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Estimations of rip current rescues and drowning in the United States

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April 13, 2004

Therese Pierce, W/OS21
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Dear Therese,

You have asked for an estimate of the number of lives lost annually due to rip currents. With the assistance of our statistician, Rick Gould, we have developed a figure that we consider a reasonable estimate based on available data.

The United States Lifesaving Association estimates that the annual number of deaths due to rip currents in the US exceeds 100.

This is a very difficult estimate to make since there is no national reporting system for rip current drowning deaths. Even if there were, many attempting to make such a determination would likely be unqualified to do so. Moreover, a significant number of drownings occur with no witnesses to detail the circumstances. In fact, there is no system in place in the US at present to categorize ocean drowning deaths versus inland drowning deaths. Thus, we are forced to make reasonable estimates based on less specific data.

It is important to note that the number of rip current drowning deaths which would otherwise occur each year is vastly reduced by the presence of lifeguards. For example, the San Diego Lifeguard Service was initiated in 1918 after 13 people died by drowning in one day in rip currents. Considering attendance at San Diego's beaches today, one can imagine that the tragedy might be increased exponentially.

The Centers for Disease Control and Prevention has estimated that at a minimum, if lifeguards were not on duty where they are today, then for every 40,000 beach visitors there would be one death by drowning and three nonincapacitating injuries.[1] Lifeguard agencies reporting to the United States Lifesaving Association estimated 205,780,834 beach visitors in 2003.[2] It appears that about 5% of these were at nonsurf beaches (where there are no rip currents). That leaves an estimated 195,491,793 surf beach visitors in that year. In the absence of lifeguards at these beaches and assuming the same

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attendance levels, the CDC estimates indicate that there would have been 4,887 deaths by drowning in 2003.

USLA has determined that over 80% of rescues at surf beaches are necessitated by distress in rip currents. This is based on a ten year sample (1990 – 1999) of beach agencies with surf which reported the primary cause of the rescues to USLA. The review determined that on average, approximately 82% of rescues were attributed to rip currents. Our statistician varied the sample for other ten year periods (1991-2000 and 1992-2001). The median result remained between 81% and 82%, with the low at 80.5%. Applying the 80% figure, we estimate that in 2003, in the absence of lifeguards *at the reporting surf beaches*, there would have been 3,910 drowning deaths due to rip currents. This does not include the many miles of unguarded beach in the US.

This estimate is necessarily made in the abstract. It seems reasonable to assume that if all of the nation's surf beaches were unprotected by lifeguards and high numbers of people were dying due to drowning, as these figures suggest, there would be far lower use of the nation's beaches. In fact, swimming in the surf would likely be viewed as a tremendously dangerous activity by many, thus discouraging this form of recreation, and lowering attendance from current figures. Lesser attendance would result in lower numbers of drowning deaths than these projections suggest. It also seems fair to imagine that beach related tourism, associated commerce, and the value of beachfront property would decline, perhaps dramatically. Indeed, one of the reasons Atlantic City, New Jersey hired the first surf beach lifeguards was that the drownings were casting a pall over the effort to promote tourism at this beach resort. Other communities followed, in part for similar reasons. Considering these factors it seems fair to state, as the CDC report indicates, that lifeguards have a significantly beneficial economic impact, as well as a critical public safety impact, particularly with respect to preventing drownings associated with rip currents.

Since there are lifeguards posted at many of the nation's beaches, particularly at highly attended beaches, death due to rip currents is vastly limited compared to what might otherwise be the case. Statistics gleaned by USLA have demonstrated that the chance of death by drowning in an area under the protection of lifeguards affiliated with USLA is 1 in 18 million. This number is calculated based on a 10 year average of annual, estimated beach attendance divided by average number of drowning deaths at guarded beaches, as reported to USLA by lifeguard agencies. (The raw statistics are available for review at www.usla.org.)

USLA statistician Rick Gould has determined that there were an average 60,380 rescues from drowning per year performed at surf beaches by lifeguards employed by agencies reporting to USLA over a ten year period ending in December 2002. Considering our determination that over 80% of these are attributable to distress due to rip currents, we have determined that at least 48,300 rescues per year are attributable to rip currents.

Since there is no national reporting system for rip current drowning deaths or even for deaths that occur in large bodies of water with surf (e.g. the ocean), we have been forced to develop our estimate of rip current drowning based on available studies and our own data. They are detailed as follows:

1. A study of 1995 data to determine where children die by drowning found that 4% of unintentional, non-boat-related drowning deaths of people in the US under the age of 20 occurred in seawater.[3] This data is skewed by the fact that 42% of the total number of drowning deaths was composed of children under the age of five, none of whom died by drowning in seawater. Conversely, 6.8% of those aged 5 – 19 died by drowning in seawater, with the percent increasing to 10% in the oldest age bracket. Considering that almost half of this study included a population with little exposure to seawater (those under 5), it seems reasonable to surmise, absent the availability of published studies, that significantly more than 4% of drowning deaths for the population as a whole occur in seawater. Indeed, 6% or more seems more likely. Not all seawater drownings, of course, occur at surf beaches. We would conservatively surmise that for the population at large, at least 4% of all drowning deaths occur at surf beaches.

   The Centers for Disease Control and Prevention reported that there were 4,350 unintentional drowning deaths in 1995 (the same year of the study), not including boat-related drowning deaths.[4] As previously explained, USLA postulates, based on rescue data, that over 80% of drowning deaths at surf beaches occur due to rip currents. Nevertheless, assuming that 4% of drownings at surf beaches is a conservative figure and multiplying the total number of non-boat-related drowning deaths times the total number of accidental drowning deaths and then the 80% figure yields a total of 139 drowning deaths in 1995 that could be estimated to have been caused by rip currents. The same approach could be applied to any year for which the CDC has reported drowning deaths.

2. A study of unintentional drownings in Los Angeles County covering the period 1976 to 1984 found that 17.1% for all ages occurred in the ocean.[5] While this information is dated and covers a community with high exposure to the ocean, it is mentioned as one of few studies on the issue.

3. A study of unintentional drownings in Pinellas County, Florida covering the period 1983 to 1987 found that 47% for all ages occurred in saltwater (other than canals).[6] While this information is dated and covers a community with high exposure to the ocean, it is mentioned as one of few studies on the issue. (Boat related drownings were included in this study and comprised 6% of all drowning deaths.)

4. Over the past 10 years, an average of 80 drowning deaths per year were reported nationally by surf lifeguard agencies affiliated with USLA to have occurred *within their jurisdictions* (mostly in unguarded areas). Applying the estimate that 80% of surf beach drowning deaths are caused by rip currents results in an average, estimated 64 rip current caused drowning deaths per year within the jurisdictions of these reporting agencies. Most of the nation's coastline however, is outside the jurisdiction of surf lifeguard agencies, and USLA statistics demonstrate that most drowning deaths within their jurisdictions occur in unguarded areas. Even within lifeguard jurisdictions, many lifeguard agencies provide services seasonally and off-season drowning deaths may not be reported to USLA. In the Pensacola area alone, for example, news reports indicate that there were 11 surf drownings in 2001, none of which were reported to USLA by a lifeguard agency or included in our database. The

Atlanta Constitution reported that in 2003, 23 people drowned in rip currents in a 100 mile section of the Florida Panhandle between Pensacola and Panama City.[7] Media accounts though, are hardly a conservative indicator. One study found that only 52% of drowning deaths in Washington State were reported in the newspaper.[8] It therefore seems reasonable to postulate that the actual number of drownings caused by rip currents nationally is at least double the 64 number or higher.

Finally, with respect to our estimate of over 100 drowning deaths annually which are associated with rip currents, this does not consider related problems that do not result in death. According to the CDC, for every child who dies by drowning, "… six receive emergency department care for near-drowning or non-fatal submersion injuries. Half of those seen in the emergency department require hospitalization (CDC 2002)."[9] Some of these injuries are debilitating, lifelong injuries or result in delayed death that may not ultimately be classified as being due to drowning. Thus, the number of injuries from drowning far outstrip the number of deaths related to drowning and the number of deaths are underreported.

If you have any questions or comments on this issue, please feel free to contact me or our statistician, Rick Gould. Rick can be reached at: 661-255-4978.

Sincerely,

B. Chris Brewster
President

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