CHAPTER THREE

Process Evaluation of Implementation and Dissemination of a Sun Safety Program at Swimming Pools

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Skin cancer is the most common form of cancer in the United States, and it accounts for an estimated 1.3 million new cases of cancer each year (American Cancer Society, 2000). The incidence rate of melanoma, the most deadly form of skin cancer, has more than doubled since the early 1970s (National Cancer Institute, 1999; American Cancer Society, 2000) and continues to rise (Jemal, Devesa, Fears, and Hartge, 2000). Mortality from melanoma has increased by 30 percent over the past two decades (Howe and others, 2001).

Exposure to ultraviolet radiation from the sun is the most important known cause of skin cancer. Lifelong protection from the sun's rays can prevent most skin cancers (Gilchrest, Eller, Geller, and Yaar, 1999). Because sun exposure during childhood accounts for an estimated 80 percent of the total lifetime exposure (Preston and Stern, 1992) and children in elementary school receive more solar exposure than secondary school students do (Diffey, Gibson, Haylock, and McKinlay, 1996), young children can benefit substantially from preventive actions.

Skin cancer is the most common cancer, but it is also one of the most preventable. For primary prevention of skin cancer, one should limit time spent in

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the sun, avoid the sun during peak hours (10 a.m. to 4 p.m.), use sunscreen with a sun protection factor (SPF) of 15 or higher when outside, wear protective clothing (hats, shirts, and pants) and sunglasses, seek shade when outdoors, and avoid sunburn (American Cancer Society, 2000; Hill and Ferrini, 1998). Skin cancer is most common in fair-skinned individuals, and persons who lived in tropical, sunny climates when they were young are also at increased risk (Gilchrest and others, 1999; Department of Health and Human Services, 1996).

Although awareness about skin cancer is growing, the practice of preventive behaviors remains low in the United States (Robinson, Rigel, and Amonette, 1998). Preventive interventions have demonstrated modest success, with the majority of programs being delivered in school settings (Buller and Borland, 1999). Another, especially promising, setting for skin cancer prevention activities is outdoor recreation settings (Rosenberg, Mayer, and Eckhardt, 1997; Glanz and others, 1998; Glanz, Lew, Song, and Murakami-Akatsuka, 2000).

In particular, aquatics settings—such as swimming pools—are uniquely suited to sun safety programs, for several reasons: swimming lessons offer a structure for teaching sun safety skills, children and adults are minimally clothed, which increases the relevance of protective practices, families and communities often gather at swimming pools in the summer, lifeguards and aquatics instructors can serve as role models, and environmental changes and supportive policies can promote solar protection for pool users. The fact that most pool managers are willing to adopt skin cancer prevention curricula (Rosenberg, Mayer, and Eckhardt, 1997) suggests that such efforts can succeed. Up to now, only two studies of aquatics-based skin cancer prevention programs have been published (Mayer and others, 1997; Lombard, Neubauer, Canfield, and Winett, 1991). Both studies were novel and showed some positive effects, but they were constrained to small samples, in limited geographic areas, and they emphasized either educational efforts (Mayer and others, 1997) *or* environmental-behavioral efforts (Lombard and others, 1991).

This chapter reports on the methods and findings of process evaluation across two distinct phases of the Pool Cool program, a sun safety program at swimming pools. The first phase (the main trial phase) involved developing and testing the efficacy of the Pool Cool program in a randomized trial at twenty-eight swimming pools in two geographic locations. The second phase was a pilot study of nationwide dissemination of the Pool Cool program (the pilot dissemination phase).

Evaluation of the combined main trial and pilot dissemination phases is based on the Reach, Efficacy, Adoption, Implementation, and Maintenance (RE-AIM) framework for evaluation (Glasgow, Vogt, and Boles, 1999; Glasgow, 2002). Process evaluation data also helped us interpret results of the efficacy trial. The main trial included a process evaluation addressing *reach* and an impact evaluation to

assess *efficacy.* Reach is concerned with how many people received how much of the intervention. Efficacy is concerned with how much change occurred as a result of the intervention. For the pilot dissemination phase, process evaluation focused on *adoption* and *implementation.* Future work is planned to continue the sun safety program and evaluate *maintenance* as well as reevaluate the reach and efficacy of Pool Cool, comparing two different strategies to encourage its diffusion. We also used diffusion theory (Rogers, 1995) to help analyze and interpret the process evaluation findings from the pilot dissemination phase.

The project team responsible for process evaluation during each of the two phases of the program was closely integrated with the research, development, and core program implementation team. For the main trial phase, a total of twenty-two investigators and staff members were involved, including two behavioral scientists, four health educators, thirteen field research assistants, and three data management staff members. The pilot dissemination phase had a process evaluation team of ten, consisting of two behavioral scientists, four health educators, two data managers/statisticians, and two staff members from the National Recreation and Parks Association.

Context of the Larger Pool Cool Project

The skin cancer prevention program for aquatic settings was first systematically developed using formative evaluation methods and was then evaluated in a randomized controlled trial of its efficacy. After the efficacy of Pool Cool was demonstrated, we conducted a pilot study of dissemination at 186 pools across the United States and in Canada.

Program Development and Efficacy Trial: Intervention and Evaluation Methods

The aims of Pool Cool, a multicomponent skin cancer prevention program, were to improve sun protection (SP) behaviors and reduce sunburns among children who take swimming lessons and to provide sun safety environments and policies at swimming pools that would accept an SP program. Initial formative research was conducted in 1997, and it built on our previous formative research in outdoor recreation settings (Glanz, Carbone, and Song, 1999). We made site visits to swimming pools and conducted focus groups with pool managers, aquatics instructors, and lifeguards. The information collected during this period helped the project team understand both the opportunities and the practical challenges of implementing a skin cancer prevention program at swimming pools. According

to focus group participants, the key considerations were easy implementation and the need to weatherproof any materials and environmental supports. Informants confirmed our expectation that a sun safety program was consistent with their organization's primary mission of promoting healthy, safe outdoor recreation and skill development.

The Pool Cool SP intervention was pilot tested at six pools (three in Hawaii and three in Massachusetts) during the summer of 1998. Results of the pilot testing showed high acceptance of the program by the site staff, including the willingness to attend orientation sessions and lead SP education during swim lessons. The program strategies were refined based on feedback from aquatics staff members.

During the pilot year, we also explored study design options for the main trial. We found that pools were increasingly providing on-site sunscreen, so it would not be possible to test the separate effects of environmental and educational strategies as we had done in a previous study (Glanz, Lew, Song, and Murakami-Akatsuka, 2000). The pilot test also revealed the importance of providing a program for *control sites,* as pool managers and community advisers felt that participation would be limited if people at the control group sites were asked to collect data but did not receive a program benefit. This was the basis for offering an injury prevention (IP) program at pools randomized to the control arm.

Pool Cool was evaluated in a randomized, controlled trial at a total of twenty-eight swimming pools in Hawaii and Massachusetts during the summer of 1999. The program was for children five to ten years of age (primarily those taking swimming lessons), their parents, and lifeguards and aquatics instructors. Participating pools included public municipal and suburban pools, YMCAs, and pools on military bases. The swimming pool site was the unit of randomization and intervention. Randomization was done separately in Hawaii and Massachusetts, using a blocking procedure to balance pool size and geographic location within regions.

Sites in the SP arm (n = 15 pools) received the Pool Cool SP intervention, which included a one-hour staff orientation/training by the study staff, as well as both educational and environmental components for the children, the parents, and the pool environment. The *educational* components included a series of eight sun safety lessons to be taught at the start of each swimming lesson (provided on waterproof laminated sheets), a *big book* to make lessons more interactive, on-site interactive activities, and incentives to reinforce the sun safety messages. The *environmental* components included providing sunscreen, shade, and signage, as well as promoting sun-safe environments. Research project staff members visited each pool about twice a week. Table 3.1 provides more detail about the intervention strategies used in the main trial phase.

TABLE 3.1. POOL COOL SUN PROTECTION PROGRAM INTERVENTION COMPONENTS.

Lifeguard/Aquatic Instructor Training

Leader's Guide
- ➢ Skin cancer and sun safety basics
- ➢ How to include Pool Cool into swim lessons
- ➢ Other Pool Cool activities and incentives
- ➢ Evaluation Activities: Monitoring Forms and Surveys

Educational Components

Sun Safety Lessons
(1) Introducing Pool Cool: Rules for Sun Safety
(2) Water, Water Everywhere
(3) The Ins and Outs of Sunscreen, Part 1
(4) The Ins and Outs of Sunscreen, Part 2
(5) Covering Up with Protective Clothing
(6) Hats and Sunglasses
(7) Shady Deals
(8) Pool Cool Review

Big Book: Pool Cool Rules for Sun Safety (to use with lessons)

Activities
(1) The UV Index—Weather Watch
(2) Sun Jeopardy Game
(3) UV Light Machine (Dermascan)
(4) Colored Sunscreen Demonstration
(5) Sun Protective Clothing
(6) UV Solar Exposure Cards
(7) Skin Examination
(8) Pool Cool Review

Incentives

Sun-Safe Message Pens
Pool Cool Lanyards
Sunscreen Samples
T-Shirts
Hats
Pool Cool Refrigerator Magnets
Photosensitive Water Bottles
Glitter Sunscreen
Lip Balm
Pool Cool Insulated Lunch Sacks/ Can Holders

Environmental Components

Sunscreen—Pump Bottles
Shade Structure (tent, canvas/tarp cover, umbrella for lifeguard stands)
Sunscreen Tips Poster for Swimming Pools
Sun Signs—Official-Looking Metal Traffic Signs Adapted for Sun-Safe Messages (for fences)
Informal **Consultations** on Environmental and Policy Changes

Sites in the IP arm (n = 13 pools) received a parallel IP program, including lessons and activities on bicycling safety, rollerblading safety, fire safety, traffic and walking safety, playground safety, and poisoning and choking prevention.

The main evaluation was based on self-administered surveys completed at the beginning of the summer and approximately eight weeks later—by parents (for themselves and their children) and by lifeguards/aquatics instructors. Response samples were two independent cross-sections of parents accompanying or picking up their children at the pools. Measures for questionnaire items were selected or adapted from previous surveys on this topic that have been published in the literature (Newman, Agro, Woodruff, and Mayer, 1996; Weinstock, 1992; Arthey and Clarke, 1995) or have been used in earlier studies conducted by the project team (Koh, Bak, and Geller, 1997; Glanz and others, 1998). The main behavior outcomes—measures of SP behaviors—were assessed on a four-point ordinal scale ranging from 1 ("rarely or never") to 4 ("always"). The behaviors that were measured included using sunscreen, wearing a hat, wearing a shirt, seeking shade, and wearing sunglasses, and a composite sun protection habits index was made. Each survey took about ten minutes to complete.

Main Trial Results

The analyses of the efficacy trial used completed surveys from 1,010 parents at baseline and 842 parents at follow-up, as well as 220 aquatics staff members at baseline and 194 aquatics staff members at follow-up. Results showed significant positive changes—with children's increased use of sunscreen and shade, an overall improvement in their SP habits, and fewer sunburns among them, as well as improvements in parents' SP habits and reported pool SP policies. In the SP group, there was a reported 23 percent reduction in children's sunburns from the number that occurred in the preceding summer, with only a 1 percent reduction in sunburns from the previous summer in the IP group ($p = 0.04$). Effect sizes were small for child behavior changes and for sunburns ($d = .17–.23$) (Cohen, 1988). At follow-up, the SP group parents reported a 55.1 percent higher level of SP policies at their pools, compared with the IP group, on a scale of 0 to 4 ($p < 0.001$), for a medium effect size ($d = .54$). A *dose response* (as amount of intervention increases so does behavioral change) trend was found for exposure to Pool Cool lessons and activities. Observational indicators showed favorable changes in the availability of sunscreen, sun safety signage, and the use of shirts by lifeguards (Glanz and others, forthcoming). When the child and parent effect models were rerun using the random effects models to account for within-pool clustering, they remained virtually unchanged.

The Pool Cool SP program significantly increased children's sunscreen use, shade seeking, and total SP habits, compared with the effect of a control program, and it reduced sunburns in fair-skinned children. There was a clear dose response effect; that is, people who received more program components were more likely to be affected. This suggests that the magnitude of observed program effects is a conservative analysis of impact. Parents' sunscreen use, hat wearing, and total SP habits were also improved. And lifeguards' sunburns were reduced, though no improvements in lifeguards' behaviors were found (Geller and others, 2001). This may have happened because lifeguards were more rigorous about taking precautions during peak hours of sunshine and on the sunniest days, even though they were not consistent about improving their sun safety habits.

Of particular importance is the fact that reported pool SP policies increased substantially in the SP arm of the trial. These reports were corroborated by independent observations that showed significant improvements in sunscreen availability, sun safety signage, and lifeguards' wearing of hats. The effects were seen in two disparate ethnic and climactic locations.

From Main Trial to Pool Cool Dissemination Pilot Study

The effect sizes were modest, but this is to be expected with a relatively low-intensity public health approach to prevention. When multiplied across a large population, the impact on morbidity, and even mortality, can be substantial. We concluded that if the Pool Cool program could be widely disseminated, successfully implemented, and maintained over time, it could make an important contribution to preventing skin cancer. This was the basis for the pilot study of the nationwide dissemination of the Pool Cool program.

A key requirement for program dissemination was a partnership with an appropriate linkage agent with national ties to aquatics and recreation programs. Therefore, we approached the National Recreation and Park Association (NRPA), which is the professional organization for the recreation industry. The NRPA supports over five thousand parks and recreation departments nationwide, and these departments manage over sixty-five thousand public swimming pools. The NRPA has excellent communication/promotion channels, including monthly membership magazines, program catalogues, and a dynamic Web site. In addition, the NRPA has a history of collaborating with health promotion programs that have a natural place in recreation and leisure services, including a youth activity promotion program and a physical fitness program for older adults. Because the NRPA is responsible for training and professional certification in specialized skill

areas, it is well positioned to collaborate on both the pilot dissemination and longer-term diffusion of the Pool Cool sun safety program.

After developing a memorandum of agreement that specified the respective roles and commitments of the NRPA and the Pool Cool program centers, the Pool Cool team worked with the NRPA to develop promotional efforts. The pilot dissemination was announced in a brochure and in "advertorials" in the NRPA program guide and magazine during Winter/Spring 2000. These materials invited interested pool managers to complete a mailed or Web-based application form to become *pilot sites* (basic) or *highlight sites* (enhanced). With modest publicity, the response was enthusiastic, and managers of 186 pools across the United States and in Canada participated in the year 2000 dissemination.

Program materials were adapted for dissemination as *tool kits* in either corrugated logo boxes or customized coolers on wheels and included leaders' guides, sun safety lessons, *mini-big books,* a decision maker's guide, a resource guide, sun safety signs and posters, and a Pool Cool zip disk for reproducing additional materials. And the project team provided support by telephone, e-mail, and fax. We conducted site visits and telephone interviews and analyzed various sources of process evaluation data at the end of the summer.

Main Trial Phase Goals and Methods

During the main trial phase, the process evaluation was designed to help determine the extent of program implementation, the amount of time spent on the program, whether environmental changes were implemented, whether children and the lifeguards were exposed to the program components, and how they rated the program components. The process evaluation was also intended to identify unanticipated circumstances that might explain program implementation or outcomes and to ascertain whether both experimental (SP) and control (IP) pool sites were equivalent in levels of program implementation. The process evaluation for the main trial assessed the *reach* (that is, the percent of intended audience who participated in Pool Cool) of the Pool Cool intervention and the satisfaction of persons exposed to it (Glasgow, Vogt, and Boles, 1999; Glasgow, forthcoming).

Data sources included *monitoring forms,* completed by lifeguards and aquatics instructors (see the example in Appendix A), *project staff logs* of what occurred in their contacts and visits with participating pools, *observations,* and *selected items on the postprogram surveys.* These data sources were intended to allow triangulation of the data and to pick up a range of intended and unintended occurrences and situations. The quantitative instruments—monitoring forms, observation records,

and posttest surveys—had all been pretested and refined during the pilot study of the preceding summer.

Monitoring and staff logs were completed throughout the intervention period. The monitoring forms were designed to ascertain implementation of each of the eight sun safety (or IP) lessons, including the time spent on the lessons, components of the lessons taught, whether parents were present, and how each lesson was received. Survey items on the posttest surveys asked parents about their own or their child's participation, the incentives they received, and their reactions. At posttest, the survey asked aquatics staff members about the frequency with which they taught SP or IP lessons, the various teaching methods they used, and the incentives they received.

Data were collected at both the SP and the IP pools. All pools were included, and all lifeguards were asked to complete monitoring forms.

Results

We analyzed monitoring form data to ascertain the delivery of both the SP and the IP interventions at participating pools. Seventy-six percent of the aquatics instructors reported teaching the lessons, and 61.9 percent said that they taught the majority of the lessons (five or more). Monitoring forms (n = 615 forms) indicated that between 88 and 100 percent of aquatics instructors taught each lesson, that the average length of time per SP or IP lesson was five to six minutes, that about 40 percent of the children were "interested" or "very interested," and that more parents were present at the IP lessons than at the SP lessons (48 percent versus 10 percent). About two-thirds of the parents reported receiving SP or IP information and 57 percent said that their pool taught these health topics in swimming lessons, although activity participation was reported to be at a fairly low level. This finding led us to create a combined dose variable reflecting receipt of the SP intervention (in the experimental group only). Statistical analysis revealed a dose-response relationship with recommended SP behaviors. In other words, those who received more of the program had better SP practices. These data indicate that the SP program was successfully implemented and well received at swimming pools, as was the parallel IP program.

Staff posttest surveys showed that 87 percent of SP staff taught SP in swim lessons, nearly 66 percent used the Pool Cool leader's guide, and 60 percent used sunscreen provided in a dispenser. At IP pools, 83 percent of the staff reported that they taught child IP lessons, and 70 percent said that they used the Pool Cool leader's guide. Finally, because the response samples were not a cohort, we examined the association between the frequency of teaching Pool Cool lessons

and the posttest SP habits. There was a trend toward higher SP habits scores with more frequent teaching of lessons and activities. This trend was not statistically significant, however.

Staff logs served dual roles—as ongoing quality assurance tools and to provide a check on any unanticipated results from the monitoring forms and surveys. They were used to help solve problems throughout the summer and revealed variable levels of distribution of incentives and aquatics staff participation. This finding was partly related to the size of the pool sites and their swimming lesson programs and was partly reflective of pool manager and staff enthusiasm for implementing the Pool Cool SP and IP programs. Another theme that emerged was related to the differential participation and implementation during rainy, cool, or cloudy weather, and this was seen more in Boston than in the Hawaii pool sites.

In summary, key findings in the main trial process evaluation were used to support and help interpret the efficacy findings. They showed a high level of implementation and satisfaction across both the SP and the IP arms, and they indicated that the program did not require a lot of time from the pool staff (lifeguards and managers). This information also provided a basis for publicizing the dissemination phase.

Pilot Dissemination Phase Goals and Methods

The aims of the Pool Cool dissemination pilot study were to (1) develop a program package, or tool kit, from the intervention evaluated in the efficacy trial, (2) assess the interest in, and acceptability of, Pool Cool being adopted in various locations without on-site project staff members, (3) assess the rate of decisions to adopt Pool Cool, and (4) determine rates of implementation and satisfaction with two versions of the adapted Pool Cool program package. The second, third, and fourth of these aims constitute the aims of the process evaluation during the pilot dissemination phase.

The research design included preimplementation data, data collected during the program period, and interviews and surveys conducted at the end of the summer. Data sources for the process evaluation included application forms (Web-based/paper forms), site visits, telephone interviews, evaluation forms, and checklists. Each instrument was intended to capture information about a different stage of dissemination, and each was designed to be relatively unobtrusive and low in respondent burden. We purposively sampled from a variety of locations and types of pools for the site visits and observations. For other methods, we sought to obtain data from as many pools as possible.

Two options were offered for the pilot dissemination phase: pools could either be a *highlight site* or a *pilot site.* The highlight sites would receive a more comprehensive tool kit, or package of materials, which included a big book and extra supplies and incentives, packed in a durable plastic cooler on wheels (a Pool Cool cooler). These sites also had to agree to a site visit by the project team. The pilot sites received a smaller tool kit with samples of supplies and incentives and with ordering forms for extra items (to be purchased at the pool's expense), packed in a rectangular corrugated logo box with a handle. Both highlight site pools and pilot site pools were expected to participate in evaluation forms completion and telephone interviews.

Pools that applied to be part of the Pool Cool dissemination pilot were asked to confirm their decision to adopt the program by signing a pool reply form. Application form data provided background information. Other instruments and methods used to determine rates of implementation and satisfaction were site visits, evaluation forms and checklists, telephone interviews, and surveys. Samples of selected forms are shown in Appendix B.

Results

Here we summarize findings for each aim, based on data received by September 2000.

Interest and Background Information

Application forms were completed either on written forms or on the Web. From twenty-one U.S. states and Ontario, Canada, 110 forms were received, representing 176 pools. The number per state ranged from one to twenty-three, with the most (twenty-three) from Ohio, nineteen from California, and thirteen from Illinois. On most of the application forms, respondents indicated that they would like to be either a highlight site (80.9 percent) or a pilot site (19.1 percent), and many respondents checked both options. Over 90 percent indicated that their pools were located in urban or suburban areas. Respondents were parks and recreation staff members (45.9 percent), aquatics coordinators (37.6 percent), or pool managers or directors (16.5 percent). About three-quarters were responsible for two or more pools, and most (57.3 percent) said that they made decisions about new programs themselves, whereas others (24.7 percent) indicated that they made these decisions with others. The most common pool sizes were twenty-five meters (67.3 percent), with 16 percent reporting fifty-meter lengths. New multisection

pool sizes accounted for the remainder. Eighty percent of the pools had at least ten summer aquatics instructors, most of whom also worked as lifeguards. In addition, 80 percent of the pools expected at least a hundred five- to ten-year-old children in swimming lessons that summer, with the median number of children being 350 and the number of children ranging from forty to fifteen hundred. The most common schedule of swimming lessons (at 64.4 percent of pools) was two weeks, four to five times per week. Seventy-eight percent of pools were open only during the summer season.

The majority of pools reported providing sun safety advice (89.1 percent), sunscreen (74.5 percent), umbrellas (74.5 percent), and shirts and/or hats (87.3 percent) for their lifeguards and aquatics instructors. They also reported including SP information in in-service trainings (86.4 percent) and staff manuals (77.3 percent). More than 80 percent recommended that staff members use sunscreen and wear sunglasses and protective clothing. However, few pools reported providing sunscreen (25.5 percent), sun safety advice (29.1 percent), or sun safety signs (6.4 percent) for swimmers. It was more common for them to provide shade areas (69.1 percent) and to schedule swimming lessons to avoid peak sun hours (50.9 percent). Respondents at 71.8 percent of the pools recommended to pool users that they wear sunscreen, and respondents at 42.7 percent of the pools told pool users to seek shade, but only 20 percent recommended wearing a hat, only 14.5 percent recommended avoiding peak sun, and only 12.7 percent recommended wearing protective clothing.

Decision to Adopt

The project team originally planned to offer the dissemination pilot to a total of one hundred pilot sites and fifteen highlight sites. However, we decided instead to provide program materials and support to all pools that subsequently confirmed their decision to adopt the program. To formalize the decision to adopt the Pool Cool program, swimming pool managers who were interested in participating were asked to sign and return a pool reply form to confirm their continued interest and make a commitment to complete evaluation forms and/or allow a site visit by Pool Cool and/or the NRPA. The response exceeded 100 percent (106 percent), as some late requests arrived after the deadline for application forms. A total of 186 pools returned reply forms, including seventeen for highlight sites and 169 for pilot sites. As a result, this large number of pilot and highlight sites led to a delay in producing and shipping program materials (because of a limited staff to meet the demand). Materials were shipped in late June and early July.

Implementation and Satisfaction

We conducted site visits at eight highlight sites and five pilot sites in Hawaii, California, Colorado, Ohio, Massachusetts, Maryland, and Ontario. A site visit protocol included interview questions and forms. Pool Cool was being implemented at all but one of the sites visited, and at that pool, the local high school used the facility for swimming lessons and the aquatics coordinator had not reassigned the Pool Cool tool kit to another pool. Some tool kits shipped to Ontario were delayed in Canadian Customs. Interviews indicated that every pool that implemented the program was using the leader's guide (two-thirds had made additional copies), teaching the Pool Cool lessons, using the mini-big book, and displaying the sun safety signs. All pools had also used the pump bottle of sunscreen, and all but one site had conducted a training session for their swim instructors and looked at or used the decision maker's guide, the resource guide, and brochures. More than half of the sites had conducted the poolside activities. Only two pools had used the Pool Cool disk to produce additional materials. The majority of the sites were observed using Pool Cool materials such as signs, sunscreen, and incentives. All lifeguards were wearing protective clothing (mainly shirts), though few were observed using sunscreen. Reactions to the materials were very favorable; pool managers and swim instructors indicated that the materials were easy to use, attractive, and well received. Several pool managers were disappointed that the materials had arrived after the summer season had begun. They requested more materials and incentives, asked that the sun safety signs be made larger and said that they shared the materials with other pools in their district. Several felt that the decision maker's guide would be useful for planning for the next year's swim season.

Evaluation forms, checklists, and telephone interviews were used to assess implementation, satisfaction, and environmental and organizational policies for SP at the end of the pilot dissemination phase. Telephone interviews were conducted during the first week of September to obtain information from pools that had not yet returned written forms. Some informants who were county/municipal liaisons responded for multiple pools in their districts. As a result, we were able to obtain information from a total of 144 out of the 186 swimming pools, or 77.4 percent. Ninety percent of the pool managers said that they taught the Pool Cool lessons with a median of eight aquatics instructors teaching them at each pool. Ninety-seven percent gave lessons to children aged five to ten years, but about half of them gave lessons to children younger than five and older than ten. Seventy percent said that the kids liked the lessons moderately or a lot, and 96.8 percent said that they would either definitely (71 percent) or possibly (25.8 percent) teach the lessons the following summer. Two-thirds to three-quarters of the pools completed th

poolside activities and most said the staff members and children liked them moderately or a lot. About half of the pools said that they made copies of the lessons, activities, leader's guides, and big book, and about one-third made extra copies of signs from the zip disk. Several pools adapted the activities using their own creative ideas, including making Pool Cool sun safety banners, creating a "Pool Cool wall," and publicizing the program through the local media. Some pools used the program activities for rainy-day alternative activities. The most frequent complaint from pool managers was that the materials arrived too late, and they said that they would have liked more items for the children and lifeguards. Some were concerned about "adding one more thing" to cover in swimming lessons and felt that environmental and policy changes would take more than one summer season to accomplish. We received letters with compliments and feedback from many pools.

We used checklist data to examine the internal consistency of measures of implementation and pool sun safety policies. Because of the small number of highlight sites, the preliminary implementation measure was limited to two items (teach lessons and display information), with a Cronbach alpha of 0.84. The pool sun safety policies measure used four items on policies directed toward swimmers (encourage shade, remind about sunscreen, remind parents to send sunscreen, provide sunscreen), and each was measured on a three-point scale. The resulting composite index has a Cronbach alpha of 0.88. A similar parent-reported policy measure yielded an alpha of 0.80, the same as in the efficacy trial.

Criterion validity indicates how well a new measure obtains the same result as that found from another available, highly credible measure or standard (Nunnally and Bernstein, 1994). To assess the criterion validity of the implementation measure, we examined narrative and quantitative site visit data in comparison with pool reports on checklists, evaluation forms, and telephone interviews. This was done by two or three independent raters for each of ten highlight pools and two pilot pools where site visits had been conducted. Raters were blinded to the database contents and had not been on any site visits. Raters gave each pool a score between one (lowest) and five (exemplary). Ratings were highly reliable, with only one pool receiving a rating discrepant by more than one point difference. Eighty-three percent of ratings were consistent with conclusions based on the quantitative data. We concluded that the implementation measure has high criterion validity.

We received seventy-one lifeguard surveys from nine pools. Eighty percent of the lifeguard respondents were white, with an average age of twenty-one years, and most (60.6 percent) reported having a sunburn the preceding summer. Among SP behaviors, they were most likely to report wearing sunglasses and sunscreen, followed by staying under an umbrella or wearing a shirt, and they were least likely to report wearing a hat. Most lifeguards reported taking part in Pool Cool activities and receiving at least one Pool Cool incentive item.

Lessons Learned About Process Evaluation

LESSON 1. *Process evaluation can serve different purposes in different phases of a study.*

During each of the two phases of the Pool Cool skin cancer prevention program, process evaluation was integral to the implementation and assessment of the intervention, but it played different roles in each of the two phases. During the efficacy trial, it mainly addressed reach, satisfaction, and level of implementation. During the pilot dissemination phase, process evaluation focused on the adoption and implementation of components of the program during the pilot dissemination phase. In each phase, the results of the process evaluation provided important information for understanding the program and interpreting the findings. Although some of the information obtained in the process evaluation might have emerged through ad hoc experiences of the staff working on Pool Cool, the use of systematic tools and strategies for data collection provided much richer and more dependable sources of information.

LESSON 2. *Site visits and structured observations are useful process evaluation tools.*

Site visits are very feasible and even welcomed by pool managers. Observations were useful both in the main trial phase and in the pilot dissemination phase. They corroborated information from interviews, checklists, and monitoring forms, which revealed individual approaches at the various swimming pools.

LESSON 3. *Process evaluation can help interpret the results of a randomized trial.*

During the efficacy trial phase, monitoring forms and staff surveys revealed a high level of implementation of both the SP and IP versions of Pool Cool by the aquatics staff. There were few major differences: the length of the lessons was similar, as was the perceived interest level of the children. The approximately equal levels of implementation allowed us to interpret group differences in key outcomes as being due to the different programs rather than the differential uptake of the program.

LESSON 4. *Process evaluation data can be used to examine a dose-response relationship.*

Although the staff surveys and monitoring forms showed consistent and fairly high implementation levels, and the log forms showed that all incentives were distributed, the parents' responses to postprogram surveys suggested that many of them and their children were not fully exposed to the intervention. This appeared to be most likely due to the repeated cross-sectional design, which meant that some

children came to swimming lessons after some of the lessons or activities were carried out. Because of this, we created a dose measure based on the number of lessons and activities that the SP group children received. The finding of a clear dose response effect on SP habits for children receiving two or more lessons or activities, compared with those whose parents reported that they received zero or one, suggested a steady increment in SP habits scores between the least involved and the most involved respondents (Glanz and others, forthcoming). Similarly, the aquatics instructors' results showed a trend toward higher SP habits scores associated with teaching more lessons and activities (Geller and others, 2001). In this case, the process evaluation served two functions: (1) it helped interpret the study findings and supported the main effects and (2) it clearly revealed important limitations of the repeated cross-sectional study design.

LESSON 5. *Process evaluation can be used to identify intervention problems.*

One of the first key conclusions we made was that "there is nothing like a site visit." The study team learned more from being on-site, and in some cases attempting to find the program sites, than could ever have been learned from phone calls and self-administered forms and surveys. In a word, we learned what could go wrong and how easily things could slip through the cracks when dissemination is conducted over a wide geographic area. Also, we overreached during the pilot dissemination phase by agreeing to send materials to almost twice as many pools as we had originally anticipated. We were unable to match the pools' enthusiasm with a larger project staff and hence delivered materials much later than desirable to many of the pools. From this lesson, we learned how important it is to ship materials on time, and we completed materials shipping for nearly three hundred pools in the following year.

LESSON 6. *Process evaluation results can identify problems with data collection and possible solutions.*

With respect to data collection methods, we learned that efforts to collect surveys need to begin earlier, be more systematic, and include visible incentives. Without these efforts, response rates were too low for the data to be informative. Data collection can be most successful if aligned with seasonal events such as registration for swimming lessons.

LESSON 7. *Process evaluation results can be used to help plan for a larger study.*

We learned many things from the process evaluation of the dissemination pilot study that set the stage for a larger diffusion trial. First, we found that *interest* in a

skin cancer prevention program at swimming pools is very high, especially in view of our limited promotional efforts. We also learned that, at present, many pools provide sun safety advice and support for their staff but fewer do so for the swimmers. Next, we found that the *decision to adopt* the program was apparently made at the time an application form was submitted, as there was less than 100 percent completion of the written pool reply form. We also learned a great deal about the operation of a dissemination project. We learned unequivocally that materials should be sent out before the beginning of the summer swim season, that a stronger training component was welcome, and that direct contact with pool managers should also occur if a district coordinator is the main liaison. We also learned that some materials that should be added to the materials package—all of which are feasible—are (1) a banner for each pool, (2) a training video, (3) larger sun safety signs, (4) more incentives, including some for lifeguards, (5) more discounts for sun safety products, (6) parent brochures, (7) special information about skin cancer risk for nonwhite children, (8) and materials that could be downloaded from the Web.

Conclusion

This chapter illustrates a process evaluation that was systematically designed alongside the outcome evaluation and provided substantial *value added* (that is, contributed to the overall study) and insights about the two phases of the study. The organizational setting for this cancer prevention program—swimming pools—is a novel setting for health promotion and one for which there was little preexisting guidance and information. Well-organized and carefully conducted process evaluation yielded great assets for Pool Cool. This information can be useful not only for this program's future diffusion efforts but also for other public health workers who conduct programs in partnership with recreation industry sites.

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APPENDIX A: POOL COOL MONITORING FORM.

POOL COOL

Your Name

Your Pool

Pool Cool Monitoring Form
Lesson 1: Introducing Pool Cool Rules for Sun Safety

Marking Instructions

Please use a pencil or blue or black ink. Correct ● Incorrect ⊘ ⊗ ⊖ ⊙

Date of the lesson: ☐☐/☐☐/☐☐ Month Day Year

Did you do the following?

	YES	NO
A. Complete Lesson #1	○	○

If YES, how many minutes did this lesson take to complete?

1	2	3	4	5	6	7	8	9	10	>10
○	○	○	○	○	○	○	○	○	○	○

	YES	NO
B. Introduce the four Pool Cool Rules to the class	○	○
C. Discuss the power of the sun	○	○

D. How many children attended this lesson? ☐☐

E. How interested were the children in this lesson?

Not interested	A little interested	Somewhat interested	Interested	Very interested
○	○	○	○	○

F. Were any parents present for the lesson? YES ○ NO ○

If YES, how many? ☐☐

If YES, how interested were they in this lesson?

Not interested	A little interested	Somewhat interested	Interested	Very interested
○	○	○	○	○

For Office Use Only

	1	2	3	4	5	6	7	8	9	0
☐	○	○	○	○	○	○	○	○	○	○
☐	○	○	○	○	○	○	○	○	○	○

APPENDIX B: SITE VISIT PROTOCOL AND FORMS.

Pool Cool Site Visit Protocol—*Highlight Sites,* Summer 2000

Before Visit

1. Schedule meeting with site (Plan on *at least* 1.5–2 hours)
2. Get directions to site
3. Checklist of material to bring
   - ○ Pool Cool shirt and hat for PC staff
   - ○ 20 Solartech cards
   - ○ Interview schedule/protocol
   - ○ Materials Use form
   - ○ Observation form
   - ○ Camera
   - ○ Pool info.—directions, travel arrangements, etc.

Site Visit Procedures

- ❑ Wear PC hat and shirt
- ❑ Introductions and purpose
- ❑ Interview (use attached form)
- ❑ Materials use (use attached form)
- ❑ Do Solartech card activity
- ❑ Watch lessons if possible
- ❑ Talk with other available involved persons
- ❑ Complete Observation form
- ❑ Sit back and watch pool (don't forget to take pictures)

Pool Cool Site Visit
Highlight Sites: Summer 2000
Interview (Open-Ended Questions)

Pool ID & Location: _____

Today's Date: _____

Names of Site Visitors: _____

Section A. General Background

1. Clarify liaison—person talking to—Are they the one who applied for Pool Cool? What is their title/position/role?
2. When did you receive the Pool Cool toolkit? _____
3. Did you complete, or are you planning, a training session for your lifeguards/aquatic instructor staff for Pool Cool?

   ○ Yes ○ No

   If *yes,* describe time, length, format:
   -Group/individual
   -Who led?
   -How long?
   -What was included?

Section B. ToolKit Use and Ratings

4. What components of the toolkit have you used, and which have you found to be the most helpful? Which have you found not to be useful? *(Ask "used" and "helpful" for each, mark if they state "NOT useful" but do not ask this question separately)*

	Used	Helpful/Very Helpful	Not Useful
a. Leader's Guide	❑	❑	❑
b. Lessons	❑	❑	❑
c. Decision Maker's Guide	❑	❑	❑
d. Resource Guide	❑	❑	❑
e. Mini Big Book	❑	❑	❑
f. Sun Signs	❑	❑	❑
g. Pool Cool Disk	❑	❑	❑

Comments:

5. Do you have suggestions about ways to make the Pool Cool toolkit easier to use?

Section C. Lessons and Support Use

6. How often are the Pool Cool lessons taught at your pool?

7. Do your lifeguards/staff members like to teach Pool Cool lessons?

8. What kind of support have you used or are planning to use from Pool Cool? (ask each)

a. Toll Free Hotline	❑ Used	❑ Plan to use
b. E-mail	❑ Used	❑ Plan to use
c. Fax	❑ Used	❑ Plan to use
d. Other: _____	❑ Used	❑ Plan to use

Section D. Overall Opinion, Future Ideas, Suggestions

9. Do the children and/or parents at your swimming pool enjoy Pool Cool?

10. Do you feel that Pool Cool is making a difference in the sun safety of the children at your pool?

11. Please help us plan for the future of Pool Cool. If they were available for Pool Cool, would you use . . . ?

a. Training video	○ Yes	○ No
b. Web site to download information and materials, and/or order brochures, incentives, and supplies	○ Yes	○ No

12. Other Suggestions:

Thank you very much. Now, I have just a few more specific questions to go over.

Pool ID #: _____
Pool Location: _____
Date: _____
Site Visitors: _____

Pool Cool Site Visit
Highlight Sites, Summer 2000

Materials Use Questions	Yes	No
1. **Leader's Guide**		
a. Have you used or do you plan to use the **Leader's Guide?**	☐	☐
b. Did you make or do you plan to make copies of the **Leader's Guide?**	☐	☐
c. If yes, how many? _____		
2. **Pool Cool Lessons**		
a. Have you used or do you plan to use the **Pool Cool Lessons?**	☐	☐
b. Have you made or do you plan to make copies of the **Pool Cool Lessons?**	☐	☐
c. If yes, how many? _____		
3. **Brochures/Pamphlets** in the Leader's Guide		
a. Have you looked at the **brochures?**	☐	☐
b. Have your ordered or do you plan to order copies of brochures?	☐	☐
3. **Decision Maker's Guide to Sun Safety**		
a. Have you used or do you plan to use the **Decision Maker's Guide?**	☐	☐
b. Did you make or do you plan to make copies of the **Decision Maker's Guide?**	☐	☐
c. If yes, how many? _____		
4. **Resource Guide**		
a. Have you looked at the **Resource Guide?**	☐	☐
b. Do you plan to use the **Resource Guide?**	☐	☐
c. Did you order or do you plan to order items from the **Resource Guide?**	☐	☐
d. If yes, what are you planning to order?	☐	☐
5. **Mini Big Book**		
a. Have you used or do you plan to use the **Mini Big Book?**	☐	☐
6. **Sun Signs**		
a. Have you posted or do you plan to post the **Sun Signs?**	☐	☐
b. Where did you place the Sun Signs? _____	☐	☐

Materials Use Questions	Yes	No
7. **Pool Cool Disk**		
a. Have you used or do you plan to use the **Pool Cool Disk?**	☐	☐
b. Have you used the Pool Cool Disk to make **Sun Signs?**	☐	☐
c. Have you used the Pool Cool Disk to make a **Mini Big Book?**	☐	☐
d. Have you used the Pool Cool Disk to make copies of **Lessons?**	☐	☐
e. Have you used the Pool Cool Disk to make copies of the **Leader's Guide?**	☐	☐
f. Have you used the Pool Cool Disk to make copies of the **Decision Maker's Guide?**	☐	☐
8. **Large Pump Bottle of Sunscreen**		
a. Have you used or do you plan to use the **Large Pump Bottle of Sunscreen?**	☐	☐
b. Did you order or do you plan to order more **Large Pump Bottles of Sunscreen?**	☐	☐
c. If yes, how much/how many? _____		
Ask #9 only after July 22nd		
9. **SunSafe Checklist, Evaluation Form, Surveys**		
a. Have you completed the **SunSafe Checklist?**	☐	☐
b. Have you completed the **Pool Cool Evaluation Form?**	☐	☐
c. Have your lifeguards/aquatic instructors completed the **Surveys?**	☐	☐
d. If yes, how many? _____		
e. Have you distributed and collected the **Parent Surveys** at your pool?	☐	☐
f. If yes, how many? _____		

PROCESS EVALUATION FOR PUBLIC HEALTH INTERVENTIONS AND RESEARCH

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