGREE
SLIGHTLY AGREE
Neither
SLIGHTLY DISAGREE
STRONGLY DISAGREE
Can't say/Don't know

**20. “SUNBURN CAN CAUSE SKIN CANCER”**

STRONGLY AGREE
SLIGHTLY AGREE
Neither
SLIGHTLY DISAGREE
STRONGLY DISAGREE
Can't say/Don't know

**21. “CLOTHING WHICH COVERS MOST OF THE ARMS AND LEGS IS NOT FASHIONABLE”**

STRONGLY AGREE
SLIGHTLY AGREE
Neither
SLIGHTLY DISAGREE
STRONGLY DISAGREE
Can't say/Don't know

22a. Do you know anyone who was diagnosed with skin cancer? If yes, who?

22b. IN THE LAST WEEK HAVE YOU READ, SEEN OR HEARD ANY INFORMATION OR ADVERTISING ABOUT PROTECTING YOURSELF FROM THE HARMFUL EFFECTS OF THE SUN?

Yes	1
No	2
Dont Know	3

**Go to  
QS. 24**

---

**23. WHERE DID YOU READ HERE OR SEE THAT INFORMATION?**

Multiple responses (order 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>)

TV
Magazines
Newspapers
Radio
Billboard
Posters
Brochure/Leaflet/Pamphlet
Doctor and other health expert
Health centre

Chemist
Friends
Workplace
School
Pre-school/Child Care
Sporting event or venue
The Internet
Beach sign
Other ( <i>specify</i> )
Don't know

**24. OVER THE PAST MONTH DO YOU REEMEMBR SEEING A MESSAGE / SIGN FOR SUN PROTECTION METHODS NEAR THE BEACH?**

Yes	
No	<b>Show sign and go to qs. 26</b>
Don't Know	

**25. PLEASE DESCRIBE WHAT YOU CAN REMEMBER FROM THE SIGN? (Order 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>)**

Sun protection general	Unprompted	Prompted
Irish cancer society		
Sun Smart		
Umbrella		
Avoid mid day sun(11-3)		
T- shirt		
Sun factor 15 +		
Glasses		
Hat		
Other (Specify)		
Don't Know		

26. WHAT DO YOU CONSIDER AS THE MAIN POINT THE

SIGN WAS TRYING TO MAKE? (Order 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>)

	<i>Unprompted</i>	<i>Prompted</i>
Skin cancer is serious		
Protect your skin at the beach		
Use a variety of skin protection methods		
Use shade		
Avoid mid day sun (11-3)		
Wear a Hat		
Use Sunscreen any factor		
Use sunscreen factor 15 +		
Wear sunglasses		
Cover up in the sun		
Other (specify)		
Don't Know		

27. HOW RELEVANT DO YOU THINK THAT THE SIGN IS TO YOU PERSONALLY?

Very Relevant
Quite Relevant
Not Very relevant
Not at all relevant

--

28. DID THIS SIGN INCREASE YOUR KNOWLEDGE ON WAYS TO PROTECT YOUR SKIN FROM THE HARMFUL EFFECTS OF THE SUN?

Increase
Decrease
No effect
Thought about it
Don't know

**29a. WOULD THIS SIGN INFLUENCE YOU TO CHANGE YOUR LEVEL OF SUN PROTECTION?**

Yes
No
Don't Know

**29b. IF YES, WOULD THIS SIGN INFLUENCE YOU TO INCREASE OR DECREASE YOUR LEVEL OF SUN PROTECTION?**

Increase
Decrease
No effect
Thought about it
Don't know

30. WHAT (IF ANYTHING) HAS THE SIGN MADE YOU MORE OR LESS LIKELY TO DO?

	More Likely	Less Likely	No Difference	Don't Know
Stay out of the sun				
Use a wider variety of Skin protection methods				

Wear a hat				
Wear a sunscreen any factor				
Use a stronger sunscreen				
Wear long sleeves				
Wear a sunscreen 15+				
Seek shade				
Other Specify				

**31. CAN YOU REMEMBER WHO PRODUCED THE SIGN?**

Sun Smart
Irish Cancer Society
Department of Health and Children
County Council
Other (specify)
Don't know

**32. ARE YOU?**

Male
Female

**33. ARE YOU A?**

Local
Visitor

34. WHAT AGE ARE YOU AT PRESENT? ..... **Years.....months**

35. WHAT DID YOUR EDUCATION INCLUDE?

No schooling
Primary school education only
Some secondary education
Complete secondary education
Some third level education at college, university, RTC/IT
Complete third level education at college, university, RTC/IT

36. WHAT IS YOUR PRESENT MARITAL STATUS?

Married	Cohabiting	Widowed
Separated	Divorced	Single/ Never married

37. ARE YOU A PARENT?

Yes	No. of Children under15.....
No	

38. DOES YOUR JOB REQUIRE YOU TO SPEND TIME OUTDOORS?

Yes	Hrs per day.....
No	

39. WHAT IS YOUR CURRENT EMPLOYMENT SITUATION?

Currently employed
Homemaker
Seeking work for the first time
Unemployed
At school, student
Wholly retired
Unable to work owing to permanent sickness/disability

Other please specify.....

**40. WHAT IS YOUR JOB TITLE?** (If you are not in a paid job at the moment give the title of your last job if you had one) .....

If you are not the principal wage earner, please answer the following about the principal wage earner in your household:

**41.WHAT IS HIS/HER JOB TITLE?** (If they are not in paid employment at the moment give the title of last job if they had one?) .....