



Lifeguard Effectiveness:

A Report of the Working Group



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Executive Summary

Each year, about 4,000 people die from drowning in the United States. Drowning was a leading cause of unintentional injury death among all ages in 1998, and the second leading cause of unintentional injury death among children ages 1-14 that same year. Approximately 50-75% of drownings occur in open water such as oceans, lakes, rivers, and ponds. About 60% of drowning deaths among children occur in swimming pools.

Many organizations, including the Centers for Disease Control and Prevention (CDC), routinely respond to inquiries regarding the efficacy of lifeguards in preventing drownings. Community and local government officials facing decisions about whether to begin, retain, or discontinue lifeguarding services typically want to know whether lifeguards are truly effective in preventing drowning and other aquatic mishaps, and whether the value of providing lifeguard protection outweighs the costs. Most drownings are preventable through a variety of strategies, one of which is to provide lifeguards in public areas where people are known to swim and to encourage people to swim in those protected areas. Some estimates indicate that the chance of drowning at a beach protected by lifeguards can be less than one in 18 million. There is no doubt that trained, professional lifeguards have had a positive effect on drowning prevention in the United States.

The significance of the patron surveillance and supervision that lifeguards provide is emphasized by understanding how people drown. Many people assume that drowning persons are easy to identify because they exhibit obvious signs of distress. Instead, people tend to drown quietly and quickly. Children and adults are rarely able to call out or wave their arms when they are in distress in the water, and can submerge in 20-60 seconds. For these reasons, managers should never assign lifeguards duties that distract them from keeping an eye on the water, such as selling admission tickets or refreshments. In addition, the presence of lifeguards may deter behaviors that could put swimmers at risk for drowning, such as horseplay or venturing into rough or deep water, much like increased police presence can deter crime.

When making decisions about using lifeguards and other means of increasing public safety in aquatic settings, policy makers should use available local evidence. This evidence includes:

- the effects that lifeguards have had on patrons' safety and attitudes;
- the number of people using the facility or beach area during the past years;
- the incidence of water-related injuries and drownings at the facility or beach area during those time periods;
- data on the number of water-related injuries and drownings at pools and beaches in the local area or state with and without lifeguards, for comparison; and
- the level of lifeguards provided (e.g., number of lifeguards per number of persons using the facility).

In addition to these factors, policy makers should consider public attitudes about lifeguards and legal issues related to using lifeguards.

Introduction

Each year, about 4,000 people die from drowning in the United States (National Center for Health Statistics, 2000). Drowning was a leading cause of unintentional injury death among all ages in 1998, and the second leading cause of unintentional injury death among children ages 1-14 that same year (National Center for Health Statistics, 2000). Approximately 50-75% of drownings occur in open water such as oceans, lakes, rivers, and ponds (Dietz & Baker, 1974). About 60% of drowning deaths among children occur in swimming pools (Dietz & Baker, 1974).

Most drownings are preventable through such means as restricting swimming areas, posting warning signs, and fencing the perimeters of pools and waterways. Two important preventive strategies are providing lifeguards in public areas where swimmers frequent, and encouraging use of such protected areas. The United States Lifesaving Association (USLA) compiles statistics for drownings that occur at about 95% of ocean beaches and at some non-ocean sites patrolled by lifeguards.¹ For the years 1988-1997, USLA recorded fewer than 100 drownings at these sites with more than three-quarters occurring during hours when the beaches were unguarded (USLA, 2000). These data indicate that the vast majority of drownings each year occur at unguarded locations (Mael, Seck, & Russell, 1999); about 60%-70% of U.S. beaches are unguarded (Brewster & Richardson, 2001). USLA statistics estimate that the chance of drowning at a beach protected by lifeguards trained under USLA standards is less than one in 18 million per year (USLA, 2001).²

The Centers for Disease Control and Prevention (CDC), the American Red Cross and USLA routinely respond to inquiries regarding the efficacy of lifeguards in preventing drownings. Community and local government officials facing decisions about whether to begin, retain, or discontinue lifeguarding services typically want to know whether lifeguards are truly effective in preventing drowning and other aquatic mishaps, and whether the value of providing lifeguards outweighs the costs. Officials often use cost as the primary criterion in their decision-making.

This report is the result of a 1998 meeting CDC convened with a panel of experts to identify gaps in lifeguard effectiveness at recreational waters, and ways to remedy them. This meeting was intended as a discussion about the issues related to the provision of lifeguards. This working group discussed:

- the problem of retaining lifeguards and evaluating the efficacy of existing lifeguard services;
- drowning fatalities and other hazards resulting when lifeguards were removed from facilities;

¹ Open water lifeguard agencies submit reports on annual beach attendance, rescues, preventive actions, drownings and other information to USLA, which reports lifesaving statistics from eight regions, with typically over 85 agencies and beaches reporting (USLA, 2001).

² This calculation is based on ten years of reports from USLA affiliated lifeguard agencies, comparing estimated beach attendance to the number of drownings in areas under lifeguard protection.

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- the best methods to communicate information about the efficacy of lifeguards to relevant constituents; and
 - sources of information about the efficacy of lifeguards, additional data, resources, and case studies.

The report includes a brief history of lifeguarding services in the United States; data and findings related to the use of lifeguards in preventing drowning in open water and swimming pool facilities; the experience of an agency which does not provide lifeguards at its water recreation facilities; and economic and legal issues related to the provision of lifeguards. We also provide suggestions for decision makers and alternative solutions for preventing drowning.

Drowning prevention, much like other areas of injury prevention, is a young and emerging field. This report aims to stimulate new ideas and approaches. The authors of this report hope it is useful to local policy makers who must make vital decisions about the provision of lifeguards and other interventions to enhance water safety in their communities.

Lifeguarding Services in the United States

A Brief History

In the 1800s, swimming, then known as bathing, became an increasingly popular recreational activity in the United States. Entrepreneurs built resorts in places like Atlantic City, New Jersey, to attract people from inland cities to escape the summer heat. As water activity increased, so did the incidence of drowning. In fact, by the early 1900s as many as 9,000 people drowned each year in the United States (American Red Cross, 1995).

Initial efforts to reduce drownings included installing lifelines.³ However, lifelines proved inadequate because struggling swimmers were not always able to hold on to them. Duke Kahanamoku, the famed Hawaiian surfer, introduced the rescue board between 1910 and 1915, and Captain Harry Sheffield of South Africa is credited with developing the first rescue float (American Red Cross, 1995). Some municipalities assigned police officers to perform water rescues, but this diverted resources from law enforcement. Eventually, municipalities began to hire persons trained and equipped specifically for water rescue. They were called “lifeguards.”

The lack of a consistent lifeguard presence at all bathing areas led the Young Men’s Christian Association (YMCA) to develop a volunteer National Lifesaving Service in 1912. In 1914, Commodore Wilbert E. Longfellow established the American Red Cross Lifesaving, which trained swimmers throughout the United States in lifesaving and resuscitation, organized them into a volunteer corps, and encouraged them to accept responsibility for supervision of bathing activities in their communities.

At their inception, these lifesaving training programs primarily emphasized personal water safety: how to prevent drownings and protect oneself in emergencies. Nonswimming rescue methods, such as throwing a rope or a floating object to the person in the water, were encouraged. Lifeguards considered swimming rescues a last resort due to the hazard presented by a panicked person in the water.

However, swimming rescues were unavoidable for professional beach lifeguards in the United States. Special tools, such as the landline⁴ and the dory,⁵ were developed to assist in swimming rescues. Over time, improved lifesaving devices were created by beach lifeguards in the United States. These include the rescue buoy, the rescue tube, and the rescue board⁶ which are commonly used around the world at beaches, pools, and water parks. Today, many beach lifeguards use powerboats and personal watercraft to assist them in reaching off-shore swimmers in distress quickly and use scuba equipment for deep water rescues.

In 1964, the organization now known as the United States Lifesaving Association (USLA) was founded by members of several California surf lifeguard agencies originally to enhance lifesaving efforts and drowning prevention, to standardize beach lifeguard practices, to educate the public about water safety, and to improve professionalism among

³ Lifelines are ropes tied onshore and to poles in the ocean water, to which bathers can cling.

⁴ The landline is a rope used by a lifeguard during a swimming rescue. A lifeguard swims with the landline to a victim in the water, and people onshore pull both lifeguard and victim to safety.

⁵ The dory is a small boat rowed out to rescue victims in distress.

⁶ The rescue board is a surfboard modified for rescuing drowning victims.

beach lifeguard organizations around the country. Membership has since expanded to include any employee of an ocean, bay, lake, river or other open water rescue service (Brewster, 2001). In 1980, the World Waterpark Association was formed to address needs in aquatic amusement parks. Following this, Ellis and Associates, through the National Pool and Waterpark Lifeguard Training program, established specialized waterpark lifesaving standards and certification programs. In 1983 and 1986, respectively, the American Red Cross and YMCA expanded their training programs to provide nationally standardized instruction for lifeguards at both swimming pools and beaches. Local employers continue to provide lifeguard training at most surf beaches. The American Red Cross, USLA and Ellis and Associates establish standards which are universally adopted for lifeguard training.

Lifeguards have always provided first aid as well as rescue. Cardio-pulmonary resuscitation (CPR) and general first aid training are standard requirements for most lifeguards. In addition, many lifeguards are now both trained and certified to use advanced lifesaving tools such as the external defibrillator and portable oxygen. In some communities, lifeguards have taken on broader public safety responsibilities, such as advanced life support, coastal cliff rescue, and law enforcement.

Major aquatic safety organizations in the United States have continually emphasized prevention rather than rescue as the primary method to reduce drownings. Public safety education and onsite supervision by lifeguards have helped keep drowning rates low for 40 years, and have significantly reduced the number of drownings in the United States. Since 1960, both beach attendance and rescues by lifeguards have risen steadily, although the total number of reported drownings on lifeguarded beaches remained relatively stable with fewer than 106 cases each year (USLA, 2000). In fact, from 1986 through 1999, USLA reported that in California, while beach attendance has increased, so has the amount of lifeguard education (See Figure 1 in Appendix) (USLA 2000). Although rescue activity fluctuated, the number of drownings is down.

Estimates indicate that today, U.S. lifeguards rescue more than an estimated 100,000 persons from drowning annually. USLA data show a rescue-to-drowning ratio in the 1960s of one drowning for every 2,004 rescues at beaches with on-duty lifeguards. In the 1990s, however, the ratio improved to one drowning for every 4,832 rescues at lifeguarded beaches. In addition, for every rescue, an effective lifeguard makes scores of preventive actions, such as warning an individual away from a dangerous area and suggesting that poor swimmers stay in shallow water. There is no doubt that trained, professional lifeguards have had a positive effect on drowning prevention in the United States.

While the number of Americans participating in water recreation has grown tremendously since the late 1800s and the popularity of aquatic activities has increased, the annual incidence of drowning in the United States has declined from about 6,300 persons in 1981 to about 4,000 persons in 1998 (National Center for Health Statistics, 2000). Nevertheless, despite the advances in rescue techniques and the decline in drowning rates in the United States, drowning remains a leading cause of unintentional injury death, especially among children and youth. If the incidence of drowning is to be reduced further, greater attention to prevention, including the staffing and training of lifeguards, is essential.

Events Describing the Efficacy of Lifeguards in Preventing Drowning Deaths

Evidence suggests that lifeguard services benefit public safety by saving lives, lowering drowning rates, and preventing injuries in aquatic recreational environments. Lifeguards also indirectly provide economic and social benefits. They add to the savings in emergency medical care and long-term hospital treatment involving cases of near-drowning (Hassell 1997) and alleviate emotional trauma and social costs to family and friends.

Communities sometimes choose to discontinue lifeguards as a cost-saving measure. We provide a series of case studies to demonstrate the impact of lifeguards on drowning. A few caveats are worth noting when considering these case studies. First, geography, environmental conditions, demographics, and other local conditions may be factors in drownings. Also, national data are not available to assess the number of drownings that occur on beaches without lifeguards because no centralized reporting system exists. Nonetheless, case studies help illustrate the potential effects of lifeguards on public safety.

Case Studies

Case 1: American Beach (Nassau County), Florida

In 1989 the Nassau County Commission decided to eliminate lifeguards on American Beach in order to save county expenses. Less than a year later on Memorial Day, 1990, five persons drowned and 20 others nearly drowned when rough ocean conditions and strong winds caused rip currents to form immediately offshore, making this one of the worst drowning episodes in Florida's history. Shortly after this tragedy, local officials reestablished lifeguarding services. In the eight years since, no one has drowned.

Case 2: Keawaula Beach, Hawaii

Keawaula Beach at Kaena Point State Park is located at the westernmost point on the island of Oahu. The beach is exposed to high surf; a strong shore break; and a strong, often severe, current. The remote, pristine site attracts many surfers, sunbathers, swimmers, and waders. The combination of dangerous physical features and heavy use by patrons increases the risk for water-related injury and death. From 1985 to 1991, two drownings and 40 near-drownings occurred at Keawaula Beach. Although the State of Hawaii does not provide lifeguards, it elected to contract with the City and County of Honolulu to place lifeguards at Keawaula Beach beginning in January, 1992. Since then, no drownings have occurred at this beach.

Case 3: Ocean Beach, San Francisco, California

Ocean Beach covers more than five miles of the Pacific shore in the City and County of San Francisco. Rip currents are common in the water off this beach. The beach is administered by the U.S. National Park Service and is part of the Golden Gate National Recreation Area (GGNRA). Until the early 1990s, GGNRA provided lifeguards at several beaches in the region, including Stinson Beach, China Beach, and Aquatic Park near

Fisherman's Wharf, with occasional patrols and emergency response to Ocean Beach. As a result of budgetary concerns, lifeguards for Aquatic Park, China Beach, and Ocean Beach were gradually removed in the early 1990s. However, the beach-going public continued to swim at Ocean Beach, and drownings continued to occur, despite the development of an aquatic response team by the San Francisco Fire Department, which accomplished a number of rescues. During the late spring and early summer of 1998, there were seven drownings at Ocean Beach, which exceeded the previous six-year total. These drownings generated extensive media attention and resulted in calls by several major groups and prominent individuals for lifeguard protection. GGNRA consulted with USLA to develop a plan to employ, train, and deploy aquatic rescue personnel at Ocean Beach. On-site lifeguard services began before the summer of 1999, and since that time, no drownings have occurred at Ocean Beach.

Case 4: Ocean Beach, San Diego, California

In 1918, 13 people drowned in rip currents in a single day at San Diego's Ocean Beach, garnering local and national news attention. Beach attendance that day was estimated at 5,000. City officials cited inadequate lifeguard protection as a cause of the tragedy, and as a result, initiated a municipal lifeguard service. The ocean conditions have changed little since then. San Diego's local leaders view the 17 miles of oceanfront shoreline, which include Ocean Beach, as a safely managed tourist attraction due to the presence of lifeguards. Despite an average estimated annual attendance of 15 million people and over 7,000 rescues at the major lifeguarded beaches, the average number of drownings in areas under lifeguard protection is between zero and one annually.

Patron Surveillance: A Key Component of Lifeguarding Services

Lifeguards play an important role in a swimming facility's risk management program. Lifeguards are trained to monitor the aquatic environment, supervise patrons, inform patrons about the potential for injury, educate them about the consequences of injury-producing behavior, and enforce rules and regulations that prevent injuries. They are also, of course, expected to perform rescues to prevent drownings and to provide immediate first aid and CPR. But to do so, they must first identify persons who are in distress in the water.

Patron surveillance is key to preventing aquatic injury. It involves maintaining a constant watch over persons both in and out of the water and over the aquatic facility in order to identify circumstances that may cause injury. Action can then be taken to prevent or minimize injury. For example, a lifeguard may notice a small child playing alone in the water near a known drop-off and intervene before the child steps in water that is too deep. A lifeguard may also observe a person struggling in the water and perform a timely rescue.

The importance of lifeguards providing patron surveillance, especially monitoring the behavior of swimmers, can be demonstrated with a brief description of how persons drown. Many people assume that drowning persons are easy to identify because they will exhibit obvious signs of distress in the water, such as yelling or waving their arms. However, this kind of behavior is not common. Instead, people tend to drown in more quiet, less attention-getting ways. Drowning persons usually struggle to keep their mouth above the surface of the water in order to breathe. Struggling to stay afloat and possibly suffocating, they are rarely able to call out or wave their arms. Observational studies of persons at flat water (non-surf) beaches have revealed that non-swimming adults who find themselves in water over their heads are generally able to struggle on the surface of the water for about 60 seconds, while infants and very small children can submerge in as little as 20 seconds. These characteristics of drowning – the inability of a person to call or wave for help and the short time period before submerging – emphasize the need for lifeguards as a source for continuous surveillance and immediate action.⁷

However, supervisors and managers at aquatic facilities sometimes make the mistake of assigning lifeguards unrelated duties to perform while also expecting them to conduct effective patron surveillance. Because drowning can occur quickly and quietly, it is not surprising that lifeguards, distracted from keeping an eye on the water by other assigned duties, have failed to spot drowning persons in time to rescue them. Indeed, unobserved drownings have occurred even while lifeguards were stationed 20 feet from the water, taking tickets of those entering the facility or selling refreshments. It is clear, therefore, that swimming facilities must be staffed adequately to ensure effective and continuous patron surveillance, and that lifeguards should be given no other task that would distract them from this work. This concept is also supported by the USLA. The USLA

⁷ These characteristics of persons in distress in the water have been called the Instinctive Drowning Response by Pia (Pia F., 1971, *On Drowning*, 2nd rev. ed, Water Safety films, Inc., Larchmont, NY; Pia F., 1974 *Observations on the drowning of nonswimmers*. *Journal of Physical Education*, The YMCA Society of North America, Warsaw, IN).

requires lifeguard agencies seeking USLA certification to adhere to the following principles: “Lifeguards assigned to supervise an aquatic area shall not be subject to duties that would distract or intrude their attention from proper observation of persons in the waterfront area, or that prevent immediate assistance to persons in distress in the water. Specifically, lifeguards assigned to water surveillance shall not be assigned to any duties other than public safety” (USLA, 2000).

Use of Design Criteria to Reduce Drownings at Lakefront Facilities

Although providing quality lifeguarding services at water recreational facilities is effective in preventing drowning, some decision makers may elect not to hire lifeguards. In that case, environmental modifications to the facility can still improve safety for patrons. This section describes some environmental design changes that one water recreation provider used to reduce drownings at facilities that did not employ lifeguards.

The U.S. Army Corps of Engineers is the second largest provider of outdoor recreation facilities in the United States, managing more than 7 million surface acres of water and 4.5 million acres of land. Corps lakes are located in 43 states, and in 1998 staff recorded 2.6 billion visitor hours at these lakes. Approximately 58% of these hours (1.5 billion hours) are attributable to water recreation, such as swimming, wading, boating, water skiing, and fishing.

As a policy developed to limit liability, the Corps does not assign lifeguards to its facilities; it has a “swim at your own risk” policy. However, to reduce the number of drownings occurring at its beaches, the Corps established specific design criteria for its lakefront swimming beaches in 1987. These design criteria appear to have helped. Between 1971 and 1987, before the criteria were implemented, an average of 330 swimmers drowned each year. The design criteria were introduced between 1988 and 1998, and over that decade the yearly average fell to 183 drownings. These criteria are intended for inland lakes rather than surf beaches, where surf action makes them difficult to implement.

The majority of the design criteria for Corps swimming beaches relate to environmental controls. The priorities in the design of a beach are safety of the user, effects the physical features of the site will have on the beach, and future operation and maintenance considerations.

The Corps design criteria include estimating expected patron visitation levels; providing access for disabled persons; creating slope gradients that gradually and smoothly lead to deeper water; making efforts to ensure that the swimming area is protected from possible sources of contamination; maintaining consistent water levels; prohibiting diving platforms and swim floats; using buoys and markers to delineate the swim area and keep boats out; and ensuring the availability of additional safety measures such as rings, buoy lines, and poles. The complete design criteria for Corps swimming beaches can be found in Engineer Manual [EM -1110-1-400], Recreation Planning and Design Criteria, July 31, 1987.

The U.S. Army Corps of Engineers also supports a comprehensive water safety information campaign. Corps employees who work in water safety throughout the United States develop a coordinated, annual water safety campaign. Evaluations of previous campaigns allow the Corps to identify specific water safety issues each year for a full-scale educational campaign at all its facilities. The campaigns include print and television public service announcements. Many of the messages target school-aged children, a high-risk group.

Economic Costs of Drowning Deaths

Public safety education and onsite supervision by lifeguards have helped keep drowning rates low for 40 years, and have significantly reduced the number of drownings in the United States. Still, the cost of a single catastrophic injury or death while using an aquatic facility can be substantial. Experts have described the costs of unintentional death through two measures. The economic costs framework measures the victim's productivity loss and the expenses related to the event.⁸ Comprehensive costs include the economic loss, as well as the value of lost quality of life associated with the death or injury.

In 1997, the National Safety Council placed the economic value of each unintentional injury death at \$790,000 and the comprehensive cost at \$2,790,000 (National Safety Council, 1997). Using the drowning figures from beaches in the USLA reporting system, the comprehensive costs of drowning on coastlines in 1997 amounted to \$273,420,000. From 1960 to the present, the total cost of drowning deaths at these USLA beaches is estimated to have been \$4.2 billion. Factoring in costs of drowning in other aquatic facilities and the estimated annual cost of \$138,000 per incapacitating injury, and the \$180,000 annual cost for a catastrophic injury, the total costs of unintentional injury begin to climb geometrically. For comparison, salaries and benefits (typically 50% of costs) for full-time beach lifeguards range from \$26,500 to \$32,000 in Hawaii, Southern California and South Florida, where lifeguards work year-round. It is clear that providing a safe aquatic environment and instituting programs to prevent aquatic injury or death offer significant economic and social savings to society as a whole.

Although water-related injuries and drownings already result in tremendous costs, they would be substantially higher without lifeguards. One way of describing these costs is to estimate that one percent of the total rescues made by lifeguards would have resulted in a drowning death in the absence of lifeguards. In 1997, USLA recorded approximately 77,000 rescues for areas served by lifeguards. If one percent of these rescues (770) had instead resulted in death, either because the rescue had not taken place or because there were no lifeguards, then the economic cost of these deaths would be more than \$600 million, and the comprehensive cost would exceed \$2.1 billion.⁹

Using the same assumption, that one percent of the rescues instead resulted in incapacitating injuries (i.e., ones that would disable persons and permanently prevent them from performing some or all work), would yield a cost of approximately \$4.1 billion per year over and above initial economic or comprehensive costs. If one percent of the rescues had instead resulted in nonincapacitating injuries (i.e., ones that required medical care or hospitalization but would not result in disability), then the anticipated cost would be about \$10.7 million for economic costs per year and \$27.5 million per year for comprehensive costs. Table 1 in the Appendix includes cost estimates for different models using a lifeguard rescue effectiveness ranging between 1% and 36%.

⁸ Included in the components of economic losses are: wages and productivity; medical expenses; administrative expenses of law enforcement, legal fees and insurance costs; and employer costs.

⁹ These figures do not estimate the costs of converting a death to an incapacitating injury because of a rescue.

While these estimates help demonstrate the range of costs of drownings and water-related injuries and the benefits of prevention on a national scale, the numbers may be so large that they do not assist decision makers working with a single, community facility. Mael, Seck, and Russell (1999) provide a helpful method of estimating costs on a smaller scale by converting the ratios to a given baseline of 10,000 patrons. They estimate the number of rescues needed if no preventive actions are taken, the number of injuries if there are no rescues, and the number of drownings if there are no rescues (i.e., no lifeguards present to intervene). This method provides minimum and maximum estimates of both the economic and the comprehensive costs of drownings and injuries at unprotected sites. They calculate that the total economic costs for not having lifeguards per 10,000 patrons ranges from \$202,500 to \$4.6 million and the total comprehensive costs per 10,000 patrons ranges from \$705,380 to \$16.1 million (see Table 2 in Appendix).

Legal Implications of Providing Lifeguard Protection

The decision to provide lifeguard protection can be influenced by civil liability laws, which may hold the owners of aquatic areas and the lifeguards they employ responsible for fatal and nonfatal injuries.

One aspect of liability involves malfeasance. In most states, lifeguards, like other safety providers, are expected to act within a standard of care set by their training, local protocols, and past court rulings. A variation from the standard of care may result in liability. Another aspect of liability involves the condition of the facility and the quality of warning or protection provided. Some laws absolve federal, state, or local governments of liability for injuries resulting from natural conditions, such as currents and surf action. In California, for example, local governments are immune from injuries sustained at beaches as a result of natural conditions, regardless of the presence or absence of lifeguards or warning signs. This approach neither discourages nor encourages the placement of lifeguards.

Some state laws hold governments liable for natural conditions under certain circumstances. The Supreme Court of Hawaii (*Kaczmarczyk vs. City and County of Honolulu*, 1982) has determined that while a municipality is not an insurer of the safety of those using public beaches and adjacent waters, governments must exercise reasonable care in maintaining these facilities and in supervising their use by the public.

The court has found that the municipality has a duty to warn of extremely dangerous conditions known to the municipality which would not be obvious to an ordinary person. One method of warning is the placement of signs, and Hawaii is assessing the adequacy of warning by signage.

In Florida, municipalities have discretionary authority to operate a designated swimming area at a beach, but once they decide to operate a swimming facility, they assume a common law duty to operate it safely. In determining liability for drownings, Florida courts look for a previous knowledge of the danger, the presence of lifeguards, and the adequacy of warnings. Generally, a private Florida landowner, such as a hotel owner, has no duty to post lifeguards on public beaches or warn guests of hazardous ocean conditions. If, however, the hotel designates the beach as a swimming area, it incurs a duty to provide adequate warnings and safety precautions. Even if an area is not designated as a swimming area, a duty still may be placed on the landowner to operate the area safely through local ordinances or contractual agreements with beach vendors.

Liability definitions categorize swimming pools into those open to the public, those accessible by fee, and those provided by hotels. For public pools, some states and local jurisdictions specifically define the required level of lifeguard protection. In other areas, the level of protection may be left to the pool owner, but in the case of an incident, assessing the quality of protection may be a matter of what is considered reasonable by a judge or jury. In most states, hotels must simply post signs with approved or commonly accepted language. This passive approach to water safety may limit liability, but it also limits injury prevention. It is clear that lifeguards can significantly reduce the

incidence of water-related injury and death. Therefore, laws which encourage placement of lifeguards, although more expensive, can logically be expected to enhance public safety.

Decision Maker's Guide to Lifeguard Protection

The decision to protect the public in an aquatic facility, either by providing lifeguards or using another preventive strategy such as signage, requires careful assessment of the alternatives available to the facility or jurisdiction. This section offers some suggestions about how decision makers might approach such a choice and frame the alternatives.

In order to assist in evaluating the need for providing lifeguards in a facility or local jurisdiction, consider these steps:

(1) Use any relevant data available on the facility or jurisdiction. Data may include:

- The number of people using the facility or beach area during past years;
- The incidence¹⁰ of water-related injuries and drownings at the facility or beach during those times;
- The number of water-related injuries and drownings at pools and beaches in the locality or state with and without lifeguards, for comparison; and
- the level of lifeguards provided (e.g., number of lifeguards per number of persons using the facility).

(2) If lifeguards are already provided, then ask the questions:

- How have lifeguards affected patrons' safety and attitudes?
- Is the drowning rate increasing, decreasing, or has it remained unchanged?

(3) Assess proposed alternatives (e.g., hiring lifeguards, placing warning signs, modifying the aquatic environment or restricting access to the facility). As various alternatives are developed, use history and precedence to assess them.

- Try to estimate the cost-effectiveness of each alternative.
- Assess legal implications and opinions that are critical to the issue and the alternatives.

¹⁰ Incidence is the number of drownings (or number of water-related injuries) divided by the total number of visitors at the facility or jurisdiction, multiplied by the period of time in question (e.g., 1 year).

Summary and Conclusions

When making choices about drowning prevention interventions in their areas, decision makers must balance a sincere desire to protect the public with “real-world” issues of budgets and legal liability. In this report, we have attempted to provide useful information and relevant questions that can be applied when making these decisions. One effective drowning prevention intervention is to provide trained, professional lifeguards to conduct patron surveillance and supervision at aquatic facilities and beach areas.

USLA data during 1988-1997 indicate that more than three-quarters of drownings at USLA sites occurred at times when beaches were unguarded and that the chances of drowning at a beach protected by lifeguards trained under USLA standards is less than one in 18 million. The four case studies provided in this report also describe the positive impact of lifeguards at beaches where multiple drownings had occurred when unguarded. When lifeguards are employed, it is vital that they be trained effectively in detecting persons in distress, and when assigned to water surveillance not be given duties other than public safety. The presence of lifeguards may deter behaviors that could put swimmers at risk for drowning, such as horseplay or venturing into rough or deep water, much like increased police presence can deter crime. Also, the experiences of the U.S. Army Corps of Engineers suggests that environmental design changes (at inland lakes) and safety information campaigns can also play a role in reducing drowning deaths. Owners and managers of natural water recreation venues should consider these design characteristics, regardless of the presence or absence of lifeguards.

Regardless of the evidence, or lack thereof, of lifeguard effectiveness, some communities insist on lifeguard services, based on local circumstances. Policy makers need to make use of the available local evidence and consider public attitudes and the legal environment when making decisions about lifeguard services and other means for increasing public safety in aquatic settings. Providing a safe aquatic environment and instituting programs to prevent water-related injury or death offer significant economic savings. Table 2 in the Appendix can serve as a useful tool for estimating the human and economic impact of not providing lifeguards.

Finally, if a community develops water recreational facilities to attract patrons who spend money in the local area, then it can be argued that the community has an obligation to protect these patrons. When weighing the costs and legal implications of interventions to prevent drowning, decision makers should never lose sight of the enormous importance of protecting people from harm and preventing tragedy at beaches and pools, places where people go for pleasure, for health, and for solace.

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Organizations and Associations that Promote Lifeguarding and Water Safety

American Alliance for Health, Physical Education, Recreation and Dance (AAHPERD)

1900 Association Drive
Reston, Virginia 22091
(703) 476-3400

American Red Cross Health and Safety Division

8111 Gatehouse Rd.
Falls Church, Virginia 22042
(703) 206-7180

BOAT/U.S. Foundation

880 S. Pickett Street
Alexandria, Virginia 22304
(703) 823-9550

Boy Scouts of America

1352 Walnut Hill Lane
Irving, Texas 75038-3096
(214) 580-2000

The Canadian Red Cross Society

1800 Alta Vista Drive
Ottawa, Ontario
Canada K1G4J5
(613) 739-3000

The Commodore Longfellow Society

2531 Stonington Rd.
Atlanta, Georgia 30338

Girl Scouts of America

420 Fifth Avenue
New York, New York 10018
(212) 852-5720

Jeff Ellis and Associates, Inc.

3506 Spruce Park Circle
Kingwood, Texas 77345
(713) 360-0606

National Intramural and Recreational Sports Association (NIRSA)

850 SW 15th Street
Corvallis, Oregon 97333
(503) 737-2088

National Recreation and Park Association (NRPA) Aquatic Section

650 West Higgins Road
Hoffman Estates, Illinois 60195
(708) 843-7529

National Association of State Boating Law Administrators (NASBLA)

Box 11099
Lexington, Kentucky 40512-1009

National Safe Boating Council

2911 Russell Road
Ostrander, Ohio 43061
(614) 666-3009

National Water Safety Congress Administrative Services

1181 Shake Rag Road
Buckhead, Georgia 30625
(706) 342-3775

The Royal Life Saving Society Australia

P.O. Box 1567
North Sidney, NSW 2059
02-957-4799
FX 02-929-5726

The Royal Life Saving Society Canada

287 McArthur Ave.
Ottawa, Ontario
Canada K1L 6P3
(613) 746-5694

The Royal Life Saving Society UK
Mountbatten House
Studley
Warwickshire
B80 7NN United Kingdom
+ 0527 853943

U.S. Army Corps of Engineers
Safety Office
20 Massachusetts Avenue, NW
Washington, DC 20314-1000
(202) 761-8600

United States Coast Guard (USCG)
Commandant (G-NAB)
2100 Second Street, SW
Washington, DC 20593-0001

United States Coast Guard Auxiliary
3131 North Abingdon Street
Arlington, Virginia 22207

United States Lifesaving Association
P.O. Box 366
Huntington Beach, California 92648
www.usla.org

YMCA of the U.S.A.
101 North Wacker Drive
Chicago, Illinois 60606
1-800-872-9622

YWCA of the U.S.A.
726 Broadway
New York, New York 10003
(212) 614-2700

World Waterpark Association
P.O. Box 14826
Lenexa, Kansas 66285-4826
(913) 599-0300

Figure 1
California Beach Activity 1986–1999

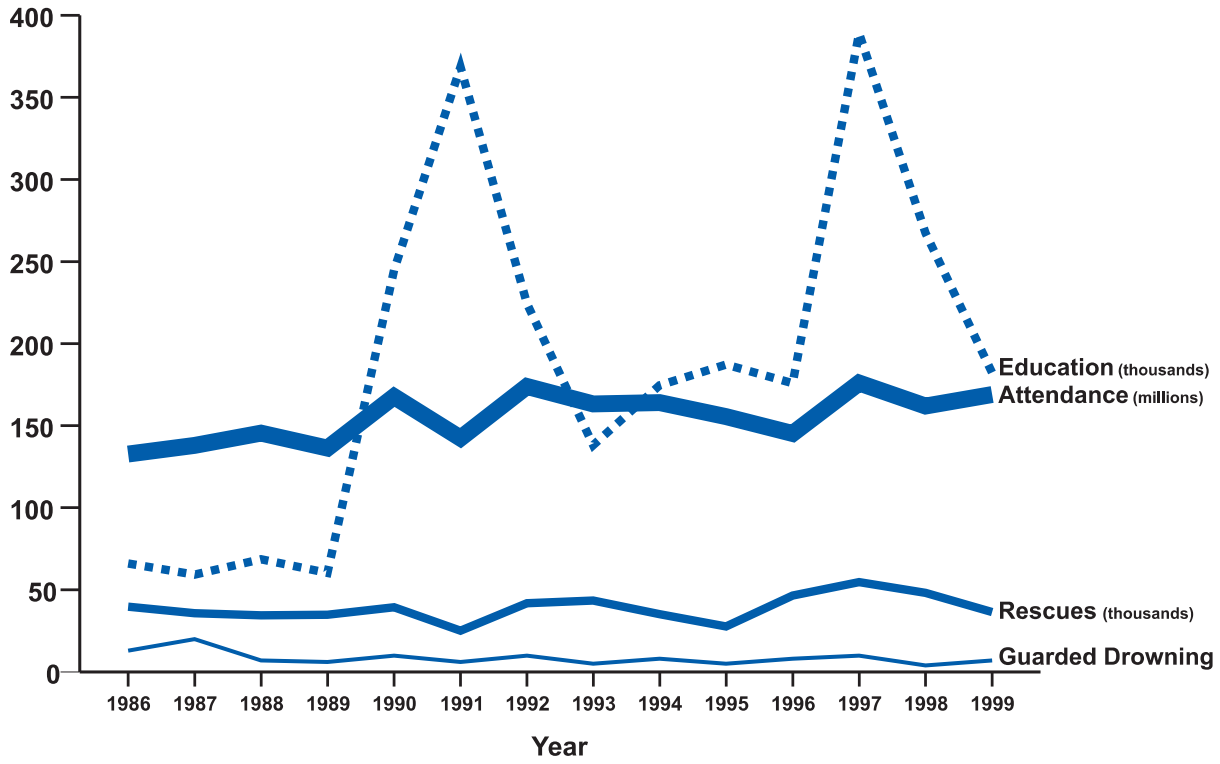


Table 1
Estimated Cost if Percent of 770,000 Reported Rescues in 1997
Had Not Been Made by Lifeguards*

Percentages:	1%	5%	10%	16%	20%	36%
Economic costs of deaths	\$609,130,000	\$3,045,650,000	\$6,091,295,000	\$9,746,072,000	\$12,182,590,000	\$21,928,662,000
Comprehensive costs of deaths	\$2,151,230,000	\$10,756,150,000	\$21,512,295,000	\$34,419,672,000	\$43,024,590,000	\$77,444,262,000
Economic costs of incapacitating injury	\$31,767,000	\$158,836,000	\$317,673,000	\$508,276,000	\$635,345,000	\$1,143,621,000
Comprehensive costs of incapacitating injury	\$106,405,000	\$532,000,000	\$1,064,050,000	\$1,702,478,000	\$2,128,100,000	\$3,830,576,000
Monthly costs of incapacitating injury**	\$4,163,700,000	\$20,818,350,000	\$41,636,700,000	\$66,618,720,000	\$83,273,400,000	\$149,892,120,000
Economic costs of nonincapacitating injury	\$10,718,000	\$53,588,000	\$107,176,000	\$171,482,000	\$214,352,000	\$385,833,000
Comprehensive costs of nonincapacitating injury	\$27,527,000	\$137,632,000	\$275,265,000	\$440,424,000	\$550,530,000	\$990,953,000

Source: USLA rescue data.

* Percentages represent assumed percent of deaths or injuries that would occur if rescues were not performed.

** \$15,000 per month, assumption of 30 years continued life = \$5,400,000

Table 2
Number of Preventive Actions, Events Requiring Rescues, Drownings, Injuries,
Costs and Estimated Savings for Every 10,000 Beach Patrons

Maximum Estimates:		Economic Cost	Comprehensive Cost
Preventive actions	97.4		
Number of rescues if no preventive action	35.0		
Number of (nonincapacitating) injuries if no rescues	12.6	\$175,450	\$450,600
Number of drownings if no rescues	5.6	\$4,431,640	\$15,650,960
Total Savings for each 10,000 Patrons		\$4,607,090	\$16,101,560
Minimum Estimates:		Economic Cost	Comprehensive Cost
Preventive actions	97.4		
Number of rescues if no preventives	4.9		
Number of (nonincapacitating) injuries if no rescues	0.73	\$10,150	\$26,080
Number of drownings if no rescues	0.25	\$192,350	\$679,300
Total Savings for each 10,000 Patrons		\$202,500	\$705,380

