Water Quality Forecast Signage Project Evaluation

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Executive Summary

Overview

The Environment Protection Authority (EPA) and Life Saving Victoria (LSV) aim to ensure that the millions of people who visit Port Phillip Bay enjoy the beautiful coastline, and swimming beaches, safely. The EPA in conjunction with LSV conducted a water quality forecast communication pilot project at a select number of bay beach sites. Water quality signage was displayed at four bay beach sites with another two beach sites used as controls. The project was designed to address the area of Providing Accessible Information under the Cleaner Yarra River and Port Phillip Bay Action Plan. An evaluation of the pilot project was conducted to determine the effectiveness of providing information about water quality direct to beach-users. This report outlines the results of the evaluation.

Methods

Six Life Saving Clubs (LSCs) were invited to participate in the pilot study conducted from February to April 2013. The club sites were selected based on visitation numbers, capacity to conduct the project, and those with previous variation in water quality forecasts, to ensure an appropriate spread of beach sites. Water quality signage was displayed at four bay beaches, Altona, St Kilda, Mordialloc, and Frankston. Two beach sites were randomly allocated as control beaches (Elwood, Mentone) without any signage during the entire trial period.

The different signage conditions for the study included:

1. Control- No-signage variable
2. Intervention One- EPA Sign: A-Frame signage with EPA Water Quality Forecast only, and
3. Intervention Two- EPA/LSV Sign: A-Frame signage with EPA Water Quality Forecast incorporated into existing LSV beach signage.

A community survey was conducted at each beach at Baseline and Follow-up, to determine whether communication of water quality via signage and education changed awareness, knowledge, attitudes and intended behaviour of beachgoers. In addition, lifesaving volunteers at the intervention club sites that were on patrol during the study period were invited to complete an online questionnaire at the end of the trial period. This approach was used to determine the impact on LSCs and volunteers.

Key Findings

A sample size of 997 (n= 398 Baseline and n= 599 Follow-up) beachgoers was obtained for the community study. One in three respondents that had not previously been exposed to the Beach Report (Uninformed Beach Report Users) was made aware of this information via the signage.

EPA information was more often recalled (unprompted) at Intervention One sites rather than Intervention Two sites. Comparatively when recall was prompted, similar numbers of respondents at the intervention sites recalled the EPA information. The most highly recalled prompted information was the Good/Fair/Poor/Unacceptable rating.

When prompted, one in two respondents correctly recalled seeing the Intervention One signs when present. Fewer respondents, one in five, correctly recalled the Intervention Two signs when present. Of those respondents that correctly recalled seeing any intervention signs around half said the signs told them something new about water quality at the beach. Of those seeing the Intervention One signs, one in four respondents felt that the signs made them more confident that they could safety swim at the beach. However, one in two respondents that saw Intervention Two signs felt that the signs made them more confident that they could safely swim at the beach. Neither signage condition influenced respondent's planned activities at the beach. This may be due to the water quality rating being consistently 'Good' throughout the trial period.

From the perspective of lifesavers, the majority of the 39 lifesavers directly involved in the project and that completed the survey felt that the project did not impact on their usual routine as a lifesaver and were satisfied with key aspects of the project. They were also supportive of the expansion of the project

to other LSCs next season.

In regards to each of the aims:

1. To determine whether communication of water quality via signage and education changes awareness and knowledge about water quality at selected Victorian beaches.

There was a significant increase in awareness of the water quality signage at the intervention beach sites demonstrated by prompted and unprompted recall. The signage also influenced awareness and knowledge about water quality with half of all respondents that had correctly recalled seeing the signage reporting that it communicated something new about water quality at the beach, and one in three respondents thought that the signage reminded them about water quality at the beach.

2. To determine whether communication of water quality via signage and education influences attitudes and intended behaviour at Victorian beaches.

The signage influenced attitudes of beachgoers demonstrated by the one in three respondents that felt the signs made them more confident that they could safety swim at the beach. An indication that the signage, or more specifically the Beach Report rating, may influence behaviour at beaches was noted when respondents rated their likelihood of swimming according to each of the Beach Report ratings. The majority of respondents were likely to go swimming if the water quality rating was 'Good' and unlikely to go swimming if it was 'Poor' or 'Unacceptable'.

3. To determine the most appropriate format of signage to display water quality at selected Victorian beaches.

The signage with the greater recognition and the greatest amount of EPA information recalled were the Intervention One signs, that is, those signs with EPA information only. However the Intervention Two or composite EPA/LSV sign made people more confident that they could safely swim at the beach.

4. To determine the impact on Life Saving Clubs and volunteers of providing an additional communication of water quality service to the public.

The majority of lifesavers felt that the project did not impact on their usual routine as a lifesaver and supported expansion of the project to other life saving clubs.

Recommendations

The results support the expansion of the water quality forecast signage project to other bay beaches in Victoria. The following recommendations are contingent upon expansion of the project:

Communication of water quality via signage and education

- Review the Beach Report rating definitions to clarify in particular the 'Fair' rating for the general public and provide guidelines for lifesavers to explain the rating to beachgoers.
- Undertake a more extensive education and awareness campaign to increase the community's awareness and knowledge of water quality at beaches.

Signage to display water quality at beaches

- Conduct further research into the final design format of signage, taking into account the need to keep information on the sign to a minimum and provide distinctive colours to gain beachgoers attention and in keeping with the National Aquatic and Recreational Signage Style Manual.
- Include visual representation of the Beach Report rating in signage utilised at beaches.
- Increase the number of signs allocated to each LSC to three in order to increase the number of beachgoers likely to be exposed to the signage.

Lifesaver service communicating water quality to the public

- Expand the phase-in period for LSCs to allow wider consultation with lifesavers. This should allow detailed information about the Beach Report and guidelines around delivery of this information to be provided to all lifesavers before the season begins. Any consultation should occur where possible outside patrol hours so as not to distract lifesavers from their patrol duties.

Introduction

The Environment Protection Authority (EPA) is charged with protecting the Victorian environment (EPA, 2012). By regulating pollution in Victoria, EPA strives to deliver, amongst other things, healthy waterways for Victorians. The Cleaner Yarra River and Port Phillip Bay Action Plan (2012) outlines 17 actions under four key priorities that the government will undertake over five years to ensure water quality is protected in the Yarra River and Port Phillip Bay. One of these actions is to improve existing monitoring programs by providing accessible water quality information to the community.

EPA has monitored water quality in Port Phillip Bay for more than 20 years. In order to inform the community about the about the suitability of water quality for swimming and other recreation in the Bay, EPA initiated the Beach Report. Beach Report includes a daily forecast of water quality at 36 bay beaches over summer and is currently available via the internet, smart phones or newspapers. EPA is looking to provide the Beach Report direct to users at Bay beaches through Life Saving Victoria's (LSV) volunteer life saving services.

Life Saving Clubs (LSCs) and the services provided by Life Saving volunteers and paid lifeguards provide an integral part of Australia's coastal and inland waterways and the communities they serve. The iconic volunteer lifesavers and lifeguards provide patrol services along Victoria's coastline as well as providing education and training in lifesaving activities. LSCs harness the support of local communities, and use a network of support services to ensure the safety of the state's waterway users. LSCs are therefore ideally placed to provide EPA Victoria Beach Report information direct to beach users.

Together the services provided by EPA and Life Saving Victoria (LSV) aim to ensure that the millions of people who visit Port Phillip Bay enjoy the beautiful coastline, and swimming beaches, safely. Therefore the EPA in conjunction with LSV conducted a water quality forecast communication pilot project for a select number of bay beaches with LSCs from February to April 2013. Water quality signage was displayed at four bay beach sites with another two beach sites used as controls. The project was designed to address the area of Providing Accessible Information under the Action Plan.

An evaluation of the pilot project was conducted to determine the effectiveness of providing information about water quality direct to beach-users. The aims of the project evaluation are detailed below. Determination of the aims will assist both EPA and LSV in assessing the feasibility of expanding the project to additional LSCs at Beach Report sites in summer 2013/14.

Aims

1. To determine whether communication of water quality via signage and education changes awareness and knowledge about water quality at selected Victorian beaches.
2. To determine whether communication of water quality via signage and education influences attitudes and intended behaviour at Victorian beaches.
3. To determine the most appropriate format of signage to display water quality at selected Victorian beaches.
4. To determine the impact on Life Saving Clubs and volunteers of providing an additional communication of water quality service to the public.

The following report provides the findings from evaluation of the pilot project.

Methods

Location

Six LSCs were invited to participate in the pilot study: Altona, Elwood, St Kilda, Mordialloc, Mentone, and Frankston. These club sites were selected based on high visitation numbers to obtain the required sample size within the required timeframes; those with the membership capacity to conduct the project; and those that had varying water quality forecasts to ensure an appropriate spread of beach sites. Two beach sites were randomly allocated as control sites without any signage during the entire trial period. Baseline and Follow-up surveys were conducted at each beach.

Signage

Signage was designed in consultation with EPA Victoria and was based on expert opinion, evidence from the literature, and in keeping with the National Aquatic and Recreational Signage Style Manual (LSV, 2006). Two A-Frame signs were provided to each LSC to fit in with existing signage utilised by LSCs (Figure 1). The Frames were designed to allow changes to be made to the beach forecast rating (Good, Fair, Poor, or Unacceptable). The signs were to be displayed next to the patrol flags during patrol times in February and March 2013.

The different signage conditions for the study included:

1. Control- No-signage variable
2. Intervention One- EPA Sign: A-Frame signage with EPA Water Quality Forecast only, and
3. Intervention Two- EPA/LSV Sign: A-Frame signage with EPA Water Quality Forecast incorporated into existing LSV beach signage.

Intervention One Sign **Intervention Two Sign**

Figure 1 Sign types for each intervention beach

Community Study

The first study included a community survey conducted during February and March 2013. Sample collection timeframes were within the patrol times for each participating club. A Baseline sample was collected prior to any signage being used at the LSCs. A Follow-up sample was collected three and four weeks after the signage was first introduced and therefore when signage was still in place at the four club sites included in the intervention.

Participants

Participants included adults aged 18 years and over randomly selected at each of the beach sites included in the signage trial. Random sampling of coastal recreation users at six bay beach sites occurred once beachgoers were settled on the beach and therefore after they were likely to have passed the water quality forecast signage. The survey was designed to include all beachgoers, that is, both active and passive recreation users and not necessarily specific to water users (e.g. included foreshore area users in proximity to the water's edge).

Given the estimated 307,422 visitors to bay beaches in Victoria where there is a LSC (determined by Life Saving Club internal patrol statistics; an average of visitor estimates from 2010/2011 and 2011/2012 seasons utilised) and therefore that may access the Beach Report the recommended minimum sample size at Baseline and Follow-up was 384, a total of 768. This was calculated based on the following: 95% confidence interval and 5% error margin. The proposed target sample for the surveys in total was 985, that is, approximately 197 surveys per test condition.

Questionnaire

A questionnaire (Appendix B) was designed in consultation with EPA Victoria, to assess: awareness and knowledge of water quality information from all potential sources; attitudes and intended behaviour change (such as deciding not to enter the water due to a certain water quality rating); and recognition and recall rates specific to signage content. Information on socio-demographic variables such as gender, age, and ethnicity was also collected. Questionnaires were filled out with the assistance of trained survey data collectors to ensure consistency of data collection.

Data analysis

Data were analysed utilising IBM SPSS Statistics 21. Chi-square tests were used to determine statistically significant differences between intervention and control groups. Relevant statistically significant findings have been reported at $p<0.05$.

Additional analyses were conducted to determine whether there were significant differences between population subgroups in recognition and recall of signage according to whether respondents were:

- **Active Beach Users**- defined as those who would be directly exposed to the water; their main activity at the beach was swimming, surfing, boating or fishing.
- **Passive Beach Users**- those in proximity to the water but **not** directly exposed to the water; their main activity at the beach was sunbathing, walking or another activity on the beach.
- **Informed Beach Report Users**- defined as those that had previous awareness of the Beach Report.
- **Uniformed Beach Report Users**- those that had **no** previous awareness of the Beach Report.

Life Saving Club Study

The second study included a cross-sectional survey (Appendix B) of lifesaving volunteers designed to determine the impact on LSCs and volunteers of providing the Beach Report forecast information, an additional communication service, to the public.

Participants

Lifesaving volunteers at the intervention club sites that were on patrol during the study period were invited to complete an online questionnaire at the end of the trial period in mid-March to April 2013.

Questionnaire

The impact of water quality signage placement on typical volunteer patrol duties was assessed via an online questionnaire. Information on socio-demographic variables such as gender, age, and ethnicity were also collected.

Findings

Community Study

Participants

In total, a sample size of 997 (n= 398 Baseline and n= 599 Follow-up) was obtained (Table 1). The overall response rate was 71.2%.

Table 1: Number of respondents at each location.

Intervention Group	Beach Name	Baseline	Follow-up	Total
Intervention One	St Kilda	51	101	152
	Frankston	50	100	150
Intervention Two	Mordialloc	50	100	150
	Altona	47	100	147
Control	Elwood	100	100	200
	Mentone	100	98	198
Total		398	599	997

Over half of the respondents were female, ranging from 55.0% to 66.3% across the sites and at Baseline and Follow-up. Respondents attending beach sites in Intervention One were of a younger age range, 18-24 years and 25-34 years, while there were more respondents in the Intervention Two and Control sites in the 25-34 year and 35-44 year age ranges. Further information about the demographic make-up of respondents at Baseline and Follow-up is provided in Appendix A, Table A.1.

The study population was similar to that observed in previous studies of Victorian beachgoers by Andronaco et al (2012), and a Newspoll study (2013) which included a question on visitation to Victorian bay beaches with a life saving patrol. There was only between 1% to 3% difference in any of the age ranges of respondents in the current study compared with those reporting that they had been swimming at a patrolled bay or flat water beach in Victoria in the past 12 months (Newspoll, 2013; different age ranges were used in the Andronaco et al study, so were not used for comparison). There were a slightly higher number of females in the current study with 6% more females completing surveys compared with the Andronaco et al study (the Newspoll study had set gender quotas so was not used for comparison). English was the main language spoken at home for the majority of respondents in this and previous surveys, therefore more work is required to test the effectiveness of signage in culturally and linguistically diverse (CALD) communities.

The majority of respondents were regular beachgoers, visiting the beach at least fortnightly. Swimming, sunbathing and walking or general recreation activities on the beach were the main activities respondents were undertaking (Appendix A, Table A.2). When asked to select and then rank their reasons for choosing a beach to go to, the highest priorities for people were being 'Close to home' (selected by 70.6% to 79.4% of respondents), followed by: 'Convenient to get to' (ranging from 58.1 to 67.2%); being 'Safe' (ranging from 39.2% to 52.5%); 'Patrolled' (ranging from 35.0% to 55.4%); having 'Less pollution' (ranging from 30.3% to 48.5%); and finally the 'Beach Report forecast'(ranging from 24.9% to 44.6%).

Water quality and the Beach Report

Overall two in three respondents were satisfied with EPA's performance as a trusted source of information about the environment, with only 2.1% dissatisfied. Most respondents felt that the water quality at the beach they were visiting was 'good' to 'excellent', (ranging from 61.0% to 82.8%). However, 53.5% of respondents were concerned about water pollution at that beach. This is similar to a previous study where 56% of people who could identify a Victorian waterway of importance to them expressed concern about water pollution in that particular waterway (Maddern, 2012). Similar to that study, the type of pollution respondents were most concerned about in the current study was from street litter/rubbish, and sewage in the water. Other areas where more than half the respondents in the current study expressed concern included cigarette butts, smelly water, discoloured/murky water, industrial discharge of chemicals, and dog droppings. Respondents in the current study were more concerned about these types of pollution than those in the previous study, with respondents who reported the beach as their most important waterway being more likely to be concerned about oil (Maddern, 2012).

Across all respondents, 32.1% thought that the Beach Report water quality rating provided information on the condition of the environment, 16.5% thought it provided the current, past and future condition of the environment, and only 10.0% of all respondents thought the Beach Report provided a forecast. Many respondents (41.5%) did not know what was provided in the Beach Report. Of the 27.3% of respondents that had heard about the Beach Report rating before: 46.1% thought it provided information about the condition of the environment; 20.1% thought it provided the current, past and future condition of the environment; 21.6% did not know what was provided; and only 12.3% thought it provided a forecast. Therefore there appeared to be confusion about the nature of the information contained in the Beach Report.

Informed Beach Report Users were more likely to see the water quality signage (Table 2). This was statistically significant in the Intervention One group. This demonstrates the importance of providing education and awareness about the Beach Report in addition to the signage because people who are aware of the Report may be more likely to notice the signage. Previous studies have indicated the importance of multifaceted approaches to increase public safety (Pearn et al., 2008).

Almost one third of Uninformed Beach Report Users correctly reported seeing the water quality signage (Table 2), demonstrating the value of the signage for increasing awareness of information contained in the Beach Report.

Table 2: Intervention signage awareness of Beach Report Informed and Uninformed Users.

	Beach Report				Significance
	Informed Users		Uninformed Users		
Intervention Group	Frequency	Percent (%)	Frequency	Percent (%)	
Intervention One	33	70.2	72	47.4	p<0.05
Intervention Two	15	26.3	23	16.8	
Total	48	46.2	95	32.9	

Signage Recognition and Recall

At Baseline an average of 45.8% of respondents had seen any type of signage as they walked along the beach. This figure is the same as that found in similar signage study by LSV at four Victorian beaches in which 45.0% of people recalled seeing signage (Andronaco et al., 2012). At Follow-up the average number of respondents that had seen any signage was 47.4% and therefore did not change significantly from Baseline. However the proportion of respondents that had seen any signage at the control sites (with no additional signage in place) significantly decreased from Baseline to Follow-up.

Those that saw any signage at the beach were asked to specify where they observed the signage (Appendix A, Table A.3). There was no significant difference in the number of respondents reporting seeing any signage at access/entrance points to the beach. When asked about signage near the LSC, there was a significant difference in the proportion of respondents that had seen signage at the Intervention One sites at Follow-up (23.9% at Baseline compared with 54.0% at Follow-up). This may be due to the placement of the EPA signs in particular at St Kilda LSC positioned near the patrol stand located between the LSC and the flags and being a short distance between both.

Both intervention and control sites had increased numbers of respondents reporting that they had seen signage next to the red and yellow flags on the beach ($p<0.05$). When asked to specify what they had noticed on the sign respondents at both intervention sites noted the EPA information and rating scale. The Intervention One sites with EPA signage only, had a greater number of unprompted mentions of the EPA information (21 - Intervention One versus 6 - Intervention Two).

While it was unexpected to see an increase in signage noticed next to the red and yellow flags at the control sites this is most likely due to signage located near the flagged area at one of the control sites indicating a LSC rescue boat training exercise in the area. When asked to specify what was on the signage most people noted the caution signage related to this activity. Indeed the only significant difference in prompted information recalled by respondents at the control sites was patrol information.

Recognition and Recall of EPA Information

When recalled unprompted the EPA information was more often recalled at those sites using only the EPA sign (Intervention One) rather than the composite EPA/LSV Sign (Intervention Two). However when recall was prompted, similar numbers of respondents at the intervention sites recalled the EPA information. The most highly recalled prompted information was the Good/Fair/Poor/Unacceptable rating (Appendix A, Table A.4). This is not unexpected as pictorial symbols have been shown to enhance the effectiveness of warnings over text alone, convey meaning more quickly, and be visible from a greater distance (Laughery and Wolgalter, 2011; Lehto, 1992).

When prompted 106 (52.7%) respondents correctly recalled seeing the Intervention One signs when present compared to 4 (4.0%) respondents at Baseline ($p<0.05$; Table 3). While fewer respondents correctly recalled the Intervention Two signs when present, 39 (19.5%), there was a significant increase in recognition of these signs when prompted (5.2% at Baseline compared to 19.5% at Follow-up).

Further analysis of signage recall comparing respondents that were sitting between the patrol flags to those outside the patrol flags, indicated that respondents that were sitting between the patrol flags were more likely to notice the signage, with an increase in prompted recall by approximately 10% in both intervention groups. Prompted recall increased to 62.9% when the Intervention One signs were present and to 31.0% when the Intervention Two signs were present. This is likely due to those people sitting between the flags being more likely to have walked past or have seen the signs as they were in closer proximity to the signs. Those people located outside the patrol flags may have accessed the beach from a location not near the club or the patrolled area and therefore would be less likely to have seen the signs.

Table 3: Prompted recall of signage at Baseline and Follow-up.

Intervention Group	Sign type recalled	Baseline (n)	Baseline (%)	Follow-up (n)	Follow-up (%)	Significance
	EPA Sign					
Intervention One	Yes	4	4.0	106	52.7	p<0.05
	No	97	96.0	95	47.3	
	Total	101	100.0	201	100.0	
Intervention Two	Yes	9	9.3	27	13.5	
	No	88	90.7	173	86.5	
	Total	97	100.0	200	100.0	
Control	Yes	8	4.0	11	5.6	
	No	192	96.0	187	94.4	
	Total	200	100.0	198	100.0	
	EPA/LSV Sign					
Intervention One	Yes	4	4.0	12	6.0	
	No	97	96.0	189	94.0	
	Total	101	100.0	201	100.0	
Intervention Two	Yes	5	5.2	39	19.5	p<0.05
	No	92	94.8	161	80.5	
	Total	97	100.0	200	100.0	
Control	Yes	6	3.0	4	2.0	
	No	194	97.0	194	98.0	
	Total	200	100.0	198	100.0	

Influence of signage on awareness and knowledge, attitudes and intended behaviour

Of those respondents that correctly recalled seeing Intervention One signs, more than half (55.7%) said the signs told them something new about water quality at the beach, while 45.3% felt the signage reminded them about water quality at the beach (Table 4). More than one in four respondents felt that the signs made them more confident that they could safety swim at the beach.

Similar to Intervention One, of those that attended sites with the Intervention Two signs nearly half (48.7%) said the signs told them something new about water quality at the beach, while less, 25.6%, felt the signage reminded them about water quality at the beach (Table 4). However, a greater proportion of respondents that saw the Intervention Two signs felt that the signs made them more confident that they could safely swim at the beach (51.3%).

The results demonstrated that the signage influenced awareness and knowledge of beachgoers, thus supporting the hypotheses from Aim 1. The results also demonstrated an increased awareness of beachgoers which supports the hypothesis from Aim 2 that the signage would influence attitudes of Victorian beachgoers. However, the second hypothesis associated with Aim 2 regarding an influence on intended behaviour was not supported as neither signage condition influenced respondent's planned activities at the beach. This may have been due to the water quality rating being consistently 'Good' throughout the trial period. The below results regarding respondent's intended behaviour with different Beach Report ratings provide greater insight in this area.

There were no differences in results for the different population subgroups assessed, that is, Active versus Passive Beach Users, or Informed versus Uninformed Beach Users.

Table 4: Intervention signage and awareness, knowledge, attitudes and intended behaviour.

What have the signs done?	Intervention Group			
	Intervention One		Intervention Two	
	Frequency (n=106)	Percent (%)	Frequency (n=39)	Percent (%)
Told you something new about water quality at the beach.	59	55.7	19	48.7
Reminded you about water quality at the beach.	48	45.3	10	25.6
Made you change your planned activities at the beach today.	2	1.9	0	0.0
Made you more confident that you can safely swim at the beach today.	28	26.4	20	51.3

Beach Report Rating

Respondents were asked to rate on a scale of 1 to 5 (1=extremely unlikely to 5=extremely likely), how likely it was that they would go swimming on a fine sunny day according to each of the Beach Report ratings of Good, Fair, Poor or Unacceptable, defined as follows:

- Good - Water quality is suitable for swimming
- Fair - Water quality may not be suitable for swimming
- Poor - Water quality is not suitable for swimming
- Unacceptable - Testing has confirmed that water quality is not suitable for swimming.

The median likelihood of swimming under each of the Beach Report ratings was consistent across the groups except for the control group at Baseline, the respondents at control sites were less likely to swim under the poor rating than the other respondents. If the rating was 'Good' the median likelihood of swimming was 'extremely likely'; if 'Fair' it was 'likely' respondents would still go swimming; if 'Poor' it was 'unlikely' respondents would go swimming (except controls at Baseline which was 'extremely unlikely'); if 'Unacceptable' it was 'extremely unlikely' respondents would go swimming.

The greatest variation in respondent's likelihood to go swimming was found if the rating was 'Fair' with 47% to 62% of respondents still likely to go swimming (Figure 2). The results indicate that it may be unclear for beachgoers as to whether or not they should be going swimming when this rating is used.

There were no differences in results for the different population subgroups assessed, that is, Active versus Passive Beach Users, or Informed versus Uninformed Beach Users.

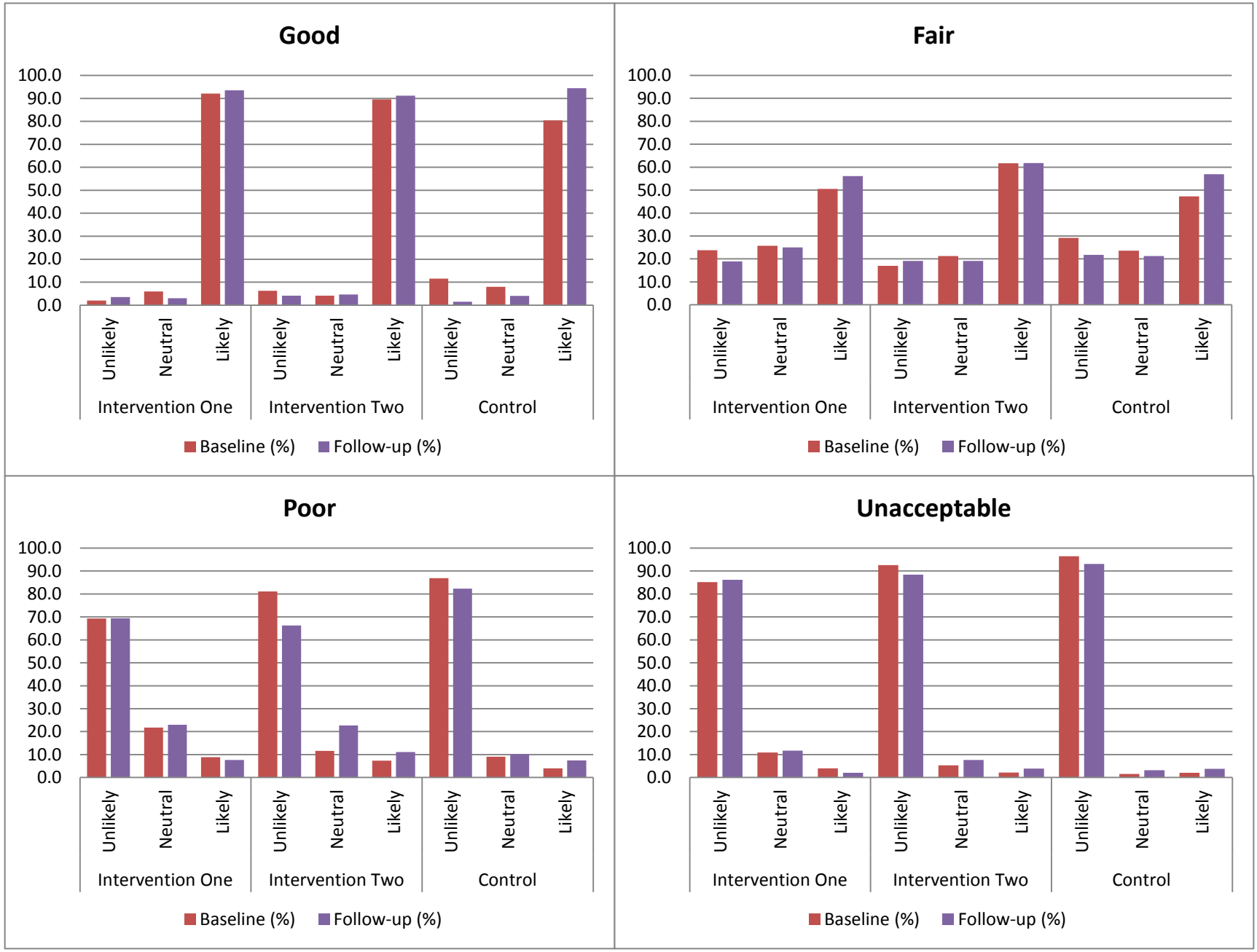

Figure 2. Likelihood of respondents going swimming depending on the Beach Report rating (Good/ Fair/ Poor / Unacceptable)

Life Saving Club Study

Participants

Of the 99 lifesavers contacted 39 completed the online survey; 11 from club sites with Intervention One signage (St Kilda, n=7 and Frankston, n=4) and 28 with Intervention Two signage (Mordialloc, n=15 and Altona, n=13). Lifesavers were from a broad range of ages, and the majority were male (77.1%). Two thirds had been volunteering for up to five years, and just under a third (28.6%) had been volunteering for over 10 years. All except one participant had been born in Australia and spoke English as their main language.

Water quality and the Beach Report

All except one lifesaver were satisfied with EPA's performance as a trusted source of information about the environment. Similar to the public, 55.6% of respondents were concerned about water pollution at that beach. The type of pollution lifesavers were most concerned about included street litter/rubbish, discoloured/murky water, and cigarette butts.

Approximately half of lifesavers had heard about the Beach Report before. There was some confusion as to the nature of the information provided in the Beach Report. One third of lifesavers did not know whether the Beach Report provided information about the current or past condition of the environment, forecasts or both. Only 22.2% of lifesavers knew that the report provides forecasts of the conditions. While this figure is higher than for the community the results suggest that there is a need for greater education for lifesavers regarding the Beach Report and the information this provides in order for them to accurately inform the public.

Public response to the trial

The majority of lifesavers (74.4%) spoke to at least one person regarding the Beach Report information. Less than a third of lifesavers received any feedback from beachgoers regarding the signage however all feedback received was positive. The feedback included that the signage was clear and easy to understand (noted by lifesavers in the Intervention Two sites) and that it was good to be informed about the water quality and know whether to go in the water. This may indicate an increased level of confidence in deciding whether to enter the water by beachgoers due to the presence of the signs.

Impact on lifesaver routines

The overall impact of the project on the usual routine of lifesavers was not considered to be arduous. Most lifesavers felt that the project either did not impact on their usual routine (38.5%) or it provided a way to interact with the public in general or specifically about water quality and water safety (38.5%). Four lifesavers (10.3%) felt the project took time away from either their key duties as a lifesavers or interacting with the public about water safety and only one lifesaver felt the project made their job as a lifesaver easier.

Most lifesavers (78.4%) spent up to 15 minutes in setting up signs updating forecasts and talking with beachgoers about the water quality forecasts during any one patrol session. The majority (71.8%) of lifesavers spoke with up to nine people per patrol session about the water quality forecast.

The level of satisfaction regarding the project was positive overall with the majority of lifesavers being satisfied with each aspect of the project (Table 5). Those areas where more than 10% of lifesavers were dissatisfied were the placement of the signs, number of signs, and resources to handout to the public.

Suggested areas for improvement included to allow decision making regarding the location of signs up to each club as they would have a greater understanding of public access and therefore the best possible placement of signs to increase the proportion of the public seeing the information. It was further suggested that having three signs rather than two would increase the potential number of people viewing the signs. In regards to resources, some lifesavers either didn't receive the resources to handout to the public or were not made aware of these. Some lifesavers also did not feel that resources to handout to the public were necessary, that the signage was self explanatory and that if there was a 'Poor' rating this would generate further interaction with lifesavers to direct the public appropriately.

All LSCs utilised the tablet provided by EPA Victoria to obtain the water quality forecasts, the use varied according to the club however for three out of the four clubs this was the most highly utilised method. Three out of four clubs had their own internet access with some lifesavers utilising the computer in their life saving club building to obtain the forecast, however for the club with no internet access the only other option for them was to use their own Smartphone, therefore the tablet reduced any burden on the club and club members in providing this service to the public.

In total 31 (91.0%) lifesavers completing the survey supported the expansion of the project to other LSCs next season.

Table5: Level of satisfaction of lifesavers (n=39)* with different aspects of the project.

		Intervention Group					
		Intervention One		Intervention Two			
	Level of Satisfaction	Frequency	Percent (%)	Frequency	Percent (%)	Total	Percent (%)
Communication about the project (including procedures and background information)	Satisfied	7	87.5	18	81.8	25	83.3
	Unsure	0	0.0	3	13.6	3	10.0
	Dissatisfied	1	12.5	1	4.5	2	6.7
Information about the surveys being conducted	Satisfied	4	66.7	17	73.9	21	72.4
	Unsure	1	16.7	6	26.1	7	24.1
	Dissatisfied	1	16.7	0	0.0	1	3.4
EPA representative visiting your club on the weekends	Satisfied	10	90.9	17	98.5	27	90.0
	Unsure	0	0.0	1	5.3	1	3.3
	Dissatisfied	1	9.1	1	5.3	2	6.7
Ease of use of the tablet	Satisfied	5	45.5	14	73.7	19	63.3
	Unsure	5	45.5	3	15.8	8	26.7
	Dissatisfied	1	9.1	2	10.5	3	10.0
Access to the tablet	Satisfied	6	54.5	14	77.8	20	69.0
	Unsure	3	27.3	4	22.2	7	24.1
	Dissatisfied	2	18.2	0	0.0	2	6.9
Ability to obtain Beach Report rating	Satisfied	9	81.8	18	78.3	27	79.4
	Unsure	2	18.2	4	17.4	6	17.6
	Dissatisfied	0	0.0	1	4.3	1	2.9
Accuracy of the Beach Report ratings	Satisfied	7	63.6	17	70.8	24	68.6
	Unsure	3	27.3	7	29.2	10	28.6
	Dissatisfied	1	9.1	0	0.0	1	2.9
Size of the signs	Satisfied	11	100.0	19	76.0	30	83.3
	Unsure	0	0.0	3	12.0	3	8.3
	Dissatisfied	0	0.0	3	12.0	3	8.3
Location of the signs (i.e. next to the patrol red and yellow flags)	Satisfied	9	81.8	18	72.0	27	75.0
	Unsure	1	9.1	3	12.0	4	11.1
	Dissatisfied	1	9.1	4	16.0	5	13.9
Number of signs (i.e. two, one next to each patrol flag)	Satisfied	10	90.9	18	72.0	28	77.8
	Unsure	1	9.1	3	12.0	4	11.1
	Dissatisfied	0	0.0	4	16.0	4	11.1
Resources to handout to the public (e.g. magnets)	Satisfied	4	36.4	12	48.0	16	44.4
	Unsure	3	27.3	7	28.0	10	27.8
	Dissatisfied	3	27.3	3	12.0	6	16.7
	N/A (Didn't receive information)	1	9.1	3	12.0	4	11.1

*Note: Due to low figures the results should be interpreted with caution.

Discussion and Conclusions

The general community and lifesavers view the EPA as a trusted source of information, and have concerns about pollution at our beaches. Therefore any additional information provided to the public to improve their confidence in decision making to safely enjoy the water at our bay beaches would be expected to be highly regarded in the community.

The results of the water quality forecast signage project demonstrated increased recognition and recall of EPA Beach Report information. The visual aspect of the rating scale was the most highly recalled aspect of the signage. The signage influenced awareness, knowledge and attitudes of beachgoers. An additional 32.9% of respondents that had not previously been exposed to the Beach Report information were made aware of this information via the signage.

The strength of the current study was that it was conducted in the field to directly assess the effectiveness of the water quality signage on Victorian beaches. Furthermore the sample was reflective of typical beachgoers along bay beaches in Victoria. The limited number of respondents from CALD communities highlighted that more work is required to test the effectiveness of signage for people from CALD communities.

The full extent of the effectiveness of the signage may not have been realised due in part to the short-term nature of the trial. Recall and recognition as well as any effects on intended behaviour may have been greater (in particular for regular beachgoers) with a longer duration of the signs being in place and also with broader promotion of Beach Report and the signs. Therefore a more extensive awareness campaign coupled with the signage may have improved the outcomes. Evidence in many areas including drowning demonstrated the success of multifaceted approaches for injury prevention and safety promotion (Pearn et al., 2008). In addition, because the forecast rating was 'Good' throughout the trial any influence of 'Poor' or 'Unacceptable' ratings on intended behavioural change were unable to be fully elucidated. However, intended behavioural patterns were able to be determined when respondents were asked the likelihood of swimming under these conditions.

In regards to each of the aims:

1. To determine whether communication of water quality via signage and education changes awareness and knowledge about water quality at selected Victorian beaches.

There was a significant increase in awareness of the water quality signage at the intervention beach sites. When recalled unprompted the EPA information was more often recalled at those sites using only the Intervention One (EPA) sign rather than the Intervention Two (composite EPA/LSV) sign. However when recall was prompted, similar numbers of respondents at all intervention sites recalled the EPA information. The most highly recalled prompted information was the Good/Fair/Poor/Unacceptable rating.

The signage also influenced awareness and knowledge about water quality with half of all respondents that had correctly recalled seeing the signage reporting that it communicated something new about water quality at the beach. One in three respondents that correctly recalled seeing signage also thought that the signage reminded them about water quality at the beach.

2. To determine whether communication of water quality via signage and education influences attitudes and intended behaviour at Victorian beaches.

The signage influenced attitudes of beachgoers demonstrated by the one in three respondents that felt the signs made them more confident that they could safety swim at the beach. A greater proportion of respondents exposed to the Intervention Two signage felt that the signs made them more confident that they could safely swim at the beach (51.3%).

Results regarding intended behaviour at the beach were mixed. Neither signage condition influenced respondent's planned activities at the beach, which may have been due to the water quality rating being consistently 'Good' across the trial period. An indication that the signage, or more specifically the Beach Report rating, may influence behaviour at beaches was noted when respondents were asked to rate their likelihood of swimming according to each of the ratings. The majority of respondents were likely to go swimming if the water quality rating was 'Good' and unlikely to go swimming if it was 'Poor' or 'Unacceptable'. However there appeared to be some confusion with the 'Fair' rating with around one in two respondents still likely to go swimming with this rating. More work may be needed to clarify the rating definitions, in particular the 'Fair' rating. Once this is clarified, guidelines for lifesavers are required to enable them to provide beachgoers with sufficient information to make an informed decision about whether to go swimming on not according to each rating.

3. To determine the most appropriate format of signage to display water quality at selected Victorian beaches.

The signage with the greater recognition and the greatest amount of EPA information recalled were the Intervention One signs, that is, those signs with EPA information only. However the Intervention Two or composite EPA/LSV sign made people more confident that they could safely swim at the beach.

The higher level of recall of Intervention One signs may be due to the colour and/or the amount of information on the signs. The solid blue colour may have stood out because it is not typical of signage at the beach and therefore beachgoers would not be expecting to see it and thus may be more likely to take notice of it. There was also less information contained on the Intervention One signs which would have ensured that all information was legible to the reader and more likely to be understood in the short space of time when walking past signage.

It is also possible that people have become accustomed to the red and yellow colours displayed at beaches and therefore may less likely to pay attention to the signage and rely on the lifesavers for their safety. This is further reflected in that the Intervention Two signs made people more confident they could safely swim at the beach because lifesaving and the red and yellow colours are associated with safety at the beach.

Further research is required to determine the final design format of signage should the project be expanded. The research would need to take into account the need to keep information on the sign to a minimum and provide distinctive colours to gain beachgoers attention, ensuring that any updated signs are in keeping with the National Aquatic and Recreational Signage Style Manual.

4. To determine the impact on Life Saving Clubs and volunteers of providing an additional communication of water quality service to the public.

The overall feedback from lifesavers directly involved in the project was positive. Most lifesavers felt that the project did not impact on their usual routine as a lifesaver and were satisfied with key aspects of the project. They were also supportive of the expansion of the project to other life saving clubs next season.

Recommendations

The results support the expansion of the water quality forecast signage project to other bay beaches in Victoria. The following recommendations are contingent upon expansion of the project:

Communication of water quality via signage and education

- Review the Beach Report rating definitions to clarify in particular the 'Fair' rating for the general public and provide guidelines for lifesavers to explain the rating to beachgoers.
- Undertake a more extensive education and awareness campaign to increase the community's awareness and knowledge of water quality at beaches.

Signage to display water quality at beaches

- Conduct further research into the final design format of signage, taking into account the need to keep information on the sign to a minimum and provide distinctive colours to gain beachgoers attention and in keeping with the National Aquatic and Recreational Signage Style Manual.
- Include visual representation of the Beach Report rating in signage utilised at beaches.
- Increase the number of signs allocated to each LSC to three in order to increase the number of beachgoers likely to be exposed to the signage.

Lifesaver service communicating water quality to the public

- Expand the phase-in period for LSCs to allow wider consultation with lifesavers. This should allow detailed information about the Beach Report and guidelines around delivery of this information to be provided to all lifesavers before the season begins. Any consultation should occur where possible outside patrol hours so as not to distract lifesavers from their patrol duties.

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Appendix A: Supplementary Tables

Table A.1: Characteristics of beachgoers surveyed at Baseline and Follow-up.

Intervention Group	Characteristic	Baseline (n)	Baseline (%)	Follow-up (n)	Follow-up (%)	Total (n)	Total (%)	Significance
	Gender							
Intervention One	Male	34	33.7	68	33.8	102	33.8	
	Female	67	66.3	132	65.7	199	65.9	
	Unknown	0	0.0	1	0.5	1	0.3	
	Total	101	100.0	201	100.0	302	100.0	
Intervention Two	Male	38	39.2	86	43.0	124	41.8	
	Female	59	60.8	110	55.0	169	56.9	
	Unknown	0	0.0	4	2.0	4	1.3	
	Total	97	100.0	200	100.0	297	100.0	
Control	Male	79	39.5	75	37.9	154	38.7	
	Female	121	60.5	119	60.1	240	60.3	
	Unknown	0	0.0	4	2.0	4	1.0	
	Total	200	100.0	198	100.0	398	100.0	
	Age range							
Intervention One	18-24 years	30	29.7	67	33.3	97	32.1	
	25-34years	27	26.7	49	24.4	76	25.2	
	35-44 years	15	14.9	40	19.9	55	18.2	
	45-54 years	17	16.8	28	13.9	45	14.9	
	55+ years	12	11.9	15	7.5	27	8.9	
	Unknown	0	0.0	2	1.0	2	0.7	
	Total	101	100.0	201	100.0	302	100.0	
Intervention Two	18-24 years	2	2.1	38	19.0	40	13.5	p<0.05
	25-34years	22	22.7	56	28.0	78	26.3	
	35-44 years	36	37.1	51	25.5	87	29.3	
	45-54 years	23	23.7	38	19.0	61	20.5	
	55+ years	14	14.4	12	6.0	26	8.8	
	Unknown	0	0.0	5	2.5	5	1.7	
	Total	97	100.0	200	100.0	297	100.0	
Control	18-24 years	11	5.5	31	15.7	42	10.6	p<0.05
	25-34years	52	26.0	65	32.8	117	29.4	
	35-44 years	58	29.0	44	22.2	102	25.6	
	45-54 years	34	17.0	38	19.2	72	18.1	
	55+ years	43	21.5	14	7.1	57	14.3	
	Unknown	2	1.0	6	3.0	8	2.0	
	Total	200	100.0	198	100.0	398	100.0	

Table A.1 (cont'd): Characteristics of beachgoers surveyed at Baseline and Follow-up.

Intervention Group	Characteristic	Baseline (n)	Baseline (%)	Follow-up (n)	Follow-up (%)	Total (n)	Total (%)	Significance
	Children (14 years of age or less) in your care today							
Intervention One	Yes	27	26.7	53	26.4	80	26.5	
	No	73	72.3	143	71.1	216	71.5	
	Unknown	1	1.0	5	2.5	6	2.0	
	Total	101	100.0	201	100.0	302	100.0	
Intervention Two	Yes	58	59.8	77	38.5	135	45.5	p<0.05
	No	39	40.2	115	57.5	154	51.9	
	Unknown	0	0.0	8	4.0	8	2.7	
	Total	97	100.0	200	100.0	297	100.0	
Control	Yes	47	23.5	65	32.8	112	28.1	
	No	152	76.0	130	65.7	282	70.9	
	Unknown	1	0.5	3	1.5	4	1.0	
	Total	200	100.0	198	100.0	398	100.0	
	Country of birth							
Intervention One	Australia	52	51.5	103	51.2	155	51.3	
	Other/Unknown	49	48.5	98	48.8	147	48.7	
	Total	101	100.0	201	100.0	302	100.0	
Intervention Two	Australia	59	60.8	120	60.0	179	60.3	
	Other/Unknown	38	39.2	80	40.0	118	39.7	
	Total	97	100.0	200	100.0	297	100.0	
Control	Australia	120	60.0	112	56.6	232	58.3	
	Other/Unknown	80	40.0	86	43.4	166	41.7	
	Total	200	100.0	198	100.0	398	100.0	
	Language spoken at home							
Intervention One	English	86	85.1	165	82.1	251	83.1	
	Other/Unknown	15	14.9	36	17.9	51	16.9	
	Total	101	100.0	201	100.0	302	100.0	
Intervention Two	English	88	90.7	172	86.0	260	87.5	
	Other/Unknown	9	9.3	28	14.0	37	12.5	
	Total	97	100.0	200	100.0	297	100.0	
Control	English	189	94.5	177	89.4	366	92.0	
	Other/Unknown	11	5.5	21	10.6	32	8.0	
	Total	200	100.0	198	100.0	398	100.0	

Table A.2: Frequency of beach visitation and typical activities of respondents.

Intervention Group	Frequency/ Activity	Baseline (n)	Baseline (%)	Follow-up (n)	Follow-up (%)	Total (n)	Total (%)	Significance
	Beach visitation in last 3 months							
Intervention One	Daily	9	8.9	19	9.5	28	9.3	
	Weekly	28	27.7	61	30.3	89	29.5	
	Fortnightly	17	16.8	41	20.4	58	19.2	
	About once a month	16	15.8	30	14.9	46	15.2	
	Less than once a month	10	9.9	23	11.4	33	10.9	
	Just this time	21	20.8	27	13.4	48	15.9	
	Total	101	100.0	201	100.0	302	100.0	
Intervention Two	Daily	9	9.3	15	7.5	24	8.1	
	Weekly	34	35.1	55	27.5	89	30.0	
	Fortnightly	16	16.5	50	25.0	66	22.2	
	About once a month	16	16.5	41	20.5	57	19.2	
	Less than once a month	7	7.2	17	8.5	24	8.1	
	Just this time	15	15.5	22	11.0	37	12.5	
	Total	97	100.0	200	100.0	297	100.0	
Control	Daily	33	16.5	25	12.6	58	14.6	
	Weekly	78	39.0	82	41.4	160	40.2	
	Fortnightly	33	16.5	32	16.2	65	16.3	
	About once a month	25	12.5	21	10.6	46	11.6	
	Less than once a month	10	5.0	8	4.0	18	4.5	
	Just this time	21	10.5	30	15.2	51	12.8	
	Total	200	100.0	198	100.0	398	100.0	
	Main activity							
Intervention One	Sunbathing	46	45.5	97	48.3	143	47.4	p<0.05
	Swimming	29	28.7	80	39.8	109	36.1	
	Surfing	0	0.0	1	0.5	1	0.3	
	Walking	6	5.9	14	7.0	20	6.6	
	Other	20	19.8	9	4.5	29	9.6	
	Total	101	100.0	201	100.0	302	100.0	
Intervention Two	Sunbathing	21	21.6	78	39.0	99	33.3	p<0.05
	Swimming	39	40.2	90	45.0	129	43.4	
	Surfing	0	0.0	1	0.5	1	0.3	
	Boating	0	0.0	1	0.5	1	0.3	
	Fishing	1	1.0	1	0.5	2	0.7	
	Walking	18	18.6	8	4.0	26	8.8	
	Other	17	17.5	20	10.0	37	12.5	
	No Answer	1	1.0	1	0.5	2	0.7	
	Total	97	100.0	200	100.0	297	100.0	
Control	Sunbathing	33	16.5	67	33.8	100	25.1	p<0.05
	Swimming	44	22.0	75	37.9	119	29.9	
	Surfing	1	0.5	0	0.0	1	0.3	
	Boating	1	0.5	0	0.0	1	0.3	
	Walking	99	49.5	31	15.7	130	32.7	
	Other	21	10.5	25	12.6	46	11.6	
	No Answer	1	0.5	0	0.0	1	0.3	
	Total	200	100.0	198	100.0	398	100.0	

Table A.3: Frequency of beach signage recall.

Intervention Group	Signage Location	Baseline (n)	Baseline (%)	Follow-up (n)	Follow-up (%)	Total (n)	Total (%)	Significance
	Saw any information signs							
Intervention One	Yes	46	45.5	113	56.2	159	52.6	
	No	42	41.6	63	31.3	105	34.8	
	Unsure	13	12.9	25	12.4	38	12.6	
	Total	101	100.0	201	100.0	302	100.0	
Intervention Two	Yes	44	45.4	97	48.5	141	47.5	
	No	37	38.1	77	38.5	114	38.4	
	Unsure	16	16.5	23	11.5	39	13.1	
	No Answer	0	0.0	3	1.5	3	1.0	
	Total	97	100.0	200	100.0	297	100.0	
Control	Yes	93	46.5	74	37.4	167	42.0	p<0.05
	No	70	35.0	91	46.0	161	40.5	
	Unsure	37	18.5	29	14.6	66	16.6	
	No Answer	0	0.0	4	2.0	4	1.0	
	Total	200	100.0	198	100.0	398	100.0	
	Access point at beach entrance							
Intervention One	Yes	26	56.5	56	49.6	82	51.6	
	No	20	43.5	57	50.4	77	48.4	
	Total	46	100.0	113	100.0	159	100.0	
Intervention Two	Yes	19	43.2	44	45.4	63	44.7	
	No	25	56.8	53	54.6	78	55.3	
	Total	44	100.0	97	100.0	141	100.0	
Control	Yes	55	59.1	36	48.6	91	54.5	
	No	38	40.9	38	51.4	76	45.5	
	Total	93	100.0	74	100.0	167	100.0	
	Near the Life Saving Club							
Intervention One	Yes	11	23.9	61	54.0	72	45.3	p<0.05
	No	35	76.1	52	46.0	87	54.7	
	Total	46	100.0	113	100.0	159	100.0	
Intervention Two	Yes	23	52.3	53	54.6	76	53.9	
	No	21	47.7	44	45.4	65	46.1	
	Total	44	100.0	97	100.0	141	100.0	
Control	Yes	44	47.3	39	52.7	83	49.7	
	No	49	52.7	35	47.3	84	50.3	
	Total	93	100.0	74	100.0	167	100.0	
	Next to red and yellow patrol flags							
Intervention One	Yes	10	21.7	47	41.6	57	35.8	p<0.05
	No	36	78.3	66	58.4	102	64.2	
	Total	46	100.0	113	100.0	159	100.0	
Intervention Two	Yes	7	15.9	42	43.3	49	34.8	p<0.05
	No	37	84.1	55	56.7	92	65.2	
	Total	44	100.0	97	100.0	141	100.0	
Control	Yes	7	7.5	23	31.1	30	18.0	p<0.05
	No	86	92.5	51	68.9	137	82.0	
	Total	93	100.0	74	100.0	167	100.0	

Table A.4: Prompted recall of specific information on signage at Baseline and Follow-up.

Intervention Group	Information	Baseline (n)	Baseline (%)	Follow-up (n)	Follow-up (%)	Significance
	Good/ Fair/ Poor/Unacceptable Rating					
Intervention One	Yes	1	8.3	27	54.0	p<0.05
	No	11	91.7	23	46.0	
	Total	12	100.0	50	100.0	
Intervention Two	Yes	1	11.1	21	50.0	p<0.05
	No	8	88.9	21	50.0	
	Total	9	100.0	42	100.0	
Control	Yes	0	0.0	2	8.0	
	No	12	100.0	23	92.0	
	Total	12	100.0	25	100.0	
	EPA advice					
Intervention One	Yes	0	0.0	15	30.0	p<0.05
	No	12	100.0	35	70.0	
	Total	12	100.0	50	100.0	
Intervention Two	Yes	0	0.0	5	11.9	
	No	9	100.0	37	88.1	
	Total	9	100.0	42	100.0	
Control	Yes	1	8.3	1	4.0	
	No	11	91.7	24	96.0	
	Total	12	100.0	25	100.0	
	Logo					
Intervention One	Yes	5	41.7	21	42.0	
	No	7	58.3	29	58.0	
	Total	12	100.0	50	100.0	
Intervention Two	Yes	6	66.7	17	40.5	
	No	3	33.3	25	59.5	
	Total	9	100.0	42	100.0	
Control	Yes	3	25.0	8	32.0	
	No	9	75.0	17	68.0	
	Total	12	100.0	25	100.0	
	Contact details (Phone, website, twitter)					
Intervention One	Yes	0	0.0	3	6.0	
	No	12	100.0	47	94.0	
	Total	12	100.0	50	100.0	
Intervention Two	Yes	1	11.1	2	4.8	
	No	8	88.9	40	95.2	
	Total	9	100.0	42	100.0	
Control	Yes	0	0.0	0	0.0	
	No	12	100.0	25	100.0	
	Total	12	100.0	25	100.0	

Table A.4 (cont'd): Prompted recall of specific information on signage at Baseline and Follow-up.

Intervention Group	Information	Baseline (n)	Baseline (%)	Follow-up (n)	Follow-up (%)	Significance
	Colour only					
Intervention One	Yes	5	41.7	6	12.0	p<0.05
	No	7	58.3	44	88.0	
	Total	12	100.0	50	100.0	
Intervention Two	Yes	0	0.0	13	31.0	
	No	9	100.0	29	69.0	
	Total	9	100.0	42	100.0	
Control	Yes	2	16.7	2	8.0	
	No	10	83.3	23	92.0	
	Total	12	100.0	25	100.0	
	Life Saving patrol information					
Intervention One	Yes	4	33.3	21	42.0	
	No	8	66.7	29	58.0	
	Total	12	100.0	50	100.0	
Intervention Two	Yes	2	22.2	18	42.9	
	No	7	77.8	24	57.1	
	Total	9	100.0	42	100.0	
Control	Yes	2	16.7	13	52.0	p<0.05
	No	10	83.3	12	48.0	
	Total	12	100.0	25	100.0	

Appendix B: Questionnaires